Development of nutrition, healthy eating and food preparation guidelines for child and youth care centres in KwaZulu-Natal, South Africa

Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Food and Nutrition in the Department of Food and Nutrition: Consumer Sciences, Faculty of Applied Sciences at Durban University of Technology

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Development of nutrition, healthy eating and food preparation guidelines for child and youth care centres in KwaZulu-Natal, South Africa

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I, Mumsy Evidence Chibe, hereby declare that the work presented in this thesis has not been presented or previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree within any other tertiary institution.

Signature: _______ Date: 16 March 2023

DECLARATION IN RESPECT OF A DOCTORAL THESIS

I, Mumsy Evidence Chibe and my supervisors hereby declare that in respect of the following dissertation: Guidelines for child nutrition, healthy eating, and food preparation in Child and Youth Care Centres in KwaZulu-Natal, South Africa, as far as we know and can ascertain, no other similar thesis exists. All references as detailed in the thesis have been completed in terms of all personal communications engaged in and published works consulted.

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APPROVAL

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DEDICATION

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ABSTRACT

Background

Child and youth care workers (CYCWs) are human service professionals that have constant contact with the children and youth placed in child and youth care centres (CYCCs). Some CYCWs work with children are uneducated and under-empowered. Childhood and adolescence are critical stages in life when physical, social, cognitive, and behavioural development occur.

Methodologies and Results

The development of the child nutrition, food preparation, food safety, and healthy eating guidelines in this study was carried out in accordance with the FAO framework used for planning, implementing, and evaluating. Situational analyses of child and youth care workers were part of phase 1 of the project (CYCCs). Nine respondents (two child and youth care managers (CYCMs) and seven CYCWs) from the two CYCCs were chosen. Self-administration, one-on-one interviews with English-written interview questions that were translated into IsiZulu, weighing food to determine plate waste, and the collection and analysis of microbial samples for surfaces, hands, and water were all used to gather data. Thirty respondents responded to a second survey that was given out in the same CYCCs to determine the preferred learning materials. The outcomes of this phase improved the success of the primary study and helped design the guidelines. The results of this phase showed that all of the respondents had low levels of education, and some had no formal education. The respondents had a high level of work experience, with 44.4% having more than five years of experience in the CYCCs. Additionally, 100% of the respondents lacked training in food safety and hygiene. The observers noticed that food for the older children and adolescents was kept in the oven or stove for longer than 15 minutes before serving. None of the CYCCs had appropriate guidelines or procedures in place, nor did they have written and signed policies and procedures in place for receiving, storing, and serving food, as well as maintaining good hygiene and adhering to administrative practises. Despite a coliform count of 57 in the collected water samples, the CYCCs had access to water for drinking and cleaning utensils. According to the nutrition knowledge results, 88.9% of respondents did not understand the keys to healthy eating. When 77.9% of respondents suggested that starch should not be consumed in most meals, this revealed limited knowledge.

Respondents were also unaware of how much water they should drink each day, with 66.9% incorrectly reporting that six or fewer glasses were sufficient. The food served to the children and youths, which included uPhutu and beef served with potatoes, lacked the variety of nutrients recommended by the FBDGs. Guidelines were preferred by 46.7% of respondents. Meanwhile, a sizable proportion of respondents (83.3%) preferred the learning material with drawings, images, photographs, and words written in isiZulu.

The guidelines were developed based on the literature and phase one findings and presented to three subject matter experts for content validity. The experts received completed and language-edited guidelines. The guidelines' organisation and content were subjected to expert evaluation. They had two to three weeks to read and comment on the guidelines' content, organisation, structure, and overall aesthetic appeal. Reviews and comments were provided back to the researcher, who used them to update the guidelines based on advice from the experts. The guidelines were then revised, published, and translated.

In order to collect data in the two CYCCs from 18 participants (pre-) and 14 participants (post-) implementation in the same study site(s), the behaviour over time was assessed using a three-step approach (pre- implementation (phase three), implementation (phase four), and post-implementation (phase five). the participant's prior knowledge of the guidelines' subject matter (menu planning, nutritious recipes, nutritional guidelines, food handling, and preparation). A behavioural change technique was used in the post-implementation phase to evaluate knowledge change over a ten-month period (the implementation process). Zoom was used for the interviews with the CYCMs and CYCWs. The discussion for this interview was facilitated by a video, which was also recorded with the participants' knowledge and consent.

During the 10-month implementation period, participants were reminded once a week via phone and email to incorporate the guidelines into their day-to-day work activities and to ask clarification questions. Data from the pre-and post-implementation phases were transcribed and analysed using thematic analysis. Poor menu planning, failure to prepare nutritious recipes and follow nutritional guidelines due to limited funds, limited nutrition training, and limited knowledge of food handling, storage, and preparation were among the key findings that emerged from the pre-implementation of the guidelines.

Guidelines were reported to be useful in the post-implementation phase in terms of menu planning, food handling and preparation taking into account all food groups, handling of cutlery and cutlery, proper washing of hands, hair covering, and food storage. Menu planning, the development of nutritious recipes for children and youths, following nutritional guidelines, food handling and food preparation, sourcing of ingredients, food preparation equipment, and personnel required to prepare the food were reported as lessons learned from the guidelines.

Conclusion

Poor hygiene and food handling procedures among CYCWs were attributed to a lack of skills training or guidelines prior to implementing the newly developed guidelines. However, there was a positive impact from the developed guidelines' post-implementation phase, where the respondents were discovered to have improved menu planning abilities, nutritional guidelines awareness, and food-handling skills, and could allocate correct portion sizes. The proper implementation of the guidelines developed in this study could reduce the rate of malnutrition and foodborne infections caused by poor food handling and preparation.

Key Words: Child and Youth Care, Child and Youth Care Centres, Child and Youth Care Workers, Child and Youth Care Managers, Nutrition, Malnutrition, Food-borne Illnesses, Food Safety, Food Handling, and Preparation.

GLOSSARY

Adequate Intake (AI) is established when evidence is insufficient to develop an RDA and is set at a level assumed to ensure nutritional adequacy.

Balanced diet: A balanced diet includes at least one food item from each of five groups and fulfils all of a person's nutritional needs in terms of energy, protein, minerals, vitamins, and fibre required for the growth, development and maintenance of the body.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of their height in metres (kg/m^2).

Caregiver: A caregiver is anyone who cares for a child. Caregivers include grannies, aunts and other relatives who care for the child with the consent of the child's parents or guardian, a foster parent, someone offering temporary safe care, the head of a shelter or child and youth care centre, a child and youth care worker supporting children in the community, and a child (of 16 years and older) heading a child-headed household.

Child and youth care centre: A facility for the provision of residential care to more than six children outside the child's family environment in accordance with the residential care programme suited for children in the facility.

Child and youth care manager: A person who works in the living space of children and youth with both normal and special development needs to promote and facilitate optimum development through the planned use of everyday life events and programmes to facilitate their ability to function effectively within a different context.

Child and youth care worker is a person who works in the living space of children and adolescents with both normal and special development needs to promote and facilitate optimum development through the planned use of everyday life events and programmes to facilitate their ability to function effectively within a different context.

Child: The terms child and children refer to all children and young people from birth to 18 years of age, as specified in the UN Convention on the Rights of the Child.

Diet is the sum of food consumed. Food which provides a mixture of foods that include enough of all the essential nutrients required for living. It is also concerned with the eating patterns of the individual or a group. It may also be modified and used for medically ill persons as part of their therapy (therapeutic diets).

Dietary Reference Intake (DRI) is the general term for a set of reference values used to plan and assess the nutrient intakes of healthy people. These values vary by age and sex.

Food handler: A person who, in the course of his or her normal routine work on food premises, directly handles or comes into contact with packed or unpacked food, equipment, utensils, or food-contacted surfaces and is therefore expected to comply with food hygiene requirements.

Food hygiene otherwise known as Food Safety can be defined as handling, preparing and storing food or drink in a way that best reduces the risk of consumers becoming sick from food-borne diseases.

Foodborne diseases are caused by the contamination of food and occur at any stage of the food production, delivery and consumption chain. They can result from several forms of environmental contamination including pollution in water, soil or air, as well as unsafe food storage and processing.

Hands – for purposes of food handling and preparation, the forearm, or the part of the arm extending from the wrist to the elbow, is included in the definition.

Kilojoule (like a calorie) is a measure of energy in food. One kilojoule equals 1 000 Joules. In the International System of Units (SI), the universal unit of energy is the Joule (J).

Malnutrition is an abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes under nutrition and over nutrition as well as micronutrient deficiencies.

Nutrients are compounds in foods essential to life and health, providing us with energy, and are the building blocks for repair and growth, and the substances necessary to regulate chemical processes.

Nutrition is a fundamental pillar of human life, health and development across the entire life span.

Nutritional status: The physiological state of an individual that results from the relationship between nutrient intake and requirements and from the body's ability to digest, absorb and use these nutrients.

Obesity occurs when the body weight is above normal for height as a result of an excessive accumulation of fat. Obesity is defined as a BMI (kg/m2) of 30 or more.

Overweight occurs when the body weight is above normal for height as a result of an excessive accumulation of fat. It is usually a manifestation of over-nourishment. Overweight is defined as a BMI (kg/m2) of more than 25 but less than 30.

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.

Protein malnutrition: Insufficient intake of nitrogen-containing food (protein) to maintain a nitrogen balance or nitrogen equilibrium. Children are particularly prone to develop protein malnutrition. In order to grow, children have to consume enough nitrogen-containing food (protein) to maintain a positive nitrogen balance, whereas adults need only to be in nitrogen equilibrium.

Protein-energy malnutrition (PEM) applies to a group of related disorders that include marasmus, kwashiorkor (see the images below), and intermediate states of marasmus-kwashiorkor.

Recommended Dietary Allowance (RDA) is an average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%-98%) healthy people.

Tolerable Upper Intake Level (UL): The maximum daily intake unlikely to cause adverse health effects.

Undernutrition: The outcome of undernourishment and/or poor absorption, and/or the poor biological use of nutrients consumed as a result of repeated infectious disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted), and deficient in vitamins and minerals (micronutrient malnutrition).

ABBREVIATIONS

ACRWC	African Charter on the Rights and Welfare of the Child
AI	Adequate Intake
AIDS	Acquired Immunodeficiency Syndrome
BMI	Body Mass Index
BMR	Basal Metabolic Rate
BMZ	Federal Ministry for Economic Cooperation and Development
BQCC	Basic Qualification in Child Care
CDC	Centres for Disease Control and Prevention
CEFA	Continuing Education for Africa
CNDCs	Community and Nutrition Development Centres
COVID-19	Coronavirus Disease 2019
CRC	Convention on the Rights of the Child
CYC	Child and Youth Care
CYCCs	Child and Youth Care Centres
CYCWs	Child and Youth Care Workers
DoA	Department of Agriculture
DoH	Department of Health
DRC	Democratic Republic of Congo
DRIs	Dietary Reference Intakes
DSD	Department of Social Development
DTI	Department of Trade and Industry
DUT	Durban University of Technology
EER	Estimated Energy Requirements
EHPs	Environmental Health Practitioners
FAO	Food and Agriculture Organization
FBDGs	Food-based Dietary Guidelines
FIFO	First In, First Out
FSMA	Food Safety Modernisation Act
GAIN	Global Alliance for Improved Nutrition
HHS	US Department of Health and Human Services
HIV	Human Immunodeficiency Virus

HQCC	Higher Qualification in Child and Youth Care
HWSETA	Health and Welfare Sector Education and Training Authority
IDD	Iodine Deficiency Disorder
IFRC	International Federation of Red Cross Crescent Societies
IFSS	Integrated Food Security Strategy
IM	Integrated Models
INEP	Integrated Nutrition Education Programme
INP	Integrated Nutrition Programme
IOM	Institute of Medicine
IREC	Institutional Research Ethics Committee
kJ	Kilojoules
KZN	KwaZulu-Natal
MoH	Ministry of Health
MRC	Mackay Regional Council
NACCW	National Association of Child Care Workers
NCD	Non-Communicable Disease
NDDIC	National Digestive Diseases Information Clearinghouse
NEP	Nutrition Education Programme
NHI	National Health Institute
NHMRC	National Health and Medical Research Council
NICD	National Institute for Communicable Diseases
NICDAM	National Institute for Community Development and Management
NIH	National Institute of Health
NKQ	Nutrition Knowledge Questionnaire
NPO	Non-Profit Organisation
NRC	National Research Council
NSNP	National Schools Nutrition Programme
NTP	Nutrition Therapeutic Programme
PEM	Protein Energy Malnutrition
PVM	Protein, Vitamin and Mineral
RDA	Recommended Dietary Allowance
RDP	Reconstruction and Development Programme
SA	South Africa

SABS	South African Bureau of Standards
SADC	South African Development Community
SAQA	South African Qualifications Authority
STATSSA	Statistics South Africa
UN	United Nations
UNICEF	United Nations Children's Fund
UNISA	University of South Africa
USA	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WCSCF	Western Cape Street Children's Forum
WFP	World Food Programme
WHO	World Health Organization

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CHAPTER 1 - THE PROBLEM AND ITS SETTING: CHILD AND YOUTH CARE CENTRES

1.1 INTRODUCTION

This chapter outlines the scope of the study including the background, context of the research, problem statement, aims and objectives, as well as the significance of the study. Details regarding the conceptual framework and the chapter outline are also provided in this chapter.

1.2 BACKGROUND OF THE STUDY

Every day millions of children are denied their fundamental right to safety and security, according to the United Nations Children's Fund (UNICEF) (2021: para 1, line 1). Literature suggests that out of the 2.2 billion children aged between 0-18 in the world, 73.7 million live in the United States of America (USA), over 400 million live in Africa, and South Africa (SA) accounts for 19.7 million (Britto 2017: 9; Hall and Sambu 2019: 132). Children are the most vulnerable and marginalised group in society (UNICEF 2020: para 2, lines 1-3). According to Statistics South Africa (Stats, S.A 2019: 7), a large number of children live in KwaZulu-Natal (KZN) (16.1%), Eastern Cape (EC) (14.6%), Mpumalanga (MP) (13.4%), and Free State (FS) (13%), with the lowest numbers in the Western Cape (WC) (5.9%), Limpopo (LP) (9.1%) and Gauteng (GP) (9.2%). In South Africa political violence, migration, forced removals, and urbanisation have impacted children's lives severely. In 1976 children's struggles became more noticeable when they were exposed to gross human rights violations (Allsopp and Thumbadoo 2002: para 2, line 2). A culture of violence and poverty, and a lack of resources have rigorously contributed to the exposure of children to exploitation. Most of these difficulties were aggravated by the transition into a globalised economy. The inequality between population groups, the gap between rich and poor, and the impact of the acquired immunodeficiency syndrome (AIDS) pandemic are some of the challenges affecting children (Zinyemba, Pavlova and Groot 2020: 36; Allsopp and Thumbadoo 2002: para 2, lines 3-6).

The South African Children’s Amendment Act 41 of 2007 describes a child as someone below 18 years of age. The Act is the one that governs social services for children, families, and Child and Youth Care Centres (CYCCs). The Act recommends that a child is supported,

and not abused or neglected as per the founding values of the South African democracy of "*Ubuntu*", which means dignity, equality, and advancement of human rights and freedom (Jamieson 2013: 18; Republic of South Africa 1996: 3). More than 1.5 million children have experienced the death of parents and live with grandparents or custodial grandparents or kin (Hillis, Unwin, Chen, Cluver, Sherr, Goldman, Ratmann, Donnelly, Bhatt, Villaveces and Butchart 2021: 399). Hall and Sambu (2019: 132-135) reported that about 2.8 million children have been orphaned by losing a mother (2.4%), father (7.4%), or both parents (7.6%). UNICEF (2017: para 1, lines 2-4) reported that out of the 140 million orphans globally, 52 million were living in Africa. Various studies have shown that disease, conflicts and natural disasters have significantly contributed to the increase in the number of orphans (Meintjes, Hall, Marera and Boulle 2009: 40; UNICEF 2011: 4-5; Salaam 2004: 3-4; Gulaid 2004: 7; Väyrynen 2023: 303).

A report by UNICEF (2017: 3-4) showed that HIV and AIDS have had the highest impact on number of orphans. A World Bank and UNICEF (2017: 3, 6) report indicated that poverty, livelihood insecurity, social illnesses, and disease pandemics continued to threaten children's education, healthcare and nutrition while exposing them to abuse, exploitation and neglect. Poverty is damaging to children and it affects the development of the body and mind. Half of sub-Saharan Africa and one in five children living in developing countries were growing up in extreme poverty in 2016 (Lake 2016: para 2, lines 1-2). Similarly, Du Plessis and Conley (2007: 58) and the American Psychological Association (2015: para 1, line 1) outlined that millions of children are faced with a shortage of clothing food, , and shelter as well as access to food, clothing, shelter, and basic needs.

Most orphaned, abused, abandoned or destitute children are reported to end up in various CYCCs, where professionals are trusted with the responsibility of raising and meeting the children's educational needs (Malatji and Dube 2017: 109; Vision Child & Youth Care Centre 2019: para 1, line 2). VanderVen (1991: para. 2 lines 1-2) described a Child and Youth Care (CYC) as a field that focuses on the lives of children and youth by assuring their development and growth. According to Petrowski, Cappa and Gross (2017: 394), official records from 140 countries reported that around 2.3 million children and youth were living in residential care globally (UNICEF 2017: Para 1, lines 1-2). Child and Youth Care Centres (CYCCs) were created in response to the socio-economic difficulties posed by urbanization and industrialisation (Pinkerton and Muhangi 2009: 57; Smith, Fulcher and Doran 2013: 192). A

CYCC is defined as a place that cares for six or more children separated from the household setting according to the CYC programmes for children (SA, Children's Amendment Act 41 of 2007: 191). The CYC programmes' mandate is to promote the social competencies and healthy development of children and youths by them participating in and using their environment, life experiences, and the development of therapeutic relationships (Thumbadoo 2011: 24).

1.3 THE CONTEXT OF THE RESEARCH

Developments in the field of Nutrition and Consumer Science have led to a renewed interest in child youth care centres and workers (Grobbelaar, Napier, and Oldewage-Theron 2013: 29-36; Grobbelaar, and Napier 2014: 1-7) while studies have focused on Food-Based Dietary Guidelines (Napier, Oldewage-Theron, and Grobbelaar 2018: 55-61; Napier, Grobbelaar, and Oldewage-Theron 2021: S1-S8; Faber and de Villiers 2021: i-ii). This study emanated from the findings of a study conducted by Grobbelaar and Napier (2014) on the need to improve the nutrition knowledge of Child Youth Care Workers. Drawing on responses from Child and Youth Care Workers (CYCWs), the authors investigated the profile, nutrition knowledge, and food safety and hygiene practices of CYCWs in residential care settings in order to guide the development of child nutrition, food preparation, food safety, and healthy eating guidelines. The overall findings of this study supported the development of comprehensive child nutrition, food preparation, food safety, and healthy eating guidelines for children in residential care facilities. It is in this context that this study established the need for (through conducting a pilot study) and developed the guidelines for CYCWs that contribute to safe food preparation and balanced meal presentation for children in CYCCs.

The National Association of Child Care Workers (NACCW) pioneered CYCW training programmes in South Africa in the 1980s. However, it was not until 1994 that the government made significant strides toward establishing a democratic society and caring for children (UNICEF South Africa 2014: 104). The health, education, safety and well-being of children were prioritised by calling for the provisioning of basic nutrition, shelter, healthcare and social services while protecting children from maltreatment, neglect, abuse and degradation as outlined in the SA Constitution (Abrahams and Matthews 2011: 3; Statutes of the Republic of South Africa Constitution Law 1996: 1255). In South Africa, the government and non-governmental organizations established 345 orphanages/CYCCs, employing 4,800

CYCWs in response to the 21 000 children and youth who were thought to be living in registered CYCCs (UNICEF 2011: 2; Mahery, Jamieson and Scott 2011: 15).

A study conducted by Swanzen and Jadrijevic (2014: 137) in Finland compared the role of CYCWs to the role of a parent considering, their intervention in helping children with their well-being and other daily life activities. The authors argued that children's physiological development and maturity levels required that caregivers be equipped to keep them safe. Along the same lines, the National Research Council (NRC) (2015: 89) stipulated that according to children's development theories, the state of mind of the child affects how they respond to people and the lessons they learn from them. The ecology system theory by Bronfenbrenner (1979) acknowledged that children's development is affected by their environment (Guy-Evans 2020: para. 2 lines 1-2).

Nahikian-Nelms (1997: 508-509) stated that care for children needs an understanding of the different phases of development and health which involves physical, social and emotional care and support. Therefore, there is a need for the incorporation of nutrition, food safety handling practices and preparation within the programmes offered to CYCWs. Unhealthy diets and poor nutrition are cited as the top risk factors for chronic diseases such as cardiovascular diseases, cancer, diabetes, and other obesity-related conditions in UNICEF (2018: para 5-6, lines 1-2) and WHO (2020: para 1, lines 1-2) reports. These reports further mention the effects of stunting and overweight or obesity amongst more than 155 million children globally. In addition, Vivas, Galaye, Aboset, Kumie, Berhane and Williams (2010: 73-79) stated that inadequate sanitary conditions and poor hygiene practices contribute to the development of infectious diseases (diseases that spread from one person to another). Several scholars in literature have agreed that nutrition skills can aid in the decrease of child undernutrition, which is globally accountable for most children’s deaths (Sunguya, Poude, Mlunde, Shakya, Urass, Jimba and Yasuoka 2013: 1-14; Black, Allen, Bhutta, Caulfield, De Onis, Ezzati, Mathers and Rivera 2008: 243, 260).

1.3.1 Role of Child and Youth Care Workers (CYCWs) and Programmes

Child and Youth Care Workers are human service workers on the front line and are in regular contact with the children and youth placed in the CYCCs (Thumbadoo 2013: 4). According to Barford and Welton (2010: 272), providing care in a residential (CYCC) setting is stressful and difficult. Thesen (2014: 3-4), noted that some CYCWs who work with children are

untrained and thus feel disempowered. Childhood and youth are life stages where physical, social, cognitive and behavioural variation takes place, hence it is important that CYCWs should be educated and informed about their roles and responsibilities, including being involved in the healthcare of children at risk (Barford and Whelton 2010: 284; Grobbelaar and Napier 2014: 6). Failure to practise good nutrition and proper food handling, preparation, and feeding practices when caring for children can result in them contracting foodborne illnesses and ultimately, malnourishment (Bailey and Hedlund 2012: 15; World Food Program 2015: para 2, lines 1-3; Vinck 2013: 5; Scott 2003: 280). This view corresponds with the WHO (2015: para 2, lines 1-3) report that stated that most foodborne diseases are associated with food preparation using unsafe water, poor hygiene practices, inadequate conditions in food production and storage, and low levels of literacy and education of the CYCWs. Tanaka (2017: 1) summed it all up by noting that nutrition is one of the fundamental components of a child's life.

The above requirements of CYCWs within the context of providing healthcare for children require a multidisciplinary approach which not only requires knowledge of acceptable practices within the child's mind but also knowledge about nutrition and food service. Hence, within the CYCWs' scope of work, attempts have been made to create interdisciplinary or trans-professional approaches which work with individuals, groups and communities (Anglin 1999: 146). Anglin (1999: 143, 146), further stated that training programmes had shifted towards combining knowledge, skills and professional development. Child and youth care workers (CYCWs) are recruited from diverse disciplines such as social work, education, public health, and community education. Yet, the number of qualified CYCWs remains limited, as some do not have formal education and rely on skills and knowledge obtained on the job (Bowie and Bronte-Tenkew 2006: 1; Thumbadoo 2011: 3). When the role of CYCWs was first introduced in SA in the 1980s, CYCWs did not need to have formal qualifications, as they were only expected to look after the children (Mabetoa 2013: 14). UNICEF (2019: para. 2-4, lines 1-5) reported that SA was a country that was at the forefront of pioneering child and youth care and its educational programmes, and hence skills development programmes should be treated as a national priority (Health and Welfare Sector Education and Training Authority (HWSETA) (2019: para. 1 and 2 lines 1-3). Most of the programmes were offered as a collaboration between government entities, educational institutions, and private training providers (2005: 22). Allsopp (2005: 22) reported that programmes for CYCWs' learning were developed in response to the diverse needs of the country. The Basic

Qualification in Child Care (BQCC) was the first training programme that was developed and used to train CYCWs in most of the South African metropolitan areas (Mabetoa 2013: 14). The National Association of Child Care Workers (NACCW) is a non-profit organization that provides professional training and infrastructure for healthy child and adolescent development, as well as raising the standard of care and treatment for at-risk children and teenagers (Allsopp 2005: 23). The organisation interacts and collaborates with colleges and other institutions to give non-accredited training and the South African Qualifications Authority (SAQA) recognized training for the betterment of child and youth care (Loffell, Allsopp, Atmore and Monson 2008: 48). A wide range of training for CYCWs is taking place worldwide in a community setting and other training programmes are more formally based in colleges and universities (Garfat and Fulcher 2013: 22). Meanwhile, Molepo and Delport (2015: 154-156) found that there were still some existing challenges in the field such as limited career growth and development, training, and promotional opportunities. Very few South African CYCWs were identified as having a tertiary qualification, with a significant number of them depending on the training from the NACCW and previous work experience (Grobbelaar and Napier 2014: 5). Core Literacy Training in Child Care, BQCC, Higher Qualification in Child and Youth Care (HQCC), and a degree in Child and Youth Care (CYC) were among the available learning opportunities offered in collaboration with the University of South Africa (UNISA) and the Durban University of Technology (DUT) (Allsopp 2005: 23; Mabetoa 2013: 14). Additional training for illiterate CYCWs was offered in the rural areas of SA in response to the need for childcare services (Assapp 2005: 24). The content of these courses included belonging, attachment, regulation, mastery of competencies, independence and empowerment, generosity, and the spirit of Ubuntu. Additional content included child and youth care policy and principles, perceptive and life-space work, reclaiming the environment, self-awareness, teamwork, strength-based work, creativity, values, spirituality, and cultural sensitivity (Western Cape Street Children's Forum (WCSCF) 2015: 5; Jamieson 2013: 7; South Africa, Department of Social Development (DSD) 2013: 78; Civil Society Challenge Fund (CSCF) 2015: 9).

A Western Cape Street Children's Forum (WCSCF) (2015: 5) report revealed that CYCWs were facing ongoing obstacles affecting the completion of capacity-building programmes offered within the sector. Nahikian-Nelms (1997: 508-509) stated that care for children needs an understanding of the different phases of development, and therapeutic and health care which involves physical, social, and emotional care and support. Therefore, there is a need

for the incorporation of nutrition, food safety handling practices and preparation within the programmes offered to CYCWs. Unhealthy diet and poor nutrition were cited as the top risk factors for chronic diseases such as cardiovascular diseases, cancer, diabetes, and other obesity-related conditions in UNICEF (2018: para 5-6, lines 1-2) and WHO (2020: para 1, lines 1-2) reports. These reports further mentioned the effects of stunting and overweight or obesity amongst more than 155 million children globally. Vivas, Galaye, Aboset, Kumie, Berhane, and Williams (2010: 73-79) stated that inadequate sanitary conditions and poor hygiene practices contributed to the development of infectious diseases (diseases that spread from one person to another). Several scholars in literature agreed that nutrition skills can aid in the decrease of child undernutrition which is globally accountable for most children's deaths (Sunguya, Poude, Mlunde, Shakya, Urass, Jimba and Yasuoka 2013: 1-14; Black, Allen, Bhutta, Caulfield, de Onis, Ezzati, Mathers, Rivera and Group MaCUS 2008: 243, 260).

According to Swanzen and Jadrijevic (2014: 139), worker competency is critical in the field of CYCWs in implementing excellent safety practices and providing quality care. The competency challenge in the area of CYC work in SA is evident in the limited institutions that provide the related programmes. It is important to note that the qualifications in CYC outlined in the table below do not offer subjects on menu planning or nutritious recipes suitable for children aged between 5 to 18 years of age. Additionally, they do not offer nutrition guidelines for children, and/or safe food handling practices and preparation or other nutrition-related matters. This is the case even though the National Child Care and Protection Policy document of 2019 outlines that children should receive nutrition support (SA, DSD 2019: 23).

Table 1.1: Community and formal Child and Youth Care (CYC) qualifications offered in South African Colleges and Universities

Qualification	Institution	NQF Level/ Year/s	Major Subjects
Community-level qualifications			
Isibindi	South Africa's National Association of Child Care Workers (NACCW)	Non-accredited	- Delivery of child and youth care services in communities - Creating safe and caring communities in the context of HIV and AIDS - Community development - Child rights framework - Family preservation - Developmental assessment - Risk management - Accountability mechanisms – supervision, team meetings, consultancy & recording forms and formats
College-level qualifications			
Westhill Health and Welfare College	Community Health Work	4	- Fundamentals of child and youth care, Basic communication skills, Support, and caring skills, Professional and personal competence, Developmental and therapeutic work
Child and Youth Care Work	Continuing Education for Africa (CEFA)	4	- Practical experience and community-based learning equip people for their role as auxiliary child and youth care workers.
Child and Youth Care Work (accredited by HWSETA)	St John College, South Africa	4	- Care and development of the young person, knowledge of work that is consistent with the ethics of the field and workplace. - Online and consultative supervision and their role in the provision of care and own personal development. - Recognise the rights of young people, and promote these in their practice.
Further Education and Training Certificate in Child and Youth Care Work	Rostec College of Health Science, South Africa	1 year	- The programme offers skills-oriented training, equipped with an approach for supporting children and adolescents and their families on matters of handling personal and day-to-day living challenges
Child and Youth Care Work	NACCW Providers		- Not listed
Further Education and Training Certificate in Child and Youth Care Work	NACOSA Training Institute	18 months	- Based on practical experience and community-based learning for the auxiliary child and youth care worker, especially those who have been practising in the field without formal recognition.

Table 1.1: Continued

Qualification	Institution	NQF Level/ Year/s	Major subjects
Child and Youth Care	Luther Varsity in Southern Africa	4	- Communicate with and on behalf of young persons at risk for developmental and therapeutic ends. - Develop professional and personal competence in auxiliary child and youth care work. - Participate in development assessments of children and youth at risk - Provide support for children and youth at risk
Further Education and Training Certificate (FETC) for CYCWs	South African Private Empirical Academy	1 year	- Fundamentals of child and youth care work - Developmental theories in child and youth care - Child and youth care work practice - Interpersonal skills in child and youth care.
University-level qualifications			
Diploma to a Bachelor's degree in Child and Youth Care	The DUT	3-4 years	- Legal and ethical framework child rights. - Methodologies of child and youth care work - care, relationship, life-space work, milieu therapy, group approaches, creativity, and activity-based approaches - Teamwork - Domains of development (physical, social, emotional, cognitive, spiritual).
Master's degree Specialist CYCW	University of South Africa (UNISA)	2 years	- Child, Youth, Family Care, and Related Legislation
Diploma to Masters in Child and Youth Care and Youth Work	UNISA	3-4 years	- Child, Youth, Family Care, and Related Legislation
Bachelor of Child and Youth Care	The Independent Institute of Education (formerly Monash University)	3-4 years	- Child and youth development in South Africa: A person-in-environment perspective - Child and youth development: A five-level developmental model - Child and youth assessment: Risk and protective factors, signs, and symptoms - Child and youth interventions: Individual, group, and community interventions
PhD Specialist CYCW	University of Pretoria	3 years	- Child and youth care: challenges and coping strategies

Adapted from Molepo and Delport (2015: 158).

1.3.2 Nutritional Knowledge and Education of CYCWs

Knowledge regarding nutrition influences the nutritional status and behaviours of individuals families, and communities. Two forms of knowledge on nutrition are usually declarative and formal knowledge. Declarative knowledge focuses on the awareness of things and processes,

for example, lemon as a good source of vitamin C, while formal knowledge focuses on doing things, such as choosing a low-salt package of soup; nutritional knowledge is mostly considered to be declarative knowledge (Worsley 2002: S579). The study conducted by Grobbelaar and Napier (2014: 6) in Durban, South Africa found that CYCWs and caregivers had poor nutritional awareness. Nutritional awareness of caregivers or families affectsthe nutritional status of children under their care, which ultimately affects their academic success (Agbozo, Colecraft and Ellahi 2016: 569-579; Bello and Pillay 2019: 2). There is consensus among scholars that nutrition education plays a part in improving dietary awareness (Kupolati, MacIntyre, Gericke and Becker 2019: 6; Coppoolse, Seidell and Dijkstra 2020: 6).

1.3.3 Child and Youth Care Facilities

In South Africa, secure care centres are known as CYCCs, and the legal jurisdiction, authority, and management of these facilities is governed by the Child Justice Act and the Probation Services Act. As a result, the government's mandate is to provide safe residential institutions as an alternate type of care for children in need of support and protection. These CYCC institutions must provide high-quality care and development programmes that are accessible, inclusive and centred on the needs of children. In order to fulfil this role, the South African government regulated the registration of CYCCs (SA, DSD 2019: 58). Child and youth care centres (CYCC) are identified as places of residence for children and youths. Children and young people are placed in the CYCCs for various reasons, including the absence of parents to care for them or their decision to leave home and live on the streets (Dawes 2009: 21). The goal of CYCCs is to provide diverse programmes for holistically growing children based on their specific therapeutic and developmental requirements as indicated in their thorough evaluation, care plan, and individual development plan (SA, DSD 2019: 58). Schmid (2006:121) mentioned that children face different challenges as a result of a fractured family system which resulted in CYCCs being developed to serve children most vulnerable to HIV and AIDS, and hunger and abuse in a home-type setting. Child and Youth Care Centres in South Africa are governed by the Children's Act 38 of 2005 which mandates the registration of CYCCs with the provincial social welfare department (Centre for Child Law 2012: 6; Jamieson 2013: 67-68). In line with the Children's Act 38 of 2005, services for CYCCs must focus on the development and recovery necessities of children and adolescents (Jamieson 2013: 17).

Jamieson (2013: 67) cited the programmes regulated by the Children's Act as those presented below:

- The reception, care and development of children who are separated from their families or who are shared with a parent or other people who have parental duties towards the child.
- Receiving and providing temporary safe care for children in the following situations:
  - Children awaiting a placement decision;
  - Children who are victims of trafficking or commercial sexual exploitation;
  - Children needing protection from abuse or neglect or;
  - Children under observation and/or assessment, or requiring counselling and/or other treatment, or assistance in reconnecting with their families and communities.

A framework for reporting on service provision in the CYCCs was developed as part of the monitoring process. Monthly, quarterly and in-year monitoring reports are also completed and sent to the DSD as part of the monitoring procedure (DSD 2021: 127).

1.3.4 Children and young people at CYCCs

All children in South Africa, according to the 2019 National Child Care and Protection Policy, must live in healthy and nurturing families, communities and societies that allow and support their survival, growth to their full potential, and protection from violence, abuse, neglect, and exploitation. The policy also states that all vulnerable children whose development and safety are jeopardized due to their personal, social, and economic circumstances, or who are victims of violence, abuse, neglect, or exploitation, must be provided with the additional care, security, assistance, and services they require to reach their full potential (SA, DSD 2019: 34). The South African government promotes a CYCC as a facility that offers care for six or more children who are not living with their biological families. Section 191(2) of the SA Children's Act provides for services available in a CYCC (South Africa Republic 2018: 71; Jamieson 2013: 9).

Under Act 38 of 2005, CYCCs are expected to provide the below-mentioned services (Jamieson 2013: 67-68; Union 2020: 3):

- The reception, care, and development of children separated from their family environment or living on a shared basis with the parent or other person with parental responsibilities;
- The reception and temporary safe care of children awaiting decisions about their placement, or who are victims of trafficking or commercial sexual exploitation;
- The CYCCs are also regulated to protect children from abuse or neglect, observe and assess children and provide them with counselling or other treatments, or reconnect the children with families or communities;
- Child and youth care centres must also provide reception, development and secure care for children awaiting trial or sentence;
- Additionally, CYCC programmes include early childhood development, the reception and care of street children, providing the appropriate care and development for children with disabilities or illnesses, therapeutic and development programmes;
- The programmes also include treating children with addictions or treating children with psychiatric conditions, and transformational programmes for assisting children after leaving the centre after the age of 18 years.

1.3.5 The CYCWs caring for children and youth in CYCCs

The National Aids Convention of South Africa (Nacosa) (2016: 1) explains the function of CYCs as being part of the wider transition to a social welfare growth paradigm and equal service delivery which requires a wide and diversified workforce. Child and Youth Care research is known to be part of the larger shift to a model of development in social security and equitable provision of services. The delivery of these programmes still requires a broad and diverse workforce. A study by Thurman, Yu and Taylor (2009: para 1, lines 1-4) and Jamieson (2013: 13) reported that the initial introduction of CYCWs was to provide care for children in residential facilities. Primary care duties include food preparation and monitoring food safety, nutrition and hygiene practices. However, there seems to be a challenge in that the training provided for CYCWs only covers the child's and youth's cognitive, emotional, physical, spiritual, and social needs (Jamieson 2013: 1).

In past years, the CYCW's role has expanded to include households and the CYCC space. (Thurman, Yu and Taylor 2009: 8,12; and Jamieson 2013: 1). Thurman, Yu and Taylor (2009: 12) further reported that CYCW’s responsibilities included the provision of services

such as social grant applications, collecting required records, coordinating counselling, medical supervision, health education, and health and social services referrals, assisting with basic household tasks, and offering general hygiene lessons, gardening, and nutrition. Likewise, Jamieson (2013: 40) identified another role of CYCWs; that is to identify children suspected of being intentionally abandoned at home, or being physically or sexually abused, and report such cases to the appropriate child protection department, local DSD, or police officer.

1.3.6 The budget allocated for CYCCs

The Department of Social Development (DSD) is a government social service organisation authorized to fund and supervise child and youth care centres and to build the capability of social service professionals in South Africa. A large number of children’s social welfare services including those of the CYCCs are provided by Non-Profit Organisations (NPOs). These NPOs are partially funded by the provincial departments of social development and partially funded by national and international donors. There is not much information on how much the nine provincial departments of social development are allocated to provide these services. Proudlock (2014: 3) observed that this information is not easily accessed within the provincial budgets as children’s social services are spread across a number of different budget sub-programmes. However, information last updated in 2012/13 shows that the nine provincial departments combined were allocated approximately R4.4 billion for Children’s Act services (Proudlock, 2014: 3). The Children's Act of South Africa calls for CYCCs to be available in all provinces. This highlights the fact that the children in the CYCCs are placed there by the courts which are the authorities of the state and exist in all the provinces of South Africa. The government of South Africa funds the CYCCs of all the provinces with the CYCCs receiving a monthly subsidy per child and youth even though the amount received is reported by the International Budget Partnership (IBP) of South Africa and UNICEF (2016: 4) as not standardised across the provinces. Evidence indicates that in 2015/16, the five provinces were provided with monthly subsidies ranging from R1 700 to R2 650 per month. A subsidy in the Northern Cape was 35% higher than in the Western Cape. While the amount allocated to the Western Cape was reported to be the highest in the country, it was less than half of the average figure reported by KPMG in 2013 as the core cost per child at a children's home. In the meantime, Northern Cape subsidies have remained static since 2013/14 even though they were lower than the other provinces. In the Western Cape, subsidies for shelters, which are a type of CYCC, were the same as for children's homes. Child and Youth Care

Centres (CYCCs), other than children's homes in KZN, were allocated only R63 per child per month, compared to R2372 charged to children's homes (International Budget Partnership (IBP) South Africa and UNICEF 2016: 7). According to a report published by the Department of Social Development in 2021, the budget has been increased, with CYCCs receiving roughly R4000 per child per month (Qabathe 2021: 15). In an e-mail communication of the 10 March 2022, the manager of St. Theresa's Child and Youth Care Centre stated that the amount caters for all the children's needs including groceries, meals, medical expenses, utility bills, stationery, excursions, school uniforms and clothing (Maduray 2022).

1.3.7 Food service and nutrition in CYCCs

Regulation 73 on Children's Rights in CYCCs stipulates that every child placed or cared for in the CYCC has the right to nutrition, clothing and nurturing (Jamieson 2013: 71). Child and Youth Care Centres (CYCCs) provide nutrition, shelter, clothes, supervision, developmental programmes, rehabilitation, special needs programmes, and therapeutic and educational programmes (Jamieson, 2013:72). Deriving its core mandate from the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), in Section 28(1) of the Constitution, the Department of Social Development sets out the rights of children regarding appropriate care, basic nutrition, shelter, health care, social services and detention. Although the DSD depends upon the CYCCs to provide residential care to children, no updated data were found on the DSD website that indicated the nutritional status and food consumption patterns of children in CYCCs. The development of policies and legislation such as the White Paper on Families in South Africa (2013), the South African Department of Health's report on Early Childhood Development (2016), and the National Food and Nutrition Security Plan for South Africa 2018-2023 provided better guidelines that promote nutrition and food services. In CYCCs children need to receive adequate nutrition (Centre for Child Law 2012: 16). Nutrition given to children in childcare plays a critical role in their development as well as in developing future eating habits. The CYCC menu must meet the child's daily nutritional needs. Children should consume or be served a variety of foods such as vegetables, fruit, cereals, lean meat, fish, chicken, milk, yoghurt and cheese. Children should be fed and encouraged during the day to drink water and milk. In childcare centres, candy or sweet foods such as cookies, biscuits, lollies and chocolate should not be served daily (US, Health and Human Services Department 2020: 1).

1.3.8 Guidelines relating to nutrition for children in CYCCs

Deputy Minister of Social Development Bogopane-Zulu in the strategic plan 2020-2025 notes that poverty and inequality continue to ravage communities as it is experienced through multi-deprivation and vulnerabilities, which include poor nutrition, unemployment, poor education, and poor health outcomes (SA. DSD Strategic plan 2020-2025). Despite the fact that this plan seems appealing, there is no updated information from the Department of Social Development regarding the promotion of better nutrition and health patterns, particularly in CYCCs. Nevertheless, some guidelines deal with Early Childhood Development services interventions aimed at parents and/or primary caregivers and community-based services (SA, DSD 2006: 2). The guidelines refer to important core aspects in the early childhood phase of life such as nutrition, health care, environmental safety, and early education and learning. It remains, however, the role and mandate of the other departments to provide guidance and information on their contributions and mandates towards young children through policies, guidelines and other methods of communication (SA, DSD 2006: 2). Several attempts have been made to promote child and youth nutrition by the Department of Health which has published clear Nutrition Guidelines for Early Childhood Development Centres (SA, DoH 2016). The South African Department of Health released information similar to Schoenfeld's (2017: 5), asserting that eating nutritious food is an important part of keeping children safe and preventing diseases, as they are the most vulnerable to malnutrition. Children require nutritious food to support their growing bodies because they cannot regulate their food sources. Furthermore, good nutrition is essential for children's healthy physical development and learning (SA, DoH 2016: 2, 21).

1.4 PROBLEM STATEMENT AND MOTIVATION OF THE STUDY

Numerous children and youths are burdened with neglect, abuse, emotional distress, family dysfunction, and failure in various parts of their lives. These problems are a consequence of social, emotional, or behavioural complications from the family, classroom and community (Rostec College of Health Science 2018: 1). About 2.3 million children are already living in CYCCs worldwide, which constitutes 45% of children and youths globally (Petrowski, Cappa and Gross 2017: 394; UNICEF 2011: 53). In South Africa, Chimange and Bond, (2020:1) noted that the number of children with a history of neglect and abuse residing in Child and Youth Care Facilities was estimated to be 21,000. Issues of HIV and AIDS, food insecurity, starvation, war and child labour practices are threats which continue to increase the vulnerability of children (Zaçe, Di Pietro, Caprini, de Waure and Walter Ricciardi 2020: 96;

UNAIDS and UNICEF 2004: 7). These children require therapeutical and emotional care and also physical care. Physical care entails shelter, warmth, clothing, nutritious food, physical exercise, a safe environment, and time and space to play (Ivy Prep Early Learning Academy 2019: para 2, lines 5-6).

Child Youth Care Workers (CYCWs) take on the responsibility to take care of these children after they are adopted into CYCCs. Hansungule (2018: 2) observed that CYCWs were not effectively performing their duties and this was partly attributed to a lack of formal training. At the same time, there were concerns, as cautioned by Molepo and Delport (2015: 156), that there were many obstacles relating to the CYCWs' training and professional development. Moreover, CYCWs handle food while being inexperienced in respect of hygiene, temperature control, contamination, cleaning and sanitation procedures (Webb and Morancie 2015: 261). Untrained food handlers exhibited inadequate hygiene habits (Al-Kandari, Al-abdeenand Sidhu 2019: 108). Child and youth care workers (CYCWs) who have never been trained on basic hygiene and food safety present a food safety risk because they lack fundamental knowledge and abilities related to food nutrition, handling and safety. Nzama and Napier (2017:80), conducted a study on the nutritional adequacy of menus offered to children of 2-5 years in registered childcare facilities in Inanda, KwaZulu-Natal province, South Africa. They found that menus served to 2-5-year-olds in these registered facilities were nutritionally inadequate as most Child Care Facilities (CCFs) did not meet 60% of the daily requirements for many nutrients from menus served. Despite the fact that their study targeted CYCCs with children aged 2−5 years and this study is targeting children at the age of 5−18 years, these findings provide the basis on which the challenges faced by children in care facilities can be addressed. So far in South Africa, local studies (Grobbelaar, Napier, and Oldewage-Theron 2013: 29-36; Grobbelaar and Napier 2014: 1-7; Napier, Oldewage-Theron, and Grobbelaar 2018: 55-61; and Napier, Grobbelaar, and Oldewage-Theron 2021: S1-S8) have revealed that the nutritional value of food consumed is a problem and the DSD is not actively addressing this problem through guidelines and training. Likewise, the CWCCs are not addressing this problem because hygiene and food safety are not being given enough attention by some CYCWs due to lack of training (Grobbelaar and Napier 2014: 3). In their study, it was reported that only a few CYCWs, mostly women aged between 18 and 34, were reported to have had successfully completed a suitable tertiary degree. The findings showed that the respondents' knowledge of basic nutritional principles was adequate, but there were several areas of concern. Some of the CYCWs were reported to be unaware of the existing certification programmes offered while

some were reluctant to take part in the training programmes because they are not compulsory. However, all these concerns provided the reasons why, in this study, guidelines on child nutrition, food preparation, food safety, and healthy eating for CYCWs needed to be developed and implemented. The gaps in the nutrition, hygiene, and food safety knowledge and behaviour of CYCWs were identified and tested.

The association between food safety and nutrition results in a vicious cycle of disease and malnutrition which negatively affects children's health (Fung, Wang and Menon 2018: 94). Foodborne illnesses are a main public health concern (Shonhiwa, Ntshoe, Essel, Thomas and McCarthy 2018: 3). In SA, outbreaks of foodborne disease were documented in provinces such as KwaZulu-Natal (KZN) (43.1%; n=141), Gauteng Province (GP) (19.3%; n=63), and Mpumalanga (MP) (12.2%; n=40) (Shonhiwa, Ntshoe, Essel, Thomas and McCarthy 2018: 3). In Africa many vulnerable groups such as children and people suffering from HIV and AIDS suffer more from the effects of foodborne illnesses (Mensah, Mwamakamba, Mohamed and Nsue-Milang 2012: 6319). Africa has the highest burden of foodborne diseases. Despite this, it appears that food safety is not a fundamental concern in many African countries (Bisholo, Ghuman and Haffejee 2018: 1).

1.5 AIM AND OBJECTIVES OF THE STUDY

1.5.1 Aim of the study

The purpose of this study was to determine the need for child nutrition, food preparation, food safety and healthy eating guidelines for CYCWs in CYCCs in KwaZulu-Natal. Healthy eating guidelines addressing child nutrition, menu planning, nutritious recipes suitable for children aged between 5 and 18 years of age, and safe food handling practices and preparation were addressed.

1.5.2 Objectives of the study

The study's objectives were set in order to achieve the study's goal of developing child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs which would contribute to safe food preparation and adequate meal presentation to children. The five phases of the study's objectives are depicted in Figure 1.1.

MAIN AIM OF THE STUDY

Assess the need, and develop and implement child nutrition, food preparation, food safety and healthy eating guidelines for CYCWs

OBJECTIVES - PHASES

Phase 1, Phase 2, Phase 3, Phase 4 and Phase 5

PHASE 1
Pilot study

- Determined the need for child nutrition, food preparation, food safety and healthy eating guidelines in CYCCs by assessing the demographic characteristics of the CYCCs using a demographic questionnaire to determine current material, physical, financial and human resources.
- Determining the food safety and hygiene practices of the CYCWs by using a food safety questionnaire and swabs analysis.
- Determining the management practices of the food service system (receiving, storage, preparation, and service) by means of a management questionnaire.
- Observing the food and safety practices of the CYCWs by using an observational checklist.
- Determining the portion sizes of the meals presented to the children using the weighed food record method
- Determining the nutrition knowledge of the CYCWs by using a nutritional knowledge questionnaire.

PHASE 2
Development

To use the findings of the pilot study (phase 1) and literature review to develop the child nutrition, food preparation, and food safety and healthy eating guidelines for CYCCs (phase 2).
- Test the information in the manual for content validity and refine the content by presenting it to three (3) experts in the field.- Finalize the food safety and healthy eating guidelines .

PHASE 3
Pre-implementation test

- Use focus groups to conduct a pre-implementation analysis of the methods currently employed in the preparation of nutritious food.
- Test the child nutrition, food preparation, and food safety guidelines for validity and usefulness in the CYCCs amongst the CYCWs to determine their understanding of the content outlined in the manual.

PHASE 4
Implementation

- Implement child nutrition, food preparation, and food safety guidelines for a period of 10 months
- Conduct weekly monitoring through telephone calls and email

PHASE 5
Post-Implementation

- To conduct a post-implementation online focus group with CYCWs to determine implementation challenges and use of the child nutrition, food preparation, and food safety guidelines gaps identified and assess what worked well.
- To determine the change in food safety and food preparation practice and child nutrition knowledge.
- To adopt and finalise the child nutrition, food preparation, and food safety guidelines for use in CYCC's.

Figure 1.1: The objectives and sub-objectives of the study

1.6 SIGNIFICANCE OF THE STUDY

The study is unique in that it is based on an exploratory examination of menu planning, nutritious recipes appropriate for children aged 5 to 18, nutrition standards for children, and safe food handling methods and preparation of the CYCWs in the CYCCs. The research contributes to proper menu planning, the preparation and serving of nutritious foods, as well as the safe handling and preparation of food. The researcher will lobby the DSD to adopt these child nutrition, food preparation, food safety, and healthy eating guidelines, which may be used to contribute to the development and training of CYCWs in order to offer safe and nutritious meals to children and youth in CYCCs. Although the study that has assisted in the development of child nutrition, food preparation, food safety, and healthy eating guidelines was undertaken in the KwaZulu-Natal region, the guidelines contain information that can be used in other SA provinces and elsewhere. The intention is to contribute to safe food preparation and adequate meal presentation to children and youth in CYCCs by providing information based on identified gaps in the knowledge and behaviour of CYCWs.

1.7 CONCEPTUAL FRAMEWORK OF THE STUDY

The thesis summary is shown in Figure 1.2. There is no separate methodology chapter mainly because of the nature of the study. Chapters detailing the study's completion process were presented with methodology, results, and discussions. These are chapters four (pilot phase), five (development phase), and six (implementation phase) (pre- and post-implementation phases). The conceptual framework of the study and the organization of the chapters are shown in Figure 1.2 below.

TITLE OF THE THESIS
Guidelines for child nutrition, healthy eating, and food preparation in Child and Youth Care Centres in KwaZulu-Natal, South Africa

CHAPTER 1: PROBLEM AND ITS SETTING
The chapter focuses on providing the background to the study. Thereafter, chapters give an in-depth description of the aim and objectives of the study. Formulation of the problem statement and Initial Literature Review

CHAPTER 2: LITERATURE REVIEW: A GENERAL OVERVIEW
Academic articles, books, and other studies are explored to gain in-depth insight into child nutrition, menu planning, nutritious recipes suitable for children aged between 5 and 18 years of age, nutrition guidelines for children, malnutrition in children, nutrition status of children, dietary needs of children, Food-Based Dietary Guidelines and nutrition education.

CHAPTER 3: CONCEPTUAL FRAMEWORK OF THE STUDY
Nutrition Education Programme (NEP) preparation, formulation, implementation, and evaluation of NEP.
Academic articles, books, and other studies are explored to gain in-depth insight into the development of child nutrition, food preparation, food safety, and healthy eat ingguidelines.

CHAPTER 4: PILOT - PHASE ONE OF THE STUDY
Methodology, Data collection, Data analysis, Results, and Discussion
This chapter presents a discussion of the research methodologies adopted to conduct the study. The results of the pilot study are presented and discussed and a conclusion is drawn.

Figure 1.2: Continued

Process	**Objectives of the study**	**Inclusion Criteria and Survey Instruments**	**Analysis of Pilot Study data**
Selection of participating CYCCs Contact the CYCCs Meeting the CYCCs' managers and staff Administration of the questionnaires	Determination of the situational analysis for the study group and assess the results questionnaire.	**<u>Inclusion Criteria</u>** **<u>CYCCs</u>** - Registered in terms of the Children's Act No. 38 of 2005 (section 197) under a relevant provincial Department of Social Development. - Permanently employed and long-term contracts **<u>CYCWs.</u>** - Children and Youth aged 5 to 18 years old. **<u>Survey Instruments</u>** - Food handlers questionnaire - Managers questionnaire. - Observational checklist. - Weighed food record method. - Nutritional knowledge questionnaire. - Swabs test (hands, surface, and water). - Preferred Learning Material in the CYCCs	**<u>Statistical Analysis Instruments</u>** SPSS: frequencies and percentages (descriptive statistics)
Analysis of data: Confirmation of the problem statement's applicability to the Child and Youth Care Workers			

CHAPTER 5: DEVELOPMENT PHASE TWO

The development of child nutrition, food preparation, food safety, and healthy eating guidelines for CYCCs

This chapter presents a discussion of the research methodologies that we adopted to conduct the study.

The results of the development phase are presented and a conclusion is drawn.

Phase 2 Developmental	**Objectives of the study**	**Inclusion Criteria**	**Exclusion criteria**
- **Identify the type, format, and structure of the guidelines.**	- Using pilot phase findings and literature to develop the guidelines.	- Pilot results Relevant literature Experts in the field of CYCC, nutrition, and community development. Language editor Graphic designer.	- Information that was not relevant to the field or old.

Figure 1.2: Continued

CHAPTER 6: PRE- (N=18)-IMPLEMENTATION AND POST- (N=14) IMPLEMENTATION (PHASES 3, 4 & 5)

Methodology, Data collection, Data analysis, Results, and Discussion

This chapter presents a discussion of the research methodologies that were adopted to conduct the study. The results for both pre- and post-implementation of the child nutrition, food preparation, food safety, and healthy eating guidelines are presented, discussed and a conclusion is drawn.

Pre-Implementation	Objectives of the study	Inclusion Criteria	Analysis of the Pre- and Post-implementation
Selection of sample group	- Organise and conduct online focus group - Provide the rationale for the selection of the group.	- CYCWs willing to participate in the study - Weekly follow-ups to encourage the use of child nutrition, food preparation, food safety, and healthy eating guidelines	- Step-by-step thematic analysis: - Step 1: Familiarising yourself with your data - Step 2: Generating initial codes - Step 3: Searching for themes - Step 4: Reviewing themes - Step 5: Defining and naming themes - Step 6: Producing the report - Reporting of themes that emerged across focus group interviews.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

Conclusions are drawn and recommendations for future research are offered.

Figure 1.2: The conceptual framework of the study and the organization of the chapters

1.8 CONCLUSION

The primary purpose of this chapter was to provide background information for the study. The chapter also examined the challenges that CYCWs face in CYCCs, such as nutrition training, food handling and preparation, and food safety measures. These fundamental factors served as the foundation for the research. Furthermore, the chapter included critical background information regarding children and youth in CYCCs, nutrition, adequate diet, food safety, and the role of CYCWs in providing services to children and youth in CYCCs. This information was utilized to create child nutrition, food preparation, food safety, and healthy eating guidelines, which were subsequently used to improve the research area. The study's goal and objectives were also discussed, and the presentation concluded with project structure and thesis layout summaries. The focus of the following chapter will be on malnutrition and the factors that contribute to it, the nutrition status of children, the nutrition needs of children and youth, and the nutrition status of children and youth in CYCCs.

CHAPTER 2 - LITERATURE: A GENERAL OVERVIEW

2.1 INTRODUCTION

The consequences of HIV and AIDS, physical or sexual abuse and abandonment have already resulted in a generation of disadvantaged children who struggle socially and economically, and who need special survival assistance *(*The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) 2018: 8; Stover, Bollinger, Walker and Monasch 2007: 21; Jamieson 2013: 32). Millions of these children are abandoned and need living conditions that sustain them (UNICEF 2010: para 2, line 1). Research by Humphreys and Fleck (2016: 312) revealed that most orphans lack access to treatment and grow up in large institutions or orphanages, whereas families or communities may be affected by severe poverty (Stover, Bollinger, Walker and Monasch 2007: 23). According to the SA Children's Act of 2005, most children and youths end up in CYCCs because they are mistreated, abandoned, orphaned, neglected, exploited, maltreated, or addicted to substances. A major issue is child abuse, which is one of the most serious issues in South Africa, with an estimated number of sexually assaulted children totalling more than 60 000 documented incidents (Artz, Ward, Leoschut, Kassanjee and Burton 2018: 791). The United Nations (UN) Child Rights Guidelines stipulate that every child and young person must live in a safe, secure, and caring environment that fosters their development. Furthermore, the guidelines state that when a child's biological family is unable to offer protection and proper care, or abandons the child, the government has a responsibility to defend the child's rights by ensuring security and care (UN 2019: 2-3).

2.2 CHILD MALNUTRITION: THE GLOBAL CONTEXT

The Covid-19 pandemic outbreak at the beginning of 2020 has been one of the challenges that has derailed the world's commitment to end all forms of world hunger and malnutrition by 2030 (WHO 2021: para 1, lines 1-3). Stunting, wasting, underweight, micronutrient deficiencies or inadequacies (lack of important vitamins and minerals), and being overweight are all examples of causes of malnutrition (WHO 2016: para 1, lines 1-4).

Malnutrition symptoms may be mild at first, but as they progress, they might increase to cause infections and weariness. Iron deficiency is one of the most common micronutrient deficiencies in the world (Astley and Finglas 2016: 4). Hunger and undernutrition, stunting, wasting, underweight and micronutrient deficiencies, are all part of the global malnutrition crisis, as are diet-related noncommunicable-diseases (NCDs) such as overweight, obesity, diabetes, cardiovascular disease and cancer, which affect every country in some way. Malnutrition statistics remain unacceptably high (Micha, Mannar, Afshin, Allemandi, Baker, Battersby, Bhutta, Chen, Corvalan, Di Cesare and Dolan 2020: 21). Malnutrition has been documented even in affluent countries such as the United States of America (USA), where more than 16 million children are said to be malnourished. According to the World Health Organization, nearly 5.9 million children died from malnutrition in 2015. (WHO 2017, para 3, lines 1–5). In 2017, just around a quarter of the world's 16.6 million children under the age of five received treatment for severe acute malnutrition, highlighting the critical need to address this unacceptable burden (Global Nutrition Report 2020: 16). According to the WHO, 149 million children worldwide were stunted (too short for their age), 45 million were wasted (extremely thin for their height), and 38.9 million were overweight or obese in 2020.

Meanwhile, malnutrition was responsible for 45% of all child deaths (WHO 2020: para 1, lines 3, 4). Yet, Asia (with 418 million undernourished people) and Africa (with more than one-third of its population being undernourished) accounted for more than half of the world's undernourished (282 million). In 2020, there were 46 million more people impacted by hunger in Africa, 57 million more in Asia, and 14 million more in Latin America and the Caribbean than in 2019 (FAO, IFAD, UNICEF, WFP and WHO. 2021: 7). According to UNICEF, malnourished people are trapped in a vicious cycle that begins at birth (low birth weight, anaemia), continues through childhood (stunted, wasted, or underweight children) and adolescence, and culminates in malnourished women of reproductive age giving birth to malnourished children, where the cycle repeats itself (2018: 3).

2.3 CHILD MALNUTRITION: THE AFRICAN CONTEXT

Conflict, and especially armed conflict, has resulted in large population displacements and severely restricted access to essential social services, resulting in historic levels of child malnutrition. The coronavirus pandemic exacerbated issues in already disadvantaged West

and Central African areas, such as the Sahel region, which includes Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal that were already experiencing food scarcity and malnutrition. These six countries were expected to have 4.5 million cases of acute malnutrition in 2020 before the COVID-19 epidemic. With rising insecurity and COVID-19, that figure has risen to about 5.4 million (UNICEF 2020: para 2, lines 1-4). Chronic malnutrition is the root cause of half of all childhood deaths in South Africa (UNICEF 2020: para 2, lines 3,4). Of note, Dawes, Borel-Saladin and Parker (2004: 178) acknowledged that malnutrition can negatively affect the cognitive development of a child. UNICEF (2019) linked income, poverty, physical vulnerability and abuse to malnutrition. Dr. Mariame Sylla of Unicef South Africa stated in a televised interview with Uveka Rangappa on the E-news channel on malnutrition that South Africa is dealing with three types of malnutrition − stunting, obesity and hidden hunger (Sylla 2019). Stunting (21.9%, or 149 million children) and wasting (7.3%, or 49 million children) affected children under the age of five worldwide in the year 2018, while 5.9%, or 40 million, children were overweight (UNICEF, WHO, International Bank for Reconstruction and Development/The World Bank 2019: 1).

2.4 FACTORS CONTRIBUTING TO MALNUTRITION

Malnutrition was described by UNICEF (1998: para 1, line 1) as a complex condition that can involve multiple overlapping deficiencies of protein, energy and micronutrients. Furthermore, UNICEF released a conceptual framework in 1997 to explain malnutrition in children. This framework was adopted in this study to provide the context of malnutrition in children, and the causes presented by UNICEF in the framework can also be applied to children living in Child and Youth Care facilities (Figure 2.1). Malnutrition is caused by a combination of sickness and insufficient nutritional intake, according to UNICEF (1997). Underlying factors include a lack of access to food, poor health facilities, a lack of clean water and sanitation, and a lack of child and mother care (UNICEF 1997: para 1, line 2).

According to Lung'aho (2017: 1) and the International Food Policy Research Institute (2017: 2), poor hygiene practices such as not washing hands with soap and water, can result in malnutrition. In thirty-four countries of the world, around two billion children are suffering from malnutrition. The findings further state that African governments spend an annual budget of approximately 16.5% of the gross domestic product on combating the effects of

poor nutrition. If action is not taken to reverse this trend by the year 2030, roughly 200 million children will be malnourished on the continent of Africa. These children will be considered to be malnourished when they do not consume or are not fed a sufficient diet or consume food that is too rich in both quantity (kilojoules) and quality (micro and macronutrients) (Bailey and Hedlund 2012: 15; World Food Program 2015: 2). Malnutrition advances when food consumed is not providing the right quantities of vitamins and minerals to meet regular dietary requirements (Rodriguez, Kang-Landsberg and Pillai 2015: 1). Dietary changes have resulted in an increase in child and adolescent obesity, which is cited as the leading cause of noncommunicable diseases (Sewpaul 2018: 1). Unfortunately, in situations of violence, social alienation and drug abuse, malnutrition is even more prevalent (Saunders and Smith 2010: 624). The causes of child malnutrition are depicted in figure 2.1 below (UNICEF 1997). 1997).

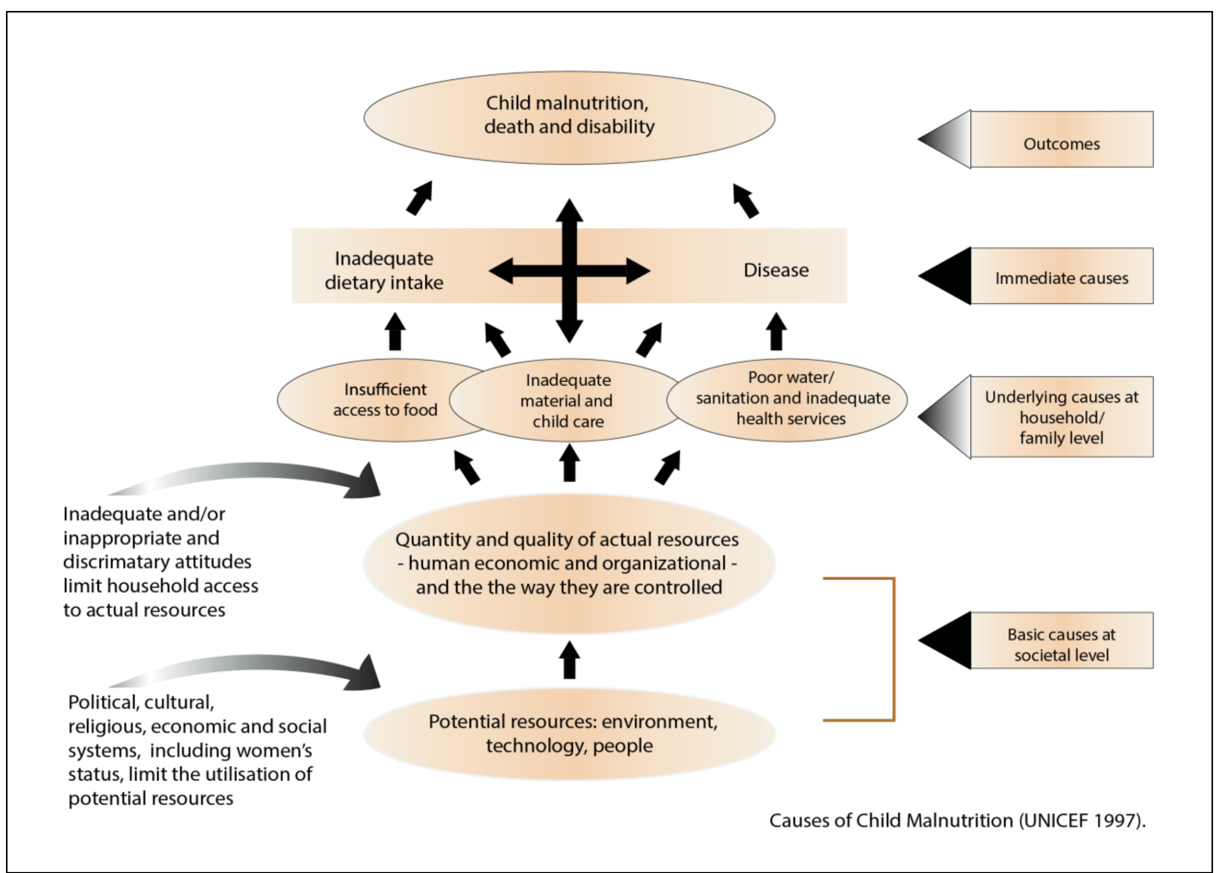

Figure 2.1: Causes of child malnutrition (UNICEF 1997)

The content of figure 2.1 will be discussed further below.

2.4.1 Basic causes of malnutrition

Politics, economics, legal issues, and ideology (including religion, culture and tradition) can all work against people's best efforts to eat healthily. These factors include, for example, the extent to which law and tradition protect women's and girls' rights, women's control over resources, political and economic institutions that determine how income and assets are distributed, and societal views and policies. Global food and fuel price increases have been felt all around the world (Ben Hassen and El Bilali 2022). Due to the harmful impact of these hikes on the poorest, tough decisions have had to be made. People’s already limited household budgets have not always been sufficient to cover their most basic needs, and growing global costs have added to the strain. Eating less food, skipping a meal, and eating a less diverse diet are all likely to have had an impact on their nutritional status during this time (Ersado 2022: 7; Fadilah and Romadona 2022: 157).

Cluster (2011: 10-11) goes on to add that the physical environment in which individuals live has a substantial impact on their nutritional health at the most fundamental level. Dietary consumption in children is heavily influenced by the environment. Parents, grandparents, peers, siblings, teachers and others play a vital role in the socio-cultural environment, for example, by modelling conduct, enforcing regulations, and expressing specific standards (Gubbels 2019: para 1, line 2). Chronic emergencies are common in areas with a difficult physical environment (such as frequent droughts, inconsistent rainfall, extreme temperatures, and so on). The economic, political, social and ideological context influences how available resources are used, distributed and consumed, as well as who benefits from the money generated by them. One of the primary causes of malnutrition is political discrimination based on religion, race or tribe. This can result in systemic marginalization and exclusion from readily available food and assistance. Systemic disparities are frequently exacerbated during times of crisis, resulting in minority groups' nutritional status rapidly deteriorating (Cluster 2011: 10-11).

In many circumstances, economic marginalization and poverty are also major drivers of malnutrition. The poorest sections of society are generally the most seriously affected in countries prone to disasters such as flooding because they reside in distant and poorly supplied locations where national rescue capabilities may be limited. Climate change has had a direct influence on the food and nutrition security of millions of people, undermining current efforts to prevent hunger. Climate change will have a negative impact on nutrition in many ways, including food security, the quality of food crops, the availability of safe drinking water as well as water for agricultural purposes and health, as diseases move to new locations. The effects of climate change on nutrition security should be properly recognized in strategies to respond to climate change through adaptation, mitigation, finance, technology and capacity building (United Nations System Standing Committee on Nutrition (UNSCN) 2010: 5).

2.4.2 Underlying causes

Malnutrition is caused by several issues that include three dominant factors, namely: a lack of food security, inadequate care and health services, and an unhealthy household environment, such as a lack of access to clean, safe water and sanitation (UNICEF 1997). The three categories are inextricably linked, and actions affecting one can have far-reaching consequences for the others. In order for a person to be adequately nourished, all three issues must be addressed. Culture, and available assets such as time, wealth, education, available land, and cattle, among others, all impact household decisions in these three areas. Vulnerable households' decisions are frequently a trade-off; for example, choosing to spend even the smallest amount of money available on agricultural supplies may leave money unavailable for health care (Mukaila, Falola, Akanbi, Egwue, Obetta and Onah 2022: 221).

2.4.2.1 Insufficient access to food

Food insufficiency is defined by Casey, Szeto, Lensing, Bogle, and Weber (2001: 514) as a deficiency in food consumption due to a lack of money or means to get enough food. Meanwhile, the right to food is guaranteed by the South African Constitution. "Everyone has the right to sufficient food and water," states Section 27(1) of the Constitution of the Republic of South Africa. Section (27) emphasizes that "within its available resources, the state must develop reasonable legislative initiatives and take other steps to facilitate the progressive

fulfilment of fundamental rights". Under the right to food, it states that food must be available, accessible and sufficient for everyone without discrimination. Meanwhile, the Department of Agriculture, Forestry and Fisheries (DAFF) is in charge of establishing agricultural policy and launching support programmes to assist SA in producing food and reducing food insecurity. The National Development Plan (NDP) and the global Sustainable Development Goals (SDGs) both depend on the implementation of the Food and Nutrition Security Policy: Reduce hunger, improve nutrition, and promote sustainable agriculture by 2030, according to Goal 2 of the Sustainable Development Goals (StatisticsSA 2019: 1).

2.4.2.2 Inadequate maternal and child care

The methods used to feed, nurture, care for, teach and guide the vulnerable, such as children, the elderly and the sick, are known as caring practices. Adults and society are both responsible for this. Both formal and informal systems of care may exist through institutional care and family networks. Cultural factors, as well as resources such as money, time and education, impact caring behaviours. The emphasis given to the care of vulnerable persons is heavily influenced by societal ideals. Caregiving practices are influenced by attitudes regarding modern healthcare, water sources and sanitation. Women's status, responsibilities, authority, and education, which may be culturally dependent, are integrally linked to care for vulnerable populations (Cluster 2011: 7). Furthermore, a poor social and care setting is characterized by poor child-feeding habits, poor home care for ill children, and poor health-care-seeking behaviour. Questions about breastfeeding, general feeding practices, home care, and clinic visits during the most recent episode of illness are frequently asked in nutrition surveys. However, that is not the only way to figure out how much of a role this group of underlying characteristics plays (Woodruff, Bornemisza, Checchi and Sondorp 2019: para 2, lines 1-3).

2.4.2.3 Poor water/sanitation and inadequate health services

A lack of safe, clean water, inadequate sanitation, and other factors contribute to an unhealthy household environment. According to research, young children's first foods are influenced by both a family's financial situation and cultural standards, and hence vary widely (Cluster 2011: 9). Unhygienic household and sanitation conditions are undesirable and infectious diseases are more likely to spread in such an environment. An unfavorable familial

environment may also play a role in the occurrence of disease (new cases). People's capacity to work is harmed as a result of sickness, and they spend more time caring for ailing family members (Cluster 2011: 8-9). According to FAO and WHO, children's nutritional status is strongly linked to their health and access to health services (1992: para 1-2, lines 1-11). Malnutrition is caused by a combination of factors, including a lack of proper nutritional intake and poor healthcare-seeking behaviours. Communicable disorders including diarrhoea, measles and malaria can also induce malnutrition. Diseases affect children's nutritional status in three ways (FAO and WHO 1992: para 1-2, lines 1-11):

- They increase the level of nutrients required by the body, both to fight the disease and to rebuild bodily reserves during recovery;
- They can reduce appetite and lead to a reduction in food intake at a time when the body requires more nutrients;
- They can result in food waste due to diarrhoea and vomiting.

Armed conflict also affects the family's food supply and hence the nutritional status of the children. This may increase disease vulnerability by increasing micronutrient deficits such as vitamin A, iron and zinc deficiency, and so on. Vitamin A deficiency, for instance, has been related to diarrhoea and respiratory illnesses. Vitamin A sufficiency reduces the severity of the infection, as well as the likelihood of recurrence and death. Conflict can and has significantly impacted healthcare services, as well as preventive efforts like immunization programmes and mother-and-child care, as well as other amenities (such as sanitation, water, and electricity delivery). By causing displacement and trauma, conflict increases the need for health care (FAO and WHO 1992: para 3, lines 1-3).

2.4.3 Immediate causes of malnutrition

Malnutrition is brought on by a lack of food and illness (UNICEF 2011: 6). Malnutrition is described as a mismatch between the number of nutrients absorbed from the diet and the number of nutrients required by the body, according to UNICEF (2011: 6). This occurs as a result of eating too little food or being sick, both of which raise the body's nutritional requirements, decrease appetite, or interfere with nutrient absorption from the gut. Hunger and infection commonly coincide in practice. Malnutrition increases the likelihood of disease, and infection increases the likelihood of malnutrition, producing a vicious cycle. A

malnourished child with a weakened immune system becomes unwell and starves, reducing his or her ability to fight illness and other diseases. The overwhelming number of deaths (mortality) during emergencies is caused by diarrhoeal diseases, acute respiratory infections, measles and malaria. These illnesses are usually linked to malnutrition. Infections and food have a range of interactions. The severity of the infection, as well as the degree of malnutrition, influence the interaction. HIV-positive individuals are particularly susceptible to infection from food (UNICEF 2011: 6-7).

2.4.3.1 Inadequate dietary intake

In the twenty-first century, malnutrition remains a silent crisis. Undernutrition is caused by a lack of nutrients in the diet, resulting in weight loss and slowed growth, manifested as wasting and/or stunting (UNICEF 2020: para 1, lines 1-2). According to Theron, Amissah, Kleynhans, Albertse and MacIntyre (2007: 388), malnutrition in young South African children is caused by poor food quality rather than a lack of food. Various social and economic elements, as well as food insufficiency levels, were revealed as important drivers of nutritional inadequacy in a study done in France (Mejean, Deschamps, Bellin-Lestienne, Oleko, Darmon, Serge and Katia 2010: 377). Meanwhile, it was shown that the implications of poor eating habits are particularly significant among children and adolescents with chronic rheumatic conditions. Chronic diseases have pro-oxidative effects, which can be reduced by adopting a healthy lifestyle and dietary habits (Caetano, Ortiz, Terreri, Sarni, Silva, Souza, and Hilário 2009: 514). Furthermore, according to Caetano *et al.* (2009: 514), insufficient eating habits, such as excessive protein and lipid intake paired with low micronutrient intake, may favour risk factors for cardiovascular illnesses such as dyslipidemia and homocysteine. According to Ochola and Masibo (2014: 24), the food diversity of school-aged children and adolescents from underdeveloped nations is quite low. Animal foods, fruits, and vegetables are consumed in small amounts, while calorie-dense processed meals are consumed in large quantities. In developing countries, the problem is often aggravated by the replacement of traditional foods with Western diets.

2.4.3.2 Disease and illness

Treatment of malnutrition is increasing the number of children and young people who survive, but far too few of them develop sufficiently. To solve the difficulties of the twenty-

first century, people must recognise the influence of factors such as urbanization and globalization on nutrition and place a greater emphasis on using both local and global food systems to enhance children's, youth's, and women's diets (UNICEF 2019: 15). In low- and middle-income countries, many boys and girls enter adolescence with stunting due to nutritional deficiencies and anaemia caused by insufficient food intake and frequent illnesses as children. Undernutrition affects their growth and development capacity, as well as increases the risk of intrauterine growth retardation in the foetuses of pregnant adolescent girls, enhancing the infant's risk of being obese and suffering noncommunicable diseases later in life (e.g., cardiovascular diseases and type 2 diabetes). At the same time, the proportion of overweight and obese young people worldwide is rising (Utkirzhonovna 2022: 18).

2.5 FACTORS AFFECTING A CHILD'S NUTRITIONAL STATUS

Low nutritional intake, contamination, a lack of proper health care, and inequitable food distribution within the home make children and adults prone to malnutrition in underdeveloped nations. In India, secondary data from the National Health and Family Survey (NFHS), which was conducted between 1992 and 2006, were examined. In order to investigate the determinants of the nutritional status in children under the age of five, the researchers used stunting, underweight, wasting and anaemia as indicators. Household conditions were found to be the most important predictors of undernutrition in this sample of children. The strongest predictive indicators for childhood undernutrition were maternal employment, maternal education, the family’s socioeconomic level, and geographic location. Joint households with grandparents, which tended to reduce the risk of malnutrition, and dietary intake by the children investigated (International Institute for Population Sciences (IIPS) 2007: 267) were also found to have a positive impact on the nutritional condition of the children. Children's dietary intake and eating behaviours have a strong and significant impact on their nutritional status, according to Chakraborty and Ghosh (2020: 92). Previous studies have linked the undernutrition phenomenon to low household income, low maternal education, and a lack of maternity care and follow-up (Amare, Negesse, Tsegaye, Assefa and Ayenie 2016: 5). Other studies have suggested that family size, a child's gender, immunization status, age, and a diarrhoeal episode are all variables (Gebre, Reddy, Mulugeta, Sedik and Kahssay 2019: 11). Birth order, the child's birth weight, breastfeeding, nutritional

diversity score, household wealth, and developmental delay have all been highlighted in studies as variables determining nutrition status (Adedokun and Yaya 2021: 8).

2.5.1 Food choices

Given the importance of dietary change in the general population, a greater understanding of the factors that drive food choices is essential (Verain, Bouwman, Galama and Reinders 2022). In a study conducted in the United States, participants were found to have poor information that did not enable them to make daily healthy meal choices. One cannot make sound decisions if one does not have the relevant knowledge (Popescu-Mitroi and Popescu-Mitroi 2022: 38; James 2004: 359). Of course, hunger is the fundamental incentive for eating, but our food choices are not only based on physiological or nutritional needs. Other factors that influence food preferences are:

- Biological determinants such as hunger, appetite, and taste
- Economic determinants such as cost, income, and availability
- Physical determinants such as access, education, skills (e.g., cooking skills), and time
- Social determinants such as culture, family, peer pressure, and recognised meal patterns
- Psychological determinants such as mood, stress, and guilt
- Attitudes, beliefs, and knowledge about food (see Bellisle 2006: para 1, lines 1-2).

The preceding list, which is not exhaustive, highlights the complexities of food selection. Food selection criteria fluctuate according to life stage, and the value of any one element differs from person to person or to a group of people. As a result, not all population groups will benefit from the same type of intervention to improve food consumption behaviour. Rather, interventions should be customized to specific groups of people, taking into consideration the numerous factors that influence their food choices (Bellisle 2006: para 3, lines 1-4).

2.5.2 Food trends and new foods

Today's world has enough food to ensure that no one goes hungry provided it is distributed equally (Siddiqui, Zannou, Karim, Awad, Gołaszewski, Heinz and Smetana 2022: 20. In developing countries, the availability of daily dietary energy per capita increased by 0.7

percent per year on average during the 1980s. Also, during the 1980s, the largest increases in per capita food availability were seen in China and the Far East, while the smallest increases were shown in Latin America and Africa. Even though available food energy was distributed evenly within each country, 25 developing countries were unable to produce sufficient food energy (2.200 calories per person per day) for their populations by the end of the 1980s, whereas this applied to 45 countries by the end of the 1970s, therefore this is a significant reduction. Over half of the African countries would still be unable to meet their population's food needs even if available food was distributed fairly among the people of each country (Pinstrup-Andersen 1993: 2).

Over the previous two decades, consumer attitudes on food choices have shifted dramatically. Because meals that were popular 20 years ago no longer exist or are consumed by fewer people, these changes have an influence not only on the customer (in terms of the food they consume) but also on the food manufacturers (in terms of the foods they produce) (Mehmeti and Xhoxhi 2014: 393). Food has always played a significant role in society. Food's significance is unlikely to diminish in the foreseeable future, but given the current state of societal uncertainty, people's interactions with food may take on new forms that are impossible to predict (Barilla Center for Food and Nutrition (BCFN) 2012: 23).

2.5.3 Early experience with food

Breastfed infants are more likely to adopt a new vegetable, as well as new meals, as they are introduced into their diet. Many factors influence an infant's feeding habits as they interact and contribute to the development of future eating patterns. Mothers who eat a variety of healthy foods throughout pregnancy and breastfeeding and then provide these foods to their children during the complementary feeding phase can help their children and families develop healthy eating habits. While it is acknowledged that a high intake of salt and refined sugar in childhood may be associated with subsequent non-communicable illnesses, the individual's genetic background and susceptibility to specific nutrients make developing a precise cause and effect dose-dependent relationship difficult to establish (De Cosmi, Scaglioni and Agostoni 2017: 6; Saavedra, Deming, Dattilo and Reidy 2013: 34).

In infancy and young toddlers, food pleasure is more difficult to quantify than food aversion. However, it can be revealed through facial expressions, behaviours and food consumption of the person. Early feeding and sensory experiences, such as prenatal exposure to different pleasant flavours, milk feeding experiences, supplementary feeding experiences, and the quality of the mealtime environment, all naturally contribute to eating pleasure. Infants are born with the ability to appreciate various foods and to calculate how much of each food to consume. This ability to learn appears to peak between the ages of two and four, i.e., before the possible onset of food phobia, which is a developmental feature that may not be stabilised later on. This is an ideal moment to introduce products from the family's diet, ensuring that the delight of eating these foods is taught before neophobia sets in. In children, the complex interplay between motivational and hedonic regulation of eating is still poorly understood (Nicklaus 2016: 8; Zickgraf, Richard, Zucker and Wallace 2022: 683).

2.6 DIETARY RECOMMENDATIONS FOR CHILDREN

Children's bodies require additional energy to grow (Koletzko 2008: e179, e184). Rapid growth, changes in body structure, and cognitive and psychosocial development occur during childhood and adolescence. The bodyweight increases at this moment, with muscles expanding up to twenty times their original size and bones and joints growing up to twenty times their original size. As a result, the bones become longer and stronger (Hume, Timpero, Ball, Salmon, Andrianopoulos and Crawford 2018: 1-2).

Healthy eating habits and regular physical activity have a significant impact on children's and youths' general health and well-being. A balanced lifestyle is vital for optimum growth and well-being and reduces the risk of chronic nutrient-related disorders (Alberta Health Service 2013: 1; Nyberg, Singh-Manoux, Pentti, Madsen, Sabia, Alfredsson, Bjorner, Borritz, Burr, Goldberg and Heikkilä 2020: 767). Fulfilment of the required needs can be obtained by eating an adequate diet. To support healthy growth and weight gain, older children and young children require an adequate diet and enough activities (Hume, Timpero, Ball, Salmon, Andrianopoulos and Crawford 2018: 1-2).

2.6.1 Energy requirements

Human metabolism requires energy, according to the Nutrient reference values for Australia and New Zealand. The metabolism of cells, the synthesis and absorption of proteins and hormones, the distribution of components within the body, the regulation of body temperature, and the functioning of the brain and heart muscles are all part of metabolism (Capra 2006: 15; Wu, Lin, Cao, Wu, Jin, Wang, Wong, Yang and Cai 2022: 14). The overall energy need is referred to as the basal metabolic rate for this purpose (BMR) (Baranova, Song, Cao and Zhang 2023: 149). BMR accounts for between 45% and 70% of daily energy, depending on age, gender, body size and structure (Capra 2006: 15; Dziadak, B., Makowski, Ł., Kucharek, M. and Jóśko, A., 2023: 25-26). Moreover, children require an adequate supply of energy for proper growth and development. Microntrients supply dietary energy for healthy metabolic and physiological processes by containing chemical energy (United Nations University and World Health Organization 2004: 4).

2.6.2 Macro-nutrient requirements

According to research, considerable amounts of macronutrients such as carbohydrates, proteins and fats are required for normal growth, metabolism, development and other physiological processes (Gordon-Davis and van Rensburg 2012: 13-16). Meanwhile, the entire amount of the body's soft tissue is made up of a combination of carbohydrates, lipids and proteins. When combined with protein (glycoproteins) and fat, carbohydrate is critical in the formation of membrane receptors for hormones and other transmitter molecules (glycolipids). Fat in the cell membrane, on the other hand, is also necessary (Campbell 2004: 288a).

2.6.2.1 Carbohydrates

WHO (2019: para 1, lines 1-5) reports carbohydrates to have a wide range of components including starch and sugar. In living organisms, the essential function of carbohydrates is mainly metabolism. Carbohydrates are also a promoter of physical fitness and bodybuilding and found in various foods. In addition, it is among the three major macronutrients (carbohydrates, protein, and fat) that act as exceptional energy suppliers. Research shows that carbohydrate intake may be in various forms, including sugar, starch, and fibre, which are listed as dietary staples in most parts of the world, including Africa. Many African

communities rely on staple crops such as maize, cassava, yam, teff, sweet potatoes, and plantain for carbohydrate intake (Oniang'o, Mutuku and Malaba 2003: 332). According to Khowala, Verma, and Banik (2008: 4-5), carbohydrate oxidation is the most non-photosynthetic essential energy-enhancing method. Meanwhile, healthy foods rich in carbohydrates include dietary fibre and whole grains, as well as foods not containing added sugar (Skouteris, Bergmeier, Berns, Betancourt, Boynton-Jarrett, Davis, Gibbons, Pérez-Escamilla and Story 2020: 442).

2.6.2.2 Protein

Lauritzen (1992: 1) outlined that protein is critical to body parts such as body organs, blood, eyes, skin, muscles, hair, finger- and toenails and bones. Protein is one of the most abundant nutrients in the body. Protein sources are reported to be critical for a healthy diet, growth and maintenance of 25 000 protein and nitrogen compounds (WHO, FAO and United Nations University (UNU) 2007: 9). Research has shown that for a healthy diet to be achieved sources of both animal and plant protein foods are important (Schönfeldt, Pretorius, and Hall 2013: 407). Comerford and Pasin (2016: 11) confirmed that plant protein food contains fibre, while animal products, such as dairy food, contain high-quality protein, calcium, magnesium, and potassium. The protein required for a healthy body is classified as a minimum intake. In addition, a minimum protein intake allows body structure and growth to be maintained at the regular age level, energy conservation, and normal physical activity (Garlick 2006: 40).

2.6.2.3 Fat

Research shows that fats and oil are part of a balanced body-energy diet (National Health Institutes, National Heart, Lung and Blood Institute (NIH) 2005: 29; The British Nutrition Foundation 2009: 1). FAO (2010: 22) highlights that the principal source of dietary fat is plant and animal tissues. An individual requires the fat that provides essential fatty acids which the body is unable to produce. Protein carries the fat-soluble vitamins required for absorption (The British Nutrition Foundation 2009: 1).

2.6.2.4 Fibre

Fibre is present in indigestible plant foods such as vegetables, fruits, grains, beans and legumes. It is a complex carbohydrate that helps to keep our digestive systems healthy. Fibre

is available in three different types, each with its unique set of functions and health benefits. Fibre delays the emptying of our stomachs, allowing us to feel fuller for extended periods. It also helps with lowering cholesterol and blood glucose control. Soluble fibre can be found in fruits, vegetables, oats, barley and legumes. Insoluble fibre absorbs water, which helps to soften bowel contents and maintain regular bowel movements. It also helps us stay satiated and maintain a healthy intestinal environment. Insoluble fibre can be found in wholegrain bread and cereals, nuts, seeds, wheat bran, and the skins of fruits and vegetables (Nutrition Australia Victorian Division 2014: 1).

2.6.3 Micronutrient requirements

According to UNICEF (2018: para 1, lines 1-2) and Lohry (2007: 1), micronutrients are one of the components of a quality diet that are required and have a profound health impact. The body requires small quantities of micronutrients and they are the basic building blocks of healthy bodies, brains and bones. Whilst plants have concentration levels of micronutrients below 100 amounts per million (ppm) (Lohry 2007: 1), approximately 13 vitamins and 16 minerals are micronutrients (Olmedilla and Granado 2000: S11). Lohry (2007:1) further stated that zinc (Zn), iron (Fe), manganese (Mn), boron (B), chlorine (C1), copper (Cu), molybdenum (Mo), cobalt (Co), vanadium (V), sodium (Na0, and silicone (Si) are the most important micronutrients. In addition, zinc is usually in short supply and iron is a difficult resource that can be made available and is essential (Lohry 2007: 1). WHO (2000: 13) findings revealed that micronutrients in a child are critical for body growth and development.

2.6.3.1 Vitamin A

Vitamin A is a fat-soluble chemical that is separated into two groups depending on whether the food source is an animal or a plant. Animal diets provide preformed vitamin A or retinol; provitamin A carotenoid, present in fruits and vegetables, can be converted into retinol in the body; beta-carotene is the most easily converted into retinol, making it a crucial vitamin A source (Noh, Gunasegavan and Mustar 2019: 14). Vitamin A is found in a variety of forms, the most common of which is an elementary form with its own structure. Vitamin A (retinol) is mostly present as retinyl palmitate in most vitamin supplements, fortified foods, and animal livers. The inactive form of vitamin A present in plants is called preformed vitamin A. Provitamin A is made up of carotenoids like alpha-carotene, beta-carotene, and beta-

cryptoxanthin. Plant-derived pro-vitamin A carotenoids and their derivatives are evaluated using human serum (Khalid, Aslam, Syed, Imran, Saad and Noreen 2020: 107). Vitamin A is required throughout one's life and at various stages of development. First milk ejected from the mammary glands, termed colostrum, and mother’s milk are key sources of mixed forms of vitamin A preformed from the time of birth to one year of age, specifically when a mother nourishes herself with appropriate elementary sources of vitamin A (National Institutes of Health 2020: 1).

Vitamin A insufficiency affects about 19 million pregnant women and 190 million preschool-aged children, mostly in the WHO regions of Africa and Southeast Asia. To stimulate rapid growth and aid in the fight against infections, vitamin A requirements for new-borns and children have increased. Member states have requested WHO guidelines on the effects and safety of vitamin A supplementation in infants and children aged 6–59 months as a public health approach to help them achieve the Millennium Development Goals (WHO 2011: 1).

2.6.3.2 B-vitamins

B-vitamins are a group of eight water-soluble vitamins that play important, interconnected roles in cellular activity, acting as co-enzymes in a wide range of metabolic and anabolic enzymatic activities (Kennedy 2016: 19). Their combined effects affect several aspects of brain function, including energy generation, DNA/RNA synthesis/repair, genomic and non-genomic methylation, and the production of several neurochemicals and signalling molecules.

(a) Thiamin (Vitamin B_1)

According to Fattal-Valevski (2011: 12), thiamine is a vital organic molecule that acts as a cofactor in the enzyme reaction cycle. Normally, thiamine is not synthesised by mammalian cells, and therefore must be provided from a diet. Thiamine is also referred to as vitamin B1. Constipation, appetite inhibition, nausea, mental illness, peripheral neuropathy and fatigue may be the results of an absence of thiamine in the body. Additionally, insufficiency of thiamine can result in serious neurological disorders such as ataxia, mental impairment, loss of eye coordination, and chronic cardiovascular and musculature deficiencies. The severity of thiamine deficiency is known as beriberi, which is caused by a carbohydrate-rich diet and

thiamine deficiency. Wernicke-korsakoff syndrome is also one of the thiamine deficiency diseases caused by poor eating habits (Aleksandrova and Rudko 2016: 26).

(b) Riboflavin (Vitamin B2)

Riboflavin, or vitamin B2, is a nutrient that is necessary for appropriate growth and development, reproduction, breastfeeding, physical health, and overall well-being, according to Saedisomeolia and Ashoori (2018: 58). Riboflavin is also important in human metabolism, according to Belinda (2014: 286), whereas Buehler (2011: 88 & 90) has confirmed that riboflavin is poorly processed in the body, and so it requires constant supplementation; however, an adequate diet can contain a complete supply of riboflavin. According to WHO (2019: para 2, line 1), a good diet of riboflavin will include staples (wheat, barley, rye, maize, rice, potatoes, cassava, and yam), legumes (lentils and beans), fruits and vegetables, and animal food (meat, fish, eggs, and milk).

Belinda (2014: 286), further reported that riboflavin's subclinical deficiency raises the plasma homocysteine concentration associated with increasing the risk of cardiovascular disease. Riboflavin deficiency affects vision and induces neurodegeneration of cancer and peripheral neuropathy. Food sources contributing to riboflavin, including milk and dairy products, can help prevent deficiencies in riboflavin. Other sources of riboflavin include cereals, meat (especially offal), fatty fish, and some fruits and vegetables, mostly dark-green vegetables (Powers 2003: 1352).

Table 2.1: Riboflavin EAR and RDA summary of ages one (1) to eighteen (18) years (Institute of Medical Food and Nutrition Board 1998: 106)

Age group	Gender	EAR	RDA
4–8 years	Both girls/boys	0.5 mg/day	0.6 mg/day
9 – 13 years	Girls	0.8 mg/day	0.9 mg/day
	Boys	08 mg/day	0.9 mg/day
14 – 18 years	Girls	0.9 mg/day	1.0 mg/day
	Boys	1.1 mg/day	1.3 mg/day

(c Niacin (Vitamin B3)

Niacin is a nutrient that is also known as vitamin B3 or vitamin PP and is commonly found in plant and animal feed. The nutrient niacin can be synthesised from tryptophan (1 mg niacin, 60 mg tryptophan equivalent). The healthy sources of niacin are yeast from meat and baked

food products, cereals, legumes and seeds. Milk, green leafy vegetables, salmon, coffee and tea all also contain significant amounts. Niacin is known in plants as nicotinic acid, whereas it is known in animal tissues as nicotinamide (Lawrance 2015: 3; WHO 2000: 15-16). Also, a wide range of nicotinamide-containing supplements is available from breakfast cereals and food items that are often fortified (Lawrance 2015: 3).

In typical food preparation, niacin is rarely destroyed; approximately 5% is lost during baking (WHO 2000: 15-16). Besides, through blanching and boiling, niacin can be washed away by salt. In methods of cooking that do not require water to be discarded, the total loss remains minimal. In pasteurisation, sterilisation, or drying small quantities are lost (WHO 2000: 15-16). According to Lawrance (2015: 3), a mild insufficiency of niacin will delay digestion, causing slight symptoms; however, the impact of niacin deficiency can be lethal if left untreated. Lawrance (2015: 3) further indicated that niacin deficiency is not common in developing countries and is mostly found in areas with protein imbalances, especially areas where the population mostly eats maize as a staple food. NICUS research describes the early stage of niacin deficiency as muscle fatigue, anorexia (eating disorder characterised by extreme restriction of calorie intake, an intense fear of weight gain), indigestion, and skin eruption. Pellagra, on the other hand, is a late-stage infection that affects the skin, the digestive system, and the nervous system. Headache, apathy, weariness, sadness, disorientation and memory loss are some of the symptoms. Similarly, pellagra, if left untreated, will lead to death (NICUS 2013: 3).

(d) Pantothenic acid (Vitamin B5)

Pantothenic acid is a physiological compound that provides possible therapeutic activities under clinical conditions (Sampedro, Rodriguez-Granger, Ceballos and Aliaga 2015: 14). Foods found to be particularly high in pantothenic acid include peanut butter, liver, kidney, peanuts, almonds, wheat bran, cheese and lobster. Meat, beef, onions, oat cereals, tomatoes, eggs, broccoli and whole grains are the principal sources of pantothenic acid while processed grains have a low content (Rucker and Bauerly 2007: 292-293).

(e) Pyridoxine (Vitamin B6)

Vitamin B6 can be derived from many foods and can be used as a supplement throughout pregnancy and infancy and it also has an immunity function; in addition, vitamin B6 plays a crucial role in brain development. The amount of vitamin B6 that the body requires to be effective depends on a person's age and the recommended levels of vitamin B6 are obtained by consuming a variety of foods. The average daily recommended amounts of vitamin B6 needed for children and youth are given in milligrams (mg) in Table 2.3 (NIH 2016: 1).

Table 2.2: Children and youth life stage overview, recommended amount of Vitamin B6, and sources of food (NIH 2016: 1)

Life stage	Recommended Amount of Vitamin B6	Food sources of Vitamin B6
Children 4 – 8 years	0. 6 mg	- Poultry, fish and organ meats are all rich in vitamin B6. - Potatoes and other starchy vegetables. - Fruit (other than citrus).
Children 9 – 13 years	1. 0 mg	
Teens 14 – 18 years (girls)	1.2mg	
Teens 14 – 18 years (boys)	1.3 mg	

(f) Biotin (Vitamin B7)

Biotin is a water-soluble vitamin that works as a key cofactor for carboxylase enzymes in numerous metabolism pathways, according to Patel, Swink, and Castelo Soccio (2017: 165). It aids in the conversion of carbohydrates, fats and proteins in food into the energy that the body requires (NIH 2017: 1). Biotin food sources include liver, and the yolk of eggs and cereals. Biotin deficiency is common in individuals with unstable diets or intestinal disorders and may disrupt energy metabolism. Deficiency is rarely found in people with a normal diet, as it is caused by a decrease in the consumption of biotin-rich foods. Biotin acts as a coenzyme within the body, contributing to carboxylase activity. Carboxylase is an enzyme involved in gluconeogenesis, the synthesis of fatty acids, and the metabolism of amino acids. Biotin deficiency symptoms include immune fatigue and a decreased production of collagen (Watanabe 2003: 1). According to Mock, Stowell, Franco, Kyosseva, Nalbant, Schmidt, Cress, Strauss, Cancelas, von Goetz and North (2022: 363), biotin deficiency is not normal in humans. Specific cases are associated with inadequate parenteral feeding, intake of significant amounts of raw egg white, and extreme malnutrition.

(g) Folate (Vitamin B9)

Folate is considered by Rosenthal, Lopez-Pazos, Dowling, Pfeiffer, Mulinare, Vellozzi, Mindy Zhang, Lavoie, Molina, Ramirez and Reeve (2015: 5-7) to be another source of vitamin B. Thus, folic acid is classified as a synthetic vitamin that is used in dietary supplements and fortified foods. Folic acid is more bioavailable than folate which naturally occurs in foods. Folate is needed for the synthesis of purines and thymidylates, and DNA synthesis, stabilisation and repair. Research further states that folate deficiency is rarely observed in countries implementing mandatory or voluntary fortification programmes for folic acid (Rosenthal, *et al.* 2015: 5-7). Folic acid is also naturally developed and only present in unfortified foodstuffs (Devlin, Ling, Peerson, Fernando, Clarke, Smith and Halsted 2000: 2837–44).

(h) Cobalamin (Vitamin B12)

The source of vitamin B12 is cobalamin and it is water-soluble. Chitambar and Antony (2006: 1440) stated that the human body cannot synthesize it so it is highly dependent on dietary sources (Chitambar and Antony 2006: 1440). Dietitians in Canada (2017: 1) reported that the body needs vitamin B12 to produce DNA and to generate healthy blood cells that keep the nerves working well. Animal and fortified foods are known to provide vitamin B12. Meanwhile, individuals who do not consume animal products may need to eat meat substitutes to offset the body's needed volume. This can be obtained from vitamin B12 fortified soy foods such as meats and beverages. Vitamin B12 foods include eggs, milk, cheese, milk products, meat, fish, shellfish and poultry (Dietitians of Canada 2017: 1). Symptoms and signs of vitamin B12 deficiency include anaemia, weakness, exhaustion, constipation, lack of appetite, weight loss, depression, uncertainty, loss of memory, numbness, and tingling of the hands and feet (Wikswo, Khetsuriani, Fowlkes, Zheng, Penaranda, Verma, Shulman, Sircar, Robinson, Schmidt and Schnurr 2009: 1).

2.6.3.3 Vitamin C

Vitamin C is a form of ascorbic acid that can be absorbed from food. Vitamin C acts as an antioxidant in the body, strengthening and protecting cells from free radical damage produced by the conversion of ingested food into energy. Vitamin C is required by the body to make collagen and protein, both of which are necessary for wound healing. Additional vitamin C

aids in the absorption of iron from plant-based foods as well as the immune system's ability to defend the body from sickness (NIH 2016: 1). Anaemia, scurvy, infections, bleeding gums, muscular degeneration, poor wound healing, atherosclerotic plaques, capillary haemorrhage, and neurotic disorders are all symptoms of vitamin C deficiency. Infections and disorders such as hepatitis, HIV, H.pylori, colds, flu, and influenza are treated with these medications (Iqbal, Khan, and Khattak 2004: 5).

2.6.3.4 Vitamin D

Vitamin D is an essential nutrient for general health. It helps with calcium absorption, which is one of the most critical building blocks for healthy bones. When vitamin D and calcium are combined, they assist in preventing osteoporosis, a disease that causes the bones to weaken and shrink, making them more likely to break. Vitamin D is essential for different bodily functions. It is necessary for muscular movement as well as nerve transmission of signals between the brain and muscles. The immune system needs vitamin D to combat germs and viruses (NIH 2021: 1). Vitamin D is a collection of fat-soluble chemicals that are necessary for the body's mineral balance to be maintained. Cholecalciferol is the name given to the vitamin D type produced by humans (vitamin D3). Vitamin D does not match the traditional definition of vitamin because it is generated in the skin by the action of ultraviolet radiation (UVB), yet it is regarded as an essential dietary component. The main source of vitamin D is the sun. Breastfed new-borns, the elderly and institutionalized, obese people, and African Americans of all ages are the most vulnerable to low vitamin D levels. In addition to bone health, new research shows that vitamin D has non-skeletal benefits for a variety of other health outcomes (Bendik-Falconnier 2017: 1).

2.6.3.5 Iron

Iron is required for the growth and development of the human body. Iron is used in the production of haemoglobin, a protein found in red blood cells that distribute oxygen from the lungs to all parts of the body, and myoglobin, a protein that transports oxygen to muscles. The body also needs iron for the production of certain hormones. The amount of iron one needs each day is affected by age, gender, and whether or not one eats mostly a plant-based diet. The average daily recommended values in milligrams are listed below (mg). Vegetarians who do not eat meat, poultry or seafood require roughly twice the amount of iron listed in the

table because nonheme iron in plant foods is not absorbed as well as heme iron in animal foods (NIH 2021: para 1, lines 1-4).

Table 2.3: Children and youth life stage overview, recommended amount of Iron, and sources of food (NIH 2021: 1)

Life stage	Recommended Amount of Iron	Food sources of Iron
Children 4 – 8 years	10 mg	- Red meat, pork, and poultry - Seafood - Beans - Dark green leafy vegetables, such as spinach - Dried fruit, such as raisins and apricots - Iron-fortified cereals, bread and pasta - Peas
Children 9 – 13 years	8 mg	
Teens 14 – 18 years (girls)	15 mg	
Teens 14 – 18 years (boys)	11 mg	

2.6.3.6 Calcium and phosphorus

Calcium and phosphate are required for skeletal mineralization as well as human physiology (e.g., neuromuscular function). Doctors must have a basic grasp of calcium and phosphate metabolism to diagnose calcium and phosphorus deficiency as well as metabolic skeletal diseases. Because calcium and phosphorus metabolism are important in so many physiological systems, abnormalities of calcium and phosphorus metabolism as a systemic disease always have negative effects, such as skeletal events or even death. As a result, understanding calcium and phosphorus metabolism is essential for early diagnosis and treatment methods (Sun, Wu, Yu, Wang, Xie, Zhang, Chen, Lu, Zhang and Li 2020: 10).

2.6.3.7 Iodine

The element iodine is a chemical compound. Other elements include calcium, oxygen, nitrogen and sodium although iodine is considerably rarer. Iodine is required for the production of thyroid hormones in humans. The thyroid gland, a butterfly-shaped structure in the front section of the neck with two "lobes" on either side of the windpipe joined by a small bridge called the isthmus, produces these hormones. Thyroid hormones flow through the bloodstream after being produced in the thyroid gland and affect a variety of chemical processes throughout the body. These hormones are required for appropriate brain and nervous system growth and function, as well as the preservation of body heat and energy (Dunn and Haar 1990: 7). Those who don't get enough iodine, on the other hand, can't

generate enough thyroid hormone. This can cause a wide range of problems. Iodine deficiency in pregnant women can have a long-term impact on the foetus, including stunted growth, intellectual disability, and delayed sexual development. Iodine deficiency can cause new-borns and children to have a lower-than-average IQ, as well as affect an adults' ability to work and think clearly. Goitre, which is the name given to an enlarged thyroid gland, is usually the first visible sign of iodine insufficiency (NIH 2020: 2). The amount of iodine a person requires daily is based on their age. The recommended daily quantities in micrograms (mcg) are mentioned below (NIH 2020: 1).

Table 2.4: Children and youth life stage overview, recommended amount of Iodine, and sources of food (NIH 2021: 1)

Life stage	Recommended Amount of Iodine	Food sources of Iodine
Children 4 – 8 years	90 mcg	- Fish (such as cod and tuna), seaweed, shrimp, and other seafood, are generally rich in iodine - Dairy products (such as milk, yogurt, and cheese)
Children 9 – 13 years	120 mcg	
Teens 14 – 18 years (girls)	150 mcg	
Teens 14 – 18 years (boys)	150 mcg	

2.6.3.8 Zinc

Zinc is an essential trace mineral for all forms of life due to its role in gene expression, cell development and replication. Diarrhoea, pneumonia and malaria are thought to have killed 176 000 children under the age of five owing to zinc deficiency. More than 28 million disability-adjusted life years were lost due to zinc deficiency (DALYs). This is because the risks of morbidity and mortality associated with zinc deficiency are relatively high, and available data suggest that zinc deficiency—defined as insufficient dietary zinc—is extremely common in many parts of the world, particularly in areas where diarrhoea, pneumonia and malaria are the leading causes of death. This identifies zinc deficiency as a key risk factor for sickness and mortality in children under the age of five, one that may ostensibly be avoided through public health efforts. The evidence indicating zinc shortage increases the risk of pneumonia, diarrhoea and malaria is solid since RCTs were conducted in places of the world with insufficient zinc in the diet and where pneumonia, diarrhoea and malaria were public health issues. There are currently no programmes or policies in place to specifically improve human zinc intake. This is especially true when it comes to boosting zinc levels in foods (e.g., interventions to improve intakes of animal products that are good sources of zinc or to reduce

phytates in foods that impair zinc absorption). Furthermore, there are currently no examples of programmes that use supplemental zinc to improve zinc status, although some are beginning to use supplemental zinc as a diarrhoeal illness adjunctive therapy, based on research demonstrating the efficacy of zinc in reducing the duration of the current episode and extending the time between episodes in paediatric populations with a high disease burden (Caulfield and Black 2004: 272-276).

2.6.3.9 Magnesium

Magnesium is a necessary mineral for good health, according to the NIH (2020: 1). Magnesium is needed for a number of body activities, including muscle and neuron function, blood sugar levels, and blood pressure, as well as protein, bone, and DNA creation. Magnesium shortage is a rare occurrence but deficiency has been linked to many disorders. Magnesium shortage is linked to cardiovascular problems in humans, such as hypertension, pre-eclampsia, arrhythmias and heart failure. In magnesium-deficient humans, arteriosclerosis, diabetes mellitus and metabolic syndrome are common (National Institutes of Health 2020: 1; Gröber, Schmidt and Kisters 2015: 8217). The magnesium requirements are determined by age and gender. The following are the average daily recommended doses in milligrams (mg) (NIH 2020: 1):

Table 2.5: Children and youth life stage overview, recommended amount of Magnesium, and sources of food (NIH 2021: 1)

Life stage	Recommended Amount of Magnesium	Food sources of Magnesium
Children 4 – 8 years	130 mg	- Green leafy vegetables, nuts, seeds, dry beans, whole grains, wheat germ, wheat, and oat bran
Children 9 – 13 years	240 mg	
Teens 14 – 18 years (girls)	360 mg	
Teens 14 – 18 years (boys)	410 mg	

2.6.4 Water

It's easy to see why providing safe drinking water and basic sanitation to the world's poorest people is gaining political traction. With 2.6 billion people in need of proper sanitary facilities and 1.1 billion without access to clean drinking water in 2002, the resulting filth, poverty, and illness have stymied many development efforts. About 4500 children die every day due to a lack of clean water and sanitation, while their siblings, parents and neighbours

suffer from illness, squalor and poverty. Immediate gains result from improvements. Health, dignity, education, productivity and income production are all long-term benefits of the provision of clean water (WHO/UNICEF Joint Water Supply, Sanitation Monitoring Programme, World Health Organization, WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and UNICEF 2005: 5).

2.7 NUTRITIONAL STATUS AND GROWTH MONITORING

Despite various initiatives to improve children's nutritional conditions, malnutrition remains a major problem in South Africa (Makanjana and Naicker 2020: 10). According to Mkhize and Sibanda (2020:17), poor access to water and sanitation has negatively impacted the children’s nutritional status. According to the 2020 Joint Malnutrition Estimates, produced before the Covid 19 epidemic, there are now more than 26 million stunted children and an estimated 10.7 million wasted children in the 21 countries of Eastern and Southern Africa, including 2.6 million severely wasted children (UNICEF 2020: 1-2).

Chronic malnutrition is the underlying cause of half of all childhood fatalities in South Africa, with 1.5 million stunted children (1 in 3) and 75 000 obese children living in households with no adults working and little or no access to a daily healthy diet (UNICEF 2020: para 2, lines 1-4). Meanwhile, nutritional status assessments, which are usually based on children's growth, have been proposed as potentially valuable predictors of community health and welfare, in addition to their utility in screening individuals for curative treatment (Dowler, Payne, Seo, Thomson and Wheeler 1982: 111). Obesity, overweight, underweight, and short height are all nutritional status indicators for the CDC Growth Charts. Percentiles are used to rank an individual or a group on a growth chart and to show where they fit within the reference population.

2.7.1 Under- and over-nutrition

Inadequate food intake to meet dietary energy requirements, as well as poor absorption and/or biological utilisation of nutrients consumed, results in undernutrition. Weight loss is common as a result of this. Overnutrition is a long-term condition in which dietary energy needs are exceeded, resulting in overweight and/or obesity (WHO 2021: 1).

2.7.1.1 Undernutrition

The burden of undernourished people in low- and middle-income states has remained the core of the nutrition agenda (Tzioumis and Adai 2014: 11-12). Gopalan (2000: 556-557) reported that in developing countries, concerns about undernutrition were widespread, especially where poverty was associated with household income, household size, poor education, an unhealthy environment, and inadequate housing. Several studies have identified that in the last two decades, undernutrition (stunting, wasting, micronutrient deficiencies) has been an underestimated public health problem such that it has received insufficient political and financial attention (Philip and James 2018: 208; World Health Organisation 2008). Approximately 842 million people, equivalent to 12% of the global population, were reported being undernourished in 2011/13 (weight-for-age <-2 SD) (FAO, IFAD and WFP 2015: 4). However, the world saw a decline to 663 million in 2017 (Roser and Ritchie 2019:).

Khan, Khan, Zia-ul-Islam, Tauqeer and Khan (2017: 25) confirmed that undernutrition happens in instances where a person takes nutrients which do not provide adequate kilojoules for the daily activities and the body type. Srivastava, Mohmood, Srivastava, Shrotriya and Kumar (2012: 1) associated prolonged undernutrition amongst children with slower mental development and severe health deficiency prospects in their life cycle.

Undernutrition during pregnancy or infancy can cause long-term physical and mental development issues. Reduced stature, thin arms and legs (lack of muscle bulk), low energy levels, and swollen legs and abdomen are all symptoms of severe malnutrition (Astley and Finglas 2016: 4). Whenever a child is undressed in preparation for weighing, certain clinical signs of acute malnutrition may be obvious. Regardless of weight, children with this illness should seek immediate medical attention for their symptoms (WHO 2008: 12).

In 2013 an increase in undernourished individuals was projected to increase from 777 million to 815 million by the year 2015. However, when compared with 900 million cases reported in 2000, the figure is slightly lower. Growing underweight is a major concern and an obstacle to achieving international hunger-ending goals by 2030 (FAO, IFAD, UNICEF, WFP and WHO 2018: 112-113). Wiggins and Keats (2014: 32) warned that the consequences of

undernourishment are serious as a stunted child is likely to have an impending physical and intellectual life-long disability. According to Khongsdier (2005: 43-52), the process of undernourishment is a vicious cycle of the link between poverty, undernutrition, ill health, economic returns and work. Black, Allen, Bhutta, Claulfield, de Onis, Ezzati, Mathers and Rivera (2008: 255-256) believed that addressing the challenges of undernutrition would require the implementation of health and nutrition programmes and intervention strategies.

2.7.1.2 Stunting and wasting

Stunting in childhood is one of the most serious barriers to human growth, impacting roughly 162 million children under the age of five worldwide. Stunting is defined as height that is more than two standard deviations below the median of the World Health Organization's (WHO) child growth criteria. It is largely irreversible as a result of poor nutrition and numerous infections throughout a child's first 1000 days of life (WHO 2021: para 1-2, lines 1-2; Leroy, Ruel, Habicht and Frongillo 2015: 10).

Individuals and societies suffer long-term consequences from stunting, including impaired cognitive and physical development, decreased productive capacity, poor health, and an increased risk of degenerative diseases like diabetes. Stunting has long-term effects for both individuals and societies, including poorer cognitive and physical development, reduced productive capacity, poor health, and an increased risk of degenerative diseases like diabetes. By 2025, 127 million children under the age of five are anticipated to be stunted if current trends continue. As a result, greater investment and action are needed to achieve the World Health Organisation’s aim of decreasing that number to 100 million by 2025 (WHO 2021: para 1-2, lines 1-7). Stunting is associated with children who are small due to a lack of enough food for their age (height-for-age z score less than 2), according to UNICEF, WHO, and the International Bank for Reconstruction and Development/ World Bank (2019: 2). These children experience unavoidable physical and cognitive damage as a result of their delayed growth. The negative impacts of stunting can last a lifetime and significantly impact many generations to come. Stunting can also occur from birth due to inadequate maternal nutrition and feeding practices, poor food quality and multiple infections and illnesses that can slow down development.

In Africa, 56.6 million children under the age of five were stunted (having a poor height-for-age z score of less than -2 SD) or were chronically malnourished (UNICEF 2020: 1). In South Africa, the risks of stunting are related to deprivation, which is mainly found among informal settlements in rural and urban areas (Mohamed 2017: 4). A UNICEF report of 2020 (2020: para 2, line 1) showed that over 1.5 million children in South Africa were stunted, representing almost three out of every 10 children. Because of the irreparable physical and cognitive damage caused by chronic food deprivation, these children are unlikely to realize their full growth and development potential (UNICEF 2020: para 2, line 3). Stunting is linked to poor brain development, therefore children with stunting may not reach their full height, and the brain may not develop to its full cognitive capacity. As adults, stunted children may have poor cognitive development, low educational attainment and productivity, reducing a country's growth potential (UNICEF 2020: para 3, line 2).

Stunted children are most likely to start their lives at a disadvantage because they may have learning difficulties at school (Global Nutrition Report 2020: 34; UNICEF, WHO, International Bank for Reconstruction and Development / World Bank 2019: 2). According to Lung'aho (2017:1), between 1990 and 2014 in East and Southern Africa the proportion of stunted children on the continent of Africa increased by 14 percent. In West and Central Africa, 41% were registered as stunted. In 23 years of democracy in SA, health policies, nutrition services, and initiatives (child protection grant) have achieved very little reduction in the prevalence of stunting as it has remained stubbornly high (Mohamed 2017: 4; Mqadi 2017: para 2, line 3). Dr. Mariame Sylla, Chief of Unicef South Africa's Health and Nutrition Department, in a television interview conducted by Uveka Rangappa on an E-news channel, stated that one out of four children is stunted in SA (UNICEF 2019). Stunting is a sign of chronic malnutrition, according to the Department of Health (2019: 6), which is most frequent among children whose mothers have lower levels of education and come from the poorest households. Meanwhile, wasting occurs when the child experiences rapid weight loss or lack of weight gain (weight-for-height z-score <-2 SD) (WHO 2008: 14). Moderate and extreme wasting will increase the risk of death but treatment is highly possible (UNICEF, WHO, International Bank for Reconstruction and Development/ World Bank 2019: 2). The Department of Health of SA identified that 3% of children under five were wasted (too thin) for their height. Wasting is an indication of acute malnutrition (DoH 2019: 6). According to

the Nutrition Global Report (2020: 34), wasting affects 49.5 million (7.3 percent) children under the age of five. In the UN Africa region, 14.1 million children under the age of five were wasted in 2015 (4.3 million of them severely). All of Africa's UN sub-regions have wasting rates ranging from 5% to 10%. (WHO 2017: 11).

2.7.2 Protein-energy malnutrition (PEM)

Protein-energy malnutrition (PEM) was defined by Sisodia, Desai and Akerkar (2018: 19) as a type of malnutrition that has a range of pathological conditions that arise in inappropriate proportions due to a lack of protein and/or energy. The study further explained that PEM is found worldwide in both children and adults and accounts for around six million deaths a year. The functional and fundamental defects are connected to primary protein-energy malnutrition and can be alleviated through dietary treatment. Persistent protein-energy underfeeding can cause permanent changes in body function and development. Meanwhile, Klein explained PEM as macronutrient disorders such as kwashiorkor, marasmus and nutritional dwarfism in children and wasting connected through sickness and injuries amongst children (Klein 2012: 23880). Food scarcity, underdevelopment, and low socioeconomic status are the main contributors to protein-energy malnutrition. Other listed effects which aggravate malnutrition are poor feeding and care practices, and poor hygiene and cleanliness (Branca, Piwoz, Schultink and Sullivan 2015: 28). UNICEF (2019: 16), reported that globally, the consequences of malnutrition are seen as a social problem.

According to Behrman, Alderman and Hoddinott (2004: 1), other results of malnutrition include a decline in economic growth and prolonged food scarcity through a loss of productivity due to poor physical performance; indirect losses due to poor mental function, poor school attendance and increased expenditure on health care. Stein and Qaim (2007: 131-132) stated that in India, the total financial cost of malnutrition was projected to be more than 10% of the gross domestic product. Meanwhile, South Africa was listed among the highest investors in health on the continent of Africa (UNICEF 2018: 7).

2.7.2.1 Kwashiorkor

The kwashiorkor syndrome (also known as oedematous severe malnutrition) is a malnutrition phenotype highlighted by oedema, fatty liver, hair depigmentation, a desquamating skin rash,

and behavioural problems in children. It is difficult to quantify how many children die each year from kwashiorkor around the world (Briend 2014: 3). The literature describes kwashiorkor as a disease that mostly affects children, especially if they do not have enough nourishment. According to WHO (2008: 13), a child with kwashiorkor (oedematous malnutrition) as a result of severe undernutrition can be identified by muscle waste; however, the wasting may be hidden due to generalized oedema (swelling from excess fluid in the tissues). The child will be withdrawn and irritable, and he will appear to be ill because he refuses to eat. The hair will be thin and sparse and will frequently be discoloured, and the face will be round (due to oedema). The skin will have symmetrical discoloured areas that fracture and peel off with time. Furthermore, kwashiorkor causes a child to be underweight, even if oedema conceals the true weight. Additionally, children with kwashiorkor should be taken for medical observation immediately (Butler and Nall 2020: para 2, lines 1-2). WHO (2008: 13), cited that kwashiorkor requires immediate specialized care, which may include specific feeding regimens, careful monitoring, antibiotics, and other treatments. Children with these symptoms should be referred for immediate care regardless of their weight. Kwashiorkor is frequently found in places where the food supply is somewhat unstable. It is notably common in Sub-Saharan Africa and other locations where people are constantly hungry or where the diet consists primarily of corn, rice and beans. When kwashiorkor is treated early, the majority of affected children recover fully. As part of the treatment, extra calories and protein are added to the diet. Children with kwashiorkor may not grow or develop normally, and their development and growth may be stunted for the rest of their lives. When treatment is delayed, serious complications might arise, such as coma, shock, and irreparable mental and physical handicaps. If kwashiorkor is not treated, it can lead to organ failure and death (Butler 2018: para 2 & 3, lines 1-7; Dipasquale, Cucinotta and Romano 2020: 6-7). Kwashiorkor is believed to be caused by a lack of protein notwithstanding a healthy calorie intake. It was originally noticed in children who ate a maize-based diet and they were also known as "sugar babies" because their diet was often low in protein but high in carbohydrates (Dipasquale, Cucinotta and Romano 2020: 6-7).

2.7.2.2 Macro-nutrient deficiencies

Macronutrient deficiencies, which include protein, fat, and/or calorie deficiencies, can result in stunting, pronounced wasting (marasmus), or a disproportionate abdomen (a sign of

kwashiorkor). Marasmus is a severe wasting condition caused by a persistent lack of protein, carbohydrates and lipids in the diet (Missouri Department of Health 2018: 341). An increasing body of research has suggested that a substantial imbalance in the relative proportions of macronutrients could raise the risk of chronic disease and may have a detrimental effect on micronutrient intake. However, the type of fat (e.g., saturated, polyunsaturated or monounsaturated fats, or specific fatty acids) or carbohydrate (e.g., starches or sugars; high or low glycaemic index) is an important factor in defining the appropriate balance in terms of chronic disease risk (Australia Ministry of Health 2014: para 2, lines 1-3).

2.7.2.3 Micro-nutrient deficiencies

According to WHO (2021: para 1-3, line 1), micronutrients have a significant impact on a body's health, and a lack of any of them can cause serious and even life-threatening disorders because they allow the body to produce enzymes, hormones and other substances necessary for appropriate growth and development, among other things. Iron, vitamin A and iodine deficits are the most common around the globe, especially among children and pregnant women (Bird, Murphy, Ciappio and McBurney 2017: 15; WHO 2021: para 1, line 3). Micronutrient deficiencies cause disorders like anaemia, scurvy and pellagra. They have the potential to be lethal and many people have died as a result of them. These diseases, however, cannot be contracted by being in close proximity to someone who has been diagnosed, unless their nutrient intake is inadequate. Furthermore, many people around the world are deficient in micronutrients, the most common of which is vitamin B_{12} which causes anaemia (Institute of Child Health for UNHCR 2003: 7). According to research, a lack of even one micronutrient can have serious repercussions, such as limiting growth, delaying maturation, or causing deficient disorders such as rickets, scorbutus and cretinism (Savarino, Corsello and Corsello 2021: 11). Micronutrient deficiencies are disproportionately common in low- and middle-income communities. Micronutrient deficiencies can cause obvious and sometimes dangerous health concerns, but they can also cause less clinically visible reductions in energy, mental clarity and overall capacity. This can lead to poor academic performance, lower work productivity, and an increased chance of contracting further ailments and illnesses. Many of these deficiencies are avoidable with adequate nutrition education and a diversified diet, as well as food fortification and supplementation as needed. These

programmes have made substantial headway in reducing micronutrient deficiencies in recent decades but more work is needed (WHO 2021: para 2 and 3, lines 1-5).

2.7.2.4 Overnutrition

Overnutrition is a type of malnutrition resulting from high consumption of food and beverage energy which subsequently increases the risk of diet-related non-communicable diseases (weight-for-height >+2 SD). For example, undernourished people may be the result of eating a large volume of kilojoules (United Nations Children's Fund (UNICEF), World Health Organization, International Bank for Reconstruction and Development/The World Bank 2019: 2; Khan, Khan, Zia-ul-Islam, Tauqeer and Khan 2017: 25). Popkin (2006: 292) reported that globally, there are more people who are obese or overweight than underweight. Findings by WHO (2016: para 3, lines 1-3) stated that families struggle to afford sufficiently healthy foods (fresh fruit, vegetables, legumes, meat and milk) which results in a causative factor of overnutrition. Popkin (2001: S16) reported that the affordability of high-fat, high-sugar and high-salt foods and drinks was increasing the number of overweight and obese children. Additionally, a change to processed foods, meat and dairy products containing high saturated fats was evident in the middle and lower-income countries and was also having a major effect on the rise in the number of people who were overweight (Popkin 2001: S16). A World Health Report of 2002 showed that in developed countries, being overweight was recorded as the fifth most serious health risk factor (World Health Report 2002: 2002). Kavey, Daniels, Lauer, Atkins, Hayman and Taubert (2003: 1565) concurred with the World Health Report 2002 by reporting higher statistics that approximately 75% to 90% of the prevalence of cardiovascular sicknesses are associated with obesity and poor nutrition. It is clear that obesity amongst children, which is related to a poor diet, is a major concern in developed countries (Alderman, Behrman, Lavy and Menon 2001: 185; Bhurosy and Jeewon 2014: 2). According to Savarino, Corsello, and Corsello (2021: 9), childhood obesity is a serious health concern since fat children are far more likely to become obese adults than children with a normal BMI. Obesity in childhood can lead to serious chronic diseases later in life, such as type 2 diabetes, cardiovascular disease, hypertension, osteoporosis, and a variety of malignancies. It can also have psychological consequences, such as delays in academic and social function, low self-esteem and depression. In 2020, it was estimated that 60 million

children were overweight (Tzioumis and Adair 2014: 3). In SA alone about 30% of children under five were reported to be overweight (DoH 2019: 22).

2.8 NUTRITIONAL STATUS OF CHILDREN IN CARE CENTRES OR CYCCs

In South Africa, there is comparatively little information on the nutritional status of children in CYCCs. The orphanage children were more likely to be underweight than their counterparts (Mwaniki, Mokokha and Muttunga 2014: 294). Orphanage children were found to be 49% more likely than non-orphanage children to be underweight in Botswana research (Mishra and Bignami-Van Assche 2008: 5). Despite several efforts to enhance children's nutritional condition, South Africa still has a high prevalence of malnutrition (Makanjana and Naicker 2020: 10). The dietary situation of children in institutions, according to DeLacey, Tann, Groce, Kett, Quiring, Bergman, Garcia and Kerac (2020: 11), has the potential to harm their health and well-being. These children are frequently malnourished and suffer from undernutrition, obesity, and vitamin deficiencies. A study conducted in Nigeria's CYCCs found a significant prevalence of stunting (62.3%), wasting (60.6%), and underweight (55.9%) among children (Adeomi, Aliyun and Sabageh 2019: 5). The rate of stunting and underweight among orphanage children in Kenya was alarmingly high (Mwaniki, Mokokha and Muttunga 2014. 292). The nutritional status of children living in CYCCs should be checked regularly, according to Acharya, Adhikari, Pahari, Shin and Moon (2020: 8).

2.9 STRATEGIES TO ADDRESS MALNUTRITION AMONG CHILDREN IN SOUTH AFRICA

The Reconstruction and Development Programme (RDP) (1994: 46-47) document issued in 1994 explains malnutrition as one of the imperative health concerns facing South Africa. According to this RDP document, 41% children aged below 10 years were malnourished and/or stunted and living in constant fear of being hungry (RDP 1994: 46-47). On the other hand, UNICEF (2013: 3) and the DoH Global Alliance for Improved Nutrition (GAIN) and UNICEF (2015: 4) confirmed that health workers' policies were strengthened to allow the implementation of essential nutrition services at community level. These included initiatives to tackle malnutrition through the fortification of essential vitamins (vitamin A, thiamine, riboflavin, niacin, folic acid and pyridoxine) and minerals such as iron and zinc. Additionally, salt was also iodized as one of the efforts to decrease birth deficiencies (UNICEF 2013: 6). In

1995, the Department of Health (DoH) established an integrated nutrition programme to ensure South Africa's adequate nutrition by preventing and treating malnutrition (Labadarios, Steyn, Mgijimac and Dladla 2005: 106).

According to Mohamed (2017: 4), addressing the underlying causes of malnutrition requires a more comprehensive strategy. Government laws and rules, similar to those that have been promulgated to regulate cigarette smoking, are required to eliminate the marketing of low-quality, high-energy foods. To enable and embed essential lifestyle changes, community-based support is required to guarantee that education, skills and motivational activities are implemented locally (Shahid and Bishop 2019: 15).

Health education and adult learning are two of the key elements in addressing child malnutrition. Interventions such as immunisation, health education and nutritional counselling at post-partum and child health services can prevent malnutrition (WHO 2013). According to the Department of Health (DoH), poor nutrition information exacerbated by a lack of health education is the main cause of malnutrition. Investing in and improvement of parental education status, especially of mothers and caregivers, nutrition, sanitation and common disease prevention strategies should radically reduce malnutrition-related mortality and morbidity (Loots 2019: 28). Sufficient and appropriately skilled human resources are at the heart of programmes to reduce malnutrition in vulnerable children including those in CYCCs. This project provided an important opportunity to advance the understanding of nutrition educational programmes as they can contribute significantly to providing care and support to children. Therefore, each department/ organisation as mandated by the Department of Health needs to ensure that human resources employed and involved with orphans and other vulnerable children are sufficiently trained and appropriately skilled for their role/task. CCCs provide nutrition education material and training for CYCWs. However, Grobbelaar, Napier and Oldewage-Theron (2013: 32), raised concerns about reports from management that it is not compulsory for the CYCWs to attend these training courses. Hence, it can be argued that there should be compulsory training of CYCWs in order to improve more specifically the nutritional status and food intake of children and adolescents to address challenges faced by the CYCWs in the CYCCs.

2.9.1 Government intervention programmes to alleviate malnutrition

Various nutrition intervention programmes targeted at reducing malnutrition among children have been implemented in South Africa, including national food fortification, salt iodization, and a National School Nutrition Programme (NSNP) (Behr 2008: 44). Learners in South Africa's quintile 1–3 public schools, which account for 60% of the country's lowest schools, receive a midday school meal that includes carbohydrates, protein, and fruit or vegetables (Department of Basic Education 2019: Para 1-3, lines 1-5). Another programme that was launched in 1994 is the Integrated Nutrition Programme (INP). There were two approaches within the INP, the Protein Energy Malnutrition (PEM) and the Primary School Nutrition System (PSNP). The PEM was introduced to combat malnutrition in children, while PSNP tackles acute hunger and improves children's diverse learning capacities in the classroom (Behr 2008: 44). UNICEF South Africa highlighted in a statement released in 2020 that effective prevention of malnutrition requires collective responsibility. Hence some of their partnerships with the private and public sectors which aim at addressing the crisis of malnutrition support the basic health and nutrition rights of all children in under-resourced and vulnerable communities (UNICEF 2020: para 1, line 2). In 1999, the National Food Consumption Survey (NFCS) in SA discovered a substantial risk of dietary inadequacy in 1 to 9-year-old children for key micronutrients. In 2003, fortification of maize meal and bread flour with vitamin A, thiamine, riboflavin, niacin, vitamin B6, folic acid, iron, and zinc became necessary to combat these deficiencies (Labadarios, Steyn, Maunder, Macintryre, Gericke, Swart, Huskisson, Dannhauser, Vorster, Nesmvuni and Nel 2005: 542).

(a) Food-Based Dietary Guidelines (FBDGs)

The FBDGs, asserted FAO/ WHO (1998:2), are operational dietary educational messages that encourage wellness and chronic disease burden-fighting strategies. The guidelines are messages of nutrition education that promote a healthy lifestyle. FBDGs guide individuals in the selection of food and beverage mixtures resulting in an acceptable diet that meets the required and practical nutrient requirements.

The revised FBDGs are as follows (Vorster, Badham and Venter 2013: s7):

- Enjoy a variety of foods.
- Be active!
- Make starchy foods part of most meals.

- Eat plenty of vegetables and fruit every day.
- Eat dry beans, split peas, lentils and soya regularly.
- Have milk, maas or yoghurt every day.
- Fish, chicken, lean meat or eggs can be eaten daily.
- Drink lots of clean, safe water.
- Use fats sparingly.
- Choose vegetable oils, rather than hard fats.
- Use sugar and foods and drinks high in sugar sparingly.
- Use salt and food high in salt sparingly.

A 2012 research study by Oldewage-Theron and Egal (2012: 4) found that nutrition education was part of the curriculum within the syllabus of SA schools' Life Orientation and Natural Science subjects. Studies revealed that higher consumption of fruits and pulses can be used as part of nutritional education under all socio-economic conditions (Gopalan 2000: 558).

(b) Food fortification

According to the World Food Programme (WFP 2008: para 1, lines 1-3), food fortification is the most effective approach to addressing the prevalence of micronutrient deficiencies. The DoH of SA (nd): 3) describes fortification as an enrichment process of adding micronutrients to a food mixture to avoid or correct people's deficiency in one or more nutrients. The strategy usually boosts a population's micronutrient status at a very practical expense (WHO and FAO 2006: 13). Neufeld, Aaron, Garrett, Baker, Dary and Van Ameringen (2016: 629) reported that most people have access to the essential nutrients of food fortification. The fortified food intake in infants results in better attendance at school and an improved economy. The Federal Ministry for Economic Cooperation and Development (BMZ) (2012: 3) stated that fortified foods have been important in food crises, during economic crises and natural disasters, and in people with compromised diet.

As part of the malnutrition alleviation programme, DOH and UNICEF (2004: 4-5) reported that wheat, flour and white maize meal were fortified in 2003. The fortified food products such as white sugar, maize, whole milk, tea and bread were described by Steyn, Wolmarans,

Nel and Bourne 2008: 130) as mostly consumed by and affordable to low-income consumers. DOH (nd): 5; Papathakis and Pearson 2012: 7) reported that food products like maize and flour were approved to receive enforced multiple micronutrient fortification. A 200g of fortified maize meal and wheat flour provides a total of 31% RDA for vitamin A, 25% thiamine, 25% niacin, 25% pyridoxine, 17% iron (maize flour), 20% iron (wheat flour) and 20% zinc to individuals aged 10 years or older (Labadarios, Steyn, Maunder, Macintryre, Gericke, Swart, Huskisson, Dannhauser, Vorster, Nesmvuni and Nel 2005: 542).

In 1995, salt was iodised in SA in accordance with the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972) in order to prevent and control iodine deficient illnesses (Labodarios, Dhansay and Hendricks 2008: 38). Despite the effectiveness of the iodization programme at the national level, Mabasa, Mabapa, Jooste and Mbhenyane (2019: 80) indicated that there were some places in SA where implementation was inadequate or knowledge and practices were lacking. This could be attributed to a lack of iodine nutrition understanding or the documented usage of cheap, non-iodized agricultural salt acquired from local spaza shops and small-scale salt dealers.

(c) Promoting the diversity of food intake

According to FAO director Lupien (1997: para 1, line 1), a growing number of people were lacking adequate amounts of nutrients required for a healthy and productive life. Dietary diversity is widely recognized as a fundamental component of high-quality diets by nutritionists. Furthermore, given the recent discovery that dietary factors are linked to an increased risk of chronic disease, dietary recommendations advocate increased dietary diversity while limiting the use of certain nutrients like fat, refined sugars and salt. Dietary diversity is a particularly serious problem among impoverished people in developing countries, as their meals are mostly based on starchy staples and sometimes contain little to no animal products and few fresh fruits and vegetables (Ruel 2002: 1-2).

According to research, an adequate diet should incorporate correct quantities of food from lean meat, whole grains, vegetables, fruit and dairy products (Schönfeldt, Pretorius, and Hall 2013: 407). Ruel (2002: 225) stated that there was limited literature available and a lack of consistency in methods used to assess dietary diversity. Hence, dietary diversification should

include the consumption of animal products or more vegetables and fruits to fulfil the requirements for vitamins and minerals. Animal products are the sources of bioavailable types of vitamin A, iron and absorbable zinc, which are often considered costly. Their cost puts poor people at a disadvantage because of their unaffordability, which limits the opportunity to meet nutrient diversity (Horton, Begin, Greig and Lakshman 2008: 7).

Most countries around the world have developed dietary guidelines for healthy food consumption and maintaining dietary diversity as the basis for ensuring adequate intake of critical nutrients (Nithya and Bhavani 2018: 418). According to Kinabo, Mamiro, Dawkins, Bundala, Mwanri, Majili, Jumbe, Kulwa, Mamiro, Amuri, Ngowi and Msuya (2016: 11303), in rural Tanzania, inadequate and insufficient dietary diversity has been identified where the majority of households have been eating fewer than six of the recommended food groups. Cereal staples and fat were reported to be consumed in nearly all households in this study; however, the diets were not sufficient to meet the energy intake and intake of other nutrients. The study further suggested promoting diversified diets and the required amount of intake to boost the nutritional situation.

Similar research (on food dietary diversity) among Malaysian households reported a mean intake of foods listed according to 6 food groups (starch, vegetables, fruits, meat, milk products and oils) was 6.0 ± 0.4 per week. Conversely, a variety of foods was consumed by households but intake was not sufficient to meet the daily recommended nutritional requirement (Zainal Badari, Arcot, Haron, Paim, Sulaiman and Masud 2012: 278). Research has revealed that school children predominantly consume a cereal-based diet but lack fruits and vegetables. Low consumption of micronutrients represents a lack of variety in the diet (Gewa, Murphy, Weiss and Neumann 2014: 2671). A national survey of South Africans showed that the previous day they had eaten only between one and three food groups, including cereals, meat and poultry, milk, and vegetables (Labadarios, Steyn and Nel 2011: 4-5). While fruit and vegetables are considered a good source of vitamins and minerals for their dietary fibre contribution, low intake has been reported (Mchiza, Steyn, Hill, Kruger, Sch Hierfeldt, Nel and Wentzel-Viljoen 2015: 8243). Claasen, van der Hoeven and Covic (2016: 8) concluded that deprivation was a weak dietary diversity factor (DDS) and should be considered a problem. Diversity is implemented at CYCCs through the establishment of

vegetable gardens, where chickens and other farm animals teach the children how to access their own food while also providing fresh eggs and vegetables for their meals (commit. works (nd): para 5, lines 1-2).

(d) Promoting food diversity through gardening

Traditional household gardens appear to be key sources of micronutrients in rural settings. Poor people get most of their nutrition from eating plants, which are less expensive and more readily available than animal meals. In humid tropical climates, green leafy plants such as Amaranthus spp., Corchorus spp., Bidens pilosa, Gynandropsis spp., Celosia spp., Basella spp., Solanum scabrum, Solanum americanum, Hibiscus sabdariffa, and Vigna unguiculata grow spontaneously and abundantly. Exotic plants have not been eaten as leafy vegetables because of the difficulty of cultivating them due to climatic circumstances. These plants' leaves are nonetheless good providers of vitamins A and C as well as protein, phosphorus, iron and, in some cases, B-group vitamins. In certain cases, their average nutritional content exceeds that of introduced vegetable species like cabbage or tomatoes (Lupien 1997: para 5, lines 1-4).

Lupien (1997: para 5, lines 1-4) offered evidence that home gardening can provide intangible benefits such as food on the table, extra income, and healthy children. For rural families with limited purchasing power, having access to home-grown fruits, vegetables, small animals, and/or fish ensures a more adequate diet and increases self-reliance. Households can improve the diversity and productivity of their traditional gardens with some help from government services or NGOs, especially in communities where specific nutritional shortages persist or where there appear to be untapped opportunities for revenue production. Gardening at home can also be a valuable component of urban food security plans. Nutrition education and information about the nutritional worth and use of fruits and vegetables in the diet are vital to ensure that the availability of garden foods translates into nutritional advantages.

(e) Nutrition education promotion

Nutrition education has been promoted by the global acceptance of the right to food for all human beings (FAO 2005: 6; South African Commission on Human Rights (nd): 1). People, according to FAO (2005: 6-7), require information and training in order to participate in

decisions that affect them. As a result, education on themes such as good nutrition, food safety-related diseases, food labelling and processing, development and preparation should be provided. In addition, integrative school curricula which include agricultural food security, climate, nutrition, and health education should all be used to help individuals increase their capacity to attain food security.

The US Department of Agriculture (USDA) (2010: 1) reported that training on nutrition helps make decisions about health and lifestyle. It provides an understanding of safe, nourishing food resources, competencies and knowledge while nutritional education involves various strategies such as improvements in the environment, legislative changes, coordinated programmes, social media and nutrition preparation. The literature cited a need to establish an all-inclusive nutrition education programme rather than the dissemination of knowledge to provide a fully operational system. The programme would educate on food preferences and sensory-effective features, factors relating to the individual, perceptions, values, attitudes, meanings, social norms and the environment (Contento 2008: 177-178; FAO 1998: 18-19). One of the noted successful nutrition education models is KABS, which is defined as changing knowledge (K), leading to changes in attitudes (A), leading to changes in behaviour (B), and acquired skills (S) practice (Contento 2008: 177-178). Evidence submitted showed that NEP improved knowledge of nutrition and attitudes towards nutrition (Kupolati, MacIntyre and Gericke 2019: 19).

(f) The planning process for nutrition education programmes (NEP)

According to Álvarez (2012: 11), nutrition education comes from communication on health promotion, behaviour changes, knowledge, communication and education, community nutrition, and food and nutrition education. The FAO (2005: 1) stated that among the three essential strategies of most national development plans are nutrition, health and education. Research has shown that nutrition education is widely embraced as one of the most effective intervention strategies. There are, however, concerns about planning and implementing nutrition education and that nutrition education should combine the various methods of learning designed to facilitate voluntary adoption of food choices and nutritional behaviours. Besides, information about nutrition awareness must be conveyed across various approaches and activities (FAO 2016: 1). The services should be tailored to promote specific dietary

changes and the use of knowledge from fields such as social psychology, healthcare, sociology, economics, nutrition science, and behavioural nutrition studies (Contento 2008: 176-177).

NEP is an important tool that has a positive effect on food protection, community nutrition, and wellness programmes as well as the potential to change dietary behaviour and nutritional status. It has been tested and found to have a long-standing impact on the children's health and it has been revealed to cost less, be realistic and affordable, and have a widespread reach. This would refer to dietary and food consumption patterns, behaviours, purchasing, cooking, health, and environmental factors (FAO 2016: 4). Factors such as attitudes and practices that are influenced by education, food taboos, long-established dietary and snacking habits, decisions on agricultural production, family food distribution and child-feeding ideas, misleading food advertisements, ignorance of food hygiene, or poor perception of vegetable consumption all play a role in promoting unhealthy diets. Nutrition education is therefore vital to countries affected by globalisation and urbanisation and has been described as experiencing a serious dietary change from consumption of cheap processed foods such as sugar, fat, and salt (FAO 2016: 4).

The National School Nutrition Programme (NSNP) was implemented in 1994. The approach should frame nutrition education, build opportunities to learn, and communicate and be aimed at advancing knowledge of nutrition, enhancing awareness, and developing life skills that benefit both individuals and the community. Developed nutrition education programmes must be concerned not just with knowledge sharing but also with encouraging, empowering, providing skills, and enhancing trust. Food awareness will also correct decisions in favour of healthier lifestyles, disease prevention and management. Nutrition education in the classroom should equip learners and the community. The NEP in SA is incorporated into the school curriculum and the associated subject Life Orientation (DBE 2014: 11-12).

Good nutrition education should not only help people become nutritionally literate but also nutritionally competent, even with minimal means able to follow a healthy diet (FAO 2005: 9). Communities with limited budgets should make better food choices and have a physically

active lifestyle. Knowledge and skills, attitude changes, and behavioural changes are important to improve health (Nebraska-Lincoln University 2018: 1).

2.10 CONCLUSION

The causes of childhood malnutrition have been discussed in this chapter. There has also been an attempt to propose solutions for coping with malnutrition in youngsters. Malnutrition and its underlying causes can be dealt with by following correct hygiene and sanitation, food handling and preparation practices, and feeding children good nutritional foods, as evidenced by the research discussed in this chapter. In the next chapter attention will be drawn to the conceptual framework for a nutrition education programme.

CHAPTER 3 - CONCEPTUAL FRAMEWORK OF THE STUDY

3.1 INTRODUCTION

This chapter outlines the conceptual framework that guided the study. Kivunja (2018: 44) describes a conceptual framework as “the total, logical orientation and association of anything and everything that forms the underlying thinking, structures, plans and practices and implementation of your entire research project”. The rationale to choose a conceptual framework is based on the complex nature of the phenomenon addressed by the study. Unlike a theoretical framework, a conceptual framework provides a broad structure in which the study is viewed and discussed. Theories and models of health behaviour change have been discovered to originate from a variety of disciplinary streams in recent years, with psychology and other behavioural sciences having a significant impact on nutrition education. For this study, a conceptual framework for the Nutrition Education Programme (NEP) is reportedly relevant in the developing countries in which it was used (Kivunja 2018: 52).

This framework covers the conceptualisation aspect of the nutrition education programme (NEP) (FAO 1997b: para 15, line 1). The significance of the NEP framework is that it provides for a wide scope of application, and has been “widely used to address nutrition and health-promotion initiatives for learners, teachers, and caregivers” (Kupolati, MacIntyre, Gerda, Gericke and Becker 2019: 10). While the NEP is widely applied in school-based nutrition education, in this study it has been applied to explain the circumstances applicable to the CYCC settings. These settings could be viewed as even more relevant considering that as of 2016 UNICEF reports identified South Africa as having the second-highest number of orphans and vulnerable children (OVC) in the world (Bello and Pillay 2019: 7-8).

3.2 CONCEPTUAL FRAMEWORK FOR NUTRITION EDUCATION PROGRAMMES

It is critical to emphasize that the NEP framework was adopted as the conceptual framework for this study and is not intended to be prescriptive, but rather to stimulate conversation about the proper concerns, parameters, methodologies, and processes for nutrition education programmes (Schmitt, Bryant, Korucu, Kirkham, Katare and Benjamin 2019: 33). Although

the framework was specifically designed for a NEP, it was found to be relevant in other food practice-related programmes considering the factors that are covered within the framework. The subject of food supply is placed at the centre of the framework because it is the focus of all nutrition teaching and promotion efforts (Figure 3.1). Interfacing with the food supply component are the four components of Galbally's NEP framework (Smith 1998: 42), namely nutrition challenges, target populations, critical settings and sectors, and design, development, implementation and evaluation methods. The types of nutrition concerns that arise for different demographic subgroups are mostly dictated by food access and availability, which are important factors to consider when selecting target groups. The level to which these components can impact and mediate people's relationship with food will influence and mediate the settings, sectors and methods chosen (Islam and Al Mamun 2020: 55-56; RA, NAF and Aryeetey 2022: 19659). The framework was chosen and implemented because it is generic, allowing a wide range of concepts and approaches, as well as combinations of these, to be used in applications. Its main purpose is to promote an integrative approach that splits the difference between community development and social marketing, risk factors and social determinants of health, and individual rather than organisational change (FAO 1998: 42).

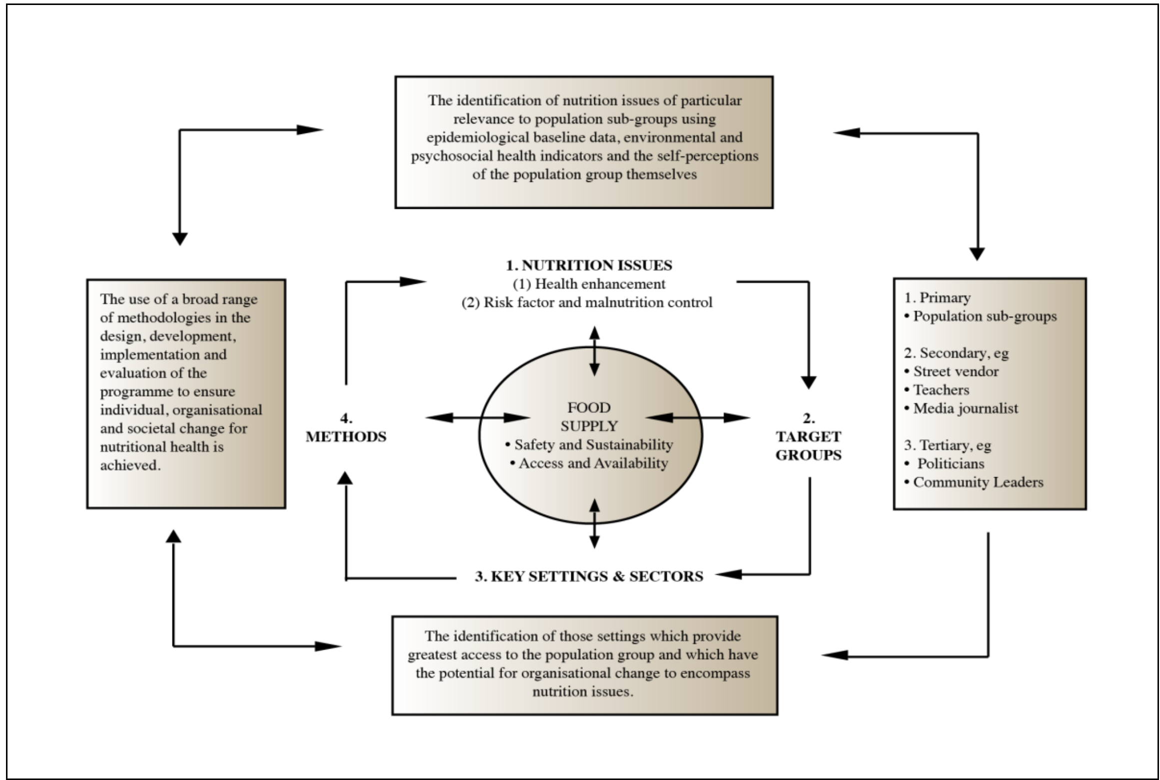

Figure 3.1: Framework for NEP adapted from FAO (1998)

3.2.1 Food supply

The study looked at CYC facilities where the nutritional status of children and youth is dependent on food safety, accessibility, and availability. The component "food supply" is central to this framework. Food safety and nutrition are inextricably linked because a person must be both well-nourished and free of foodborne disease to achieve optimal human health and well-being (Nordhagen, Lambertini, DeWaal, McClafferty and Neufeld 2022: 1). One of the findings of the study by Grobbelaar and Napier (2014: 5) highlighted food safety and hygiene practices in child residential care facilities. Despite these connections, existing frameworks have largely ignored the connections between food safety and nutrition, treating food safety as a separate sub-component that is not integrated (Nordhagen, *et al.* 2022: 1). The traditional role of nutrition education has been to improve a household's ability to make the best use of available food resources, particularly in relation to child feeding, dietary practices, and food hygiene (Serbesa, Iffa and Geleto 2019: 5). On the one hand, many programmes have included instructions on how to grow food as well as how to store, process, and prepare the food. Meanwhile, nutrition education, on the other hand, must adapt to social and technological changes.

Food supplies in many developing countries are rapidly shifting as a result of economic progress. Processed foods with added value have become available, which have had both benefits and disadvantages. Many of these items provide poor nutritional value for the price but they could be replaced with more cost-effective and healthful foods which this study aimed to show could be achieved. People may rely on advertisements to "know" about these foods because normal nutrition information is not available. Because these high-value meals are frequently the most expensive, they are more likely to be promoted widely and effectively. As food consumption habits change, health and illness trends will shift (Smith 1998: para 16, lines 2-5). In the context of this study, it means that having a proper food supply is critical for CYCCs to fulfil their mandates of providing appropriate care and hygienically prepared food for children (South Africa Republic 2018: 145).

3.2.2 Nutrition issues

The CYCCs in South Africa face numerous challenges, including a lack of nutrition-related training for CYCWs (Table 1.1). Even though childhood is a critical time for physical and

physiological development, this is still the case. As a result, children's nutritional needs are particularly important to consider, as they are an integral part of healthcare. Adequate nutrients are required for maintaining health, growth, and disease prevention (Dapp, Gashaj and Roebers 2021: 516). Hence the nutrition issue is the first element to be investigated as part of the NEP development framework, and it focuses on improving health and reducing risk factors and malnutrition. In South Africa and other developing countries, a lack of an adequate diet manifests itself as under- and overnutrition. In 2017, both under- and over-nutrition were detected in a study measuring food and nutrition insecurity in rural communities of KZN. The study identified a major barrier to improving the diets of poor rural people as being the lack of availability and access to nutritional foods (Govender, Pillay, Siwela, Modi and Mabhaudhi 2017: 16). Most of this population group relies on social assistance, which limits their dietary selection. Undernutrition, particularly stunting, is still an issue among children (Govender, *et al.* 2017: 16). Meanwhile, malnutrition, in all of its forms, is a severe health concern. Today, the world is dealing with two types of malnutrition: undernutrition and obesity, especially in low- and middle-income countries (UNICEF 2021: para 3, line 1). The NEP model should consider the nutritional challenges faced by various demographic groups.

The nutrition education goals are meant for CYCMs, CYCWs, and health professionals to use. In nutrition education, goals are more likely to be presented as guidelines that provide ideal direction for dietary change. It is possible to design guidelines for certain demographic segments, such as children. Guidelines rarely address the issue of food supply sustainability from an ecological standpoint, as well as the imperative for countries to achieve maximal food self-sufficiency (Clapp 2017: 94-94). However, it has been claimed that these issues are intertwined with health and that supporting fresh, local and seasonal meals should be included in the standards. This will help to reduce import-related food supply vulnerability, as well as the energy costs of processing and transporting items. A second priority in addressing the nutritional needs of demographic sub-groups is the establishment of environmental, social and intrinsic elements that contribute to nutritional status. Environmental indicators include structural components such as poverty, income level, employment status, and educational status (Herforth, Arimond, Álvarez-Sánchez, Coates,

Christianson and Muehlhoff 2019: 603-604; Strid, Hallström, Sonesson, Sjons, Winkvist and Bianchi 2021: 15).

Nutrition education can influence the programme's settings and techniques by studying these elements and how they relate to the nutritional status of a population sub-group. While nutrition education programmes can only do so much to mitigate these effects, they must be considered in the planning, development and implementation of the programme. Physical infrastructure, such as housing and transportation, must be considered when establishing a NEP (Zambuko 2017: 164-165). A CYCC structure should be safe and healthy for children to live in, according to the Children's Act 38 of 2005 (South Africa Republic 2018: 172). All of these factors can influence a person's sensitivity to nutritional risk. In addition to intergenerational and familial influences, they can affect nutritional status, self-esteem and motivation.

Finally, the success of the programme design will be influenced by population nutrition priorities. The programme is significantly more likely to succeed if the group's most pressing concerns are addressed, and they are involved in the development, management and ownership of the programme. Using both nutritional status and social health indicators (such as child abuse, child poverty, teenage drug abuse, unemployment, poverty, healthcare costs, food insecurity, and income inequality) to analyse the population's nutrition problems should lead to initiatives that not only reduce the risk of malnutrition but also promote and enhance population health (Holt-Lunstad 2022: 197).

3.2.3 Target population

Children and youth in the CYCCs as a target population are a group vulnerable to malnutrition that needs special care. Children's bodies have a greater need for nutrients, such as vitamins and minerals, and are more susceptible to the harmful consequences of deficiencies (WHO 2020: para 1, lines 1-5). Bello, Gericke and MacIntyre (2019: 4) elaborated that assessing the population is crucial in determining the correct target group for a specific NEP. Darling-Hammond, Flook, Cook-Harvey, Barron and Osher (2020: 30) describe education as a process that provides both knowledge and skills to enable personal development and change. Nutrition education encompasses all types of activities aimed at

changing individuals', groups', or populations' knowledge, attitudes and behavioural patterns in order to contribute to the prevention and control of malnutrition in all forms, as well as any erroneous food conceptions, including, of course, the economic aspect (Hamulka, Wadolowska, Hoffmann, Kowalkowska and Gutkowska 2018: 1439).

According to Barker, Dombrowski, Colbourn, Fall, Kriznik, Lawrence, Norris, Ngaiza, Patel, Skordis-Worrall and Sniehotta (2018: 1853-1864), the target audience for an intervention consists of many categories. It is important to distinguish between these groups to adjust approaches to each group. It is crucial to distinguish between vulnerable groups and intervention target groups. The susceptible group may be the same as the target group of a communication programme but this is rarely the case. Children under the age of five, for example, are a susceptible group at risk. The nutrition intervention to reduce this risk is aimed at all individuals involved in the treatment of children under the age of five, not just the young children. All these activities take advantage of effective communication techniques. The segments of each target group, particularly the primary group, must then be split. Within the targeted audience, there are primary, secondary and tertiary subject groups (Andrien 1998: para 1-5, lines 1-7).

- The core focus group is made up of people who need to modify their behaviour. These people could be mothers with children under the age of five, like in the case above. The goal is to alter the way parents prepare their children's meals.
- Individuals who will be used as “middlemen” to get the message to the first target group make up the secondary target group. They could be health workers, instructors, agricultural promoters, or journalists, for example. It all depends on the community's network of contacts.
- Individuals who can foster contact and behavioural improvement make up the tertiary focus group. This includes not only bureaucrats and politicians but also people who might be close to the children such as a caregiver, the child's father and extended family members (Andrien 1998: para 1-5, lines 1-7).

This means that the technique used to deliver a nutrition education programme will differ depending on the target group's educational level, socioeconomic status, and other factors, in this case, the CYCWs. Hence, we must differentiate between the target groups, for example, the children and the caregivers, and the various segments of these target groups, each of

whom would benefit from a different strategy. Caregivers who are digitally illiterate and reside in rural regions would receive different media and support resources than mothers who are more educated and live in urban areas. Researchers must remember that the target audiences should be active participants in the social communication process rather than passive users of information. The goal of a cost-effective global plan will be defeated by a one-way communication mechanism on nutrition education. Furthermore, in the context of this study, the target groups must participate in the transmission of the message to other groups. Children and those who will join the CYC in the future must be taught by the CYCWs. Members of the community who are influential can also help spread the nutrition education messages (Mozaffarian, Angell, Lang and Rivera 2018: 361).

3.2.4 Setting and sectors

The study participants included CYCWs in DSD-regulated CYCCs who care for more than six children outside of the child's family environment. The CYCCs were identified after a gap was recognised in the education programmes offered to CYCWs most likely to serve the children and youth in the CYCCs. Furthermore, a 2014 study conducted by Grobbelaar and Napier (2014) that assessed the CYCWs' profile, nutrition knowledge, and food safety and hygiene practices highlighted a need for a comprehensive food preparation and nutrition operational manual that would increase the ability of the CCWs to plan and prepare healthy menus and meals for the children in their care. This study contributed to the development of comprehensive child nutrition, food preparation, food safety, and healthy eating guidelines. The developed child nutrition, food preparation, food safety, and healthy eating guidelines aim to cover nutrition education subjects such as meal and menu planning, food safety and hygiene practices, and practical food preparation skills. The guidelines were intended to increase the CYCWs' ability to plan and prepare healthy menus and meals for the children in their care as recommended by Grobbelaar and Napier (2014: 7). The identification of the key settings and sectors providing the best access to the population group of interest is an important step in developing the programme. Malnutrition—both undernutrition and overnutrition—is more prevalent in low- and middle-income communities. A NEP paradigm is inherently multi-sectoral because it relies on critical settings that are not always health-related, with the exception of primary care (Xu, Sawadogo-Lewis, King, Mitchell and Roberton 2021: 10. Smith (1998: para 28, line 1) stated in 1997 that primary health care

services, general practitioners, community health services, families, villages and local communities, schools, day care services, work places, recreation settings—social organisations, arts, cultural, and sporting groups, retail and commercial settings—street vendors, cafeterias, and food shops could all be used to reach a wider audience. The use of a range of places and organisations enables the formation of beneficial cross-disciplinary relationships as well as much larger community participation in nutrition concerns. Moreover, it permits customized demographic targeting and the development of procedures specific to the measurable and perceived needs of these regions (Smith 1998: para 28, line 1).

In addition, a settings approach might emphasize organisational improvements that support individual transformations (Dooris 2022: 152). One example is policy drafting at the organisational level, which binds the organisation to healthy eating behaviours such as healthy food services or nutrition information services. Families, villages and local communities, schools, day-care centres, workplaces, recreation settings, such as social organisations, arts, cultural, and sporting groups, retail and commercial settings, street sellers, cafeterias, and food shops are all examples of settings for reaching the entire population. Working in a variety of contexts and with a variety of organisations necessitates collaboration and negotiation, as well as the cultivation of long-term linkages across sectors. A strategic assessment of possible areas of mutual advantage and the strategic deployment of influence methods are used to affect change in each circumstance (Allain-Dupré, Chatry, Michalun and Moisio 2020: 2).

3.2.5 Communication methods

The method of communicating the messages for the NEP involves various activities, namely programme conceptualisation, formulation, implementation, and evaluation. Andrien (1998: 11) emphasized the importance of good preparation for the successful implementation of a nutrition education intervention. Even though this study did not determine the nutritional status of the children, the menu planning, the food preparation practices, and the nutrition knowledge of caregivers/ CYCWs, can be addressed by means of a programme developed using figure 3.2 below.

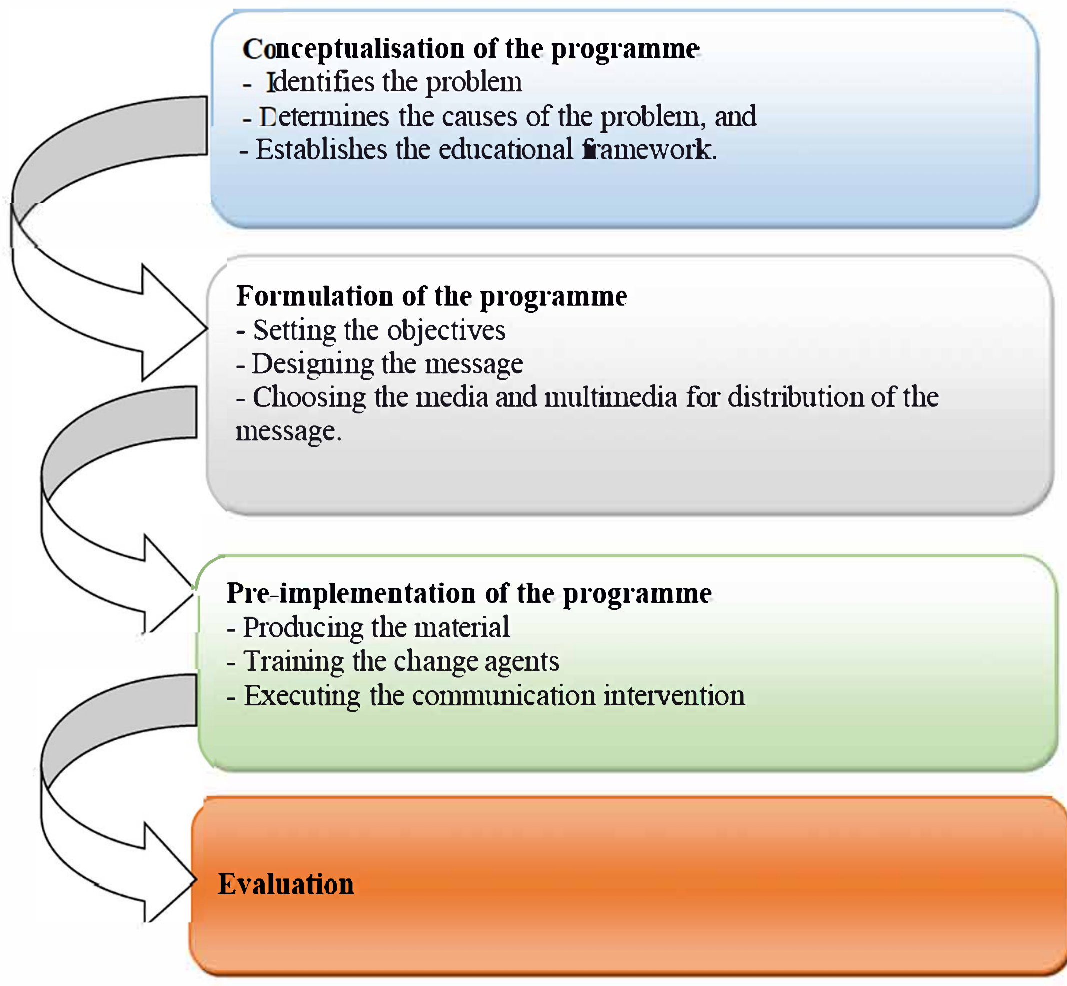

Figure 3.2: The conceptualisation, formulation, implementation, and evaluation of a NEP (Adapted from Andrien 1998: 13)

3.2.5.1 Programme conceptualisation

This first phase covers three aspects, namely the identification of the problem, the determination of its causes, and the establishment of the educational framework. Based on their vulnerability, most, if not all children in CYCCs are defined as children in need of care and protection. In tandem with designing more effective nutrition education interventions against nutrition-related challenges, Bello and Pillay (2019: 2) called for the exploration of the risk factors that may be responsible for children being vulnerable.

(a) Identifying the problem

The first step toward conceptualisation of the education programme (EP) is to analyse the problem to be solved. Bello and Pillay (2019: 2) outlined the global provision of appropriate healthcare for orphans and vulnerable children (OVC) as “critical for maximising their health, well-being, potential, and quality of life”. The process of nutritional diagnosis has been demonstrated to be effective (Andueza, Navas-Carretero and Cuervo 2022: 14). Detailed identification of the nutrition issue that needs to be addressed is required before nutritional intervention can begin. Dietary surveys, clinical sign identification, laboratory testing, and anthropometric measurements are examples of direct methods, whereas indirect methods include analysis of existing health statistics relevant to the community, assessment of environmental factors such as socioeconomic factors, sanitation, and water supply, access to health services, and cultural factors (Andrien 1994: para 1, line 1). The CYCWs in the CYCCs face a number of issues, including poor food handling procedures, a low education level, a lack of knowledge about food safety, menu planning, food preparation, and food handling, and poor personal hygiene practices (Tessema, Gelaye and Chercos 2014: 2). As a result, children with nutritional issues such as overall poor diet quality, underconsumption and overconsumption of specific dietary components, unhealthy meal and snack patterns, problematic feeding practices, and disordered eating are negatively affected (Larson 2021: 40).

(b) Determining the cause of the problem

It is clear that some CYCWs who work with children are untrained and disempowered (Thesen 2014: 3-4), and their knowledge of nutrition, menu planning, food safety, food hygiene and food handling as well as the availability of preparation training in the child and youth care sector is limited. A poor diet deficient in essential vitamins, or medicine that interferes with absorption, or both are the most prevalent causes of nutritional difficulties (Olsen and Blomhoff 2020: 550). The importance of causal analysis in the design and execution of nutrition education has long been recognised. This is due to the intricate combination of social, biological, and environmental factors that lead to nutritional problems. All advocates of nutritional solutions, whether educational or otherwise, must first identify the underlying reasons for the problem (Permatasari and Chadirin 2022: 23).

(c) Establishing the educational framework

Educational approaches should be chosen in accordance with the target groups and the environment's needs (Holmboe 2021: 585). Through a comprehensive pilot study, an educational framework in the form of child nutrition, food preparation, food safety, and healthy eating guidelines was developed and tested in the context of this study. Meanwhile, research states that once the numerous behaviours to be modified have been identified, a deeper analysis is required to establish the determining factors. External variables can be economic (for example, revenue), social (for example, laws), climatic (for example, rainy season), or geographical (for example, the nature of the soil) (Cassimon, Fadare and Mavrotas 2022: 21). Motivation, knowledge, self-confidence, decision-making, and competence are five factors that influence people's behaviour (knowledge of what to do and how to do it). The first thing to think about is motivation. The motivated individual is one who contemplates changing his or her customary behaviour (Fischer and Sliwka 2018: 2). This motivation derives from a person's perception of the problem's seriousness as well as the perceived consequences of continuing or changing his behaviour. For example, a mother may become aware of her child's poor health as a result of malnutrition and the importance of adjusting the child's diet. The second aspect to consider is comprehension. It is vital to understand what change will need to be made if an issue has been discovered and there is adequate incentive to make a change. A mother, for example, who has recognised that her child's diet needs to be changed should be informed about increasing food intake to ensure that the child consumes foods from the appropriate food groups and increasing the number of meals per day as two ways to improve the situation. Self-esteem is the third factor to consider. For health educators, this is currently the most crucial factor. The research found that it is highly difficult for persons who lack self-confidence to modify their health-related behaviour (for example, while a mother may know the proper foods to feed her child, she should also believe she is capable of preparing them) (Yao, Ziapour, Abbas, Toraji and NeJhaddadgar 2022: 309).

(d) Methods of education and communication channels

For this study, messages will be communicated using child nutrition, food preparation, food safety, and healthy eating guidelines. Meanwhile, research shows that communication pathways are the subject of an educational diagnosis. Nutritional communication takes place

through a variety of channels, including interpersonal and mass-media communication. Different people or organizations may have a greater influence on nutrition communication than others (for example, a mother-in-law may have a considerable influence on new-born feeding but not on food purchasing) (Andrian 1994: para 3, lines 1-4). According to Aryeetey (2022: 19603), information exposure can influence dietary perception, behaviour and nutritional status. Furthermore, appropriately designed and implemented behaviour change communication is critical for motivating optimal behavioural change (Aryeetey 2022: 19603). In this study, the dietary behaviour of the children and youths will be studied through literature, interviews and observation. Meanwhile, literature maintains that the method should also involve identifying the predisposing factors (knowledge, beliefs, values, attitudes and confidence) that provide the rationale or motivation for the behaviour and attitudes, the enabling factors (skills and resources), and the reinforcing factors (family, peers, teachers, and so on) that reward or contribute to the behaviour change (Coccia, Tamargo and Macchi 2020: 982). This is the type of information that will be used to plan the educational and communication tactics that will be implemented.

(e) Selection of the nutrition education channels

The child nutrition, food preparation, food safety, and healthy eating guidelines content will be selected based on the results of a pilot study in which CYCWs will select their preferred educational resource. Information has the ability to influence dietary perception, behaviour, and nutritional status, according to Aryeetey (2022: 19603-4). For optimal dietary behaviour, properly designed and implemented behaviour change communication is essential. Depending on the target group and coverage, various types of media can influence public awareness on a wide range of issues, including health and nutrition. Nutrition education is complicated by the fact that proper nutrition necessitates the ability to distinguish between a variety of meals (Stuart and Achterberg 1997: 105). The developed child nutrition, food preparation, food safety, and healthy eating guidelines will be distributed to the CYCMs and CYCWs for independent use over a period of time to determine usability and understandability.

In the field of nutrition, information alone is unlikely to be effective. Not only does it take knowledge to know what foods to add, how much of them to add, and how often to add them,

but it also takes the ability to prepare these meals. Programmes that modify behaviour (rather than just information and attitude) rely on social context and interpersonal contact to allow participants to practice new behaviours and learn to solve their nutrition problems over time, according to nutrition education assessments (Stuart and Achterberg 1997: 105). As a result, the child nutrition, food preparation, food safety, and healthy eating guidelines will be illustrated and written in simple English so that the CYCWs can apply the content to their daily work independently. It has been proven that using the media to raise community awareness of a nutrition problem, or more commonly, as part of a multi-channel strategy in which the media supports other actions, is effective (Okaka and Nagasha (nd): 3).

3.2.5.2 Programme formulation

Programme formulation is an essential and leading strategy for defining general, specific and operational goals. Stage objectives for the target group, which in this case are the CYCMs and CYCWs, must be clearly defined in the formulation. The child nutrition, food preparation, food safety, and healthy eating guidelines will be created using data from the pilot study and literature. The guidelines will then be designed by a graphic designer. According to research, conceptualisation involves determining the factors that influence the behaviour of the target group and then facilitating the process of designing messages and materials that should be used to communicate the message. As a result, messages and materials were tested in the field using strategies that enlisted the help of CYCWs. It is not possible to create effective support materials without using a variety of media. The process of choosing the media for the formulation is a crucial step in the design process. Chau, Burgermaster and Mamykina (2018: 89) described this method as being based on the findings of a potential channel of communication analysis conducted during the conceptualisation stage to promote optimal network synergy.

(a) Setting the objectives

The fundamental goal of any intervention programme is to improve the target group's well-being. In the context of this study, it is to contribute to safe food preparation and the presentation, or serving, of adequate meals to children. Research shows that dietary, biochemical, clinical, anthropometric, and biophysical variables can all be used to assess the method. These measures show how a population's behaviour changes over time (Andrien

1994: para 3, lines 2-6). Distinct treatments affect different indicators across different time frames. As a result, goals should be divided into short-term and long-term goals.

(b) Designing the message

Today, information is most effectively conveyed through the media. Nutrition and health communicators who understand how to target their audiences with messages that appeal directly to them will have a much better chance of improving the population's health (Aryeetey 2022: 19603). According to Andrien (1994: 50), the message is the formulation of a notion or idea to be communicated to a specific target group, the media is the medium via which the message is communicated, and the support materials are the materials through which the message is communicated. Posters, radio programmes, brochures and booklets can all be used as support materials. For the purposes of this study, guidelines on child nutrition, food preparation, food safety, and healthy eating will be used.

Research further states that when creating messages, it is crucial to think about the words to be used, the media, the best media mix, the materials, the images, and the colours. The following considerations should be taken into account when creating a message (Andrien 1994: para 1-9, lines 1-23):

- Keep it short; only mention a few crucial points.
- Give accurate and thorough information.
- Reiterate the concept several times.
- Recommend specific changes in behaviour.
- Demonstrate the link between the nutritional issue and the suggested behaviour.
- Make use of a catch phrase or a theme.
- Ensure that the message is delivered by a reliable source (as perceived by the target group).
- Present the data in a straightforward manner.
- Use positive terms rather than negative ones.
- Use humour in a way that is not offensive to anyone

(c) The choice of media and the multimedia combination

The media are the communication channels through which messages are disseminated. It is important to distinguish between two types of communication channels: face-to-face and mass media. The media and support are chosen based on diagnostic research conducted during the programme's conceptualization phase, which identifies the channels and active communication networks in the community. The utilisation of a multimedia mix has been an integral component of many successful public education programmes. This multimedia mix entails the coordinated exploitation of multiple communication channels at the same time. Synergy is defined as the overall impact of an intervention being increased by combining various types of media, each of which reinforces the others so that their combined impact is higher than the sum of their influences. The coupling of interpersonal communication with mass-media communication is the foundation of a media mix (Baranowski, Ryan, Hoyos-Cespedes and Lu 2019: 172-173).

Each communication route is distinct in its manner (Mesch 2009: 249). The problem is to discover the best combination that will result in each target group's objectives being met. To do so, the message's credibility must be established. Because nutrition is a priority in their industry, health workers are frequently the first choice of target in this regard. However, if the goal of nutrition education is to increase food production, other types of workers may be better suited to the job (e.g., agricultural extension officers). The ideal source for the message is frequently found through communicating with members of the target community on a one-on-one basis (Schiro, Shan, Tatlow-Golden, Li and Wall 2020: 1). During the diagnostic research phase, these sources should be identified. Other forms of communication can be used to supplement the communication strategy. Radio, for example, may reach a considerably bigger audience than development agents can (Smith and McCloskey 1998: 46-47). The planning committee should create a table with two axes, one for the various media and the other for the various supports, based on the criteria listed below. The criteria for selecting media and supporting materials are (Smith and McCloskey 1998: 46-47):

- Cost: Is the usage of this medium financially feasible? (Expenses associated with using the media, preparing participants to disseminate the message, and obtaining and providing support.)
- Media accessibility: How much media access does the target audience have?

- Media "Ease of use" (taking into account the competence already acquired by the people responsible for the intervention). Is it easy to use this medium?
- Each media type's credibility: Is this medium credible?
- Participation in the community: Does this medium foster participation in the community?
- Message dissemination over time: Can the message be sent over a long period using this medium?
- Relationship to intervention objectives: Can this medium be utilized to meet the objectives?

3.2.5.3 Programme implementation

According to Hyttinen (2017: 33), the implementation process entails projecting undertakings intended to achieve the objectives, and delivering the results, or outputs. Training and retraining are required to confirm the participants' involvement in the communication and undertakings so as to complete their roles in the respective sectors. Communication of the message to the people can be started, observed and defined according to Andrien (1994: para 1, lines 1-5). The implementation of the programme is described in detail in chapter 6.

(a) The production of communication support materials

The creation and production of communication products frequently necessitates tight collaboration amongst persons not used to working together. Each person involved in the activity must recognize his or her limitations and be willing to acknowledge the viewpoint of others. For a long time, people made the mistake of putting individuals in charge of developing the message in charge of developing support materials as well. Unfortunately, few nutritionists are also skilled graphic designers. However, it is also quite possible to make the mistake of delegating too much design work to graphic or other artists. Professionals and technical workers involved in this phase must accept the concept of a collaborative effort in which each individual's input is subject to constructive criticism for the material's overall good and success (Andrien 1994: para 1, lines 1-5). Within this study, a professional graphic designer will be approached and used to design the child nutrition, food preparation, food safety, and healthy eating guidelines.

(b) Training the change agent

The study's inclusion criteria include the facilitation and introduction of the guidelines to the target audience (CYCMs and CYCWs). The approach for developing and distributing the child nutrition, food preparation, food safety, and healthy eating guidelines was that they were for independent use. This approach was supplemented by proper instructions on how to interact with the child nutrition, food preparation, food safety, and healthy eating guidelines and initiate open communication with the developer if the material's content was not understood or followed. Even so, research suggests that NEP participants should receive adequate training. The outline of the training of the participants is an important activity that should not be overlooked. The stated steps that the participants should complete are listed below (Andrien 1994: para 3-4: line 1-2):

- Assessment of training needs;
- Conversion of training needs into training objectives;
- Implementation of programme: training sessions, didactic methods, materials and evaluation processes.

(c) Executing the communication intervention

It has been stated on numerous occasions that no single medium can significantly influence social communication. A variety of complementary mediums should be used in interventions. The success of the intervention is determined by how well this phase is coordinated. It has been stated that no single medium or channel can significantly alter nutrition-related behaviour patterns; thus, a combination of complementary media should be used (Gavaravarapu 2019: 340-341). In this study, methods such as online interaction, distribution, and use of development material (child nutrition, food preparation, food safety, and healthy eating guidelines) were used effectively.

3.2.5.4 Programme evaluation

Evaluation is relevant and applicable to three essential social themes, which include innovation, resource allocation, and anti-poverty programmes. Previously, an evaluation model was commonly associated with social science studies as a result of its tradition of quantitative and experimental studies, economic appraisal techniques, and involved methods (Calidoni-Lundberg 2006: 7). Evaluation is an important activity and instrument for

improving or restructuring communication. As a result, evaluation involves bringing together the intervention's principal players, including promoters (meeting through a planning committee), communicators, sponsors, and the population group, and in this study it was the CYCMs and CYCWs (via community representatives) (Marshall, Powell, Cronin, Caldwell, Johnsen, Gruev, Chiou, Roberts and How 2019: 6). Furthermore, Andrien (1994: para 1-2, line 1-4) stated that evaluation must answer two key questions: Have the project's intentions been met? Were the participants satisfied with the execution procedure? After 10 months of use, the impact of using the child nutrition, food preparation, food safety, and healthy eating guidelines was evaluated through a post-implementation phase of the study. The purpose of the focus group discussion was to learn about the participants' perceptions of child nutrition, food preparation, food safety, and healthy eating guidelines in terms of usability, ease of comprehension, and impact on their day-to-day work, as well as whether personal expectations were met.

3.3 CONCLUSION

The chapter explained the conceptual framework adopted to complete the study. According to the research, it was apparent that before developing any teaching material, it was necessary to analyse whether the dietary circumstances to be addressed would improve. The development should emphasize the significance of the educational material that will be created. When resolutions are made to implement the NEP, it is important to build a degree of dedication, care and support to ensure that change occurs. The following chapter will concentrate on the pilot study that was used to determine the need for a child nutrition, food preparation, food safety, and healthy eating guideline. This chapter will present the research methodology, results, discussions, and conclusion.

CHAPTER 4 - PILOT (PHASE ONE): METHODOLOGY AND RESULTS

4.1 INTRODUCTION

The goal of this pilot phase was to determine the need for child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs in KwaZulu-Natal. This chapter presents the ethical considerations that were observed, the research design, and the methodology that was used for data collection. Research gathering tools used were: self-administered questionnaires, observations, checklists, weighed food records, and swabs. This chapter also presents the demographic characteristics of the CYCWs together with the findings of the study. The themes examined were the food safety and hygiene practices in the food service system (receiving, storage, preparation and service), observation of the food and safety practices, nutritional adequacy of menus offered, portion sizes of the meals presented, and the nutrition knowledge of the CYCWs. The key findings from the study are further discussed and interpreted in line with the literature that explains the results and the literature that exposed the gaps in the area of study.

4.2 PERMISSION AND ETHICAL CONSIDERATIONS

Ethical clearance to conduct the research study was obtained from the Durban University of Technology (DUT) Institutional Research Ethics Committee (IREC No: 076/15) (Annexure A). The Department of Social Development (DSD) regional office in Pietermaritzburg was approached for consent to undertake the study in the CYCCs based in the Ulundi Cluster (Annexure B). An application letter for gatekeeper permission was supported by a detailed study summary (Annexure B1). The General Manager of Ulundi Cluster (DSD) wrote a submission to the Acting Head of Department (Annexure B1) who replied by supporting the submission, which was endorsed by the General Manager of Social Welfare Service and the Acting Deputy Director-General through signatures (Annexure B1). Following that, the researcher was sent a list of existing CYCCs, from which the two chosen CYCCs were selected (Annexure C). Child and youth care managers (CYCMs) from the two CYCCs were approached for permission to conduct the study. Immediately after gatekeeper permission was granted by the CYCMs, a formal appointment was arranged to meet CYCWs and discuss the detailed content of the study. Information letters written in English and isiZulu were

issued (Annexure D) and consent was requested (Annexure D1). Child and Youth Care Centre managers were also formally asked to participate in the study.

Respondents (CYCMs and CYCWs) were advised that no financial gain was being offered for participating in the study. Furthermore, it was clarified that participation in the study was voluntary and respondents were assured that they were not expected to incur any costs related to their participation in the study. There were no risks (either physical or psychological) to the respondents involved in the study. Respondents were assured that all information would be treated confidentially and that names would not be disclosed (Annexure A2). Child and Youth Care Centres and individual respondents were given a number to be used as a form of identification in all the completed questionnaires. Children in the CYCCs were not included as part of the study.

Individual respondents and the managers of CYCCs were aware that they could withdraw from the study at any given time. During the CYCMs and CYCWs meeting, respondents were invited to ask questions. It was also stated to the respondents that the personal information of CYCCs and individual respondents would be retained in the Department of Food and Nutrition Consumer Science at the DUT in a locked cupboard for five years after the study's conclusion study before being shredded. This information would be accessible only to the researcher and the study supervisor. After five years, all password-protected electronic data would be erased.

4.3 RESEARCH SETTING

The pilot study was conducted in the KZN, Ulundi Cluster as per the DSD demarcation, a rural cluster that includes municipalities such as uMkhanyakude, Zululand, Amajuba, uMzinyathi, King Cetshwayo, iLembe, uThukela, and uMgungundlovu (Municipality, Ulundi 2016: 1). A traditional authority governs half of Zululand, while the other half is divided between commercially owned farms, conservation areas, and private residences. Abaqulusi, uPhongolo, Ulundi, Nongoma, and eDumbe are the five local municipalities that comprise the clusters. With a population of about 803 575 people, Zululand is one of South Africa's poorest districts (in terms of income levels). Ulundi cluster is listed among underdeveloped areas with limited access to main roads and surrounding cities (Ulundi Local Municipality 2018). KwaZulu-Natal, where the Ulundi cluster is located, has the highest HIV prevalence (24%) as reported by Child (2019), the unemployment rate is (49.45%), and there is a high

level of poverty (Ulundi Local Municipality 2018; Department of Land Reform and Rural Development (DALRRD) 2016). A total of eight (n=8) CYCCs in the Ulundi Cluster were registered with DSD residential care facilities in terms of the Child Care Act of 1983 (Annexure C).

4.4 RESEARCH APPROACH

This part of the study (pilot study) adopted a quantitative approach and was conducted with clear probability intentions, methodical procedures, and clear principles for determining the feasibility of the main study. The study used numerous methods, including self-administration, one-on-one interviews with interview questionnaires written in English (translated to IsiZulu), observation of food handling practices, weighed food methods to determine plate waste, and collection and analysis of microbial samples for surfaces, hands, and water. The pilot study was conducted to determine the need for child nutrition, food preparation, food safety and healthy eating guidelines for children in the CYCCs. The findings of this phase contributed to the development of child nutrition, food preparation, food safety, and healthy eating guidelines and enhanced the success of the main study. Moreover, it aided in the identification of techniques for avoiding gaps, which would have resulted in project failure.

Respondents were selected who probed specifics, streamlined the questions, and collected measurable data from respondents using existing structured questionnaires developed by Meaker (2008), being Managers (Annexure E) and Food handlers questionnaires (Annexure F), and Nutrition knowledge questionnaire (NKQ) (Annexure G) (Whati, Senekal, Steyn, Nel, Lombard and Norris 2005). The questionnaires were completed by nine respondents. Furthermore, a self-developed and tested questionnaire (Preferred learning material questionnaire (Annexure H) was completed by 30 respondents. The researcher also conducted observations using an observation checklist (Annexure I) and collected the microbial swabs during the food preparation at CYCCs. Thereafter, questionnaires were analysed using statistical packages and laboratory analysis.

4.4.1 Research design

A quantitative study design took place in phases. The descriptive/observational pilot study (phase one) was conducted to develop child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs working in CYCCs as part of the main doctoral study.

Siedlecki (2020: 8) stated that the purpose of descriptive design studies is to describe individuals, events, or conditions by studying them as they are in nature. In other words, descriptive research identifies problems within an organisation or population and describes the phenomena and their characteristics.

4.4.2 Sample and sampling method

Two CYCCs registered with the Child Welfare Organisation Management were selected in the Ulundi Cluster from a list provided by DSD, based on easy accessibility of road infrastructure and the distance to be travelled for data collection. Roads to the selected CYCCs were gravel and access had to be gained using a sport-utility vehicle (SUV). After receiving a list of CYCCs in the Ulundi Cluster, purposive sampling was used, which is a type of non-probability, or non-random sampling in which respondents who met the criteria of easy accessibility, geographical proximity, availability at a given time, or willingness to participate in the study (Berndt 2020: 225) were used. The study included two CYCCs from the eight on the provided list registered as residential care facilities with the DSD under the Child Care Act of 1983. Each CYCC had a central kitchen and dining area with a handwashing basin and several rooms that could accommodate between 28 and 90 children and youths. One CYCM, one social worker, eight caregivers, one volunteer, and one cook made up the staff complement, totalling 12 permanent or long-term contract employees in one CYCC. Staff members at the second CYCC included one CYCM, 19 caregivers, and two cooks, giving a total of 22 people.

4.4.3 Data collection and analysis methods

The pilot phase was designed as part of the main study. Within this context, data were gathered on different days using various methods of quantitative data collection (questionnaires, observations, Weighed Food Records (WFR) using a Platform Kitchen scale, microbial swabs (hands, surface, and water swabs), and instruments (managers, food handlers questionnaires, a NKQ, observation checklists, WFR, microbial swabs, and preferred learning material questionnaires) to ensure that the study objectives were met. Questionnaires were distributed and completed in a face-to-face situation with the CYCM and the CYCWs.

The researcher scheduled a date for data collection with the CYCMs and CYCWs from the two CYCCs on four separate days. Data were collected from nine respondents using Managers (2 CYCMs) and Food Handlers questionnaires (7 CYCWs) and a NKQ (9 CYCMs

and CYCWs) obtained from nine out of the 34 registered and recognised employees (CYCMs and CYCWs) who consented to participate and were available on the days of data collection. Observations, WFR, and microbial swabs were collected from surfaces, hands, and water in two kitchens. Meanwhile, 30 respondents who consented to participate and were available on the days of data collection (including some of the nine), completed the preferred learning material questionnaire. The increase in the number of respondents from nine to 30 was due to their increased availability at work due to a shift change and their agreement to participate in the data collection. Respondents in the data collection were either employed full-time or on a long-term contract. Below are the themes that were explored.

4.4.4 Managers and food handlers questionnaires

Before the data collection process commenced, the questionnaires used to collect data were designed, reviewed and adjusted in line with the study's objectives which was to determine the need for nutrition, healthy eating and food preparation guidelines for child and youth care centres. The questionnaires were distributed to the managers and food handlers (CYCWs) for self-completion. It is worth indicating that although the researcher was present on both days when data was collected, she was available only to clarify complex questions where necessary. The one-on-one interviews were used to complete the questionnaire with respondents who could not read and write independently, either in English or IsiZulu. The structured questionnaires included both open-ended and closed questions. Respondents were expected to select from two or more answer options in a closed question. Some of the questions in the questionnaires included dichotomous questions, which offered the respondents an option to answer only 'yes/no’ or 'agree/disagree’. This applied to questions such as the length of work experience, menu planning and implementation, the assessment of stored food items, food preparation, food serving, food waste, and food safety. Questionnaires were self-completed by respondents between 08:00 and 17:00 Monday to Friday, with the researcher available in case of any questions. After collecting all the completed questionnaires, data was screened for errors thereafter analysis started. The closed and open-ended questions data were screened for errors and entered into an Excel spreadsheet, which was analysed with the assistance of a statistician to generate descriptive statistics for the small sample size of two CYCMs and seven CYCWs.

Before the data collection process commenced, the questionnaires used to collect data were designed, reviewed and adjusted in line with the study's objectives. The questionnaires were

distributed by hand on the day of data collection to the managers and food handlers (CYCWs) for self-completion. It is worth indicating that although the researcher was present on both days when data was collected, she did not interfere with the distribution process. The researcher was available only to clarify complex questions where necessary. The one-on-one interviews were used to complete the questionnaire with respondents who could not read and write independently, either in English or IsiZulu. The structured questionnaires included both open-ended and closed questions. Respondents were expected to select from two or more answer options in a closed question. Some of the questions in the questionnaires included dichotomous questions, which offered the respondents an option to answer only 'yes/no' or 'agree/disagree'. This applied to questions such as the length of work experience, menu planning and implementation, the assessment of stored food items, food preparation, food serving, food waste, and food safety. Questionnaires were self-completed by respondents between 08:00 and 17:00 Monday to Friday, with the researcher available in case of any questions. After collecting all the completed questionnaires, data was screened for errors thereafter analysis started. The closed and open-ended questions data were screened for errors and entered into an Excel spreadsheet, which was analysed with the assistance of a statistician to generate descriptive statistics for the small sample size of two CYCMs and seven CYCWs.

4.4.5 Nutrition Knowledge Questionnaire (NKQ)

The NKQ had multiple-choice answer questions that assessed knowledge of the Food-based dietary guidelines (FBDGs) and nutritional food sources. Two (n=2) CYCCs, two (n=2) CYCMs, and seven (n=7) CYCWs completed this questionnaire. Most of the questionnaires were completed by literate respondents (n=6), whereas others (n=3) had to be helped by the researcher. During the completion of the questionnaires, the respondents were separated to restrict discussion or influencing each other. The researcher was available to assist the respondents who self-administered the questionnaire to explain and clarify questions relating to nutritional food, physical activity requirements, consumption of healthy food, and foods to be avoided to stay healthy. All completed questionnaires were checked for completeness by the researcher, and the data were captured in an Excel spreadsheet and analysed for descriptive statistics for the small sample size of nine (n=9) participants. The data were then categorised and presented in accordance to FBDGs published by Vorster (Vorster, Badham and Venter 2013: s5-12).

4.4.6 Observation of practices in the CYCCs

Observation of the daily activities in both CYCCs related to food handling, preparation, and safety was conducted on two different days. The researcher used a checklist and a diary to record the findings. Direct observation was used to observe the respondents without communicating or interacting with them. Activities that were taking place in the kitchen such as pre-preparation, preparation, plating, and serving food and noting the amount of food left uneaten on the plate (plate waste), storerooms, and storage of the food (receiving, storage and issuing) were observed and recorded. The researcher captured the observation checklist (n=2) and information written in a diary in an Excel spreadsheet. The results were reported in a table that outlined the variables observed and the number of responses to the observation (Observation checklist).

4.4.7 Weighed Food Records (WFR) to determine plate waste

When food was served, weighed food records were conducted to determine the portion sizes offered to children and youth during lunch times at 12:00 and 13:00. Food was weighed using a Clicks brand Platform Kitchen scale which runs on batteries and has an LCD. The scale allows you to switch between different weight measurements, ensuring that you always use the correct amount of ingredients in your food. Eighteen (n=18) lunch time portions of food were weighed and recorded using the scale in both CYCCs. The food scale was calibrated according to the manufacturer's instructions before use. The different components of the meals served per child/youth were weighed and recorded according to their age groups before being consumed. The manufacturer's instructions for utilizing an electronic scale were followed by setting it on a flat, stable tabletop. When the digits showed zero, an empty plate was placed on the scale and the scale zeroed to automatically deduct its mass. Subsequently, the researcher carefully added the starch to the plate and recorded the weight, then zeroed the scale again before the portion of the protein was added and recorded and the same process was followed when any other food was added to the plate. The total weight was calculated by adding all the food items. Leftover food was weighed after the mealtime. After that, recorded data were screened for errors, captured in an Excel spreadsheet version 2016, and analysed for average portion sizes per age category of the children and youth and reported.

4.4.8 Swabs tests and procedures

Three different types of swabs, surfaces (n=2), hands (n=3), and water samples (n=2), were collected in two CYCCs on two separate days for microbial contamination analysis. The

researcher was trained in the correct sampling procedures to ensure the validity of the findings.

4.4.8.1 Surface swabs

Surface swabs were collected using conventional swabbing procedures by using cotton swab buds. The swab bud cover was removed by touching the top of the plastic holder. Then the cotton bud was rubbed directly onto the surface, covering about a 10cm area (i.e., 3.3 x 3.3cm or 5 x 2cm). The swab was rubbed back and forth on a surface area while rotating it to ensure the swab was evenly covered. The swab was placed back into the casing and labelled using an identification number given to the CYCC for research purposes. Collected samples were labelled correctly. Laboratory specialists analysed the samples for Total Microbial Activity (TMA). After the analysis, results were sent to the researcher by email and subsequently reported. The process was undertaken according to the swab collection protocol (Mérieux NutriSciences 2022: para 1, 1-4).

4.4.8.2 Hand swabs

Swabs were collected from the food handlers (n=3) preparing the food in the two kitchens using cotton swab buds. The swab was removed from the case by only touching the top of the plastic holder. The cotton swab bud was then rubbed directly on the hands of the participants. Thereafter, the swab was rubbed onto three fingertips, two fingernails, two grooves in the hand, a line on the palm, between the fingers, and around the finger nails. The swab was then placed back into the casing and labelled by using the identification number given to each CYCW for research purposes. Collected samples were labelled correctly. Laboratory specialists analysed the samples for Escherichia coli and Staphylococcus aureus. After the analysis, results were sent to the researcher by email and subsequently reported. The process was undertaken according to the swab collection protocol (Mérieux NutriSciences 2022: para 2, lines 1-5).

4.4.8.3 Water samples

Before collecting the water samples from two (n=2), taps, they were disinfected using a sanitising spray. A waiting period of about 10-15 seconds allowed the water to run out of the taps and clear all the possible germs. Capped glass bottles were used to collect the samples. Gloves were used to ensure that fingers did not touch the inside of the bottles or the caps. The bottle was uncapped for the sample collection. It was ensured that the water sample was not

compromised by any contact with contaminated surfaces. The bottle was filled up to an inch of the brim and sealed and labelled according to the CYCC identification number. Collected samples were labelled correctly. Laboratory specialists analysed the samples for Total Microbial Activity (TMA), coliforms, and Escherichia coli. After the analysis, results were sent to the researcher by email and subsequently reported. The process was undertaken according to the sample collection protocol (Mérieux NutriSciences 2022: para 3, lines 1-5).

4.4.9 Prefered learning material in the CYCCs

The researcher developed a preferred learning material questionnaire. The researcher looked through the literature to find questions that could be used in the context of CYCWs in 89 CYCCs (Grobbelaar and Napier 2014; Lee, Abdul Halim, Thong and Chai 2017: 11; Allam, Al-Batanony, Seif and Awad 2016: 4). The study developed questions based on the study findings after identifying approximately six (n=6) questions from previously published work on CYCCs and their practices (Grobbelaar and Napier 2014). In order to achieve the pilot project's goals, the developed questionnaire was tested among the CYCWs to determine its validity (form, question formulation, including translation if applicable; overall structure and transitions between questions and/or question sets). Following that, a questionnaire was used to collect data. Respondents (CYCMs and some CYCWs) then completed the questionnaire on their own. The researcher assisted individuals who could not read or write in completing the questionnaire in a one-on-one setting in a pleasant supportive environment. The data from the entire preferred learning material questionnaire (n=30 respondents) was then entered into an Excel spreadsheet and analysed using the Statistical Package for the Social Sciences (SPSS®) version 25. The analysis was carried out with the assistance of a qualified statistician in order to generate frequencies and percentages (descriptive statistics).

4.5 THE CYCMs AND CYCWs RESULTS

The results of the data generated through the Managers and Food Handlers questionnaire are presented in this section.

4.5.1 The demographic characteristics of the respondents.

Table 4.1 shows the demographic information of the respondents who completed the questionnaires for managers, food handlers, NKQ, and preferred learning material.

Table 4.1: Demographic characteristics of respondents: CYCMs and CYCWs

Variables	Managers, food handlers, and NKQ data		Preferred learning material data	
	Numbers (n=9)	Percentage (100%)	Numbers (n=30)	Percentage (100%)
AGE				
18-24	0	0	1	3.3
25-34	1	11.1	11	36.7
35-44	1	11.1	8	26.7
45-54	4	44.4	7	23.3
<64	3	33.3	3	10.0
EDUCATION LEVEL				
No formal education	3	33.3	1	3.3
Entered high school	1	11.1	2	6.7
High school graduate	3	33.3	5	16.7
Completed some college education	0	0.0	10	33.3
Associated Degree in CYC-related qualification	0	0.0	1	3.3
Other	0	0.0	9	30.0
JOB POSITION IN CYC				
Manager	2	22.2	1	3.3
Coordinator	1	11.1	2	6.7
Food handler (cook)	3	33.3	3	10.0
Caregiver	3	33.3	23	76.7
Volunteer	0	0	1	3.3
EXPERIENCE (LENGTH OF SERVICE IN CYC)				
0-2 years	2	22.2		
3-4 years	3	33.3		
5 and more years	4	44.4		

4.5.2 Child and Youth Care Centres Infrastructure: CYCMs and CYCWs

The findings about water, power supply and administration of the CYCCs had a positive response, where it was found that there was access to running water through the municipal taps within their kitchens and outside. Hot and cold water for both food preparation and

dishwashing were available at the kitchen sinks. An additional supply of water was available from the external tank filled with rainwater and used as an alternative during days when the water supply was cut. Findings also suggested that CYCCs used electricity as a food preparation source while gas was available to use during load shedding as an alternative.

Furthermore, the results showed that CYCCs were resourced with telephones, computers, the internet, and printing machines, and each one had a governing body. The governing body helped with the administration and management of the CYCCs. The governing body had always been active in supporting the children and youths by making sure that funds were available for food and other needs.

4.5.3 Staff members and volunteers involved in the daily running of the CYCCs

According to Table 4.4, the staff members involved in the daily running of the CYCCs included in this study, but not necessarily participants in the study, were 24 caregivers (70.6%). Three (8.9%) were cooks/ food handlers, followed by two (5.9%) CYCMs and two (5.9%) part-time general workers. Findings also showed that there was one (3.0%) social worker, one (2.9%) volunteer, and one (2.9%) community member who assisted whenever there was a need in the CYCCs.

Table 4.2: Staff members and volunteers in the CYCCs

Variables	**CYCCs**	
	Total Number of staff (n=34)	**Percentage (%)**
Manager	2	5.9
Social worker	1	2.9
Cooks (Food handlers)	3	8.9
Caregivers	24	70.6
Part-time general workers	2	5.9
Volunteers	1	2.9
Community members	1	2.9

4.5.4 Number of children in the CYCCs and budget: CYCMs' responses

According to the findings, 118 (100%) of the children and youths living in the CYCCs consumed food on a daily basis. In the CYCCs, children and youths were provided with three meals per day (breakfast, lunch and dinner). Food costs at the CYCCs averaged roughly R3200 per person per month. The management committee created the CYCC budget, which was adjusted according to daily, weekly and monthly demands. Although it was set on a

weekly and monthly basis, the budget was contingent on cash being available. Furthermore, the budget was insufficient to meet all the monthly requirements. In circumstances where there was overspending, CYCMs mentioned that they had to make alternative arrangements. On the other hand, the CYCMs reported that overspending did not affect the food supply because donors stepped in to help meet their needs.

Table 4.3: Community participation and CYCC operation: answers from CYCMs

Variables	**Positive responses**
Number of children consuming food on a daily basis	n=118 (100%)
Meals served per day (no lunch option due to school meals participation)	n=3 (Breakfast, snack, and dinner)
Estimated budget spent by the CYCCs per child per month	R 3 200
Governing body intervention in times of shortage of funding	1 (50%)
Make alternative plans in times of shortage of funding	1 (50%)

4.5.5 Policies and procedures on receiving, storage, serving, hygiene and administration, and menu planning

Table 4.4 shows that no formal or signed policies and procedures were in effect for receiving, processing, serving, hygiene, administration and menu planning in the CYCC. Suppliers have been verbally agreeing on food products such as bread and milk requiring regular delivery. A typed menu (Annexure J) was available in the CYCC but it was not regularly followed. A copy of the menu was not available, so food handlers were, therefore, cooking food dependent on available ingredients.

Table 4.4: Policies and procedures on receiving, storage, serving, hygiene, administration and menu planning in the two facilities.

Written policies and procedures for food receiving, storage, serving, and administration	
Variable	**Positive responses**
Written policy on receiving, storage, serving, and hygiene	2 (100%)
Menu planning	1 (50%)

4.5.6 The purchasing and receiving procedures for food

This section focused on examining the food purchasing and receiving procedures. This was necessary to determine the management practices of the food service system in the CYCCs.

Table 4.5: Purchasing and receiving procedures for food (n=2)

Variable	**Positive responses**
Service level agreement with the suppliers	1 (50%)
Planned delivery schedule?	2 (100%)

Variable	Positive responses
Suppliers of the services	
Commercial and local members.	2 (100%)
Delivery of non-perishable foods	
Closed car	2 (100%)
Closed truck	2 (100%)
Delivery of perishable foods	
Closed truck	1 (50%)
Closed car	1 (50%)
Storage of perishable foods	
Fridge/ Freezer	2 (100%)
Assessment of food quality.	
Expiry date on the package	2 (100%)
Smell	2 (100%)
Treatment of food of substandard quality	
Return to supplier	1 (50%)
Receive and throw away	1 (50%)
Assessment of delivery note/ invoice	2 (100%)
Method used for the assessment of deliveries	
Count	2 (100%)
Personnel who receive the stock and do food quality assessment (n=5; 100%)	
Manager	2 (40%)
Cooks	1 (20%)
Caregivers	2 (40%)
The same person is receiving the food in the CYCCs (n=2)	1 (50%)
Checking of delivery notes and invoices in the CYCCs (n=2)	2 (100%)
Conducting the food quality assessment in the CYCCs (n=2)	2 (100%)

Table 4.5 reveals that one CYCC had an established verbal service level agreement with the local community member who distributed fresh milk and bread, with delivery scheduled every Thursday. Child and Youth Care Centres (CYCC) bought and collected other grocery supplies from supermarkets. Two CYCMs mentioned that a closed vehicle or truck delivered the perishable food and it was stored in a refrigerator or freezer after receiving it. Findings further showed that the person who received the food checked the expiry dates and also smelled the food as part of routine quality control.

Moreover, the findings in respect of food that had been classified as being of substandard quality showed that it was returned to the manufacturer and a replacement requested, while the other CYCC responded that they routinely threw it away.

According to the responses, two (40.0%) CYCWs and two (40.0%) CYCMs were mostly the food delivery recipients, with one (20%) cook (food handler) also receiving food. Furthermore, the findings suggested that documents such as the delivery notes and invoices

were examined before the stock was accepted during delivery; however, at one of the CYCCs, the process of receiving the goods, verifying the invoices, approving the invoices, and signing the invoice was not followed.

4.5.7 The availability of food gardens in the CYCCs

There was only one vegetable garden, according to the CYCMs, and it produced spinach and onions. The vegetables that were grown were used to supplement the meals that were served to the children and youth. The other CYCC did not have a vegetable garden due to a lack of staff members who could assist in the garden.

Table 4.6: The availability of vegetable gardens in the CYCCs

Variable	Positive responses
Vegetable garden	1 (50%)

4.5.8 Training for CYCMs and CYCWs on food safety

According to the CYCMs and CYCWs, no one in the two CYCCs had received training in food safety, menu planning, food preparation, food handling, or personal hygiene.

4.5.9 Frequency of washing utensils in the CYCCs: CYCWs responses

This question focused on the washing of utensils used to serve food to the children and youths.

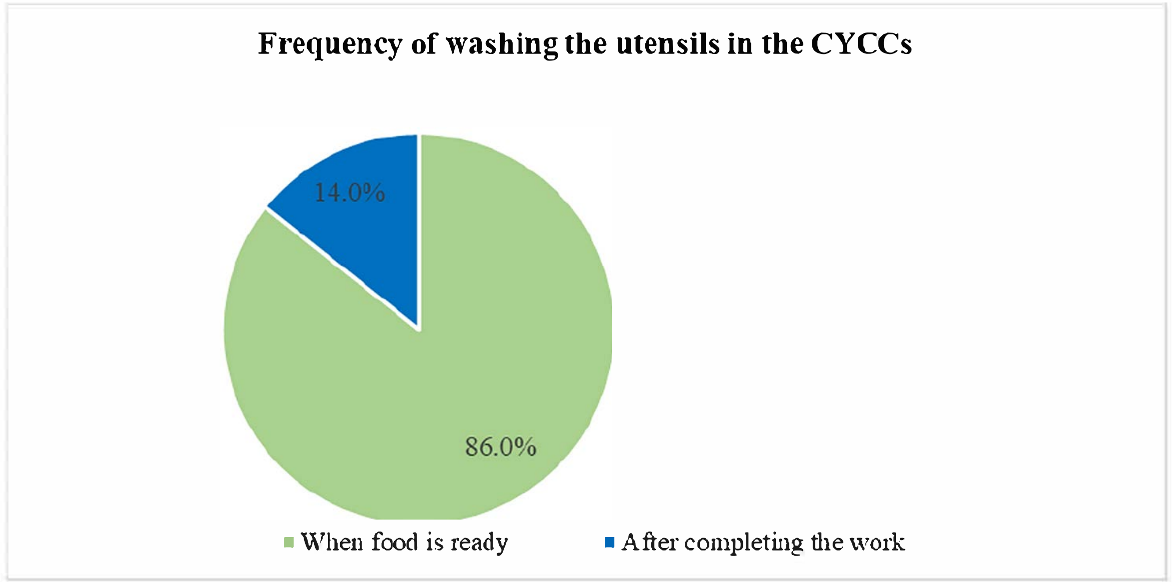

Figure 4.1: Frequency of washing utensils in the CYCCs.

Figure 4.1 shows that when the food was ready, six (86.0%) respondents washed the utensils with tap water and detergent from inside the kitchen, while only one (14.3%) washed them after the work was completed.

4.5.10 Checking food expiration dates and storing food in CYCCs: CYCCWs

Food was stored in the designated storage area in the CYCCs, to which only certain individuals had access (refer to figure 3.3). Six (85.7%) respondents said they checked the expiry dates on food products before cooking or using the food, while three (14.3%) said they did not.

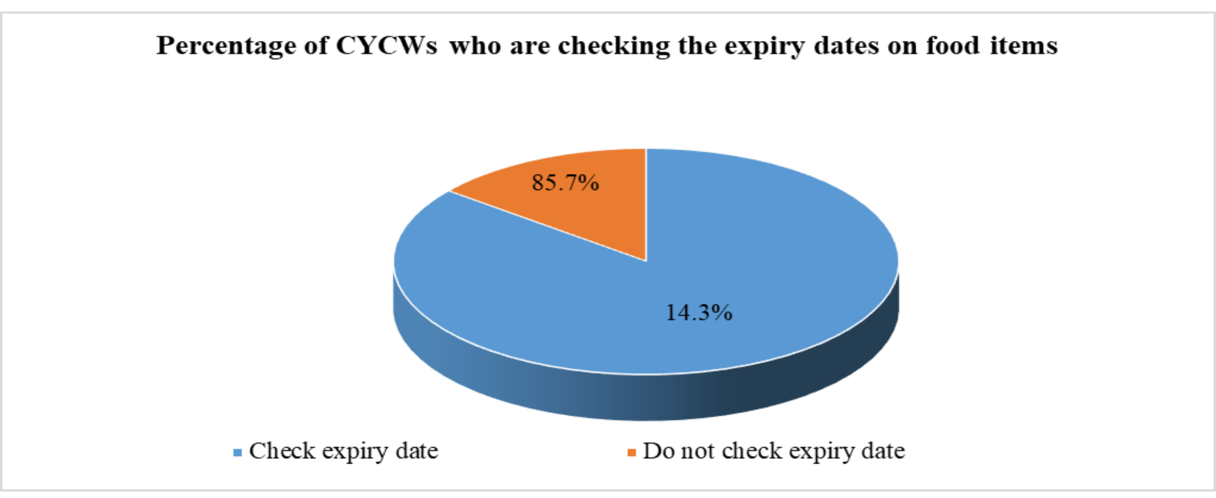

Figure 4.2: Percentage of CYCWs who were checking the expiry dates on food in the CYCCs

4.5.11 CYCWs' understanding of the meaning of the expiry date printed on food packaging

The expiry date printed on the food product was recognised and understood by eight (89.0%) of the respondents, while one (11.0%) did not know that it meant that food must be assessed before use.

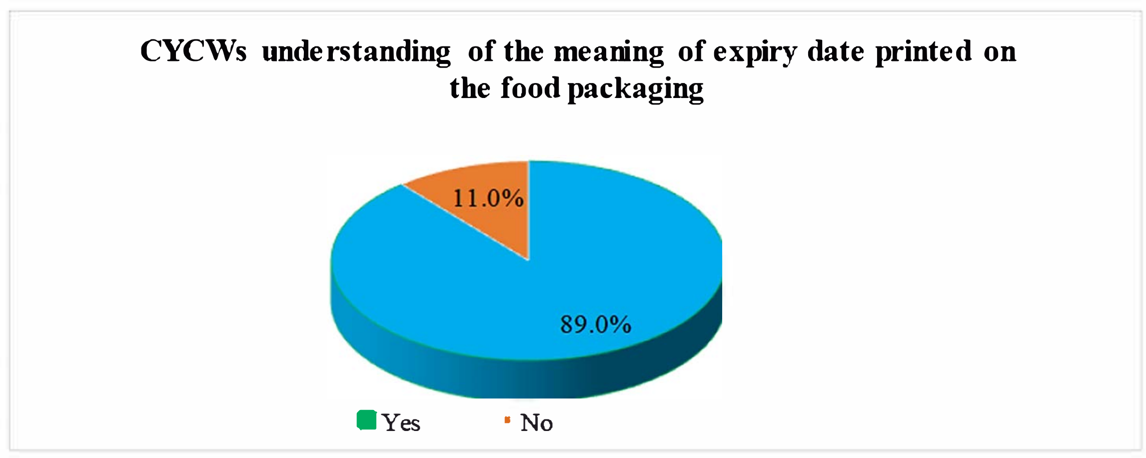

Figure 4.3: CYCWs understanding of the expiry date on food packaging

4.5.12 Food preparation practices in the CYCCs

The results of the CYCCs' food preparation procedures are discussed in this section. The results are reported in Table 4.7. All seven respondents stated that food was prepared in a specific kitchen (100%). Furthermore, the findings revealed that the main people responsible for preparing the food were three (60.0%) cooks, one (20.0%) caregiver, and one (20.0%) CYCM. The majority of respondents thought that the kitchen space was adequate (n=6; 85.7%) and five (71.2%) respondents thought that the cooking equipment was adequate. Three (42.8%) respondents reported having access to chopping boards, while one (14.3%) respondent reported having access to measuring equipment. Seven (100%) of the respondents stated that the CYCCs did not have any recipes.

Table 4.7: Food preparation practices in the CYCCs: CYCCWs responses

Variables	n=7 (Percentage)
Place where food is prepared.	
Designated kitchen	7 (100%)
The person preparing the food (n=5).	
Cooks	3 (60.0%)
Manager	1 (20.0%)
Caregivers	1 (20.0%)
Adequate space for food preparation	
Yes	6 (85.7%)
Availability of cooking utensils (knives)	
Yes	5 (71.2%)
Availability of chopping boards in the CYCCs	
Yes	3 (42.8%)
Availability of measuring equipment	
Yes	1 (14.3%)
Availability of spoons	
Yes	3 (42.8%)

Variables	n=7 (Percentage)
Availability of mixing bowls	
Yes	3 (42.8%)
Availability of recipes	
Yes	0 (100%)

4.5.13 Holding, serving and food waste in the CYCC: CYCWs responses

Table 4.8 shows that three (42.9%) respondents kept the food back for 30-45 minutes before serving it, whereas two (28.6%) kept it back for 15-30 minutes and two (28.6%) kept it back for 45 minutes or more. Five respondents (71.4%) said they kept the food warm before serving it. Furthermore, the statistics suggest that three respondents (42.9%) left the burner on and only a few (14.2%) utilised the warmer to keep the meal warm. Six respondents (85.7%) stated that the serving space was adequate. Meanwhile, all (100%) of the respondents claimed that serving spoons and ladles were accessible, and five (71.0%) stated that cups and saucers were available. All the respondents (100%) said there were enough plates, and four (57.1%) said bowls, knives, and forks were available. However, two (28.6%) said the measuring equipment was inadequate. In both facilities food is served to the children and youths on individual plates. Meanwhile, two of the respondents (28.6%) claimed that the served portion sizes for all the children were not the same.

Table 4.8: Holding, serving, and food waste in the CYCCs: CYCWs responses

Variables	n=7 (Percentage)
Holding of food after cooking before serving	
15-30 minutes	2 (28.6%)
30-45 minutes	3 (42.9%)
More than 45 minutes	2 (28.6%)
Keeping food warm before serving	
Yes	5 (71.4%)
Keeping food on the stove until serving	3 (42.9%)
Stove warming drawer	1 (14.2%)
Adequate space for serving	
Yes	6 (85.7%)
Adequate food serving utensils (ladles)	
Yes	4 (57.1%)
Availability of sufficient measuring equipment	
Yes	2 (28.6%)
Availability of enough serving spoons	
Yes	7 (100%)
Availability of enough tins (enamel mugs)	
Yes	3 (42.9%)
Availability of cups and saucers	
Yes	5 (71.4%)
Availability of eating utensils: plates	

Variables	n=7 (Percentage)
Yes	7 (100%)
Availability of bowls	
Yes	4 (57.1%)
Availability of spoons, forks and knives	
Yes	4 (57.1%)
Allocation of food to the children and youth	
Individual portioning	7 (100%)
Serving the same amount to all children and youth	
Yes	2 (28.6%)

4.5.14 Meal serving times and serving method: CYCWs responses

According to the findings, four (57.1%) of the respondents claimed that a meal was served at 17:00, while just two (28.6%) reported food was served at 11:00 and 13:00. The CYCWs were the ones who provided the food to the children in the CYCCs and the food was served in less than 15 minutes. Meanwhile, two respondents (28.6%) reported serving the same meals to both children and youths. All the CYCWs said they believed that the children and youths were satisfied with the amount of food supplied.

Table 4.9: Meal serving times and serving methods: CYCWs responses

Variables	n= 7 (Percentage)
Meal serving times	
11:00	1 (14.3%)
13:00	2 (28.6%)
17:00	4 (57.1%)
Personnel who serve the food	
CYCWs	7 (100%)
The length of food service times	
Less than 15 minutes	4 (57.1%)
Is the same amount of food served to each child?	
Yes	2 (28.6%)
Are the children happy with the amount of food they get?	
Yes	7 (100%)

4.5.15 Plate waste: CYCWs responses

The Child and Youth Care Workers (CYCWs) provided feedback on the amount of food remaining on the plates after meals. According to Table 4.10, six (85.7%) of the respondents indicated that the children and youths finished all the food on their plates. Four respondents (57.1%) acknowledged that there were no leftovers, while three (42.9%) confirmed that there was a little leftover food on certain days. However, if food remained on the children's and youth's plates, three (42.9%) respondents reported that it was thrown away.

Table 4.10: Food waste: CYCWs responses

Variables	n=7 (Percentage)
Children finished the food that has been served	
Yes	6 (85.7%)
Food that is served and left not eaten	
None	4 (57.1%)
Minimal/little on some days	3 (42.9%)
Treatment of leftover food	
Thrown away	3 (42.9%)
The amount of leftover food that is thrown away	
None	2 (28.6%)
Less than a quarter	5 (71.4%)
The availability of a designated rubbish area	
Yes	6 (85.7%)

4.6 NUTRITION KNOWLEDGE: CYCMs and CYCWs

Nutrition Knowledge Questionnaire (NKQ) data were collected from nine (n=9) respondents from the CYCMs (n=2) and CYCWs (n=7). The CYCMs and CYCWs were asked to complete this questionnaire to test their nutrition knowledge and the NKQ was developed and based on the 2003 SAFBDGs. The 60-question NKQ data are reported in the 12 groups based on the 2003 FBDGs (Whati *et al.* 2005) for healthy persons over the age of 7 years. The 12 guidelines used as sections and question numbers are listed in Table 4.11.

Table 4.11: Breakdown of the NKQ per question based on the 2003 SA FBDGs

Classification according to FBDG's (2003)	Question numbers
1. Enjoy a variety of foods.	2, 12, 16, 17, 18, 23, 24, 35, 37, 38, 40, 44, 48,51, 53
2. Be active.	11, 14, 22, 26, 28
3. Make starchy foods part of most meals.	4,9,19, 45, 47
4. Eat plenty of vegetables and fruit every day.	7, 15, 21, 25, 42, 57
5. Eat dry beans, split peas, lentils, and soya regularly.	54, 55, 58, 60
6. Have milk, maas, or yoghurt every day.	13,33
7. Fish, chicken, lean meat, or eggs can be eaten daily.	6
8. Drink lots of clean, safe water.	5, 27, 30
9. Use fats sparingly. Choose vegetable oils, rather than hard fats.	8, 43, 50
10. Use sugar and foods and drinks high in sugar sparingly.	1, 32, 36, 39, 52
11. Use salt and food high in salt sparingly.	6, 20, 28, 34
12 If you drink alcohol, drink sensibly (FBDG 2003)	10, 31, 41

4.6.1 Consuming a variety of food

Table 4.12 reflects the number of participants who accurately answered the questions related to consuming a variety of food. Four (44.4%) of the respondents responded correctly about the food sold on the street by saying the food might be undercooked, the meat might not be fresh, or the food might be kept for too long before being bought. Another four (44.4%) answered correctly that a woman must not gain weight when they are pregnant. One of the nine respondents (11.1%) correctly stated that the answer to a healthy diet is to eat a variety of foods, to consume certain foods in larger quantities than others, and to consume some foods in moderate, or limited quantities.

When asked about giving up things like bread, rice, meat, fish and margarine when trying to lose weight, four (44.4%) of the respondents selected correctly "none of the above" as an answer option. Only two (22.2%) of the respondents correctly named foods containing calcium such as milk, yoghurt and sardines. Seven (77.7%) respondents who chose fish, chicken without skin, and lean meat correctly answered question 23 on foods that prevent certain diseases. Six (67.0%) of the respondents answered question 24 correctly about foods that contain a lot of fibre, such as oats, apples and beans. Six (67.0%) of the respondents correctly answered the question on nutritional awareness regarding high-fibre foods. Three (33.3%) of the respondents knew that an adequate diet consists of carbohydrates, vegetables and fruits and contains less meat and dairy products (question 35). Six respondents (66.6%), correctly identified that eating a variety of foods is preferable to eating only a few different types (question 37).

Only two (22.0%) of those who answered question 38 said that overweight women should not try to lose weight during pregnancy. When asked whether they agreed or disagreed with the statement that it is difficult to get all the required vitamins and minerals from food, therefore vitamin and mineral supplements are necessary (Question 40), five (55.5%) answered yes, but they must be prescribed by a doctor. Question 44 revealed that four people (44.4%) thought that it was wrong for a pregnant woman to avoid eating various foods.

To stay healthy, eight (88.8%) respondents knew that they should eat lean meat, fruits and vegetables, low-fat dairy products, and bread and cereal products (Question 48). Three respondents (33.3%) recognised that it was wrong to believe that one can only stay healthy by avoiding a variety of foods (Question 51). In addition, according to three respondents

(33.3%) (Question 53), it was important for a pregnant woman to consume more milk, cheese, maas, beef, chicken, fruits and vegetables.

Table 4.12: NKQ questions related to the "Enjoy a variety of foods" guideline

Description of question	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
Cooked meat/fish/chicken sold on the street may not always be safe.	2	4	44.4
Women must not gain weight when they are pregnant.	12	4	44.4
Key to a healthy way of eating is to eat many different kinds of foods	16	1	11.1
Foods which must not be eaten when trying to lose weight is bread and rice	17	4	44.4
Foods that contains a lot of calcium are milk and yogurt	18	2	22.3
Food choices that prevent certain diseases: fish, chicken without skin, and lean meat	23	7	78
Food which contains lots of fibre: oats, apples, and beans.	24	6	66.7
A adequete diet consists of meat, with a smaller amount of starch, fruits, vegetables, and dairy products	35	3	33.3
Eating a lot of different types of food is healthier than eating only a few kinds.	37	6	66.7
Overweight women should try to lose weight when they are pregnant	38	2	22.3
It is impossible to get all the vitamins and minerals you need from food; you need a vitamin and mineral supplement.	40	5	55.6
Pregnant women need to avoid eating different kinds of foods.	44	4	44.4
To stay healthy, you should eat lean meat, fruits and vegetables, low-fat dairy products, and bread and cereals.	48	8	88.9
To protect yourself from disease you should avoid eating too many kinds of foods.	51	3	33.0
The food that a pregnant woman should eat is milk, cheese, beef chicken, fruits, and vegetables.	53	3	33.0

4.6.2 Physical activity

According to the answers to the question relating to the "Be active" guideline, only one (11.1%) of the respondents answered correctly that a pregnant woman should sleep most of the day (Question 11). The vast majority of respondents (n=6; 66.7%) were aware that being overweight does not equate to a lack of physical activity (Question 14). Question 26 revealed another high proportion of respondents with low dietary awareness. Six (66.7%) claimed that there was no need to be physically active if one ate an adequate diet. A large percentage of respondents (55.6%) correctly described physical activity as going to the gym, walking frequently, and participating in sports such as football and netball (Question 22).

Table 4.13: NKQ questions related to the "Be active" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
A pregnant woman should sleep most of the day	11	1	11.1
People who are overweight should not be physically active.	14	6	66.7
Being physically active means walking a lot	22	5	55.6
If you are eating a healthy diet, there is no need to be physically active.	26	6	66.7

4.6.3 Carbohydrate-based and fibre-rich food intake

Table 4.14 shows that a large proportion of respondents (n=7; 77.8%) were familiar with high-fibre foods (wholewheat bread) (Question 45). When asked if starchy foods were required at most meals, only two (22.2%) of the respondents correctly answered 'yes'. Only two (22.2%) respondents correctly named bread, samp, rice and porridge as the food group that should be consumed most often/ every day in Question 9. The percentage of those who correctly answered Question 19 by stating that a tub of unbuttered popcorn would be considered the healthiest snack was lower, at one (11.1%).

There were three (33.3%) correct answers to Question 47, indicating that starchy meals must be eaten even if weight loss is the goal. Question 49 received three (33.3%) similar answers to Question 49, with respondents correctly noting that eating bread is not usually the cause of weight gain.

Table 4.14: NKQ questions related to the "Make starchy foods part of most meals" guideline

Description of Question	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
You should not have starches at most meals.	4	2	22.2
The food group that should be eaten almost every day is bread, samp, rice, and porridge.	9	2	22.2
The healthiest snack is unbuttered popcorn.	19	1	11.1
Wholewheat bread is the food with the most fibre.	45	7	77.8
Starchy food should not be eaten when one is trying to lose weight.	47	3	33.3
Eating bread always causes weight gain.	49	3	33.3

4.6.4 Vegetable and fruit intake

Four (44.4%) of the respondents who said that half a cup per person was required (Question 7) answered the question about the appropriate portion size for cooked vegetables correctly. Six (66.7%) respondents knew that it was important to wash vegetables before cooking (Question 15). For Question 42, the majority of respondents knew which nutrients are found in fruits and vegetables, as six (66.7%) correctly answered the question by mentioning vitamin A and dietary fibre. Meanwhile, four (44.4%) of the respondents correctly identified vitamin A as a nutrient found in significant amounts in foods such as carrots, spinach, and sweet potatoes (Question 57). The types of foods such as apples and carrots that can be consumed to increase fibre in the diet were correctly identified by an average of four (44.4%) respondents (Question 21).

Table 4.15: NKQ questions related to the "Eat plenty of vegetables and fruits every day" guideline

Description of question	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
The portion size of cooked vegetables is half a cup.	7	4	44.4
It is usually not necessary to wash vegetables before you cook them.	15	6	66.7
Food which must be eaten to increase fibre in the diet is apples and carrots.	21	4	44.4
The number of fruits and vegetables to be eaten is 3-4.	25	0	0
The groups of nutrients found in large amounts in fruits and vegetables.	42	6	66.7
The group of food with the most vitamin A.	57	4	44.4

4.6.5 Dry beans, split peas, lentils and soya intake

According to Table 4.16, seven (77.8%) respondents said that soy mince is just as healthy as meat (Question 55). Another high level of awareness was found in Question 58, where seven (77.8%) respondents stated that dry beans, peas, and lentils are safe alternatives to meat. Four respondents (44.4%) correctly mentioned dry beans, peas, and lentils as foods that should be consumed regularly (Question 54). Only three (33.3%) respondents said that dry beans, peas, and lentils are good for the body because they are low in fat, high in fibre, and protect against a range of diseases (Question 60).

Table 4.16: NKQ questions related to the "Eat dry beans, split peas, lentils, and soya regularly" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
Dry beans, peas, and lentils should be eaten often.	54	4	44.4
Soya mince is just as healthy as meat.	55	7	77.8
Dry beans, peas, and lentils are healthy choices to eat in place of meat.	58	7	77.8
The reason why beans, peas, and lentils are good for the body.	60	3	33.3

4.6.6 Milk, maas or yoghurt intake

Most (n=7; 77.8%) respondents answered correctly that it is safe to eat milk, cheese and yoghurt during pregnancy (Question 13). Only one person (11.1%) correctly stated that one should drink at least one cup of milk or maas every day (Question 33).

Table 4.17: NKQ questions related to the "Have milk, maas or yoghurt every day" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly
It is not healthy for a pregnant woman to eat foods like milk, cheese, yoghurt.	13	7	77.8
The amount of milk or maas should be one intake a day.	33	1	11.1

4.6.7 Fish, chicken, lean meat or eggs intake

The majority of respondents (66.7%) were aware that they could eat as much meat as they wanted every day (Table 4.18) (Question 6).

Table 4.18: NKQ questions related to the "Fish, chicken, lean meat or eggs can be eaten daily" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly (n=9)
A person should eat as much meat as they want every day.	6	6	66.7

4.6.8 Water intake

Table 4.19 shows that eight (88.9%) respondents knew that not all water is safe to drink (Question 30). Meanwhile, only three (33.3%) respondents correctly stated that seven to nine glasses of water should be drunk daily. Only three (33.3%) respondents knew in Question 27 that drinking boiling water was not a healthy way to lose weight.

Table 4.19: NKQ questions related to the "Drink lots of clean, safe water" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly
The amount of water one should drink every day is 7 to 9 glasses.	5	3	33.3
Drinking boiled water is a good way to lose weight.	27	3	33.3
All water is safe to drink.	30	8	88.9

4.6.9 Fat intake and preferred choices of fat

When asked questions relating to the guideline "Use fat sparingly", only two (22.2%) of the respondents correctly identified popcorn as a low-fat snack (Question 8). Two (22.2%) respondents identified wholemeal bread with thinly spread margarine and Weet-Bix with 2 percent fat milk as part of a low-fat breakfast menu in Question 43. In addition, the results showed a lack of nutritional knowledge among most respondents, of whom only two (22.2%) correctly answered Question 50 by saying low-fat foods were grilled lean steak and boiled carrots.

Table 4.20: NKQ questions related to the "Use fat sparingly. Choose vegetable oils, rather than hard fats" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly
A snack that is low in fat is popcorn.	8	2	22.2
The breakfast menu contains low-fat milk and wholemeal bread with thinly spread margarine and Weet-Bix with 2 percent fat milk	43	2	22.2
Food which is the lowest in fat is grilled lean steak and boiled carrots	50	2	22.2

4.6.10 Sugar and foods and drinks high in sugar intake

In Table 4.21 four respondents (44%) correctly answered that eating a lot of sugar makes you feel more energetic (Question 1). The majority of the eight respondents (88.9%) believed that sugar should be consumed in moderation if one wants to lose weight (Question 32). In Question 36, eight (88.9%) of the respondents were in favour of consuming sugar and sugary products in smaller quantities, which shows a high level of understanding. In addition, seven of the respondents (77.8%) were aware that sugar does not contain many vitamins and minerals (Question 39). The results also show that five (55.6%) respondents disapproved of eating a healthy snack containing sugar (Question 52).

Table 4.21: NKQ questions related to the "Use sugar and foods and drinks high in sugar sparingly" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly
Eat a lot of sugar to have enough energy.	1	4	44.4
Only a little sugar should be eaten when one is trying to lose weight.	32	8	88.9
Sugar and foods that contain sugar should be eaten in small amounts.	36	8	88.9
Sugar contains lots of vitamins and minerals.	39	7	77.8
It is healthy to snack on food that contains a lot of sugar.	52	5	55.6

4.6.11 Alcohol intake

Question 10: Three (33.3%) respondents answered correctly that alcohol consumption leads to weight gain. A large majority (n=6; 66.7%) of respondents correctly stated in response to

Question 31 that you can drink as much wine, beer or cider as you want as long as you eat something first. Only two (22.2%) respondents correctly answered Question 41 that drinking a lot of wine, beer, or cider during pregnancy is risky.

Table 4.22: NKQ questions related to the "If you drink alcohol, drink sensibly"

Description of questions	Question number	Number of respondents who answered correctly (n=9)	Number of respondents who answered correctly
Drinking a lot of wine, beer, and cider can cause weight gain.	10	3	33.3
You can drink as much wine, beer, and cider as you want to provided you have eaten first.	31	6	66.7
It is not healthy for a pregnant woman to drink a lot of wine, beer, or cider.	41	2	22.2

4.6.12 Salt intake

A majority of the nine respondents (100%) knew that the body needs salt to stay healthy (Question 34). Question 6 also showed a high level of understanding, with seven (77.8%) respondents stating that cooked food should not be further salted before consumption. A large majority of respondents (66.7%) had some understanding of foods containing iodine by choosing table salt as their answer to Question 20. Only 55.6% were aware that salt should be used at all meals except on fruit.

Table 4.23: NKQ questions related to the "Use salt sparingly" guideline

Description of questions	Question number	Number of respondents who answered correctly (n=9)	% of respondents who answered correctly
Add extra salt to your cooked food before you eat it.	6	7	77.8
Food that has iodine is table salt	20	6	66.7
Salt should be added to all food except fruits.	28	5	55.6
The body needs a little bit of salt to stay healthy.	34	9	100

4.7 PRESENTATION OF OBSERVATION FINDINGS

This section reports the observational findings in the two kitchens, serving areas and storage facilities. The results were gathered using the observational checklist and recorded in an observation diary. Activities in the kitchen (during food preparation and serving), dining areas, and storage facilities were observed.

4.7.1 The menu, monitoring, and receiving procedures of stock in the CYCCs

Table 4.24 shows that an existing menu in one (50%) facility was posted on the kitchen wall. In the CYCCs there was no evidence of monitoring or policy procedures. Furthermore, there was no service level agreement with suppliers in the CYCCs. The observation reveals that delivery dates were written on the food packages or delivery notes. The CYCMs reported that the temperature of goods was not usually checked during delivery.

Table 4.24: Menu, monitoring, and receiving procedures

Variables	Positive observation in CYCCs
General management of the CYCCs	
Existence of a menu	2 (100%)
Evidence of monitoring procedures	1 (50%)
Evidence of policies and procedures	0 (100%)
Service level agreement with the suppliers	0 (100%)
Receiving procedures	
Writing the delivery date on the products	0 (100%)
Temperatures inspected during food delivery	0 (100%)

4.7.2 Observation of the storage facilities

Perishable foods were kept in a cold room/fridge, whereas non-perishable goods were kept in a separate room in the CYCCs, as shown in Table 4.25. Cleaning materials were detected stored alongside food in one of the CYCCs (50%). The CYCCs' storerooms were locked. Only one storeroom (50%) was found to have appropriate lighting and storage capacity. Food provided to CYCCs was in its original packaging, with correctly labelled products and an expiry date printed on them. The expiry dates of food products in the CYCCs were not labelled on the storage containers. Food containers were covered. No cold, stale, or spoiled food items were discovered during the observation period.

At one CYCC the storage facility was found to be dirty and disorganised. Food was also seen being stored directly on the floor in the storeroom. Food was distributed without a stock sheet being completed. When issuing and utilising the stock, the CYCCs used the first in, first out (FIFO) technique. There was no sign of pest infestation (rodents/ insects) in the CYCCs, and no visible flies in the kitchen or storeroom. However, in the food storage room there was an unpleasant odour.

Table 4.25: Observational findings of the research with regard to storage facilities

Variables	Positive Observations n=2 (%)
Storage of perishable food in a cold room/ fridge	2 (100%)
Storage of non-perishable food in a separate room	2 (100%)
Storage of cleaning materials with food	1 (50%)
Locking of storage room	2 (100%)
Proper storage room lighting	1 (50%)
Adequate space in the storage area	0 (100%)
Food stored in original packaging	2 (100%)
Labelling of products stored in the storeroom	2 (100%)
Food items with expiry dates	2 (100%)
Food that had passed the expiry date	1 (50%)
Labelling of expiry date onto products that are transferred to a storage container	0 (50%)
Utilization of expired food items	0 (50%)
The covering of all containers in the storeroom	2 (100%)
Stale food items observed	0 (100%)
Evidence of decayed fresh produce	0 (100%)
Cleanliness of the storage areas	1 (50%)
Arrangement of the storage areas	1 (50%)
Food stored on the floor	1 (50%)
Stock sheets availability	0 (100%)
Application of the FIFO storage method (usage of old stock before using newly arrived stock)	2 (100%)
Evidence of pest (rodents/ insects) infestation	0 (100%)
Unpleasant odours in the storage areas	1 (50%)

4.7.3 The observation of food preparation, food serving and wastage

Table 4.26 shows that there was enough space for food preparation and serving in the two (100%) CYCCs. Table 4.16 shows that they did not implement recipe standardisation since recipes were not available or displayed in the kitchen. The food's internal temperature was also not checked. The researcher observed that the CYCCs had easy access to water for cooking.

Both the CYCCs had a limited amount of food serving utensils for dining (100%). All of the food prepared for the day had been served, and there was no food left over. Children and youths all finished their meals. There were covered trash bins in the CYCCs, but one (50%) of them had not been cleaned. In terms of availability of vegetable garden, only one CYCC (50%) had an existing vegetable garden which had spinach and onions growing in it.

Table 4.26: Observational findings of food preparation, food serving, wastage and vegetable garden.

Variables:	Positive Observations n=2 (%)
Food preparation	
Enough space for food preparation	2 (100%)
Space for serving/ portioning	2 (100%)
Recipes	1 (50%)
Standardisation of existing recipes	0 (100%)
Checking the food's internal temperature	0 (100%)
Availability of water for cooking	2 (100%)
Serving of food and food waste	
Sufficient food serving utensils	1 (50%)
Sufficient eating utensils	1 (50%)
Portion size standardization	0 (100%)
Serving of the prepared/ cooked food	2 (100%)
Leftover food management	0 (100%)
Children and youth finished their meals on their plates	2 (100%)
Leftover food that has been thrown away from a plate	0 (100%)
Designated rubbish bins	2 (100%)
Covering of rubbish bins	2 (100%)
Cleaning of the rubbish bins	1 (50%)
Waste lying outside the rubbish bins	0 (100%)
Existing vegetable garden.	1 (50%)

4.7.3.1 Observational findings on personal and kitchen hygiene practices by cooks, children, and youths

According to Table 4.27, only one CYCC had the necessary cleaning supplies, such as chemicals and cloths, scourers and sponges, as determined by the researcher. There were some utensils, equipment and workstations that were not clean. In the CYCCs, clean-as-you-go (a method for reducing hazards to hygiene, health, and safety) was only employed infrequently during food preparation. The CYCCs' kitchens were provided with running water with both hot and cold water from a tap within the kitchen. However, only one CYCC staff member was seen washing their hands routinely during food preparation. Children and youths did not have soap available for handwashing. The food handlers' uniforms in the CYCC did not appear clean. Before serving the food to the children and youths, food service personnel from both the CYCCs were witnessed not washing their hands. Meanwhile, even though some did not use hand soap, children and youths in the CYCCs were seen washing their hands before consuming the food.

Table 4.27: Observational findings on hygiene by cooks and children and youth

Variables	Positive Observations n=2 (%)
Hygiene	
Cleanliness of the kitchen utensils	1 (50%)
Cleanliness of the kitchen equipment	1 (50%)
The use of correct cleaning chemicals	1 (50%)
Availability of cleaning supplies: cloths, scourers, sponges, etc.	1 (50%)
Cleanliness of the work area	2 (100%)
Cleaning of the food preparation area frequently	2 (100%)
Availability of water for cleaning	2 (100%)
Washing of hands by cooks	1 (50%)
Availability of handwashing soap	1 (50%)
Cleanliness of food handlers' uniforms	1 (50%)
Washing of hands by servers before serving the food	1 (50%)
Washing of hands by children and youths before eating	2 (100%)

4.8 COMPARISON OF RESPONSES BY CYCMS, CYCWS, AND DURING OBSERVATION

Table 28 compares the results from CYCMs and CYCWs, as well as the observations conducted in the two CYCCs.

Table 4.28: Comparison of results by questionnaire categories

Variables	CYCMs and CYCWs' responses	Observation findings
Food safety and hygiene training	The majority of the respondents indicated that they did not receive food safety training. All the CYCMs and CYCWs were not given hygiene training	Hygiene practices were poorly demonstrated. Food handlers were observed handling food without washing hands first.
Purchasing and receiving	Both the two (100%) respondents (CYCMs) stated that they buy food from local suppliers and supermarkets.	House brands from certain supermarkets were available in the food storage facilities.
Storage and stock taking	CYCMs acknowledged that the storage facility was not adequate.	As a result of limited space, food storage space was observed used as a public tuck shop.
Food holding before serving and storage	Food preparation revealed that the food could be kept for less than 15 minutes after cooking and before being served.	After school, children and youth were offered food that had been held for longer than 15 minutes. Furthermore, before serving, the dish was not verified for internal temperature.
Food preparation	Staff members who were primarily responsible for food preparation reported that there was sufficient space for food preparation and cooking.	The observation also highlighted that there was adequate food preparation and cooking space in the CYCCs, given the number of children fed (118).
Vegetable garden	Only one CYCC already had a vegetable garden.	Vegetable gardens were found in one CYCC, according to observations.
Food waste	There was no plate waste, according to staff members who are primarily responsible for food preparation and serving.	The researcher discovered no plate waste because the children consumed all of the food on their plates.

4.8.1 Food safety analysis

One of the study sub-objectives was to assess the CYCCs' food safety levels using surface and hand swabs, as well as water analyses. Three (3) hand swabs, two (2) surface swabs, and two (2) water sample bottles were collected in total.

4.8.1.1 Surface swabs

Using the SWJM 35 technique, surface swabs were tested for Total Microbial Activity (TMA) and the results showed that one CYCC had 10 colony-forming units per area and the other had 40. This indicates that, when comparing the acceptable parameter per surface, one of the CYCCs reported cfu to be significantly low, while the other cfu was in the middle but still within the acceptable range. Less than 100 TMA cfu per swab area parameter is acceptable and allowed, according to the guidelines (Mérieux NutriSciences 2022).

4.8.1.2 Hand swabs

The South African Bureau of Standards (SABS) recommends 15 cfu/1000 mm2, while Swift Silliker a Mérieux Nutrisciences Company approved a value of 71-99 cfu/10 cm2 (Mérieux Nutrisciences 2022: 2). The samples were collected from the three food handlers who prepared the food in the kitchens and tested for E. coli and Staphylococcus. The findings revealed that none of the food handlers tested positive for cfu/area development in the hands. That is, the food handlers' hands met all of the acceptable standards for clean hands. Since there was no growth, this particular test did not display the figure on the growth results.

4.8.1.3 Water samples

Water samples were microbiologically analysed for TMA, Coliforms, and Escherichia coli. The results showed that the samples collected had less than 100 Total Microbial Activity. In one CYCC a count of approximately 60 cfu/ml was reported, as well as a Coliforms count of 57, which was greater than the legally acceptable limit of 10 or less per 100ml. When tested, the activity level of Escherichia coli did not proliferate (CYCC 2). Meanwhile, growth of TMA in a cfu/ml, Coliforms in a cfu/100, or Escherichia coli in a cfu/100ml was also inactive in the CYCC results. As a result, it can be concluded that the water in one of the CYCCs was safe for consumption, whereas the coliform count in CYCC2 was slightly higher than expected.

4.8.1.4 Plate waste analysis

The leftover food on the children's plates after meal times was assessed in two CYCCs to determine plate waste. Table 4.30 shows that 18 plates of beans mixed with samp served with canned fish (six samples) and *uPhutu* pap served with boiled beef and potatoes (12 plates) were selected and weighed before being served to the children. The mean portion size of beans mixed with samp served with canned fish provided to the 5-7-year-olds was 257g, while 8-11-year-olds were served a mean of 328g. A meal with *uPhutu* pap, which was served with boiled beef and potatoes, returned a mean portion size of 310g served to children and youths ages 5-7 years, 409g to the 8-11 year-olds, and 501g, and 500g for the ages 14-18 years. The food served to children and youths comprised carbohydrates (samp), protein (beans and fish), fat and vitamins/minerals (B vitamins, potassium, and fiber) (beans). At the same time, the other meal provided carbohydrates (*uPhutu and potato*), protein (beef), and fat. Results showed that plate waste was zero (0) meaning that the children and youths consumed all the food on their plates as served in the CYCCs.

Table 4.29: Meals observed and weighed to indicate serving size and food wastage.

Variable	Serving 1	Serving 2	Serving 3	Serving 4	Serving 5	Serving 6	Serving 7	Serving 8	Serving 9	Serving 10	Serving 11	Serving 12
Age	**5-7 years (n=3)**			**8-11 years (n=3)**			**12-13 years**			**14-18 years**		
Beans mixed with samp and fish (canned pilchards)	303g	189g	277g	310g	327g	347g	Not available	Not available	Not available	Not available	Not available	Not available
Total Average	**257g**			**328g**			Not available	Not available	Not available	Not available	Not available	Not available
% waste	**(0%)**	**(0%)**	**(0%)**	**(0%)**	**(0%)**	**(0%)**	Not available	Not available	Not available	Not available	Not available	Not available
***uPhutu* pap, boiled beef with potatoes**	271g	294g	338g	382g	420g	435g	463g	520g	521g	454g	520g	526g
Total Average	**310g**			**409g**			**501g**			**500g**		
% waste	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)

4.9 PREFERRED EDUCATIONAL MATERIAL IN THE CYCC: CYCMs' AND CYCWs' RESPONSES

This section describes the instructional materials preferred as answered by thirty (n=30) CYCCMs and CYCCWs. This section aimed to assess the type of materials that the respondents would prefer in communicating about the menu planning, nutritious recipes for children aged 5-18 years, healthy eating guidelines for children, and safe food handling and preparation. The results are presented in tables and graphs.

4.9.1 The preferred type of material

Table 4.30 shows that the majority of respondents (n=14; 46.7%) stated that they would prefer the child nutrition, food preparation, food safety, and healthy eating guidelines in the form of a book, followed by four (13.3%) who preferred a poster, and four (13.3%) who preferred a pamphlet. Three (10.0%) respondents chose wall calendars as learning materials, while two (6.7%) chose desk calendars. A smaller percentage of respondents indicated that they would prefer to use a workbook (n=1; 3.3%), fridge magnets (n=1; 3.3%), or a poster (3.3%).

Table 4.30: The most preferred learning materials in the CYCCs

Variables	Numbers (n=30)	Percentages (%)
Posters	4	13.3
Pamphlets	4	13.3
Wall calendars	3	10.0
Child nutrition, food preparation, food safety, and healthy eating guidelines	14	46.8
Workbook	1	3.3
Fridge magnet	1	3.3
Desk calendar	2	6.7
Posters, pamphlets, calendars, and fridge magnets	1	3.3

4.9.2 Preferred visual presentation descriptions

The majority of respondents (n=25; 83.0%) preferred content that included colourful sketches, pictures, photos, and phrases, while fewer than three (10.0%) selected words only. Only two respondents (7.0%) preferred child nutrition, food preparation, food safety, and healthy eating guidelines with drawings, pictures, and photos.

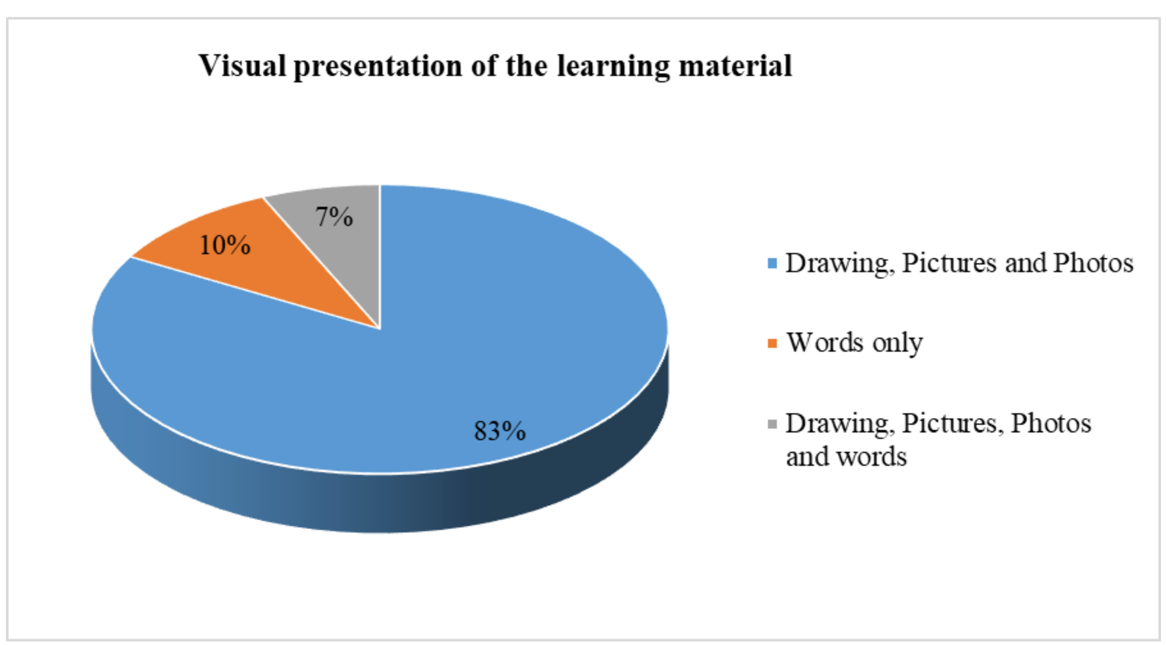

Figure 4.4: Preferred visual presentation of the learning material

4.10.3 Respondents' preferred language for the materials

Figure 4.6 shows that the majority of the respondents (n=19 or 64.0%) chose isiZulu as their main language preference for the written materials, while about (n=10 or 33.3%) chose English. Only (one or 3.3%) of respondents indicated that it did not matter which language was used.

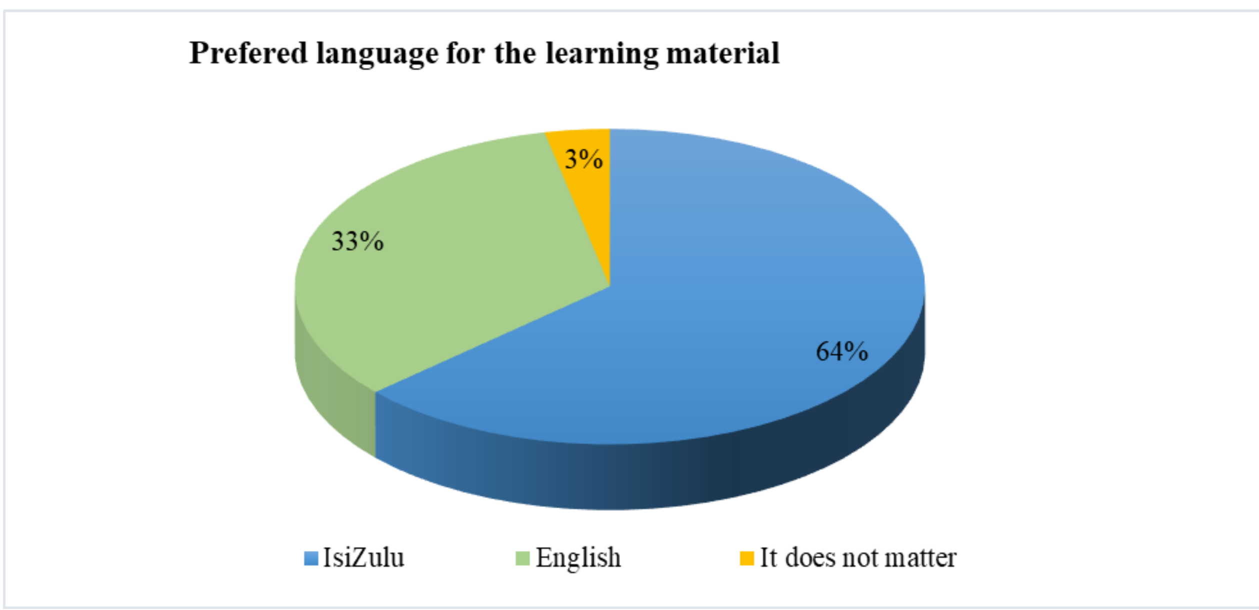

Figure 4.5: Respondents' preferred language for the education material.

4.9.4 Contents that should be covered in the education material

Table 4.31 shows that n=18 (60.0%) of the respondents preferred teaching materials on nutrition and healthy eating, food preparation and cooking management, health and hygiene, and healthy recipes. However, two (6.7%) respondents preferred materials that contained information on nutrition and healthy eating. About two (6.7%) respondents indicated that the content should cover topics such as food preparation and cooking management, and health and hygiene. Two respondents (6.7%) said that information on nutrition and healthy eating should be included in the literature. About two (6.7%) respondents preferred content dealing with safety and hygiene, as well as nutrition information and healthy recipes for healthy eating.

Only one (3.3%) respondent indicated that the content should cover food preparation and cooking management, while another one (3.3%) preferred material that covered nutrition information and healthy eating, food preparation, and cooking management. One (3.3%) respondent said the content should cover food and healthy lifestyle information, fitness, hygiene, and safe recipes. One (3.3%) said that the information should only cover nutrition, healthy eating, and healthy recipes.

Table 4.31: Preferred content of the educational guidelines

Variables	Number (N=30)	Percentages (%)
Nutrition and healthy eating	2	6.7
Health and hygiene	1	3.3
Nutrition and healthy eating and health and nutrition	1	3.3
Health and hygiene and healthy recipes	2	6.7
Nutrition and healthy eating and healthy recipes	2	6.7
Nutrition and healthy eating, health, and nutrition and healthy recipes	1	3.3
Nutrition and healthy eating and healthy recipes	2	6.7
Food preparation and managing a kitchen and healthy recipes	1	3.3
All of the above	18	60.0

4.10 DISCUSSION OF THE KEY FINDINGS

4.10.1 Training and food safety

This section assessed and interpreted the key pilot study findings in the context of previous research that has been conducted. The combination of these findings provides some support for the premise that there is a need to improve the education, training, and food safety practices of CYCWs. The results of the study show that only three respondents (33.3%) had a low level of or no formal education. Only two (22.2%) of the respondents had a postgraduate degree. The findings of the current study are consistent with those of Grobbelaar and Napier (2014: 4) who conducted a study in Durban, South Africa to investigate the profile, nutrition knowledge, food safety, and hygiene practices of child and youth care workers (CYCWs) in residential care settings. The study aimed to guide the development of food preparation and nutrition guidelines. Their study reported that very few participants had completed a relevant tertiary qualification and there were concerns about food safety because food safety practices were not always evident. Other research has suggested that the low level of education of food handlers could compromise food safety and hygiene practices, potentially leading to microbial or chemical contamination risks (Lee, Abdul Halim, Thong and Chai 2017: 11; Allam *et al*. 2016: 4). The results on the work experience of participants proved that there is a need for intervention strategies such as training of CYCWs to improve their knowledge of food safety practices. The findings of this study revealed that only four (44.4%) of the respondents had more than five years of work experience in child and youth care. What is surprising is that none of the respondents from two CYCCs (two CYCCMs and seven CYCWs) were trained in food safety and hygiene. Hence, it could conceivably be hypothesised that their experience could be supplemented by the NACOSA Training Institute course programme which could then ensure a professional appointment according to their recognised skills (NACOSA Training Institute 2016: 1). The results of this study provided further support for the hypothesis that to be effective in any situation, people working with vulnerable children need to be able to promote and support the optimal development of the children and young people (youths) with both normal and exceptional developmental needs (NACOSA Training Institute 2015: 2).

Limited food safety knowledge among food handlers/CYCCWs can lead to cross-contamination and foodborne illness as hands carry bacterial contamination (Lee, Halim, Thong and Chai 2017: 55; Lambrechts, Human, Doughari and Lues 2014: 758). The

respondents who participated in the study (n=9) reported that no one had received training in food safety, menu planning, food preparation, food contamination, and personal hygiene. Several studies have identified food handling as the main vector of microorganisms (Honua 2018: 1272; Assefa, Gelaw, Hill, Taye and Van Damme 2019: 6-7; Rossi, Beilke and Barreto 2018: 7). Poor personal hygiene of food handlers is acknowledged as a potential source of infection because of pathogenic bacteria. This notion is supported by a study conducted by Nasrolahei *et al*. (2017: 174) in Sari, northern Iran that was designed to determine the prevalence of bacterial infestation among the food handlers attending the public health care centre laboratory for annual check-ups. The findings of this study indicated that out of 220 food handlers, n=137 (62.2%) carried some pathogenic bacteria including S.aureus, P.aeroginosa, and S.boydii under their fingernails. Likewise, (Uyttendaele, Franz and Schlüter 2016: 5; WHO 2007: 1) observed that food safety is a global health issue that affects many industrialized nations causing foodborne illnesses that subsequently impact health and the economy. Therefore, the work experience of food handlers in respect of hygiene and food safety is of great importance. Contrary to expectation, this study found that in one of the CYCCs, there was no soap for hand washing for either the children or the food handlers, whilst in the literature, hands are mentioned as a common way of spreading germs (WHO 2009: 1). Moreover, hand washing with soap is the most effective method to minimize the occurrence of contaminants such as Enterococcus SPP (Burton, Cobb, Donachie, Judah, Curtis and Schmidt 2011: 99).

4.10.2 Safe food handling methods

The Foodstuffs, Cosmetics, and Disinfectants Act, 1972 (Act 54 of 1972) mandates that all food products, including the labelling, must comply with its provisions (South Africa, DoH 2004: 5). Surprisingly, none of the CYCCs had guidelines or procedures, signed written policies or procedures for receiving, storing, serving, sanitizing and managing food products. Most of the six respondents (85.7%) checked the expiration date on food labels before preparing or using the food. A service level agreement (SLA) is a mechanism for establishing a common understanding between a service provider and their client about the service to be provided. Communication is therefore key to managing expectations, clarifying responsibilities, and setting goals for evaluating effectiveness (Krych-Appelbaum, Law, Jones, Barnacz, Johnson and Keenan 2007: 70-73). In this study, SLAs were entered into verbally with a community member for the delivery of fresh milk to one of the CYCCs. Other food items were purchased at the local supermarket and transported by CYCCMs. Food waste

as a result of poor food handling methods is a challenge to the CYCCs. It was found that food deemed unfit for human consumption was received and thrown away, as noted by one of the CYCMs. This finding corroborates the findings of Lipinski, Hanson, Waite, Searchinger and Lomax 2013: 5) who claimed that food that is thrown away affects the economy and the environment.

Approximately 663 million people did not have adequate drinking water in 2015 (UNICEF and World Health Organization 2015: 4). In South Africa, Omotayo, Ogunniyi and Aremu, 2019: 37) reported that tap water, either off-site or on-site was common among households with 98.5% in the Western Cape, 97.6% in Gauteng, 85.4% in KwaZulu-Natal, 94% in the Northern Cape having access to it, with the least common being Limpopo at (70.0%) and Eastern Cape (73.9%). Nationally, the percentage of households with access to tap water off-site or on-site increased by 3.8% points during the same period. These statistics on the accessibility of water to households in South Africa are consistent with the findings of this study regarding the accessibility of drinking water and water used for cleaning utensils. Seven (100%) of the respondents said that water was available. This was the case despite South Africa being considered a water-scarce nation (Donnenfeld, Crookes and Hedden 2018: 2). The drinking water sample was safe for consumption with 57 coliform bacteria. Unsafe water is of concern, particularly for the elderly or children with diseases such as HIV and AIDS that can be severely affected by contaminants in drinking water (SA, Department of Water Affairs and Forests 2005: 3).

4.10.3 Food safety and hygiene

Regarding the storage of food before serving, it was observed in the pilot study that food for older children and adolescents was held back in the oven or the cooker for more than 15 minutes before serving which is in line with the Five Keys to Safer Food developed by the (WHO 2010:1). There are similarities between the attitudes expressed by the participants in this study and those described by WHO (2010: 1; Martin, Dean, Hardy, Johnson, Jolly, Matthews, McKay, Souness and Williams 2003: 130) that keeping cooked food at room temperature for more than two hours should be avoided as this can be a factor in the transmission of food poisoning bacteria. However, if food needs to be refrigerated, this should be done as soon as possible, particularly as microorganisms can multiply very quickly at room temperature (Uçar, Yilmaz and Çakıroğlu 2016: 11).

Proper food storage and cleaning can help reduce foodborne infections caused by dangerous bacteria (Kendall and Dimond 2007: 1). However, the findings of the current study do not support the previous research. It was found that there was not enough space in one of the store rooms because it was also being used as a tuck shop and the store room was not clean and cleaning products were packed close together. Uyttendaele *et al.* (2016: 5) advocated proper food storage as it can help maintain the quality and nutritional value of food while preventing spoilage, which could then lead to illness. The importance of the expiry date indicated on food packaging was known to six (85.7%) CYCWs. Nevertheless, their responses contradicted the results about them observing the expiry date of food in the past.

4.10.4 Menu planning, nutritious recipes, nutrition knowledge and weighed food record

The results indicated that an existing cycle menu was posted on the wall but was not implemented during food preparation. A draft menu was only available in one CYCC but it was not being fully implemented. This was the case even though the menu is considered key to the proper organisation and management of food preparation in the kitchen and also influences the daily activities of food handlers. These results are consistent with the findings of a study conducted by Vaida (2013: 40) who found that there was poor menu planning in CYCCs in Ghana. Some of the issues emerging from the findings in this study relate specifically to poor menu planning and food procurement in several CYCCs that resulted in lower energy, protein, fat, vitamin, and mineral intakes than recommended in the RDA for children and adolescents (Vaida 2013: 40).

In addition, the South African FBDGs emphasise the consumption of a variety of foods and suggest eating mixed meals (Steyn 2013: s13 Napier, Grobbelaar and Oldewage-Theron, 2021: s1). Currently, in South Africa (SA) there are two sets of guidelines, namely the paediatric food-based dietary guidelines and the South African FBDGs for the population aged seven years and older (Napier, Grobbelaar and Oldewage-Theron, 2021: s1). Unhealthy diets, skipping meals, or high consumption of quick snacks and cold drinks with low consumption of milk, fruits and vegetables are among the main concerns relating to SA adolescents (Kruger (nd): 30; Grobbelaar, Napier and Oldewage-Theron, 2013:29-30). Similarly, research in Ghana found that children sometimes received plenty of fruit, energy and protein-rich foods, but at other times did not get a single fruit for months (Vaida 2013: 40). Furthermore, inadequate nutrition and poor health in children and adolescents can have long-term effects on their cognitive abilities (Jukes 2005: s193; Prado and Dewey 2014: 280).

According to Prado and Dewey (2014: 280), an undernourished child is more likely to fail to reach their developmental potential in terms of cognitive, motor and socio-emotional skills, all of which are associated with academic achievement. In the current study eight (88.9%) of the CYCWs did not know how to eat healthily as was found by the NKQ results. A study by Gruenthal-Drell and Veigel (2020: 105) stated that youth workers need to be able to share nutrition information with young people or at least advise them on what to eat. There is a need to draw attention to young people's dietary behaviour by making them aware of the harmful consequences of poor dietary habits (Gruenthal-Drell and Veigel 2015: 536). Seven (77.9%) respondents suggested not eating starch at most meals, which contradicts the SA FBDGs. The FBDGs encourage adequate dietary carbohydrate intake. They also state that meals should be planned around starchy or carbohydrate-rich foods, as these contribute more to the diet than protein (Vorster 2013: s28; Health Department 2013: 26). In addition, the literature suggests that inadequate nutrient intake in children leads to energy deficiency and the inability to sustain predicted growth and development (Stephen, Alles, De Graaf, Fleith, Hadjilucas, Isaacs, Maffeis, Zeinstra, Matthys and Gil 2012: 765). Information on the amount of milk or maize to consume per day was also exceptionally low in this group of CYCWs. This is important as Muehlhoff, Bennett and McMahon (2013: 5-7) explained that milk consists of various nutrients and contributes significantly to the body's supply of calcium, magnesium, selenium, riboflavin, vitamin B12, and pantothenic acid (vitamin B5).

The pilot study also showed that six (66.9%) of the respondents did not know how much water one should drink daily. They incorrectly reported that drinking six glasses or less was adequate. This is despite several research findings indicating that at least eight glasses of water per day is recommended (Oakley and Baird 2015: 884-885; Wong, Ebbeling, Robinson, Feldman and Ludwig 2017: 2). In addition, the section of the FBDGs on water mentions that it is one of the essential nutrients involved in several bodily functions (Van Graan *et al.* 2013: s84). Only two (22.2%) respondents chose low-fat snacks and breakfasts, such as popcorn and wholemeal toast with a thin spreading of margarine, and Weet-Bix with milk with 20% fat. According to the National Institutes of Health, National Heart, Lung, and Blood Institute, and the National Cholesterol Education Programme (2005: 29), the structure and amount of fat consumed makes a difference. South Africans generally have a liking for high-fat foods such as burgers, fried chicken, hot dogs, potato chips, milkshakes, etc. (Van Zyl, Steyn and Marias 2010: 27) and therefore special attention should be given to avoiding these foods at facilities where children are provided with meals.

According to the WFR, the meals served to the children and youth in the study were not varied enough, as required by the FBDGs (Steyn 2013: s13). Children and adolescents are encouraged to eat vegetables or fruits because they improve nutrition and promote better health (WHO 2006: 20). Eating fruit and vegetables is associated with a lower risk of disease (Hartley, Igbinedion, Holmes, Flowers, Thorogood, Clarke, Stranges, Hooper and Rees 2013: 14; Naudé 2013: s46). The research study did not take into account the dietary energy (Kilojoules) and minimum energy requirements provided by each meal.

4.10.5 Preferred learning materials and content

Child nutrition, food preparation, food safety, and healthy eating guidelines with drawings, pictures, photos, and words attracted the interest of the majority of respondents, n=25 (83.3%), and child nutrition, food preparation, food safety, and healthy eating guidelines with coloured photos attracted the interest of n=29 (97.0%). Colour has been classified in research as an important tool in education to attract attention, improve clarity, create a code, mark objects and distinguish items (Olurinola and Tayo 2015: 1, 4; Huchendorf and Cary 2007. 2007: 3). Respondents (n=18; 60.0%) also indicated that they preferred educational materials on nutrition, healthy eating, food preparation, kitchen management, health and hygiene, and nutritious recipes. Several motivations for food behaviours, their acceptance, and their causation are influenced by a number of environmental and intra-individual factors such as the preferred learning materials and the content used to disseminate information. It is therefore natural that the development of nutritional guidelines should incorporate drawings, pictures, photos and words as preferred learning material. According to Siekmann, Webster, Samson and Moses (2017: 3), teaching in a traditional language leads to the desired results. Nineteen (63.0%) of the participants in the pilot study indicated that they would prefer training materials to be in isiZulu.

4.11 CONCLUSION

The purpose of this pilot phase was to determine whether the CYCCs needed child nutrition, food preparation, food safety, and healthy eating guidelines. To achieve this purpose, various tests (surveys, observations, and sample analyses) were conducted. In the absence of information or a working protocol to advise CYCWs on how to successfully enforce safe food preparation, hygiene, and safety, the results revealed the need for child nutrition, food preparation, food safety, and healthy eating guidelines.

The findings also revealed the need for child nutrition, food preparation, food safety, and healthy eating guidelines as there were no guidelines or procedures in place to train CYCWs on how to effectively practise proper food preparation, hygiene, and safety. The lack of food safety and hygiene training evident among the seven (100%) CYCWs who served as the focus group for the study highlighted the need for CYCC child nutrition, food preparation, food safety, and healthy eating guidelines. The findings of the pilot study support the development of guidelines for child nutrition, food preparation, food safety, and healthy eating for children aged 5 to 18 years. As a result, the next chapter describes the guidelines' development and validation process.

CHAPTER 5 - DEVELOPMENT PROCESS OF THE CHILD NUTRITION, FOOD PREPARATION, FOOD SAFETY, AND HEALTHY EATING GUIDELINES FOR CHILD AND YOUTH CARE CENTRES IN SA (PHASE 2)

5.1 INTRODUCTION

The development process of the child nutrition, food preparation, food safety, and healthy eating guidelines (Annexure K) for CYCWs in CYCCs in SA is described in detail in this chapter. Phase 2 of the study (Development Phase 2) was completed based on the pilot study's findings (Phase 1) and drawing on the literature to support the development of child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs, as outlined in the introductory chapter. The results used to develop the guidelines were obtained by conducting a rigorous pilot study in two CYCCs, involving two CYCMs and seven CYCWs, who each completed the Managers, and the Food Handlers questionnaires, and the NKQ. Additional feedback was obtained from a further 30 respondents who completed the preferred format for child nutrition, food preparation, food safety, and healthy eating guidelines questionnaire.

5.2 RATIONALE FOR THE DEVELOPMENT OF THE GUIDELINES AND THE USE OF THE PILOT STUDY FINDINGS

According to research, a child's growth is influenced by various elements, including physical, cognitive, and emotional factors. Parents' and caregivers' understanding of patterns and principles is necessary for growth and development (Ruffin 2019: 1-4). One of the healthy eating practices and principles essential for a child's optimal health, growth, and development is an adequate diet containing foods from different food groups (carbohydrates, protein, fat, vitamins and minerals). Beliefs, attitudes, and activities shaped during childhood impact adult behaviour. There is growing evidence that health in childhood and adolescence impacts health in later life (New Zealand, Ministry of Health 2015: 4). However, countries around the world continue to struggle with various forms of malnutrition (WHO 2020: para 1, line 2). Unsafe food puts global health at risk and harms everyone. Children and people with an underlying illness are most at risk, as the poor quality food they eat promotes a vicious cycle

of diarrhoea and malnutrition that jeopardises their nutritional status (WHO 2020: para 17, lines 1-2).

In the pilot study (Phase 1), it was found that hygiene procedures were poorly enforced as food handlers did not follow the necessary protocols for handling cooked and uncooked food. For example, there were cases where they touched food without washing their hands. Additionally, when the children and youths were in school, there were instances where cooked food was kept back and only served after more than 15 minutes. The pilot study's findings reflect that CYCWs performed their duties inefficiently, partly due to a lack of formal training (Hansungule 2018: 2).

Therefore, the development of guidelines for menu planning, food preparation, food safety, and healthy eating suitable for children aged 5-18 years in care settings was found to be necessary. These child nutrition, food preparation, food safety, and healthy eating guidelines will go a long way towards ensuring safe food preparation and adequate meal presentation for children and youths in CYCCs in South Africa.

5.2.1 Challenges identified during the pilot phase that played a role in the development of the child nutrition, food preparation, food safety, and healthy eating guidelines

Key findings from the pilot study (Phase 1) conducted to identify the need for child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs in CYCCs are presented in this section. The literature reviewed indicated that care facilities settings are not able to meet children's basic needs, which primarily include adequate nutrition and safe food (Malatji and Dube 2017: 123; Van Ijzendoorn, Palacios, Sonuga-Barke, Gunnar, Vorria, McCall, Le Mare, Bakermans-Kranenburg, Dobrova-Krol and Juffer 2011: 15-16). Some CYCWs do not clearly understand their positions and responsibilities regarding nutritional needs and safe foods provided to children and youth. There are no child nutrition, food preparation, food safety, and healthy eating guidelines impacting CYCC operations and the ability to meet service delivery criteria (Hansungule 2018: 2). The pilot study found a lack of formal or signed policies and procedures for receiving, processing and serving food, and also in respect of sanitation and administration in CYCCs. However, the research did not focus on operational policies in CYCCs but rather looked at the development of child nutrition, food preparation, food safety, healthy eating guidelines, and nutritious recipes for CYCWs to prepare in CYCCs to support menu planning and other food related practices.

A study by Grobbelaar and Napier (2014) found that there was a lack of understanding of appropriate food safety and hygiene standards by CYCWs. Most CYCWs in this sample were aware of the proper handling of fruits and vegetables, but this was not the case in practice. For example, the researcher found that fresh fruits and vegetables were not always washed before consumption. The results also showed that CYCWs lacked an awareness of methods to prevent food contamination and had very little knowledge of the required washing processes for plates and utensils (Grobbelaar and Napier 2014: 6).

5.2.2 Relevant legislative mandate /and policy framework informed the development of child nutrition, food preparation, food safety and healthy eating guidelines

The 1996 Constitution of the Republic of South Africa enshrined the rights of children in general and the child justice system in particular. The Children's Act of 2005 ensures the safety of children in need of care and the establishment of child and youth care centres to receive, create, and safely care for children in terms of the provisions of Chapter 10 of the Act. The Department of Social Welfare is responsible for child and youth care centres. At the same time, the Department of Basic Education is responsible for educating children sentenced to mandatory placement in a child and youth care centre (Justice and Constitutional Welfare Department, 2018: 13-14). The Children's Act 38 of 2005 regulates Child and Youth Care Centres (CYCCs) (Hansungule 2018: 3). As defined in section 191(2) of the Children's Act 38 of 2005, and as amended by the Children's Amendment Act 41 of 2007, a CYCC is a care facility for children who do not reside with their biological relatives (Jamieson 2013: 17).

In addition, section 193(2) of the Children's Act, 2005 (Act No. 38 of 2005) states that such a CYCC must be operated and maintained in accordance with the Children's Act, 2005, and the structural, protection, health, and other requirements of the community in the area where the CYCC is located (Department of Justice and Constitutional Development 2018: 40-41). Regulations 75(1), 82, and 83 of the Act require CYCCs and staff to have the necessary qualifications and skills to operate and assist in the operation of the CYCC. While the Act does not specify the required qualifications, it guides the competencies that should provide eligible qualifications, such as advanced knowledge of child and youth work (Jamieson 2013: 77-78).

5.3 DEVELOPMENT PROCEDURES OF THE GUIDELINES

A qualitative approach was adopted in this development phase (Phase 2) (literature research and interviews with experts). The pilot study results and desktop reviews served as a basis for the successful development of child nutrition, food preparation, food safety, and healthy eating guidelines for children and young people. Literature was collected (figure 5.1) from books, scientific articles, and sources relevant to the topic identified in the pilot study on menu planning, nutritious recipes for children and adolescents aged five to 18 years, dietary guidelines, and safe food handling and preparation. The results of the preferred learning materials questionnaire, shown in Figure 4.3, were used to guide the researcher in the guidelines that were to be developed. The vast majority (n=25; 83.3%) of the pilot study participants indicated that they preferred guidelines with colourful drawings, pictures, photos, and words (Figure 4.4), which were adopted and used in the development phase. The child nutrition, food preparation, food safety, and healthy eating guidelines were revised and presented to experts before being implemented in CYCCs, as shown in the workflow diagram in Figure 5.1.

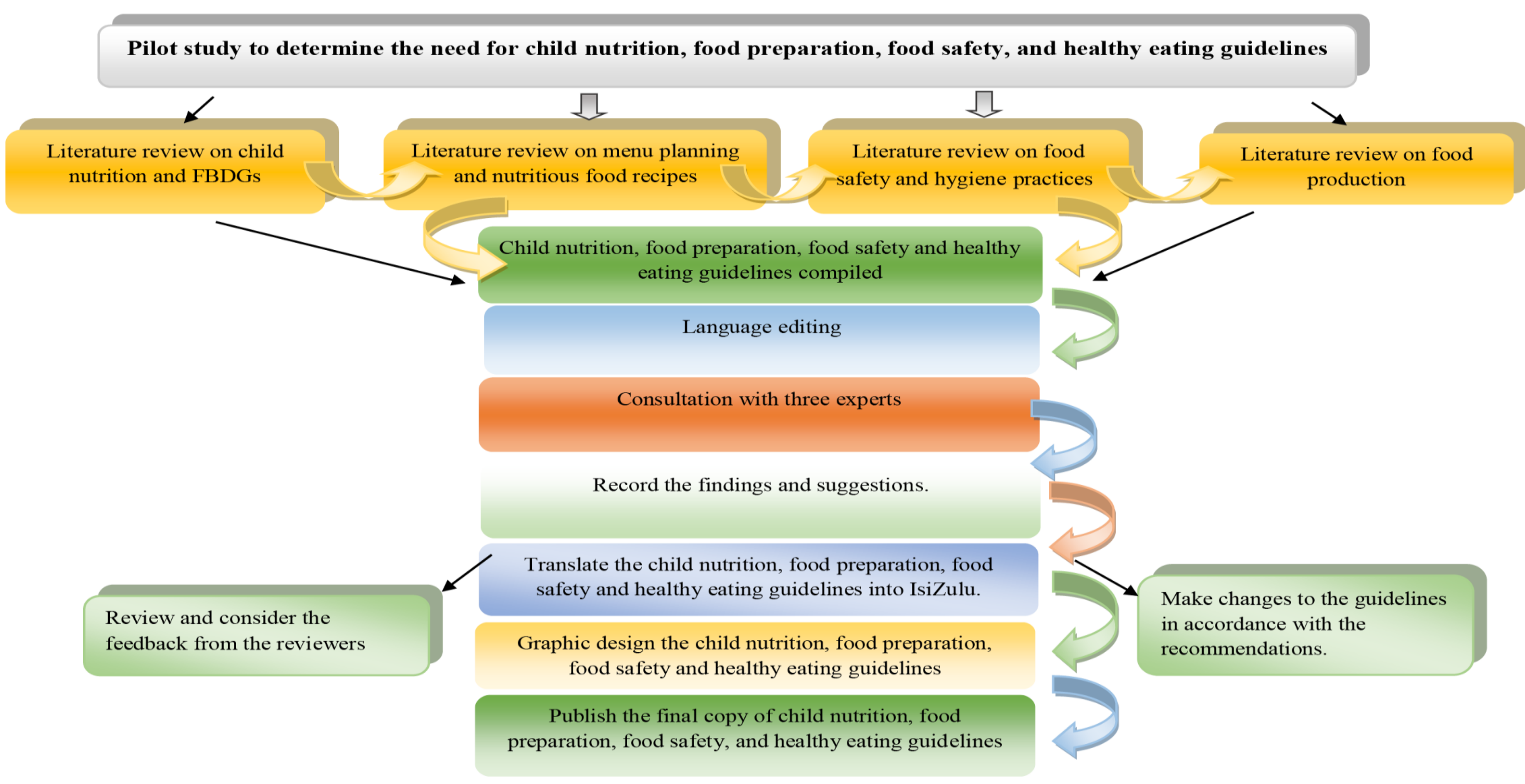

Figure 5.1: The development process of the child nutrition, food preparation, food safety, and healthy eating guidelines

Three experts were identified and they participated in the review of the guidelines as well as the analysis and management of the data obtained. Expert judgements are increasingly being used in fields such as research, education, and healthcare. Experts are defined as knowledgeable individuals in a specific discipline or field, who are typically organised as a panel, individual members, or both (Bruce, Langley and Tjale 2008: 57). The steps that were taken are detailed in the subsections that follow.

5.3.1 Procedure for selecting experts

A purposive sampling method was used to select three experts who would be considered experts for a study of this nature. They were identified and included based on their respective expertise in food, nutrition, and child and youth care (CYC), and had different expertise, affiliations, and work experience in their fields. To ensure the credibility of the data, experts from different backgrounds were selected who were based in different provinces in South Africa. The researcher contacted all the experts via email (Annexure L). For confidentiality reasons, they are identified by codes, and their profile is summarised as follows:

- Expert A: Nutrition and Research Methodology Lecturer and Supervisor, with 28 years of experience in institutions of higher learning.
- Expert B: Dietitian and Registered Nutritionist, with 35 years of experience as a strategic consultant in the CYC field.
- Expert C: Nutrition and Dietetics Educator with 33 years of experience in an institution of higher learning.

According to the literature, a suitable expert is someone who has the necessary knowledge and experience and whose opinion is recognised by their peers (Milevska-Kostova and Dunn 2010: 424).

5.3.2 Informing experts

The experts were asked to provide feedback on the structure and content of the child nutrition, food preparation, food safety, and healthy eating guidelines. Experts from three South African provinces were sourced and contacted to avoid mixing views and influencing each other's ideas. To provide a broad range of perspectives, the experts were divided into three categories: Child and Youth Care (n=1), Child and Youth Care Education and Training (n=1), and Food, Nutrition, and Community Research Education and Training (n=1).

Completed and linguistically revised child nutrition, food preparation, food safety, and healthy eating guidelines were emailed to the experts to collect insights, assessments, and suggestions. There were three questions they were asked to answer, namely, the suitability of the content of the guidelines (use of words and pictures), the layout, and their relevance to the field of child and youth care. They had two to three weeks to read and comment on the content, structure, layout, and overall presentation of the child nutrition, food preparation, food safety, and healthy eating guidelines. They were then asked to return their comments to the researcher to review and make corrections to the child nutrition, food preparation, food safety, and healthy eating guidelines. These corrections were cross-checked with the comments and suggestions. The document was not returned to the reviewers for further comment.

5.3.3 Feedback review and management

The techniques used to review the feedback from the experts are described in this section. The feedback collected from the experts was combined. The researcher then familiarised herself with it, established and sorted it by themes, reviewed them, and tabulated the results. The comments were thoroughly reviewed to find any recurring themes, ideas, and patterns (series of data that repeats). The results of their contributions are shown in Table 5.1 below.

Table 5.1: Feedback from reviewers

Introduction to the guidelines	Section A: Child nutrition and the South African Food-Based Dietary Guidelines (FBDGs)	Section B: Menu planning: meal consumption and recipes	Section C: Food hygiene and safety	Section D: Food preparation	General comments
Eliminate the illustrations which are not relevant to child nutrition, food preparation, food safety, and healthy eating guidelines.	Nutritious meals or a adequate diet should be replaced with evidence-based words that are understandable to the target audience, for example, a statement that reads as follows: meal or diet requirements, a balanced, safe eating plan or trend, and a good mixed meal.	The child nutrition, food preparation, food safety, and healthy eating guidelines must also include a healthy eating plan for children.	Align the guidelines with the WHO Five Keys to Safer Foods.	Small and large-scale kitchens should be covered in child nutrition, food preparation, food safety, and healthy eating guidelines.	With careful review and application of the feedback and recommendations, the child nutrition, food preparation, food safety, and healthy eating guidelines are relevant in the CYCCs setting.
	Use basic, easy-to-understand terms. The words used are extremely difficult to explain and recall.	Words like units, servings, and portions should be carefully considered; they must be utilised correctly.	To illustrate and display distinct concepts, additional photos should be used.		Literature, artwork, sketches, or images that correspond to the subject presented should be included in the child nutrition, food preparation, food safety, and healthy eating guidelines.
	Terms such as FBDG must be written in full (food-based dietary guidelines).	Align the food child nutrition, food preparation, food safety, and healthy eating guidelines to include more low-cost, readily available, and economical foods.			Images obtained from the internet must be objectively proven free and from an open source.

Table 5.1: Continued

	Consider using low-cost, obtainable, and easily accessible food.	Ingredients that are expensive and uncommon should not be included in these child nutrition, food preparation, food safety, and healthy eating guidelines.			The child nutrition, food preparation, food safety, and healthy eating guidelines should be designed for the SA setting.
	Ingredients that are expensive and uncommon should not be included in these child's nutrition, food preparation, food safety, and healthy eating guidelines.				Use SA acceptable terms e.g. fortified versus enriched.
					Use SA sources rather than international literature.
					The child nutrition, food preparation, food safety, and healthy eating guidelines should be localised to make sense in the SA context.

5.3.4 Incorporating data

After compiling all the results, the developed guidelines were corrected based on the common comments/inputs and the critical remarks of the individual experts. These are presented in Table 5.2 below. For more details, see the relevant table in section 5.4. The adjusted and finalised child nutrition, food preparation, food safety, and healthy eating guidelines were used in the implementation phase (Chapter 6).

5.4 THE STRUCTURE OF THE CHILD NUTRITION, FOOD PREPARATION, FOOD SAFETY, AND HEALTHY EATING GUIDELINES

The researcher drafted and amended the guidelines for child nutrition, food preparation, food safety, and healthy eating after a thorough review of the literature, and after considering the results of the pilot study and a systematic review of the comments and contributions received from the three experts. The four sections of the child nutrition, food preparation, food safety, and healthy eating guidelines are shown in Table 5.1. The topics shown in the table are addressed in each section.

Table 5.2: The structure of the child nutrition, food preparation, food safety, and healthy eating guidelines

Section A: Child nutrition and the South African Food-Based Dietary Guidelines (FBDGs)	Section B: Menu planning: meal consumption and recipes	Section C: Food hygiene and safety	Section D: Food preparation
Nutrition and nutrients - Description of FBDGs - Nutrient requirements - Food variety - Food consumption - Benefits of healthy eating - The South African Food-Based Dietary Guidelines (FBDGs) - Estimated portion sizes for children.	- Menu planning - Basic steps for menu planning - Daily meal consumption - Suggested affordable healthy recipes (Annexure K) - Recipe standardisation - Planning a successful meal/ menu.	- General hygiene for food premises. - The benefits of good food hygiene - Consequences of poor food hygiene - Features of food preparation kitchen - Safety when preparing food - Food service facility checklist - Wearing protective clothing - Procedure for keeping food safe when preparing - Description of the food safety keys.	- Standard procedure for purchasing food - Purchasing procedure for different types of food. - Stock receiving procedures - Spoilage - visible signs to check for during receiving - Storage of food - The issuing of food - Food preparation - Selection of correctly coloured cutting boards - Food defrosting procedures - Keeping food at a safe temperature after cooking - Food serving procedures - Procedure for handling cooked food.

5.5 CONCLUSION

The production of the child nutrition, food preparation, food safety, and healthy eating guidelines was summarised in this section. This was done to demonstrate how the CYCW child nutrition, food preparation, food safety, and healthy eating guidelines were developed using field data collection techniques such as surveys, observation and sampling. The pilot study identified the need for child nutrition, food preparation, food safety, and healthy eating guidelines with drawings, words, and photos.

The pilot study's findings supported the need for the development of child nutrition, food preparation, food safety, and healthy eating guidelines for children aged 5 to 18. The following chapter encompasses Pre-implementation-Implementation and Post-implementation. The chapter illustrates the methodology, data collection, funding reporting, and discussions.

CHAPTER 6 - PRE- IMPLEMENTATION, IMPLEMENTATION AND POST-IMPLEMENTATION METHODOLOGY AND RESULTS (PHASES 3, 4 & 5)

6.1 INTRODUCTION

The techniques used during the pre-implementation and post-implementation of the child nutrition, food preparation, food safety, and healthy eating guidelines are the subject of this chapter; the design and execution of the child nutrition, food preparation, food safety, and healthy eating guidelines were part of a larger study process. Phases 3, 4 and 5 of this study focused on the pre-implementation (3), implementation (4), and post-implementation (5) phases, respectively. These phases were aimed at setting out the procedures needed to validate the generated child nutrition, food preparation, food safety, and healthy eating guidelines and assess whether the child nutrition, food preparation, food safety, and healthy eating guidelines were implemented successfully. By presenting the child nutrition, food preparation, food safety, and healthy eating guidelines to the CYCMs and CYCWs through focus group interviews in the CYCCs, the child nutrition, food preparation, food safety, and healthy eating guidelines were presented to the CYCMs and CYCWs, who were given time to use them before their impact was assessed. The entire process was crucial in providing insight into this process in order to contribute to safe food preparation and adequate meal presentation, as well as the health and well-being of the children and youths who reside in KZN's CYCCs.

6.2 ETHICAL CONSIDERATIONS

6.2.1 Permission to conduct the study

The researcher searched the DSD KZN website for registered CYCCs in the eThekwini region after gaining authorization from the Department of Social Development (DSD). After the four facilities were identified, approval to conduct the implementation study was sought from the CYCC's management by email and telephone. Only two out of the four facilities approached responded. The researcher scheduled a meeting with the CYCCs’ managers and had an informal discussion with them about the study before formally requesting permission to conduct the study on their premises. The CYCMs responded that they would read the project letter before making a final decision. Due to the Covid-19 pandemic there was some

delay in the process. In order to enforce control measures, South Africa was moved to Alert Level 5 when Covid-19 infections increased. After that, adjustments were made and submitted to the DUT IREC in order to request that the data-gathering technique be changed from a face-to-face focus group to a virtual focus group utilising Skype or Zoom. Many academics believe that online focus groups are useful in research when face-to-face interviews are not available and they are commonly used in the same way via conference calls, chat rooms, and other online means (Oliffe, Kelly, Gonzalez Montaner and Yu Ko 2021: 6-7; Gray, Wong-Wylie, Rempel and Cook 2020: 1292). It was stated that the CYCCs would be provided with data access packages to enable them to connect to the internet. The technique adjustment was approved (IREC No: 076/15) (Annexure A1). Following approval, the CYCCs were approached once more to explain the newly approved method of completing the implementation phase, which they accepted and verbally agreed to prior to the study project continuing.

6.2.2 Informed consent

A potential participant must be informed of the study's main aim, including potential risks and benefits, before deciding whether or not to participate. This was confirmed by Salmons (2015: 11) who asserted that informed consent in its simplest form is based on the premise that participants who are fully informed about what the research involves have the opportunity to decide whether or not to participate. Throughout this study, the content stipulated in the informed consent was maintained. For informed consent to be regarded as legitimate, the client must be capable and the consent must be given voluntarily (Saylor 2021: 56-57). The CYCMs received printed consent forms and child nutrition, food preparation, food safety, and healthy eating guidelines in both English and IsiZulu. Following that, virtual preparatory meetings with all key players were organized (CYCMs and CYCWs). The meetings addressed the study's goals and objectives, as well as the specifics of what would be expected of the participants and what they might expect. The participants were allowed to ask questions before signing consent forms. All the individuals who agreed to participate received copies of the child nutrition, food preparation, food safety, and healthy eating guidelines from the CYCMs. Following completion of the consent form, each participant was given guidelines in the language of his or her choice in either IsiZulu or English. It is worth noting that the CYCMs were present at the meeting when participants signed the consent forms and the researcher presented the guidelines for child nutrition, food preparation, food

safety, and healthy eating to the participants. Child and Youth Care Managers (CYCMs) were then required to leave the participants alone to complete the interview.

6.2.3 Voluntary participation, malfeasance, and beneficence

The study's participants (CYCMs and CYCCWs) were notified that there would be no monetary compensation for their participation. Furthermore, participants were informed that their involvement in the study was purely voluntary and that they would incur no costs as a result of their participation. It is worth noting that the participants received reasonable data access as a form of compensation.

There were no hazards associated with participating in the study (physical or psychological). This study project was thought to have the potential to help CYCCs advance in their careers and personal lives, which would benefit the children.

6.2.4 Confidentiality

Confidentiality is an ethical practice aimed at safeguarding the privacy of study participants while collecting, analysing, and reporting data. Confidentiality refers to the separation or alteration of any personal, identifying information provided by participants from the data (Wiles, Crow, Heath and Charles 2008: 426-427). Participants were advised that their personal information would be kept secret and their identities would not be revealed during the study. In this scenario, all participants were assigned pseudonyms.

6.3 RESEARCH SETTING

The implementation study was undertaken in the municipality of eThekwini, which is located on the east coast of South Africa in the province of KwaZulu-Natal (KZN). The eThekwini Municipality Integrated Development Plan document reported that in 2016 the Municipality had a population of 3.6 million people and covered an area of around 2555 square kilometres. It is made up of a diversified society that is confronted with a wide range of social, economic, environmental, and governance issues. eThekwini was expected to have a population of 408 220 million people in 2021 (eThekwini Municipality Integrated Development Plan (IDP) 2020: 29). According to the IDP document of 2021, individuals from many ethnic backgrounds constitute the residents of the municipal area. The African community made up the majority of the population (74%), followed by the Indian community (17%), the White community (7%), the Coloured community (2%), and other foreign nationals (0.4 percent).

eThekwini's unemployment rate increased from 26.7% in Quarter 1 2018 to 27.1% in Quarter 1 2019. Inequality, unemployment, and poverty are all issues that the city faces. High population density is a problem in mixed residential regions, such as urban and non-urban/ rural areas. Residents of the metro, on the other hand, are mainly satisfied with service delivery, but unemployment, poverty, and a lack of funds remain important concerns. The metro's high rate of social problems, including teenage pregnancy, drug addiction and alcohol abuse and criminality are also important challenges (eThekwini Municipality 2020: 7, 9, 13).

The research was conducted at two registered CYCCs that specialise in Residential Care and Personal Development for abandoned, orphaned, vulnerable, poor and neglected children who have been considered to be at risk by the Children's Court. The centres are also licensed by the Department of Social Development. (St Thomas Home 2021: para 1, lines 1-3; Durban Child and Youth Care Centre 2021: para 1, lines 1-2). It should be noted that the CYCCs employed in this phase are not the same as those used in the pilot project.

6.4 RESEARCH METHODOLOGY

6.4.1 Research approach

To examine the change in behaviour over time, the study used a two-step approach (pre- and post-implementation). The implementation phase used an uncontrolled qualitative approach pre- and post-implementation in the same study site(s) with the same group of participants. The systematic gathering, organization, description, and interpretation of written, verbal or visual data is referred to as qualitative research (Hammarberg, Kirkman, and de Lacey 2016: 499). The pre-implementation technique was utilized to get a thorough understanding of the participants' knowledge of the child nutrition, food preparation, food safety, and healthy eating guidelines themes (menu planning, nutritious recipes, nutritional guidelines, food handling, and preparation). In the meantime, phase two used a behaviour modification technique to assess knowledge change over ten months. The term "behaviour modification technique" refers to the methods that are used to encourage people to modify their habits (Michie, Wood, Johnston, Abraham, Francis and Hardeman 2015: 2). The participants were provided with a copy of the child nutrition, food preparation, food safety, and healthy eating guidelines to refer to and use during the 10-month trial period. Zoom, an online video conferencing technology that allows people to meet online with or without video, was used to interview the CYCMs and CYCWs. According to Eynon, Fry, and Schroeder (2017: 4), surveys, interviews and focus groups are some of the methods used to obtain data directly

from individuals. In many circumstances, researchers have used online tools to gather responses from participants to specific questions or themes. For this study, a zoom video was used to facilitate the discussion, which was also recorded with the participants' permission. The participants were called once a week for the duration of the trial, which lasted for ten (10) months.

Because of their flexibility and adaptability at any point of the research, focus group discussions were selected and utilised. Focus group discussions, as opposed to more traditional methods such as individual interviews and surveys, allow participants to research subjects that are not all that well understood or where there has never been much research work. Supporting this view Ochieng, Wilson, Derrick and Mukherjee (2018:29) mentioned that focus group discussions, unlike structured individual interviews, use group dynamics to explore themes in context, in depth, and in detail without imposing a conceptual framework.

6.4.2 Research design

An investigation process of understanding is grounded on diverse methodological traditions of inquiry that explore a social or human problem in qualitative research design (Ahmadin 2022: 104). A qualitative researcher constructs a complex, holistic picture, analyses words, presents extensive informant perspectives, and conducts the study in a natural context (Creswell 2009: 15). The critical operations or activities of the implementation research process are depicted in Figure 6.1. The use of the developed child nutrition, food preparation, food safety, and healthy eating guidelines, as stated in Chapter 5, is one of the significant elements of this phase.

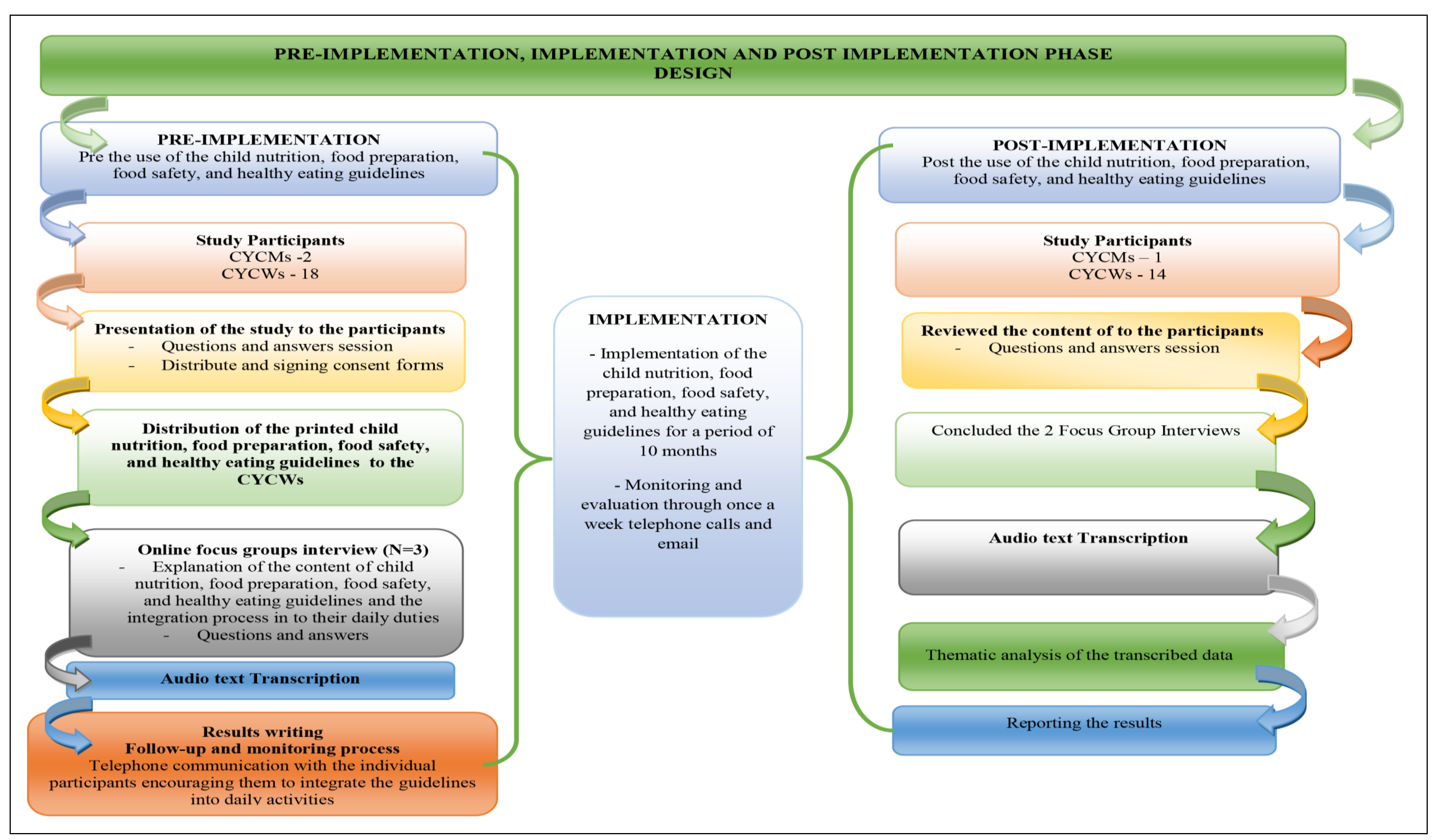

Figure 6.1: The pre-implementation and post-implementation phase study design

6.5 SAMPLE AND SAMPLING METHOD

A qualitative research approach was used to undertake the study. The two CYCCs were identified through purposive sampling. Andrade (2021: 87) describes a purposive sample as one whose characteristics are defined for a purpose that is relevant to the study. The child and youth care centers' (CYCCs) management was handed a letter explaining the study's goals, objectives, and procedural stages during the meeting. The researcher was then granted access to the participants. A zoom focus group interview was scheduled during which the CYCMs received the mailed child nutrition, food preparation, food safety, and healthy eating guidelines, consents, and letters outlining the project, and the researcher formally met the participants. Participants were given letters from the CYCM outlining the goal of the study, the scope of their involvement, confidentiality, meeting recording, data storage, and their right to withdraw from the study at any moment during the meeting. Following that, the CYCMs provided informed consent forms to those who agreed to participate. The two selected CYCCs prepared and served food to the children and youth. Two CYCCs, one CYCM, one supervisor, and 16 CYCWs made up the study's sample size of 18 participants. Under the Child Care Act of 1983, the CYCCs that took part in the study were registered as residential care facilities with the DSD. Each CYCC had a central kitchen, and food was served in a dining hall where the children and youth were staying and being cared for by the house mother or father. The children's and youth's food was collected and served by the housemother and father. The study phase did not involve the children in the CYCCs.

6.6 QUALITY OF DATA

Over the years, there has been much discussion about the importance of quality in qualitative research (Mays and Pope 2020: 10). This study investigated various methods for improving data quality in three areas: credibility, conformability, and dependability (De Vos, Delport, Fouche and Strydom 2011: 419). Following the collection and analysis of qualitative data in phases three and four of the study, the following section discusses how the three trustworthiness criteria, were used to achieve quality. The three criteria were used to ensure that the research was verified, validated, free of bias, that no assumptions or perspectives were used separate from the analysis, that it was documented, and that it could be observed, audited, and evaluated by someone outside the research. Below the three criteria are discussed.

6.6.1 Credibility

In qualitative research, credibility, or authenticity refers to the researcher demonstrating that the inquiry was conducted in a manner that accurately represented and captured the true experiences of the participants (De Vos *et al*. 2011: 419; Babbie 2020: 409). In this study, coded data was sent to supervisors for verification and validation of accuracy and authenticity. The measures outlined in section 6.7 below were used to ensure the credibility of the study.

6.6.2 Confirmability

The researcher notes confirmability as being the degree to which the research findings may be confirmed. It is comparable to objectivity in that it refers to how well a researcher is aware of or accounts for individual subjectivity or prejudice. This is supported by Boswell and Cannon (2022: 25), who mention that confirmability emphasizes the importance of analysis data in a way that keeps the researcher's biases, assumptions, and perspectives separate from the analysis. Through triangulation of conclusions with data from several sources and methodologies, (Moser and Korstjens 2018: 122) and auditing of the data, the researcher upheld the principle of confirmability. Tracy (2018: 73) asserted that it is a good idea for the researcher to store all acquired data in a well-organized, retrievable manner so that it can be made available to the reader or participants if the findings are contested by other researchers. The researcher will then store it safely for the purposes mentioned previously by Tracy (2018: 73).

6.6.3 Dependability

The degree to which research techniques are documented, allowing someone outside the research to observe, audit and evaluate the research process, is referred to as dependability (Moon, Brewer, Januchowski-Hartley, Adams and Blackman 2016: 2). It alludes to the degree to which research findings can be replicated with comparative individuals in a comparative situation, according to Merriam (2015: 130). It emphasizes the importance of the researcher representing or describing the shifting context and conditions that are critical to the study result's consistency. According to Merriam (2015: 130), dependability is difficult and impossible to achieve since human conduct is not static; it is logical and evolves based on a variety of factors. It's exacerbated by the fact that study participants are likely to have multiple perceptions of reality. A similar report with different individuals, in a different setting, with a different hierarchical culture and context, or by a different researcher may not

produce the same results. The form of inductions is also dependent on the researcher's ability to draw implications based on his or her own experience, and how effective the researcher is at acquiring and evaluating data.

6.7 DATA COLLECTION

The implementation phase was separated into three sections: the pre-implementation process, the implementation process, and the post-implementation process. In this case, data was gathered through an online video focus group discussion, by telephone, and via email. A focus group is a form of an in-depth interview that takes place in a group setting, with meetings presenting aspects such as the proposal's size, composition, and interview processes (Dilshad and Latif 2013: 192).

6.7.1 Pre-implementation phase

Weekly individual telephone calls and follow-ups were conducted by the researcher and as outlined earlier, the researcher had contacted the CYCMs and CYCWs via telephone and email to plan the data collection sessions. Data were obtained from 18 participants who were available and willing to engage in an online Zoom focus group interview mediated by the researcher, using an interview schedule. The interview schedule (Annexure M) was created to ensure that the researcher treated the various focus groups consistently and asked identical questions about nutrition awareness, menu planning, food preparation, and food safety.

In 2021, 18 of the 28 existing CYCWs were available to participate in the zoom focus group interviews. The participants were divided into three groups of six each to maintain distance and adherence to covid protocols. Because a laptop was used, the researcher was also able to see all of the participants during the interview. The 18 participants were chosen from among the 28 registered and recognised employees (CYCMs and CYCWs) who were permanent or on long-term contracts, consented to participate, and were available on the data collection days. Each focus group interview lasted 40 to 60 minutes, and a research interview guide was used to streamline the process. The researcher conducted three pre-implementation focus group interviews online via Zoom. Each interview included between four and seven participants.

Knowledge of menu planning, nutritious recipes suitable for children aged 5 to 18 years, nutrition guidelines for children, and safe food handling and preparation were some of the

questions answered during the pre-implementation phase. Other questions focused on the usefulness of having guidelines in the centre and how it could help the CYCWs. An example of such a question is: In your day-to-day work, do you face challenges related to food preparation and safe food handling practices?

Before beginning the focus group interview, the researcher requested permission to record the discussion for research purposes. When all the participants agreed that the discussion could be recorded, the recording began. Before allowing the participants to do the same, the researcher presented a brief introduction. Before beginning to ask the questions, the researcher welcomed the group and provided an overview of the themes, an explanation of the focus group's ground rules, and an assurance of anonymity. After the focus group, the participants were asked if they had any additional information to share or questions to ask. The focus group interview was then concluded by requesting the CYCMs to provide the CYCWs with child nutrition, food preparation, food safety, and healthy eating guidelines in their preferred language (English or IsiZulu). The CYCWs were then given an overview of the child nutrition, food preparation, food safety, and healthy eating guidelines by the researcher. The CYCWs were also instructed by the researcher to view and read the guidelines before incorporating the lessons into their daily operations at CYCCs. It was explained that the CYCWs would be permitted to ask questions during the follow-up interviews. The interview was then concluded.

6.7.2 Implementation

The child nutrition, food preparation, food safety, and healthy eating guidelines were implemented to assess their impact, although the process was carried out without a rigorous implementation guide. The guidelines were implemented over a period of ten months. The literature indicated that the implementation process for nutrition education programmes could be completed after three to seven months (Dickey, Pachón, Marsh, Lang, Claussenius, Dearden, Ha and Schroeder 2002: 76; Bello, Gericke and MacIntyre 2019: 30). During the implementation phase, participants were allowed to ask questions or make comments on the guidelines. Brug, Oenema and Ferreira (2005: 7) emphasised the importance of motivation to achieve voluntary behaviour change. The implementation process was completed after 10 months for the purposes of this study because all study participants indicated that they had completed the implementation of guidelines into their day-to-day work.

6.7.3 Post-implementation phase

The same technique was used as in the pre-implementation interviews. However, here the questions asked focused on the application of child nutrition, food preparation, food safety, and healthy eating guidelines after implementation. Two online focus group interviews were conducted with 14 participants using an interview schedule (Annexure N). A sample of 14 was drawn from the 26 participants who received the guidelines and applied them in their daily work. Only participants who had implemented the guidelines (14 participants) were interviewed. The other participants were excluded as they had not completed the implementation of the guidelines as they had only joined the CYCC in January, only two months before the post-implementation process could be completed. Originally, the researcher had planned to interview them as well, but after conducting the two focus groups it became apparent that the state of saturation was reached. The researcher had to realise that saturation had been reached and stopped the interviews. Hennink and Kaiser (2022) describe saturation as "the point in data collection when no additional issues or insights are identified and data begins to get repeated so that further data collection is redundant". In relation to this view, the participants were found to be providing similar answers. As a result, the researcher did not expect to get different perspectives from the remaining group of participants.

6.8 DATA ANALYSIS

A professional transcribing company transcribed the Zoom data recordings collected from the pre-and-post-implementation phases. Thereafter the researcher read each transcript and made notes in the margins of words, theories, or short phrases that summed up what was said in the text. This process is known as open coding. Thematic analysis was conducted to analyze the data. Braun and Clarke (2006: 6) defined thematic analysis as a process for identifying, analysing, and reporting data patterns and as a result, the researcher used Braun and Clarke's (2006) step-by-step theme analysis process, which involved the following steps:

- Step 1: Familiarisation – The data collected through the online interaction were sent to be transcribed. Following that, the researcher immersed herself in the transcribed data, repeatedly reading it to search for common meanings and patterns and to become familiar with the depth and breadth of the content. The transcripts were then compared to the original audio recordings for accuracy. After that, data were coded, and the patterns were identified.

- Step 2: Generating initial codes – After reading and familiarising herself with the data, an initial list of ideas was generated. The researcher identified the main ideas and produced initial codes and generated an initial list of ideas about what was contained in the data and what was interesting about them. The initial codes were produced from the data.
- Step 3: Searching for themes – After coding, data were sorted into potential themes and subthemes.
- Step 4: Reviewing themes – Themes were refined by extracting some information that did not have enough data to support them, or the data were too diverse.
- Step 5: Defining and naming themes – At this point, the identified themes were further refined. Thereafter, more focus was placed on the themes which were to be analysed, and then the data in them was analysed.
- Step 6: Producing the report – after fully working out the themes, the final analysis and write-up of the report were conducted.

The themes that emerged across focus group interviews were then reported.

6.9 RESULTS AND DISCUSSION OF THE PRE-AND-POST IMPLEMENTATION

This section of the chapter is organized around the main themes and subsequent sub-themes that emerged from the participants' reports of their experiences and perceptions of child nutrition, food preparation, food safety, and healthy eating guidelines. The section includes data analysis and interpretation, a presentation of the qualitative findings of this study, and a discussion of the findings. The pre-implementation results of the qualitative analysis of the three sets of interviews are presented according to the themes and sub-themes that developed in the implementation results section, which is separated into two segments. In the first section, the findings from the pre-implementation focus group discussions with CYCMs and CYCWs will be presented, followed by the findings from the post-implementation focus group interviews with the same group of participants (CYCMs and CYCWs) permanently employed in the CYCCs.

The researcher conducted five focus group interviews with a total of 18 pre-implementation participants and 14 post-implementation participants. Race, gender, language, age category, educational level, and duration of service will be given and explored in the biographical information of the focus group participants.

6.9.1 The profile of the participants who participated in the pre-implementation focus group interviews

Participants' biographical information encompassed race, gender, language, age, educational levels, and length of service. In the sections that follow, each variable of biographical data will be presented.

6.9.1.1 Gender of participants

Figure 6.2 shows that there were more women (78.0%; n=14) than men (22.0%; n=4) among the participants.

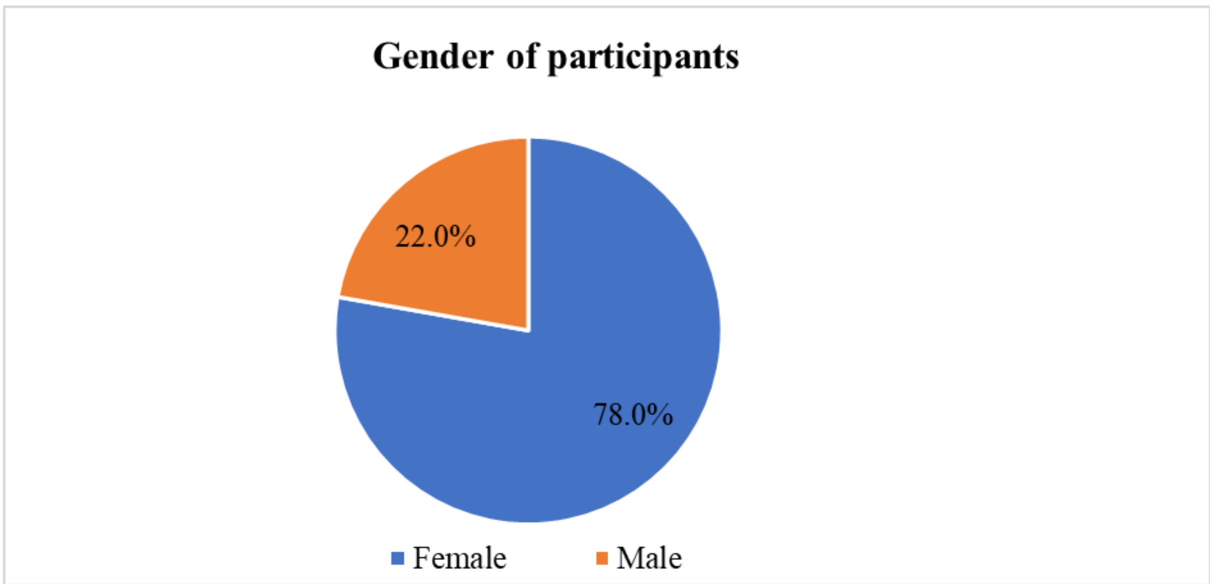

Figure 6.2: Gender of focus group participants (n=18).

6.9.1.2 Age of participants

Participants in the focus group interviews ranged in age from 30 to 70 years. According to Figure 6.3, the majority of participants were between the ages of 35-40 (n=4; 22%) and 51-55 (n=4; 22%), with three falling within the age category 41-45 years (n=3; 17%), two falling within the age category 30-34 years (n=2; 11%), another two falling between the ages of 46-50 years (n=2; 11%), and two falling between the ages of 56-60 (n=2; 11%). Only one participant (n=1; 6%) was between the ages of 61 and 70.

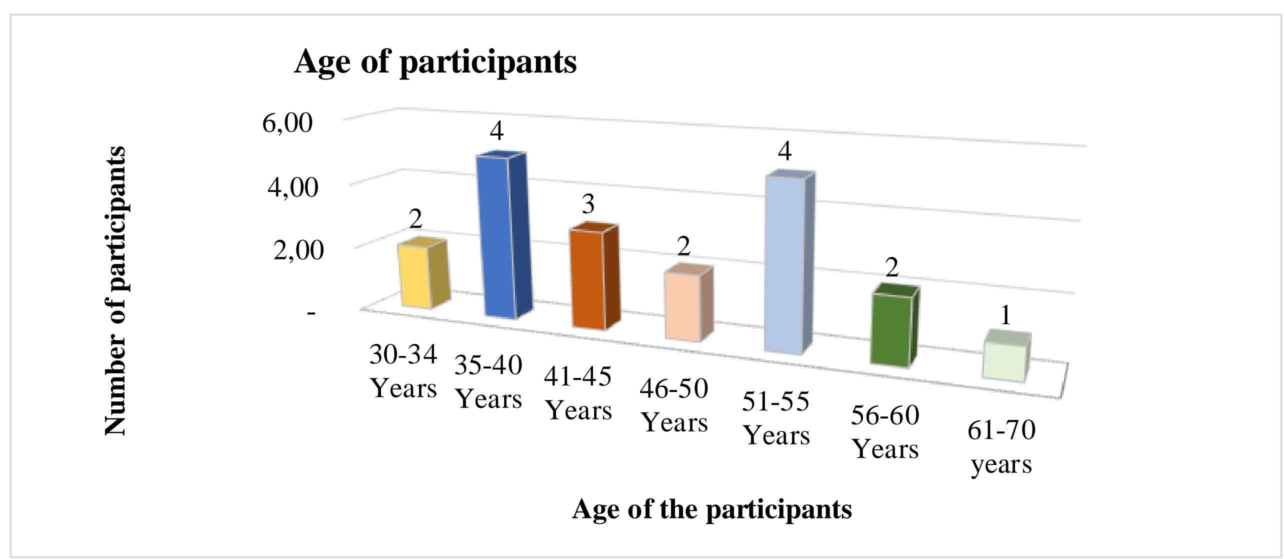

Figure 6.3: Count of pre-implementation focus group participants by age (n=18)

6.9.1.3 Race of the participants

Figure 6.4 represents the race distribution of participants, with 12 (67%) being African, three (17%) Indian, and three (16%) Coloured.

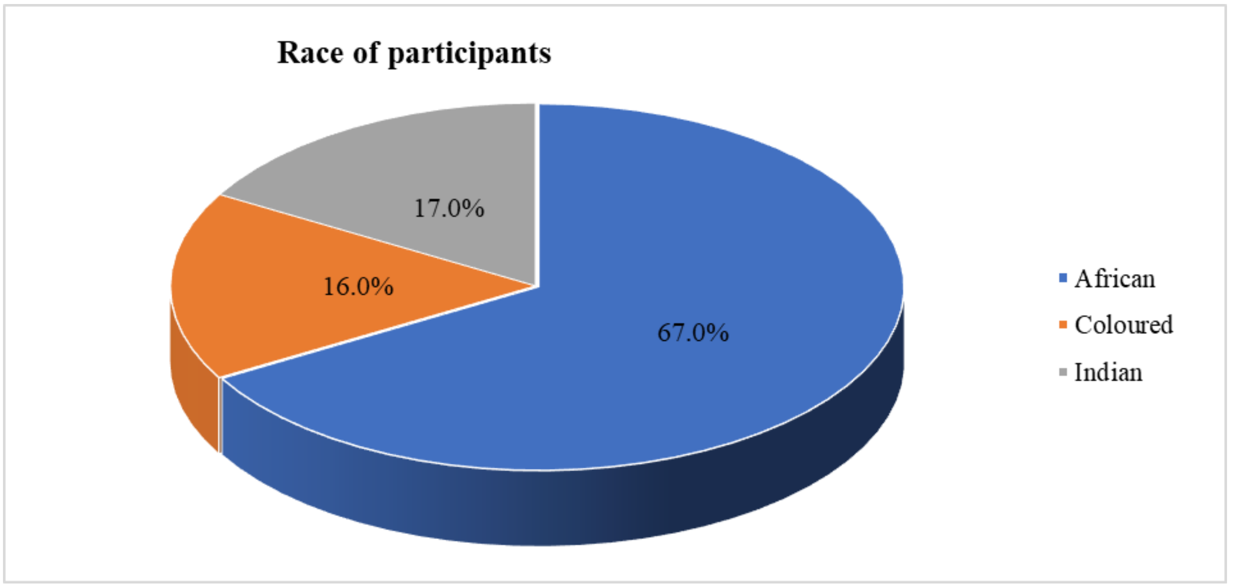

Figure 6.4: Race of focus group participants (n=18)

6.9.1.4 Language of participants

Figure 6.5 depicts a summary of the participants' various home languages. IsiZulu (n=10; 56%) and English (n=8; 44%) were mentioned as home languages by the participants.

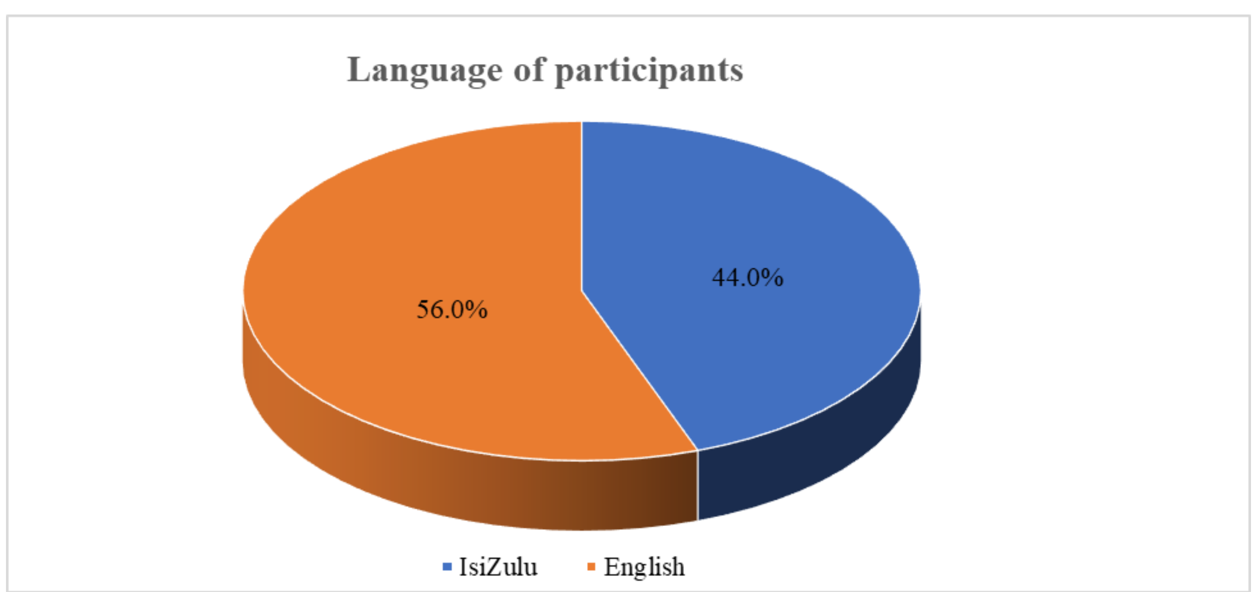

Figure 6.5: Language of focus group participants (n=18)

6.9.1.5 Educational level of participants

Figure 6.6 indicates the participants' levels of education.

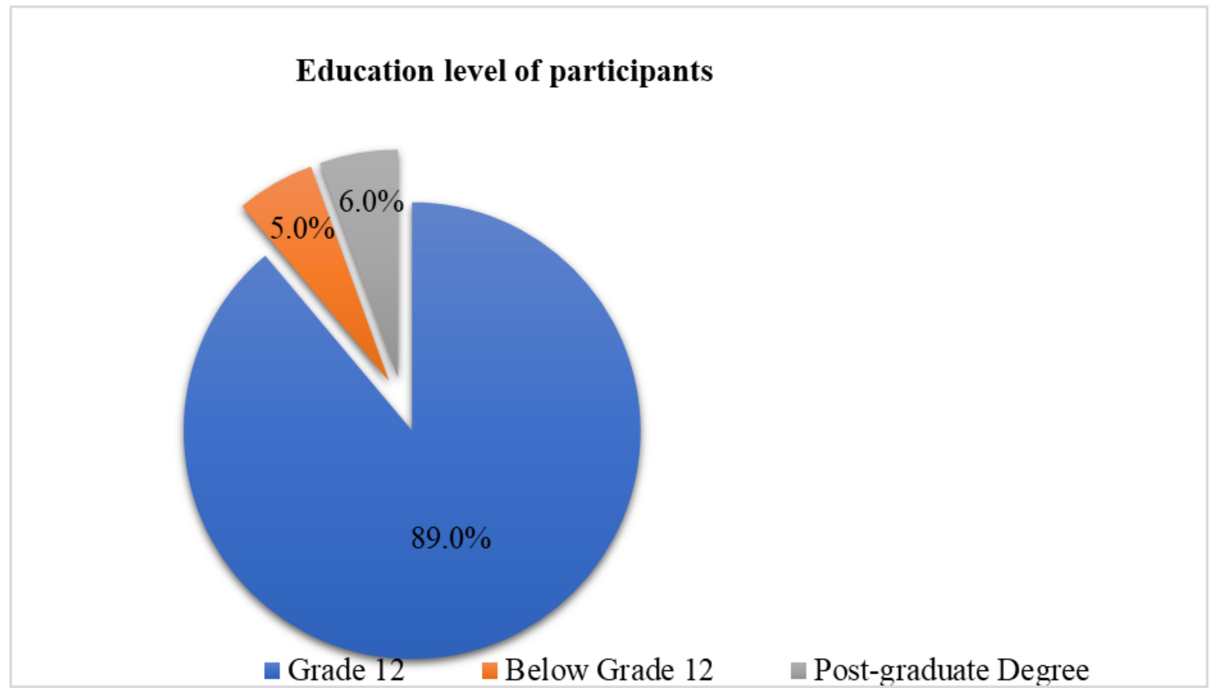

Figure 6.6: Education level of focus group participants (n=18)

According to Figure 6.6, the majority of participants (n=16; 89.0%) had completed grade 12, with one participant (n=1; 6.0%) having less than matric and one participant having a post-graduate degree (n=1; 5.0%).

6.9.1.6 Length of service in the CYC field

Participants' length of service in the field of CYC ranged from one year to 14 years. Below is Figure 6.7 which outlines the participants' length of service.

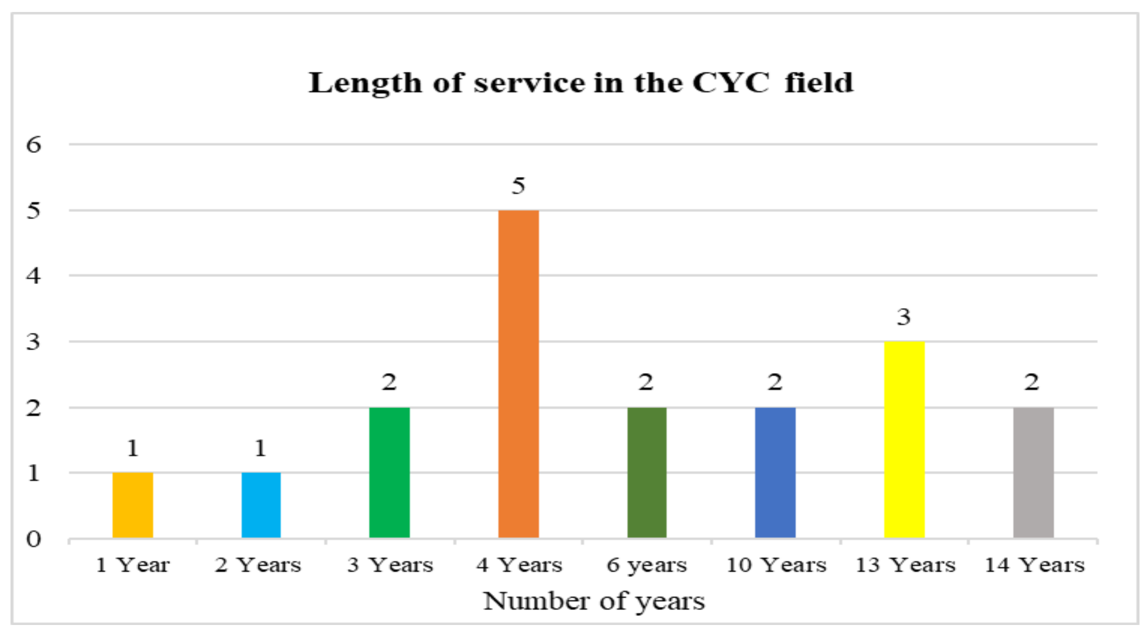

Figure 6.7: Length of service in the CYC field of the focus group participants (n=18)

According to Figure 6.7, the majority of participants (n=5; 28%) had spent four years in the CYC field, with three participants (n=3; 17%) having spent thirteen years. Furthermore, two of the participants had been in the CYC field for three years (n=2; 11%), another two for six years (n=2; 11%), another two for ten years (n=2; 11%), and the other two (n=2; 11%) for fourteen years. It should be noted that a few participants had spent two years (n=1; 5%) and one year (n=1; 5%) in the sector, respectively.

6.9.2 Thematic analysis of the data collected in the pre-and post-implementation of the child nutrition, food preparation, food safety, and healthy eating guidelines

The findings from the focus group interviews are presented in this section of the study as a summary of what participants answered in response to specific questions. This section contains the researchers' interpretation based on (1) notes taken during focus group meetings, (2) a study of audio and video recordings, and (3) a content analysis of professionally transcribed audios from the three interview sessions. In both the pre-and post-implementation phases, three themes emerged from the data, each with multiple sub-themes. Each of these themes and sub-themes is outlined below, with texts from the interviews used to highlight them.

6.9.2.1 Qualitative findings pre- and post-implementation

Following the research objective, Table 6.2 shows a summary of three themes and nine sub-themes that emerged in each focus group interview during the pre-implementation phase, while only eight are from the post-implementation phase. Themes and sub-themes will be supported with descriptions, quotations and literature throughout this section. Some of the themes and sub-themes will be clarified through literature analysis.

Table 6.1: Summary of identified themes and sub-themes

PRE-IMPLEMENTATION		POST-IMPLEMENTATION	
Themes	**Subthemes**	**Themes**	**Subthemes**
Theme 1: Nutrition-related issues faced by the participants in the CYCCs	Sub-theme 1.1: Challenges of Menu Planning in the CYCCs Sub-theme 1.2: Nutritional guidelines Sub-theme 1.3: Nutrition training	**Theme 1: The relevance of child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs**	
Theme 2: Food production-related issues	Sub-theme 2.1: Insufficient budget Sub-theme 2.2: Nutritious recipes Sub-theme 2.3: Food handling practices and food preparation. Sub-theme 2.4: Food storage practices	**Theme 2: Importance of child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs**	Sub-theme 2.1 Menu planning Sub-theme 2.2 Nutritious recipes suitable for children 5 to 18 years of age. Sub-theme 2.3 Nutritional guidelines Sub-theme 2.4 Food handling practices Sub-theme 2.5 Food preparation practices Sub-theme 2.6 Food storage Sub-theme 2.7 Hygiene practices
Theme 3: Food safety and hygiene	Sub-theme 3.1: Personal and kitchen hygiene practices, Sub-theme 3.2: Use of Personal Protective Equipment (PPEs) in the kitchen,	**Theme 3: Knowledge gained from the guidelines**	Sub-theme 3.1 Menu planning Sub-theme 3.2 Nutritious recipes suitable for children 5 to 18 years of age. Sub-theme 3.3 Portion control of nutritional foods Sub-theme 3.4 Food handling practices Sub-theme 3.5 Food preparation practices Sub-theme 3.6 Personal hygiene practices
Theme 4: Benefits of implementing the guidelines in the CYCCs			

6.9.3.1 Pre-implementation results

(a) Theme 1: Nutrition-related issues faced by the participants in the CYCCs

Participants in the three focus group interviews highlighted a variety of nutrition-related issues they encountered in the CYCCs. Menu planning, nutritional guidelines, and training were the sub-themes mentioned by participants as part of the nutrition issues. The researcher used pseudonyms to maintain the ethical principle of anonymity and used.

- **Sub-theme 1.1 Challenges of menu planning in the CYCCs**

Gordon-Davis and Van Rensburg (2012: 52) defined menu planning as the process of planning menus taking into account all aspects of food systems. Some participants mentioned food groups as one of the components to be considered when planning a menu. The first sub-theme in the topic of nutrition-related issues confronting CYCC participants was menu planning. Menu planning necessitates careful consideration of a number of aspects that will affect the operation's success. All other management and operational tasks operations are based on the menu, which serves as a reference guide. As a result, it is crucial to include the CYCWs in the menu design process, as they will be the ones to carry it out during the meal preparation.

Participants described how they are given an already planned cycle menu for them to implement. Talking about this issue, a participant (P4) in FG explained as follows: "*We are not the ones who are planning what should be on the menu. A menu is planned by other stakeholders and provided to us for implementation."* The majority of those who responded to this item felt that the planned menu was very useful and contained a balance diet. One interviewee in FG3 put it this way, *"We are given a menu which is already planned, our job is to follow that."*

Furthermore, a variety of perspectives were expressed regarding menu planning, for example, P1 in FG1 highlighted that menu planning means consideration of left-over food and serving meals with lower calories first, then followed by food with higher calories. The interviewee explained: *"…the way we are planning our menus, mostly for breakfast, we must consider food which was eaten yesterday. So, in the morning, we serve lighter food, and then as the day progresses you introduce heavier foods."* However, a common view among the interviewees was that they do not have sufficient knowledge of menu planning. Interestingly, this impression was supported in the other two focus group interviews. Participant 5 in the FG2 demonstrated that as a CYCC, they have limited menu planning experience by

submitting the following statement: "*We do not have much information when it comes to menu planning.*" The discussion around how useful the nutritional recipes included in the guidelines were revealed that participants had insufficient nutrition knowledge. As one of the participants (P3) in the FG3 explained "…*when we implement, we must implement something that we know, not information which we are not sure of. Right now we do not have information and we are so hopeful that the guidelines will be able to teach us about nutrition and menu planning.*" At the same time, participants discredited the use of leftover food to communicate their views on nutrition knowledge. Another participant (P1), in FG1 described menu planning as follows: *"….food groups need to be considered in menu planning to avoid consuming too much of these foods as opposed to the others. For example, it is not right to drink too much lemonade or eat too much starch. It also ensures that the foods on the menu must be nutritious and clear, e.g., cereals, eggs, bread, and tea should be eaten by children and young people in the morning. It requires that fruit and snacks emphasise the balance of the menu."*

This point was emphasized by another participant (P10) in FG2 who said "…*menu planning involves understanding the food, how to prepare it, and how to serve it. Proper menu planning should ensure that starchy foods like porridge and potatoes are not served together. You also need to ensure that less sugar is used in meal planning. Meal planning can also be characterized as awareness and understanding of healthy eating (P10)."* Some participants from FG1 pointed out the challenges to appropriate menu planning, stating that: "…*like organic food, that is not readily available and that it is often expensive (P4)*".

The type of meals to be offered in the morning was discussed (light food), followed by rice, pap, and meat (as part of lunch and dinner) given as an example. One interviewee (P3) in FG2 put it this way, *"I no longer use foods that were served the day before. Also, only lighter foods can be eaten in the morning. After that, foods such as rice, pap, and meat can be used when preparing lunch and dinner to support the children and young people throughout the day and night".*

A common view amongst participants on menu planning was that *"...the menu must be nutritious and healthy."* From the participants' responses, the researcher gathered that some participants had some knowledge regarding menu planning but others did not. Even if the participants had some knowledge in menu planning, they still needed to be provided with more knowledge so that they could continuously develop in menu planning. Gordon-Davis and Van Rensburg (2002: 52) mentioned that a menu planner must be qualified and suitable

for the job. It is clear that the responses from the participants revealed that most of the participants had limited knowledge when it came to menu planning which could be disadvantageous to the children whom they prepare food for. This demonstrates the importance of continuing to provide nutrition training to assist CYCWs in performing their duties. Chege and Kuria (2017: 5) showed that a lack of nutritional understanding could be blamed for poor dietary habits. Correct foods, in the wrong proportions, improper meal pairings, and poor food preparation methods would occur if nutritional understanding was lacking. Furthermore, despite the fact that various universities and colleges provided training and courses in the subject of CYCC, this research found that the programmes offered did not include nutrition or any food preparation modules.

The participants' narrations are consistent with the findings of a study conducted in France by Ducrot, Méjean, Aroumougame, Ibanez, Allès, Kesse-Guyot, Hercberg, and Péneau (2017: 1), who noted that meal planning was associated with a healthier diet and less obesity. Literature links proper menu planning with adherence to nutritional guidelines and a greater diversity of foods, and lower overweight or obese risks. Studies also revealed a concern for food handlers who lacked the ability to plan a menu, which ultimately affected food production (Condrasky, Baruth, Wilcox, Carter and Jordan 2013: 48).

- **Sub-theme 1.2 Nutritional guidelines**

Adherence to dietary guidelines is also one of the nutritional issues faced by participants. The participants stated that although there are guidelines on what they should cook, they are not implemented. The researcher further questioned the participants to find out why the dietary guidelines were not implemented. One participant (P2) in FG2 explained; *"There are some guidelines that we do not follow because we lack the resources. As much as we try to implement the right nutritional guidelines, sometimes it is not possible to get or buy fresh meat or vegetables, for example. We use what we have."* The participant cited the lack of access to fresh food as a problem. However, when the participants were further questioned about adherence to the dietary guidelines, the researcher found that they did not understand the components of the dietary guidelines. Furthermore, another participant commented, "*Dietary guidelines state that food must be appropriate for children. Meals, such as salads and vegetables, may contain several colours. Vegetables must not be overcooked or nutrients will be lost."* Participants also expressed their opinion on nutrition guidelines due to their

inadequate understanding by expressing, *"We have little knowledge about nutrition guidelines for children"* as highlighted by P1 in FG1.

- **Sub-theme 1.3 Nutrition training**

Another sub-theme that emerged from the conversations was the lack of nutrition education. This was not surprising as none of the training courses listed in Table 1.1 (Chapter 1) include nutrition-related modules or topics. The NACCW accredited training consists of about four hours of basic nutrition but does not address the practical aspects such as hygiene, gardening, health, nutrition, and household management (Thurman, Yu and Taylor 2009: 12). From the discussion, it was clear that participants had learned or understood little about nutrition. The majority of the participants were of the perception that the nutrition training and the dietary guidelines they received were quite basic. One participant (P3) in FG3 expressed, "*We are not very familiar with the nutrition guidelines. We have a module on nutrition, but it is not as strong as to give you that much knowledge.*" Participant 5 of FG3 expressed similar sentiments, saying, "*We do not know anything about the guidelines, but if we are given the information, we are willing to incorporate it into our work."* The researcher noted that some participants had some understanding of the dietary guidelines, while others did not. It is noteworthy that all participants recognised the need to familiarise themselves with the nutrition guidelines. This demonstrated that the CYCWs were open to learning new things and accept them when they were offered. The participants' views were consistent with those of Molepo and Delport (2015: 156) who identified a need for training for CYCWs to enable them to minimise personal risk to themselves and the children and young people in their care. The problem of limited training on nutrition was also described by P1 in FG2 as follows: *"We have learned something about nutrition, but the module did not give us sufficient information."* From the participants' responses it was clear that they had limited knowledge of the topic of nutrition guidelines. In their responses, participants relied on their personal opinions about what nutrition guidelines are and how to follow them.

(b) Theme 2: Theme 2: Food production-related issues

According to Moreb, Priyadarshini and Jaiswal 2017: 348 (2017: 348), food handlers should be knowledgeable in food-handling. Participants in the three focus group interviews pointed to various safe food handling issues that arose in the CYCCs. Personal and kitchen hygiene practices, use of Personal Protective Equipment in the kitchen, food preparation practices, and food storage practices were the sub-themes mentioned by the participants as part of the

food-handling problems. The researcher used pseudonyms to maintain the ethical principle of anonymity which was used.

Subtheme 2.1: Insufficient budget

When it comes to achieving good results, planning is crucial. If someone falls behind in planning, the project will be poorly executed. Lack of planning as a result of inadequate financial support in CYCCs was identified as a sub-theme in this section of the study. The DSD funded the majority of CYCCs that participated in this study, but according to participants, the budget was not sufficient to meet all the CYCCs' needs. When it came to planning and implementing major projects, the CYCCs' slowness seemed to discourage CYCWs. Financial constraints can also affect the nutrition of children and young people in CYCCs, as they are served only the available food. Food that contains important nutrients helps children grow and is essential for children's mental and physical development (Australia, DOH 2021: para 1, lines 1-3). This point was emphasized by another participant (P2) who said: "*You can plan a menu, but if you do not have funds, it's not sustainable. We serve what is available."* This statement is found in both FG1 and FG3. A participant (P7) in FG3 supported the views of P2 in FG2 by stating that *"...money is our limitation when it comes to planning and successfully executing the menu."* From the participants' responses, it is clear that lack of funds is a major constraint for CYCWs and the children they serve. The available food that is served does not contain enough essential nutrients such as vitamins, minerals and other nutrients that children need for healthy growth and development. This account is consistent with Malatji and Dube (2017: 122) who, in a study conducted in Johannesburg, identified funding as a limiting element in the work of CYCCs that had a negative impact on children.

- **Sub-theme 2.2: Nutritious recipes in the CYCCs**

The discussion also touched on the importance of having enough money to prepare nutritious food. The majority of the participants acknowledged that lack of finances negatively affected their ability to prepare nutritious food for children and young people. All the participants agreed that finances were the main barrier to developing and preparing nutritious recipes in CYCCs. One participant in Focus Group 2 explained: "*We know how to cook, we can cook, but the challenge or our concern is finances, so we cook what we have."* Agere (2014: 67) agreed with the participant's assessment that there was insufficient funding from the Department of Social Development to cover the expenses of establishing a CYCC.

Participants also pointed out that although they were able to serve nutritious meals, the funds provided to CYCCs do not allow them to do so, so they have to make do with what they have. When the researcher asked for a more detailed explanation of this statement, P5 in FG2 explained, *"To run a CYCC, you need more recipes and plenty of ingredients that you need money to buy. Therefore, we do not have any recipes."* In support of this claim, three participants from FG3 admitted that they did not have recipes. Participant 4 from FG3 echoed the statement: *"We do not follow recipes, we apply our skills.*"

- **Sub-theme 2.3 Food handling and preparation practices**

The majority of participants demonstrated strong knowledge of food handling practices. Food handlers' knowledge and practices can have a direct impact on food safety. Food handling and food hygiene training is crucial for food safety, as improper food handling contributes to foodborne illness outbreaks as noted by Dudeja and Singh (2017: 1). A common comment among the participants was the emphasis on the need to wash vegetables and meat prior to preparation. Participant P3 in FG3 explained: "*Vegetables and meat need to be washed properly before preparation."* The discussion around proper food preparation practices revealed that the accessibility of ingredients and recipes in the CYCCs greatly impacted the potential to prepare healthy meals. During the focus group discussions, it was identified that participants were confident that they would be able to follow a recipe and prepare the food for the children and youth. Whilst one participant (P7) in FG2 complained that "*We do not have enough ingredients to be able to prepare more healthy and appealing food for the children, we prepare what we have",* the researcher noted that the challenge presented by the participants with regard to food preparation practices mainly arose from limited knowledge. From the responses, it was evident that in as much as participants could prepare meals for children, they lacked the proper knowledge and skills to prepare the food. The researcher argues that if the participants were properly educated on how to prepare the food, their level of confidence would have been boosted.

Participants mentioned that when preparing the food, bowls need to be available and be used to separate the food according to its category, for example, vegetables, meat, etc. P9 in FG2 expressed the food preparation strategy that they are applying in the CYCCs as follows: "*When cooking different types of food, a kitchen must-have bowls to use to prepare the food. You need to make sure it's safe and germ-free in the kitchen."* The participants also raised the importance of running water in food preparation by presenting the following narrative: *"The*

kitchen also requires clean running water". Another participant expressed their views on food preparation as follows "*Before cooking, meat should be checked; if it has an odour, it means that it is off and it needs to be thrown away" (P4 FG1)*. Whereas P14 in FG3 mentioned contamination and the importance of separating and covering the food during preparation as follows: *"To avoid contamination, uncooked and cooked food must be separated and covered.*" According to the findings of a study conducted by Kennedy, Nolan, Gibney, O'brien, McMahon, McKenzie, Healy, McDowell, Fanning and Wall (2011: 295), a lack of thoroughly washing contaminated hands, knives, and chopping boards both after and during the process of meal preparation predicts the transfer of bacteria around the kitchen environment and onto prepared meals. Therefore, the researcher finds the responses given by participants proper and in line with acceptable food preparation procedures.

- **Sub-theme 2.4 Food storage practices**

Food storage was another sub-theme that came up frequently in participants' responses. Participants stated that they understood the concept of proper food storage, which can help preserve the quality and nutritional value of food and prevent spoilage. In addition, proper food storage can help prevent illness caused by harmful bacteria. One participant (P6) explained the method used in food storage as follows: "*Food that requires a refrigerator must be stored in the refrigerator and canned food must be stored in a cool, dry place".* The participants showed sufficient knowledge of the subject and were confident in their ability to adhere to food storage practices. P4 in FG1 raised the issue of proper food storage and stock rotation during the conversation by saying, *"Food should be consumed before the expiry date.''* In addition, P11 in the FG3 gave her perspective on other suitable food storage techniques by saying: "*Food that needs to be vacuumed-packed must be stored in an airtight container. For a sugar bag, it is important to empty it into an airtight container once it is opened."* Meanwhile P14 in FG3 described the storage procedure as follows: *"Expiry dates should be checked and cans should be checked for any damage or squashing. Food needs to be constantly checked for quality."* This finding from participants is in agreement with Boyer and McKinney's (2018: 1) findings which showed that the expiry date of meat, fish, poultry, dairy and fresh bakery items should be labelled with a "sell-by date" to indicate how long the food can be displayed. The "use-by date", on the other hand, allows the goods to be used for a reasonable amount of time following the purchase. This demonstrates that participants were knowledgeable and were following proper food storage protocols (Deshmane and Shinde 2021: 4).

(c) Theme 3: Food safety and hygiene

The sub-themes which emerged in this category were personal and kitchen hygiene practices and personal protective equipment.

- **Sub-theme 3.1 Personal and kitchen hygiene practices**

Food handlers play a critical role in lowering the risk of contamination in the food they prepare. A food handler must wash his or her hands thoroughly with soap and running water before handling food. Following any activity that has the potential to contaminate one's hands, the same routine must be performed (FAO, PAHO, and WHO 2017: 39). According to Nizame, Unicomb, Sanghvi, Roy, Nuruzzaman, Ghosh, Winch and Luby (2013: 1179), unhygienic food preparation can induce contamination. Furthermore, food that comes into contact with unwashed hands can contain bacteria that cause diarrhoea. While the participants were engaging in the sub-theme of hygiene subject, personal and kitchen hygiene came up quite frequently. On this sub-theme, participants shared their opinions, saying that on personal hygiene they do advise the children to wash their hands before eating. The viewpoint of P2 in FG1 on the food handling process was presented as follows: "*We even encourage children and youths to wash their hands before collecting and eating food, but sometimes they wash without using handwashing soap".* Additionally, in FG3, P3 described the washing of food before they cook it by saying: *"We are not sure if we are using the proper washing method of washing the vegetables or any type of food before we cook."* However, when questioned about the method of washing hands, it was revealed that it was done with soap and without soap at times. P1 in the same FG1 expressed his views as follows: "*Sometimes it happens that there is no money to buy soap so they only wash with water."* P8 in FG2 mentioned the following point in the discussion: *"Food should be washed during food preparation to ensure it is clean and healthy before cooking".* Methods that were deemed unhealthy during food preparation were presented by P4 in FG1 who explained the following: "T*alking or using a mobile phone during cooking is unhealthy and a bad food-handling procedure."*

Harrison, Jorder, Stern, Stavinsky, Reddy, Hanson, Waechter, Lowe, Gravano and Balter 2014: 121) mentioned that handwashing helps to avoid infectious diseases like the flu and other foodborne illnesses. Handwashing and hygiene have also been demonstrated to be effective techniques for reducing life-threatening infections in children such as diarrhoea (DoH 2018: 1).

Sub-theme: 3.2 Personal Protective Equipment (PPEs)

Kitchen workers sustain one of the highest rates of occupational burn injuries through exposure to the various thermal hazards present in institutional and restaurant kitchens. Fortunately, the chef's jacket and other kitchen uniforms have the potential to act as a protective garment (Zhang, McQueen, Batcheller, Paskaluk and Murtaza 2015: 2140). An FG3 participant shared more about what the food handlers should look like when they are in the kitchen. P1 shared this comment: *"A food handler must make sure that they are wearing a safety uniform in the kitchen, like safety shoes, but we do not have these uniforms."* P9 in FG2 commented: *"You must wear protective clothing such as an apron, safety clothes and shoes as part of the food safety protective equipment."* From the responses of participants, it was evident that there was limited use of PPEs in the kitchens, which may compromise the safety of the CYCWs. The researcher noted that generally, the CYCWs understood the procedures they need to follow when they are in the kitchen; however, due to a lack of resources in the CYCCs, they are forced to overlook these procedures.

(d) Theme 4: Benefits of implementing the child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs

The participants discussed how the guidelines would help them if they were adopted or used in the CYCCs. As the researcher presented the contents of the guidelines to the CYCWs, the theme of the benefit of implementing the guidelines in the CYCC emerged. Several participants stated that adopting the CYCCs' guidelines would provide the CYCWs with ideas on proper food preparation, menu planning, and other nutrition-related subjects which are critical to vulnerable children. Participant 4 in FG1 offered the following narrative about the implementation of the guidelines and the anticipated benefits to the participants: "*The guidelines will provide us with new ideas on food preparation, menu planning, and other nutrition-related topics."* Another participant (P5) in FG2 suggested that nutrition lessons could support the prevention of malnutrition by presenting the following statement: "*A new awareness that can protect and save children from different diseases such as malnutrition will also be supported by the child nutrition, food preparation, food safety, and healthy eating guidelines."* Participant 2 in FG2 supported the anticipated benefit by saying: "T*he guidelines will provide information on proper hygiene."* The majority of the participants agreed with the perception shared by P3 in FG2: *"We will know about the correct food to be included in the diet of children and understand the guidelines".*

6.9.3.2 Post-implementation results

The analysis and interpretation of the post-implementation data are presented in this section of the study, as well as a discussion of the findings. It is structured to a large extent around the main themes and subsequent sub-themes that emerged from the participants' reports of their experiences and perceptions.

(a) Theme 1: The relevance of child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs

Nutrition is an important aspect of health and development. Better nutrition is associated with better child development, a lower risk of noncommunicable diseases (such as diabetes and cardiovascular disease) and longer life. Healthy children learn better. People who eat well are more productive and can create opportunities to break the cycle of poverty and hunger (WHO 2022: para 1, lines 1-3). The issue of the relevance of the guidelines in the CYCCs was a recurring theme in the discussion that took place after the CYCWs were given time (ten months) to use the child nutrition, food preparation, food safety, and healthy eating guidelines. Participant 1 in FG1 described the relevance in terms of understandability and language used as follows: "*The guidelines are easy to use and are understandable. And the language used is simple and understandable".* Similarly, P7 in FG2 supported P4's statement in FG1 by presenting a narrative on the structure and sharing of information embedded in the guidelines as follows: *"I can say the structure was clear and understandable and easy to share with the other people."* Furthermore, P3 in FG1 stated that one of the fundamental reasons that made the guidelines relevant was the choice of language: "T*he guidelines are easy because they are written in English and IsiZulu, so it is easy to understand what is happening there and what we need to do."*

The discussion also revealed the amount of time allocated to use the guidelines as being enough to absorb the information and incorporate the lessons into their day-to-day operations. Participant 4 in FG1 summarised the allocated time as follows: "T*he guidelines have got lots of information that needed time to grasp but we did learn and implement as much as we could."*

The responses of the participants in relation to child nutrition, food preparation, food safety, and healthy eating guidelines revealed that the participants embrace child nutrition, food preparation, food safety, and healthy eating guidelines. This is very significant for them as they are the ones responsible for ensuring that food is safely

stored and prepared for the children.

(b) Theme 2: Importance of child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs

The participants agreed that the CYCCs' emphasis on food safety and healthy eating had a significant positive impact on menu planning, nutritious recipes suitable for children 5 to 18 years of age, nutritional guidelines, food handling practices, food preparation practices, and hygiene practices. To promote good health and sustain life, it is essential to have access to adequate quantities of safe, nourishing food. More than 200 different diseases, from diarrhoea to cancers, can be brought on by contaminated food that contains dangerous bacteria, viruses, parasites, or chemical substances. The present findings seem to be consistent with other research which found that each year, approximately 600 million people, or nearly 1 in 10, around the world get sick from eating contaminated food, which causes 420 000 deaths and the loss of 33 million healthy life years (DALYs) (WHO 2022: para 1, lines 1-2).

- **Subtheme 2.1: Menu planning**

Menu planning is another component of child nutrition, food preparation, food safety, and healthy eating guidelines that have been labelled as being beneficial. Some of the participants mentioned that the food they prepare and serve has improved since it is now balanced, meaning that it includes carbohydrates, protein, vegetables, and salads. Participant 7 in FG2 presented the following comment: "*Menu planning is on the right track because you can see that all of the meals are planned in such a way that they include all of the healthy meals such as starch, protein, vegetables, and salads for the children to be healthy and able to concentrate at school. The meals are nutritionally balanced.*" The participants' perspectives on how a nutritious diet consumed by children throughout their lives helps to prevent malnutrition in all forms, as well as a number of non-communicable diseases (NCDs) and conditions, corroborate those of WHO (WHO 2020: para 1, lines 2-3). Participant 7 in FG2 remarked that the child nutrition, healthy eating, and food preparation guidelines facilitated the menu planning by citing the following statement: "T*he guidelines are useful because they guide you on how to prepare a healthy menu for each day and also for the needs of each child.*" This narrative was supported by P4 in FG1, who stated the following: *"It gave all the information we needed for our menu."* This was viewed as an important step towards food and nutrition education. According to FAO (2016: 20), food and nutrition education should not

only provide information but also empower individuals to take control of their diets and health by understanding children's requirements and the factors that influence their diets. Furthermore, because children are the most vulnerable to malnutrition, providing healthy food is a crucial part of maintaining health and avoiding sickness. An adequate diet is necessary for the development of healthy bodies, and children must be able to learn effectively (Woolworths and the Western Cape Education Department 2015: 20).

- **Subtheme 2.2: Nutritious recipes are suitable for children 5 to 18 years of age**

Some participants cited nutritious recipes as the lesson they had learned from the child nutrition, food preparation, food safety, and healthy eating guidelines. Participants indicated that they had learned that recipes should cover all the micro- and micronutrients and minerals. Participant 4 in FG1 stated: "R*ecipes should have starch, proteins, fruits, and vegetables."* The participants further said that recipes should be organized so that they are easy to use by presenting the following statement: "*It was helpful so much and organized." (*P5 in FG1). Concerning the nutritious recipes for children, all the participants revealed that child nutrition, food preparation, food safety, and healthy eating guidelines are useful. The researcher noticed that the operation guidelines in this respect empowered the participants based on their knowledge of how to prepare healthy and nutritious recipes that are good for children. The findings observed in this study mirror those of previous studies which emphasised that eating a variety of foods is necessary to achieve an appropriate intake of macro-and micronutrients to meet nutritional demands (Wang, Denney, Zheng, Vinyes-Pares, Reidy, Wang and Zhang 2015: 12)

- **Subtheme 2.3: Nutritional guidelines**

Dietary guidelines were implemented in order to encourage healthy eating choices and, as a result, reduce the prevalence of overweight and obesity (Boylan 2014: 301). During the conversations it became clear that the nutrition, food preparation, food safety, and healthy eating guidelines were seen as important because they provided guidelines on healthy eating, food to consume, and portion sizes. As one participant (P3) in FG1 explained: "T*he guidelines guided us on the type of food and portions to serve and when to serve it. It also instructed on how to distribute fruits throughout meals to create an adequate meal."* This point was emphasized by another participant (P2) in the FG1 who said: "*The*

guidelines provide the details on how to prepare a healthy diet like giving the child the right food at the right time, and about vitamins and nutrition". The participants also stated that the guidelines provided information on what the children should be eating and consuming according to their age group. Participant 9 in FG3 felt that: *"It also makes it easy for us to know what and how much should be eaten by the different age groups of children".* In accordance with the findings of this study, previous studies advocated for the provision of a nutritious diet to contribute to the maintenance or improvement of overall health (Khodaee, Moghadam, Khademi and Saeidi 2015: 1184).

- **Subtheme 2.4: Food handling practices**

Some participants cited covering food, washing hands, and keeping food at safe temperatures as important food handling practices. Participants stated that the child nutrition, food preparation, food safety, and healthy eating guidelines were valuable, and according to P8, P1 and P6, it was because they taught them about food safety, hand washing and food storage. Participant 6 in FG1 described the useful lessons in the guidelines as follows: *"The guidelines educated us about the proper handling of food."* It is clear that storing food in unhygienic conditions, cooking large quantities of food and allowing it to stand in an unhygienic environment, storing raw and cooked foods together, and storing food in plastic containers all have a negative impact on food hygiene. Furthermore, if foods are contaminated at any point, from manufacturing to consumption, the food's safety is compromised, and the food becomes potentially detrimental to human health, depending on the temperature, humidity, and pH values of the environment in which it is stored (Uçar, Yilmaz and Cakiroglu 2016: 4).

- **Subtheme 2.5: Food preparation practices**

During the discussion, food preparation emerged as a sub-theme with some of the participants mentioning that the food preparation strategy was a beneficial lesson gained from the guidelines. Participant P10 in FG2 had this to say: "*Chopped-up vegetables or fruit should not just be mixed up with every other ingredient".* From the responses, the researcher noted that there was a general improvement in the participants' food preparation methods. The researcher noted that participants had become accustomed to following safety procedures in food preparation which prevented bacteria transmission. One of the established channels of germ transmission is indeed through the hands. As a

result, the most important step in limiting the transmission of hazardous pathogens and healthcare-associated illnesses should be hand cleanliness (WHO 2009: 270).

- **Subtheme 2.6: Hygiene practices**

The majority of those who responded to this item felt that the guidelines helped them to maintain hygiene practices. Participant 3 in FG2 supported this view by presenting this perspective: *"We must keep the food safely covered all the time"*. P6 in FG1 conveyed their viewpoint on hand hygiene by making the following statement: *"We also learned that we must make sure that our hands are clean first by washing with warm soapy water.* Furthermore, P10 in FG3 expressed the importance of practising personal hygiene as follows: *"You need to wash your hands, cover your hair and use gloves when you have cuts in your hands."* During the discussions with the participants, the researcher noted that there was an improvement in the participants' food handling practices. This points to the effectiveness and relevance of the guidelines that were handed to the participants for use.

- **Subtheme 2.6: Food storage**

All the participants cited that the guidelines improved their knowledge of food storage, as one participant explained: "*We also learned how to store food in the refrigerator and for how long."* Food storage, in general, refers to the various methods by which food can be kept for longer periods of time without spoiling. A food's shelf life is the amount of time it remains safe and fit for human consumption. According to general food storage guidelines, foods should be stored differently, depending on how quickly they will spoil or develop "off" odours and flavours. Foods are divided into three categories: perishable (e.g., milk, meat, raw fish), semi-perishable (e.g., vegetables and grains), and non-perishable (tinned or dried foods) (Boyer and McKinney 2018: 6).

(c) Theme 3: Knowledge gained from the guidelines

The participants discussed a range of highlights from child nutrition, food preparation, food safety, and healthy eating guidelines, which they use on a daily basis. Menu planning, nutritious recipes, nutritional guidelines, safe food handling techniques, and food preparation are some of the sub-themes that were discussed as being part of the lessons learned.

- **Subtheme 3.1: Menu planning**

One of the lessons learned from the child nutrition, food preparation, food safety, and healthy eating guidelines, according to the participants, was the technique of designing a menu. Menu planning, according to the participants, guides food preparation workers on the equipment to be used, the necessity to cook the meal properly, or thoroughly, the ingredients to use, and whether alternative food should be prepared for children with allergies. Some instances of the lessons learned on meal planning were described in the following manner by participant P2 in FG1: "E*ach day we know what to prepare, the ingredients, the food preparation equipment, and the personnel."* P1 in FG2 indicated the following concerning the lessons learned from the child nutrition, food preparation, food safety, and healthy eating guidelines: *"We also learned how to plan a menu considering children with allergies."* Participant 3 in FG1 added: *"You must plan and serve different kinds of food e.g., what you serve on Monday, should be different on Tuesday. You must change it so that they can also enjoy eating."* In support of this claim, Participant 3 in FG2, stated: "*Another example on Tuesday is fish and rice, on Wednesday we are eating beans, on Thursday and Friday we are eating something else. Do not give them the same thing. Also, always put proteins, starch, and also some vitamins."* By using the guidelines, the researcher noted that the participants had significantly improved their menu planning skills.

- **Subtheme 3.2: Nutritious recipes that are suitable for children 5 to 18 years of age.**

Another sub-theme that emerged in the lessons learned by the CYCWs was that of nutritious recipes. According to the participants, they have seen nutritious recipes; however, they stated that some of the ingredients were unaffordable or not accessible due to limited funding. Surprisingly, P2 in FG1 expressed a completely different opinion, saying: *"The recipes are good, they have everything we need, they are affordable and accessible."*

Whilst the participants agreed on the need to prepare nutritious recipes suitable for children, they raised concerns regarding the diverse groups of children at their CYCCs. The problem raised was that certain recipes attached to the child nutrition, food preparation, food safety, and healthy eating guidelines might not be implementable in

their type of CYCC e.g., *phuthu. Phuthu* is described as a crumbly type of pap enjoyed greatly within the Zulu culture. Participant 9 explained the lesson learned as follows: *"Also, we have a diverse group of children so that it is important to include varied healthy recipes for meals such as rice, meat, vegetables, and salads".* Participant P9 in FG2 expressed the lesson learned from the guidelines in this way: *"Now the meals are prepared creatively. For example, pap and beef, or curry and rice, or stews are enhanced by adding some vegetables and salads on the plate".*

- **Subtheme 3.3: Portion control of nutritional foods**

Some participants said they had learned how to portion control nutritious foods. Others believed that children's food should be portioned according to age groups, with younger children receiving smaller portions and older children receiving bigger portions. Participants said they now regulated the portions of food they eat as a result of the lessons they have learned. For instance, P7 in FG1 stated: "*We learned about the amount of food that we are giving to each child because some, they should eat so little, some they eat more. It depends on their age, so we need to be in control of that."*

Literature backs up the importance of portions, which are defined as the amount of food consumed at one time by a person. In a single quantity of food, one or more food guide units can be consumed at the same time (NICUS 2013).

- **Subtheme 3.4: Food handling and preparation**

The child nutrition, food preparation, food safety, and healthy eating guidelines, according to several participants, were informative because they taught them how to properly use kitchen equipment, cutlery, and cutting boards. For instance, P1 in FG1 stated: "*We have learned the proper way of handling the food and using different coloured chopping boards for each food item we are preparing."*

- **Subtheme 3.5: Food preparation practices**

To avoid contamination, participants stated that food should be cooked and stored properly. Participant 4 in FG1 was one of the participants who stated: "*I learned how to cook the food well and methods to use to avoid contact between raw food and cooked food."* Another participant elaborated on storage by stating: "*We need to store dry food in a dry storage area and meat in the freezer, veggies some in the refrigerator or*

dry storage area. Cooked food, how long do you have it in the fridge? Also like when eating food, you must eat it warm, not cold." In addition, the participants stated: "*Food needs to be defrosted before cooking."* (P1 in FG1). Participant 14 in FG2 went on to say: "*When you are about to prepare food you must take the meat out of the freezer and allow it to be defrosted by itself before cooking."*

- **Subtheme 3.6: Hygiene practices**

Participant 2 in FG2 agreed with the importance of learning safe food handling and described how to wash hands before touching the food as follows: *"We learned how to properly wash our hands before and after we handle food."*

Another useful tip for good food handling that was recommended was to wash hands after touching particular parts of the body or using the restroom. P7 in FG1 described the insights in the following way: *"...from the guidelines, we learned that after touching hair, face, or using the toilet one needs to wash their hands".*

6.10 DISCUSSION OF THE KEY EMPIRICAL FINDINGS

Topics will be discussed separately for clarity, and when appropriate, they will be merged. The study's objective was to fulfill the pre-and post-implementation objectives outlined in the first chapter.

Twenty-six percent (26%) of the participants, which represents the most participants, had worked in the CYC field for four years, according to the survey. It was just 5% of the participants in this survey, representing one individual, who had been working in the sector for one year while 1.5% of the participants had worked in the field for two to eleven years. These findings are comparable to those reported by Thesen (2014: 65) and Molepo (2014: 208) who found that the majority of the participants had worked in the field for five to ten years.

6.10.1 The nutrition-related issues faced by the CYCWs in the field

According to the World Health Organization (2021), nutrition is a critical basis of human life, health and development throughout the lifespan (WHO). Foetal development spans from conception to birth, infancy, childhood, adolescence, and old age. Sufficient food and nutrition are required for survival, physical growth, mental development, performance and productivity, health, and well-being. It is a vital foundation for human development. Healthy

eating habits are essential for proper growth and development as well as the prevention of several health problems in children and youths. In a roundabout way, the diet has an impact on academic success (WHO 2021: para 1, lines 1-5).

Nutrition is one of every living being's basic requirements as it provides energy for the body's various tasks (Alamgir, Sami and Salahuddin 2018: 17). The National Institute of Community Development and Management (NICDAM) (2017: 29) declared during the 21st NACCW Biennial Conference that the role of CYCWs is to foster support for positive living, a healthy lifestyle, and proper nutrition. The primary findings from the nutrition-related challenges faced by the CYCCs included poor menu planning, failure to create nutritious recipes and fulfill nutritional recommendations owing to a lack of funding, insufficient nutrition training, and little knowledge of food handling, storage, and preparation. Poor diets are one of the most pressing health and social concerns of the twenty-first century, contributing to disability and death, rising inequality, soaring healthcare costs, and environmental implications (Nabarro 2020: 10).

6.10.1.1 The nutritional knowledge of the CYCWs

The following key findings emerged under the category of nutrition knowledge in the CYCCs: including food groups while planning a menu, preparing nutritious food, offering starches on a plate, and using organic food, which is pricey and not widely available (P4). Grobbelaar and Napier (2014: 6) found that CYCWs in Durban CYCCs had insufficient understanding of good hygiene measures, as they washed dishes and utensils after eating rather than before. These findings matched those of a study conducted in the north-eastern United States, which indicated that only 55% of managers in residential care settings met competency criteria for food safety procedures for cooked and/or prepared meals, while the remaining 45% did not (Pivarnik, Richard, Patnoad and Gable 2012: 296).

6.10.1.2 Menu planning

The results show that some participants were familiar with menu planning principles while others were not. This was reflected in the participants' responses, which claimed that a good menu should include carbohydrates, protein, vegetables and salads. The participants went on to indicate that the meal should have a minimal amount of sugar. The findings back up the FBDGs, which state that an adequate diet should include adequate water, energy, micronutrients and macronutrients to suit the body's nutritional requirements (Steyn 2013:

S13). According to the NFCS (2005), the most widely consumed sources of sugar in the diet were sugar, sweetened squash (sweetened concentrate to which water is added), jam, biscuits, and carbonated sweetened soft beverages, sweets and breakfast cereals. Adolescents tend to consume more sugary foods, particularly sugar-sweetened beverages (SSBs), as they grow older (Temple and Steyn 2013: S100). The literature confirms that additional sugars, particularly those found in sugary drinks, are harmful to children and adolescents' health (Muth, Dietz, Magge, Johnson, Bolling, Armstrong, Haemer, Rausch, Rogers, Abrams and Kim 2019: 7; Vinke, Blijleven, Luitjens and Corpeleijn 2020: 9).

6.10.2 The relevance of the child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs

Almost all of the participants agreed that the guidelines were user-friendly in terms of structure, content and language. Guidelines are being developed on the subject of nutrition for a variety of purposes. For example, Guidelines in Uganda aimed to create capacity and convey knowledge about basic principles such as optimal dietary patterns and the use of current farming methods to improve household nutrition (Ekesa, Nabuuma, Namukose and Upenytho 2018: 6).

6.10.3 The importance of having child nutrition, food preparation, food safety, and healthy eating guidelines in the CYCCs

The child nutrition, food preparation, food safety, and healthy eating guidelines were useful in terms of menu planning, whereby a menu is designed with all dietary groups taken into consideration, such as starch, protein, vegetables, and salads, according to the research findings. The findings are supported by Egan's (2015: 62) explanation, which states that menu planning should encompass adequate, nutritional quality, aesthetics and variety, as well as colour, texture, flavours, and shapes and portion sizes of food. The equipment and personnel needed to prepare and serve the food are also key factors to consider while creating the menu.

Costs, production and other management difficulties should be considered in addition to all of these factors (Egan 2015: 62). Furthermore, it was obvious that the participants found the nutritious recipes valuable because they were able to determine what and how much children and youths of various ages should eat. Children must be carefully fed in order to maintain and encourage good growth and meet their energy requirements. Young children are extremely

active but they only take in a relatively small amount of food at a time. They should consume a variety of high-energy meals, such as whole-grain cereals, dairy fat or soy milk, vegetable oils, fruits (two servings) and vegetables (boiled, baked, steamed, or sautéed) (three servings). A little butter can also help them get the energy they need (Thomas 2019: 1).

The guidelines, according to the study participants, helped teach them about dietary guidelines, food types, and portion sizes to offer to the children. According to Dubey and Soy's findings (2021: 1), children's dietary needs are strongly related to their overall growth. A nutritious diet is also required for school-aged children's optimal growth, including physical, mental, emotional and social development, as well as for the promotion of a healthy environment and the prevention and control of communicable and non-communicable diseases. Children aged two and above should eat a diet rich in fruits and vegetables, whole grains, low-fat and nonfat dairy products, beans, fish and lean meat (American Heart Association, Gidding, Dennison, Birch, Daniels, Gilman, Lichtenstein, Rattay, Steinberger, Stettler, Van Horn 2006: 545).

Furthermore, the focus group participants identified areas of value in safe food handling and preparation methods, particularly in the areas of cutlery handling, correct hand washing, hair covering, and food storage. Because of their underdeveloped immune systems, lower body weight, reduced stomach acid production, and lack of control over meal preparation, young children are at a higher risk of foodborne disease, according to studies. Because of improper food-handling methods, primary food handlers who make meals for young children at home may be classified as putting the children at high risk for foodborne infections. According to Daniels, Mackinnon, Rowe, Bean, Griffin and Mead (2002:38), 74% of food handlers engaged in at least one unsafe food-handling practice. Food handlers were observed during food preparation by Anderson, Shuster, Hansen, Levy and Volk (2004: 188-189), who reported an average of four cross-contamination events between ready-to-eat foods and raw foods, with seafood, raw meat or poultry and eggs being the most common raw foods to cross-contaminate ready-to-eat foods (84%).

6.10.4 The lessons the CYCWs learned from the guidelines

Menu planning, nutritious recipes for children and youth aged 5 to 18, following nutritional recommendations, food handling, and food preparation are among the lessons learned from the child nutrition, food preparation, food safety, and healthy eating guidelines. Menu

planning and nutritional recipes were covered, as well as collecting the ingredients, food preparation equipment, and personnel needed to produce the meals.

Menus determine what foods are purchased, how meals are prepared, personnel qualifications for food preparation, and food preparation equipment, according to the National Food Service Management Institute (nd: 40). Meal planning, according to Ducrot, Méjean, Aroumougame, Ibanez, Allès, Kesse-Guyot, Hercberg and Péneau (2017: 5), is linked to improved adherence to nutritional standards and greater food diversity. As a result, meal planning was found to be associated with a lower chance of being overweight or obese.

Meal planners were found to be more likely than non-meal planners to follow dietary standards. Meanwhile, participants in the research on dietary guidelines said they learned how to serve children and youth the appropriate amount of food for their age. Children, according to NICUS (Nd: 1), require a wide variety of diets that provide roughly 1300kcal and at least 16g of protein per day. With their relatively high energy needs, it is not required to limit fat and cholesterol in this age group, though grilled and baked foods are always preferred over fried and fatty foods.

The most significant lesson that participants learned, according to the study's findings, was how to handle cutlery and use various coloured cutting boards, as well as how to wash and store them. According to the findings of Ramful and Jallow (2017: 22-23), it is critical to use utensils correctly to avoid spreading disease. Utensils should also be thoroughly cleaned, sterilized, stored and handled with caution. Hand washing before and after touching the food was also mentioned as an important lesson gained by the participants. Handwashing is one of the most important methods of preventing foodborne illness according to the World Health Organization (WHO 2005: 12-13). Uçar, Yilmaz and Cakiroglu 2016 (2016: 14) defined the following measures for optimal hygienic handwashing: hands and wrists should be washed with soap, which should be rubbed between the fingers under running water. Clean your nails with a nail brush, then use soap and water to wash your arms and wrists, and rub your hands together for 10 to 15 seconds. After turning off the water, dry your hands with hot air or a paper towel (Uçar *et al.* 2016: 14).

According to some participants, cooking and proper food storage to reduce contamination are among the skills gained regarding food preparation. According to the Minnesota Department

of Health (2007: 57), cross-contamination is defined as the physical movement or transfer of hazardous microorganisms from one person, object or location to another. Cross-contamination must be avoided to prevent foodborne illness (Kennedy, Nolan, Gibney, O'brien, McMahon, McKenzie, Healy, McDowell, Fanning and Wall 2011: 281).

6.11 CONCLUSION

To complete this component of the study, the objectives were given direction and driven by using the qualitative technique (focus group discussion). The CYCWs' participation in the validation of the child nutrition, food preparation, food safety, and healthy eating guidelines improved their knowledge of menu planning, creating nutritious recipes, and food handling. This phase's findings demonstrated that the guidelines were successfully implemented and that they were indeed necessary for the CYCCs. A general discussion of the findings, as well as the conclusions and recommendations, will be presented in the following chapter. These will, hopefully, point the way forward in terms of addressing some of the problems highlighted in this chapter

CHAPTER 7 - CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

This final chapter intends to bring together the discussion of the three previous chapters (chapters four, five and six) that presented multifaceted conclusions and drew on the procedures used to build and evaluate child nutrition, food preparation, food safety, and healthy eating guidelines for validity and reliability. The chapter begins with a summary of the study's principal findings, which are provided following the study's objectives. It then discusses the study's shortcomings, draws on findings, and concludes with a summary of the recommendations. This study was motivated by the lack of guidelines for CYCWs in CYCCs on menu planning, nutritional recipes for children aged 5 to 18, nutrition requirements for children, and safe food handling practices and preparation.

7.2 SUMMARY OF THE MAIN FINDINGS OF THE STUDY

The NEP, which took the form of child nutrition, food preparation, food safety, and healthy eating guidelines, had to be carefully constructed to intervene in the targeted sample of CYCWs drawn from CYCCs to transform perceptions, attitudes and practices, as well as teach skills that would eventually lead to lifestyle changes. To ensure that the targeted objectives were attained, discussion, monitoring and timely implementation of the guidelines were required. As a result, the study's findings are presented following these four objectives.

To determine the need for the guidelines on child nutrition, food preparation, food safety, and healthy eating in CYCCs, a demographic questionnaire, food safety questionnaire, swabs analysis, management questionnaire, observational checklist, weighed food record, and a nutritional knowledge questionnaire were used to assess the demographic characteristics of the CYCWs Quantitative data were gathered to determine whether the CYCCs required guidelines. Children's and youth caregivers' knowledge and education levels may have had an impact on their eating habits and overall well-being. Despite a large number of children and youths living in CYCCs in South Africa, this study discovered several issues, including poor food handling procedures, a low education level, a lack of knowledge about food safety, menu planning, food preparation, food handling, and personal hygiene practices, all of which could be attributed to a lack of training. According to the findings, 33.3% of CYCWs who participated in the study have been working in the industry for many years and have no

relevant tertiary qualifications. To care for, prepare, and serve food for the children and youths, the majority of them relied on their basic training and expertise gained while working in the field. The DSD selected the CYCCs to receive funding. The money used to feed about 119 children and youths was around R3 200 per day for three meals (breakfast, lunch and dinner). The findings revealed that the budget was insufficient to cover all of the CYCCs' expenses in order to address this problem. Low-cost recipes were included in the guidelines in anticipation that they would be adopted and used when cooking dinner, allowing the children to have a balanced, healthy diet. The respondents had a copy of a menu draft but did not apply it to their day-to-day operations, indicating poor menu planning.

The findings revealed a lack of knowledge about important aspects of healthy eating. According to the study, another area where respondents lacked information was the importance of starch in the diet, which was perceived as an ingredient that was not essential and need not be served regularly. Furthermore, the question about milk obtained a very poor score when it came to how much milk should be consumed each day as a source of protein in the diet (11.0%). The findings found that, contrary to the FBDGs' recommendations, children's and youth's food lacked diversity. It was noted, for example, that *uPhutu*, beef and potatoes were frequently served on the same plate, indicating that the meal lacked variety (with the exclusion of vegetables and salad), which would feed the body with micronutrients. The researcher used these findings to determine what information should be included in the guidelines.

The development of expert-validated child nutrition, food preparation, food safety, and healthy eating guidelines, as well as the transfer of necessary knowledge and skills through appropriate communication channels, were regarded as critical to improving the well-being of the CYCCs' children and youths. Child nutrition, food preparation, food safety, and healthy eating guidelines, which were regarded as the most appropriate medium for interacting with CYCWs, were used to cover the study's perceived gaps.

The four-section guidelines included nutrition and FBDGs, menu planning and recipes, food safety and hygiene procedures, and food preparation. A 58-page section on child nutrition, food preparation, food safety, and healthy eating guidelines with drawings, images and text presented the comprehensive instructions. Following that, the guidelines' 10-month guided implementation phase in the two CYCCs was completed to learn about current practices and

behaviour change over time. These CYCCs are currently receiving no nutrition education from relevant or approved sources. The outcomes of this study are in line with previous research that has shown that CYCWs' nutrition knowledge is inadequate. The implementation of the guidelines will enhance the nutritional knowledge of the CYCWs. This leads to the conclusion that the guidelines will be most useful to this group. The user-friendliness of the guidelines in terms of structure, content and language has demonstrated that they are easy to read and understand.

7.3 CONCLUSION

The study discovered that there were no available child nutrition, food preparation, food safety, and healthy eating guidelines for CYCWs in the CYC sector on menu planning, nutritional recipes for children aged 5 to 18, nutrition guidelines for children, and safe food handling practices and food preparation. Poor cleanliness and food handling procedures among the CYCWs could also be attributed to a lack of skills in the form of training or guiding materials before the development of the established child nutrition, food preparation, food safety, and healthy eating guidelines. Participants were also found to have inadequate knowledge on menu planning and a lack of ability to produce nutritious foods and did not follow nutritional guidelines, all of which was ascribed to a lack of funds. However, the study had a significant and positive impact on the study's post-implementation phase, where the guidelines improved menu planning abilities, nutritional guidelines awareness, food-handling skills, and selection of portion sizes. As a result, proper application of the guidelines as established in this study can successfully lower the rate of malnutrition and foodborne infections caused by inadequate food handling and preparation. Despite the positive impact of the guidelines developed in this study, menu planning, preparation of healthy recipes suitable for children aged 5 to 18, nutrition guidelines for children, safe food handling and food preparation techniques for CYCWs are unlikely to be resolved by the document alone. As a result, more research is needed to investigate the many hypotheses surrounding the execution of NEP lessons incorporated into the child nutrition, food preparation, food safety, and healthy eating guidelines.

7.4 RECOMMENDATIONS

This study's recommendations are categorized into three parts: policy recommendations, practical recommendations (for the CYCCs), and future research.

7.4.1 Recommendations for policy

One of the study's findings was that the food receiving, storage, serving, hygiene, administration, and menu planning at the CYCCs were not governed by any defined policy or guidelines. As a result of this finding, the following recommendations are made:

- The study proposes that the DSD endorses the child nutrition, food preparation, food safety, and healthy eating guidelines and disseminates them to all CYCCs that are registered with them.
- Because the findings consistently demonstrated low nutrition knowledge among the CYCWs, nutrition-related subjects should be integrated into the DSD planning and programme development process. This is also significant because the majority of the study's participants lacked professional qualifications.
- Collaboration between government departments, such as the DSD and the DOH and CYCCs should be encouraged in order to help educate CYCWs about the importance of good nutrition in children and youths.
- A partnership between the DSD and the DAFF is needed to assist in training the CYCWs to start food security programmes such as gardening in the CYCCs so as to have fresh vegetables to supplement the menu.

7.4.2 Recommendations for practice - CYCCs

According to the findings, none of the CYCWs working in the CYCCs had received food safety training, menu planning, food preparation, food contamination, or personal hygiene training. Based on this finding, the following recommendations are made:

- Child and youth care workers (CYCWs) should be encouraged to incorporate child nutrition, food preparation, food safety, and healthy eating guidelines lessons into their daily food preparation.
- Nutrition-related subjects should be integrated into the strategic planning and programme development process from the top down, as the study's findings consistently demonstrated a lack of nutrition knowledge among CYCWs. This is

also significant because the majority of the study's participants lacked professional qualifications.

- Menus must be provided and drafted with the help of registered nutritionists or dietitians to ensure optimal nutrient consumption in both age groups (children and youths).
- Vegetable gardens are an excellent way to teach children how to cultivate their own vegetables, and they may also be used to supplement the daily menu if grown on a large enough scale.

7.4.3 Recommendation for further research

The participants felt that the child nutrition, food preparation, food safety, and healthy eating guidelines helped teach them about nutritional requirements, food types, and serving portions for children and youths. As a result, the following recommendations are made:

- The study's focus was to develop guidelines that could be integrated into the CYCWs' daily work activities; therefore, a study must be conducted to assess whether they are properly using the child nutrition, food preparation, food safety, and healthy eating guidelines;
- Further investigation of the guidelines' impact on the CYCWs is strongly recommended.

7.5 LIMITATIONS OF THE STUDY

While the researcher of this study was able to account for many variables, there are always some inevitable limitations:

- Some of these limitations included the relatively small sample size, the use of a convenience sample, and the lack of diversity in demographic qualities.
- Due to the Coronavirus disease (COVID-19) outbreak and subsequent lockdowns, there was no face-to-face interaction with participants during the implementation phase. The matter was remedied by requesting an Ethics variation and, eventually, by using the digital tool, Zoom.
- Another constraint was the small sample size of the pilot group (n=9), which influenced the development of the child nutrition, food preparation, food safety, and healthy eating guidelines, as well as the implementation group (n=18). Although some of the conclusions are not generalizable, they may be applicable in a comparable

situation. As a result, expanding the study to include a larger, more diverse sample, particularly in terms of ethnicity, geography, and socioeconomic position, is one approach that is recommended. The interpretive counterpart of generalizability, according to Anney (2014: 277), is transferability, which is defined as the degree to which qualitative research findings can be applied to other contexts with different respondents. Furthermore, the nutritional status of children and youth living in CYCCs is unknown because the study only looked at the CYCWs and not the children. As a result, the development of the guidelines had to be guided by data only gathered from CYCWs.

- Although the CYCWs worked shifts, some of them were not always available on particular days because they were off duty. As a result, the pilot study had a small sample size (n=9). While this might appear to be a flaw at first glance, considering the qualitative part of the study, it had no bearing on the credibility of the findings. By definition, qualitative research focuses on the depth of the discussions rather than the volume.
- Measuring overall food safety and hygiene practices solely through informal observation of food preparation and serving was inadequate. On this premise, it was suggested that structured interviews be blended with informal observation in the future to produce more detailed data.
- The number of samples taken for swabs analysis was influenced by distance and time, as only samples collected on a single day were used.
- There is a scarcity of research on CYCWs in CYCCs that focus on menu planning, nutritious recipes suitable for children aged 5 to 18, nutrition guidelines for children, and safe food handling methods and preparation.
- During the pre-implementation phase, the country was on Covid-19 alert level 3 from June to July 2021, and there were certain restrictions on the number of individuals who could gather in one place, thus only 18 of the 28 registered CYCWs were able to participate in the online focus group discussion.
- The post-implementation phase was also carried out under adjusted alert level 1 in April 2021; however, there was a reorganization of the duty roster at CYCCs and staff interaction was restricted during working hours. The restrictions were put in place to keep Covid-19 from spreading. As a result, only 14 out of a total of 28 staff members were able to participate in the study.

7.6 CONCLUDING REMARKS

Consultation with all parties facilitated the development and implementation of the child nutrition, food preparation, food safety, and healthy eating guidelines (CYCMs, CYCWs, and specialists in the field). The positive findings of the post-implementation phase provide some assurance that the child nutrition, food preparation, food safety, and healthy eating guidelines are suitable for use in CYCCs. This indicates that other CYCCs in South Africa will be able to use the guidelines and incorporate them into their daily food preparation procedures. The study also discovered that, given the group of individuals they are responsible for, CYCWs must be regularly taught about and influenced by nutrition and related knowledge.

This study prepared the path for the CYCWs in the CYCCs to learn about menu planning, nutritious recipes for children aged 5 to 18, nutrition guidelines for children, and safe food handling practices and preparation. Every CYCW should be given the guidelines when they first start working in the field so that they can adequately support the children and youths in the CYCCs.

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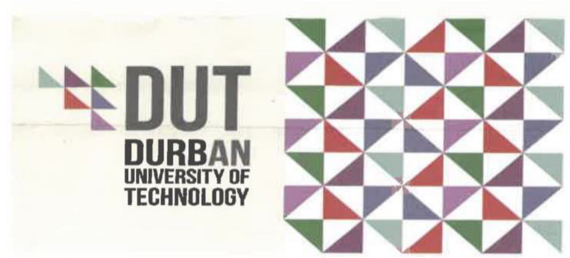
ANNEXURES

Annexure A



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12 August 2015

IREC Reference Number: **REC 78/15**

Ms M E Chibe
P O Box 1145
Thulamahashe
1365

Dear Ms Chibe

Development of a food service operation manual and nutrition guidelines for child and youth care workers in residential care facilities for children in KwaZulu Natal

I am pleased to inform you that Full Approval has been granted to your proposal REC 78/15.

The Proposal has been allocated the following Ethical Clearance number **IREC 076/15**. Please use this number in all communication with this office.

Approval has been granted for a period of two years, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2015 -08- 12
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8 June 2020

Ms M E Chibe
P O Box 1145
Thulamashashe
1365

Dear Ms Chibe

Application for Amendment of Approved Research Proposal

Development of a food service operation manual and nutrition guidelines for child and youth care workers in residential care facilities for children in KwaZulu Natal

I am pleased to inform you that your application to change from face-to-face focus group interviews to online face-to-face focus groups using Skype or Zoom has been approved.

Yours Sincerely

____

Professor J K Adam
Chairperson: IREC

Annexure A2

I ………………………………….. participating as a ………………………………. in the study fully understand that this study is dealing with human beings personal information. Therefore I pledge not to discuss the information of participants with any other person. I will keep the information confidentially in order to ensure that participants' rights are protected.

______________________	__________	_____________________
Full Name of Participant	**Date**	**Signature**
___________________	__________	_____________________
Full Name of Researcher	**Date**	**Signature**

Annexure B

The Head of Department

Department of Social Development

Private Bag x9144

Pietermaritzburg

3200

Attention: Mr LFN Nkosi

Subject: Request to Conduct Research on the development of a nutrition and food service operation manual for child and youth care workers in residential care facilities (Children homes).

Background

Thank you for dedicating your time to read through this document. My name is Mumsy Chibe, Doctorate in Consumer Sciences: Food and Nutrition at Durban University of Technology (DUT) student. I am interested to gather information which will guide on the development of a nutrition and food service operation manual for child and youth care workers in residential care facilities. I would like to request permission to conduct the study in Residential Care Facilities (Children homes). The aim of this study is to develop a nutrition and food service operation manual for child and youth care workers in residential care facilities.

Various studies have been conducted on nutrition and food handling procedures but yet cases are reported everyday all over the world of people getting sick from the food they eat. Study by Vivas, et al 2010, indicates that inadequate sanitary conditions and poor hygiene practices play a major role in increasing the burdens of communicable disease in developing countries. Statistics indicates that fifteen percent (1.02 billion) of the global population is undernourished and majority is living in developing countries. Ten percent of children under age five years suffer from diseases such as acute malnutrition caused by poverty, social-economic exclusions, unhealthy environments and limited access to essential services (UNICEF, 2006:1-2).

Summary on the benefits of research to the Department

This research will benefit both the Residential Care Facilities and Social development with the following;

- Improving the wellbeing of the children residing in homes by encouraging healthy eating habits. Studies show that active children are more likely to develop good behaviors as adolescents (attend school, get better grades, take part in after-school activities, etc.)
- Care workers will know and understand the benefit of nutritious food, safe food handling and preparation practices
- Department of Social Development will have a guiding manual on nutrition and food service operation manual for child and youth care workers in residential care facilities (Children homes), which they can be able to use nationally. The manual will assist the child care workers on their day to day food handling and preparation procedures.

For more information on the research project, see the Attached: Annexure A

Your urgent response in this matter will be highly appreciated

Yours Faithfully

Student: Mumsy E Chibe

Supervisor: Prof C Napier

Summary of the proposal

The study aim is to develop a nutrition and food service operation manual for child and youth care workers in residential care facilities. According to the World Health Organisation (WHO), everyday all over the world people get sick from the food they eat (WHO 2006:7). Inadequate sanitary conditions and poor hygiene practices play a major role in increasing the burdens of communicable disease in developing countries (Vivas, Gelaye, Aboset, Kumie, Berhane and Williams, 2010:73-79). Malnutrition is one of the major public health problems in the developing countries. Statistics indicates that 15 percent (1.02 billion) of the global population is undernourished and the majority are living in developing countries. The number of cases has changed only slightly over the last decade in developing countries (Müller & Krawinkel, 2005:6: WHF, 2009:2). Ten percent of children under the age five years suffer from diseases such as acute malnutrition caused mainly by poverty, social-economic exclusions, unhealthy environments and limited access to essential services (UNICEF, 2006:1-2).

The study is a multi-phase approach. The study is an observational, descriptive study that will develop a nutrition and food service operation manual for child and youth care workers in residential care facilities. Sampling technique applied in this study will be purposive. A total number of six (6) residential care facilities which operates under the Child Welfare Organisation Management will participate in this study. Only residential care facilities which are officially registered with the Department of Social Development as Children homes in terms of Child Care Act of 1983 will be included as part of this study.

The study population for the pilot will include three (3) of the six (6) purposively selected children's homes and all the CCWs who are permanently employed or on a long term contract that consent to participate.

Phase 1: During phase one permission will be obtained to conduct the study in the Children's homes, CCWs and managers will be approached to gain participation in the

study, A pilot study will be conducted to determine the need for a Food and Nutrition practice manual in Children's home by interviewing the CCWs and managers and observing food practices in the selected facilities.

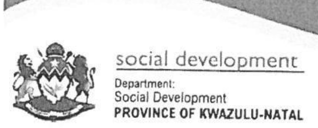
Phase 2: Developmental phase: To develop the nutrition and food service operation manual for CCWs in residential care facilities, to test the information in the manual for content validity by presenting it to two (2) experts in the field and thereafter corrections made after which it will be presented to ten (10) CCWs to determine understanding. Once the manual has developed and tested for validity and reliability in will be finalised and bound.

Phase 3: Intervention phase, before implementing the manual the knowledge of the CCWs and managers will be tested and food preparation practices observed. The manual will be implemented in child residential care facilities in order to determine the effectiveness of the manual for a period of six (6) month.

Phase 4: Post intervention phase (procedure which was applied in phase 3 will be followed).

Pre and post assessment results will be compared to see if change and increase of knowledge has taken place. Final results of the research will be presented to the department of Social Development and participating Child Care Facilities.

The study will be approved by the research Ethics Committee of the Durban University of Technology before commencement.



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OFFICE OF THE ACTING SENIOR MANAGER
Private Bag X13
ULUNDI
3838

Submission

To: Acting Head of Department.
Mrs NGM Mbanjwa

From: General Manager: Ulundi Cluster
Mr LFN Nkosi

Subject: Request to Conduct Research on the development of nutrition and food service operation manual for child and youth care workers in Child and Youth Care Centers (Children's Homes) for Mumsy Chibe, Doctorate in Consumer Science)

1. Purpose

The purpose of the submission is to request the approval from Acting Head of Department for Ms M.E. Chibe to conduct research on the development of nutrition and food service operation manual for child and youth care workers in residential facilities for children.

2. Background Information

The Department of Social Development, Ulundi Cluster received a letter from a student who is currently registered with Durban University of Technology for Doctorate in Consumer Science requesting to conduct a research study on the development of nutrition and food service operation manual for child and youth care workers in residential facilities for children .

3. Motivation

The research is purely an academic requirement for Doctorate Degree in Consumer Sciences. The research study will contribute to the development of the body of knowledge on the management of food within the residential facilities as it seeks to achieve the following objectives:

- Improving the well-being of children at residential facilities;
- Contribute to the knowledge and understanding of Care workers of the benefit of nutritious food, safe food handling and preparation practices;

1

- Development of guiding manual on nutrition and food service operation manual for child and youth care workers in residential care facilities.
- The manual will assist the child care workers on their day to day food handling and preparation procedures.

4. Recommendation

It is therefore recommended that the Acting Head of Department grant approval to Ms Mumsy Chibe to conduct research study on the development of nutrition and food service operation manual for child and youth care workers in Child and Youth Care Centres in

01/07/2014

General Manager: Ulundi Cluster
Mr LFN Nkosi

Date

Supported /Not Supported

Remarks No cost to DSD. Proposed contribution to strategic impact of DSD

9/7/2014

General Manager –Social Welfare Services
Mrs E T Mhlongo

Date

Supported /Not Supported

Remarks On condition Dept is acknowledged in the research report + copy be furnished to Dept

23/7/2014

Acting Deputy Director General
Ms NG Khanyile

Date

Approved/not approved
Remarks Comply with DDG's comments

28/07/14

Acting Head of Department
Mrs NGM Mbanjwa

Date

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Annexure C

DATABASE FOR CHILDREN'S HOMES IN ULUNDI CLUSTER

CONTACT NUMBER	NAME OF THE CHILDREN'S HOME	TOWN	CONTACT PERSON	NUMBER OF CAREGIVERS
035 798 2193	IKHAYALETHU CHILDREN'S HOME	Richards Bay	Thulani, Social Worker	Unknown
035 4766 262 072 7572 246	ST JOSEPH CHILDREN'S HOME	Eshowe	Assumppa Radebe	12
035 835 0000 082 8099 475	KONINGSDAL CHILDREN'S HOME	Ulundi	Mr Brown	22
035 574 1075 073 6432 913	MSELENI CHILDREN'S HOME	Umhlaba uya Lingana	Rachel	Unknown
034 980 8270 079 8848 533	INKULULEKO CHILDREN'S HOME	Vryheid	Moria	9
035 791 1116	IKHAYALIKABABA CHILDREN'S HOME	Felixton	Loresa	Unknown
035 792 5569 072 2916 908	MSAWENKOSI CHILDREN'S HOME		Elaine	Unknown
035 831 3300 082 610 6511	UMBONAMUHLE CHILDREN'S HOME	Nongoma	Ms Mthembu	3

Annexure D

LETTER OF INFORMATION FOR CENTRE MANAGERS

Thank you for taking the time to listen to me giving you more information regarding my study, we require all permanently and contract employed Child and Youth Care Workers to participate in the study.

Title of the Research Study:
The development of a food service operation manual and nutrition guidelines for child and youth care workers working in residential care facilities for children

Principal Investigator/s/researcher: Mumsy Evidence Chibe; MTech Food Service Management

Co-Investigator/s/supervisor/s: Professor Carin Napier; DTech Food Service Management

Brief Introduction and Purpose of the Study: The aim of this intervention study is to establish the need, develop, implement and assess an operational manual on menu planning, nutrition guidelines for children, safe food handling and preparation for Child and Youth Care workers (CYCWs) in residential care facilities. All over the world people get sick everyday from the food they eat. Inadequate sanitary conditions and poor hygiene practices play a major role in increasing the burden of communicable disease in developing countries. About 15% (1.02 billion) of the global population is undernourished and the majorities are living in developing countries. Ten percent of children under the age of five years suffer from acute malnutrition caused by poverty, social-economic exclusions, unhealthy environments and limited access to essential services.

Outline of the Procedures:
This study is a multi-phase approach, Pilot, intervention and control group. The study is an observational, descriptive intervention that will develop a nutrition and food service operation manual for child and youth care workers in residential care facilities. Research will take place in the participating Child and Youth Care Centres. Participants of the study will be centre managers and child care workers. Participants will take part in a one on one interview by completing structured questionnaire. One (1) day meeting will be arranged to complete the questionnaires which will take at least 30 minutes, observation will be conducted for four consecutive days a month for duration of six

(6) month. If there are gaps which need to be filled, communication will be sent through email or telephone. Participants will be requested to sit for about 30 minutes and answer questions which will be asked using structured questionnaire.

Benefits: Relevance and outcomes

- The project will provide information about menu planning, safe food handling and preparation by CYCWs in residential care facilities. The results would inform the Department of Social Development and residential care facilities managers on areas of improvement in healthy practices.
- This study will result in completion of Doctorate: Consumer Science: Food and Nutrition. The research will possibly be published in accredited journal and conference presentations.
- The results could be used to develop material to train CYCWs in food preparation, food hygiene and food safety practices.
- The results of the study could be used by the Department of Health to improve the nutritional status of children residing in residential care facilities. It can also result in the improvement resources used to prepare the food.

Reason/s why the Participant May Be Withdrawn from the Study: Participation in this study is voluntary.

Remuneration: You will not be remunerated for participating in the study.

Costs of the Study: You will incur no cost while participating in the study.

Confidentiality: No names will be used in the presentation of the results, each participant will be given a participant number and only the researcher. Electronic data will be password protected. Information will be stored for 5years in the DUT Department of Food and Nutrition, and then shredded. Only the researcher and supervisor will have access to the data.

No research-related Injury or discomfort will be forthcoming from this study.

Persons to Contact in the Event of Any Problems or Queries:

Supervisor: Professor Carin Napier; 031 373 2326
Researcher: Mumsy Chibe; 073 162 1612

Institutional Research Ethics administrator on 0313732900. Complaints can be reported to the DVC:TIP, Prof S. Moyo on 0313732382 or moyos@dut.ac.za.

Annexure D1

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher,___________________(name of researcher), about the nature, conduct, benefits and risks of this study-Research Ethics Clearance Number:_____________________,
- I have also received, read and understood the above written information (Participant Letter Of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed in to a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant Date Time Signature/Right Thumbprint

I,________________(name of researcher) here with confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher Date Signature

Full Name of Witness (If applicable) Date Signature

Full Name of Legal Guardian (If applicable) Date Signature

Annexure E

Manager's questionnaire

MANAGER'S QUESTIONNAIRE

DEMOGRAPHICS & CHILD AND YOUTH CARE CENTRE RUNNING

CENTRE#	

Information to be obtained from the site manager at the Centre

Please insert the interviewee's answer to the following questions by placing a cross (X) in the right hand box or filling in the relevant information e.g. number. Y =Yes and N =No.

GENERAL/MANAGEMENT:

1. Is the centre location classified as urban or rural?

Urban	1	
Informal	2	

2. How many children and youth live in the centre

Number	

Number	

3. Indicate the age (years) of the youngest AND oldest child staying at the centre?

<5	5	6	7	8	9	10	11	12	13	14	>14

6. Where does the centre water come from? (Answer all options).

6.1	Kitchen tap (i.e. running water)	Y	N
6.2	Outside tap (i.e. running water)	Y	N
6.3	Water tanker (mobile)	Y	N
6.4	Communal water supply (collected)	Y	N
6.5	River (collected)	Y	N

7. What power supply is used to prepare the food? (Answer all options).

7.1	Electricity	Y	N
7.2	Gas	Y	N
7.3	Fire	Y	N

8. Does the centre have a working telephone?

Yes	Y	
No	N	

9. Does the centre have a computer for administrative purposes?

Yes	Y	
No	N	

10. Does the centre have a governing body?

Yes	Y	
No	N	

10.1. If yes, are they involved in the feeding of the children and youth at this centre?

Yes	Y	
No	N	

11. How many permanent people *I* staff work to *prepare* food for the children and youth at the centre?

Full time staff	
Part time staff	
Volunteers	

12. If you have volunteers,

12.1. How many

Number	

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12.2. How frequently?

12.3.1	P	Days/ week				
12.3.2	C	1	2	3	4	5
12.3.3	C					

Number		Number
Part time staff		
Volunteers		
Full time staff		
rt time staff		
Volunteers		

12.3. Who are the volunteers? (Answer all options)

13. Are community members involved in any way in the delivery of the food at the Centre?

Yes	Y	
No	N	

13.1. If community members are involved in the food preparation in what capacity are they involved? (Answer all options).

13.1.1	Suppliers	У	N
13.1.2	Delivery of food items	У	N
13.1.3	Food preparation	У	N
13.1.4	Planning	У	N
13.1.5	Vegetable growers	У	N
13.1.6	Other (please specify)	У	N

13.2. Do they receive compensation / payment for their involvement?

Yes	Y	
No	N	

14. What percentage of children eats the food on a regular basis? (Select one).

<20%	1
20-39%	2
40-59%	3
60-79%	4
80-99%	5
All	6

15. In your opinion, has the implementation of the centre made any difference to: (Answer all options)?

15.1. School attendance

Increased	y	N
No change	y	N
Decreased	y	N

15.2. Performance of the children and youth at school.

Improved	y	N
No change	y	N
Declined	y	N

15.3. Community involvement at the centre

Increased	y	N
No change	y	N
Decreased	y	N

15.4. Have you noticed any other benefits?

Yes	Y	
No	N	

15.4.1. Give details:

16. How many meals are served in a day?

Number	I

17. What is your estimated budget for food per day? ______________________________

18. Is this broken down into a weekly *I* monthly or term budget?_(Select one)

Weekly	1	
Monthly	2	
Term	3	
Annual	4	
Other (please specify)	5	

19. Who devises the budget? (Answer all options).

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22.1	Social Development	Y	N
22.2	Manager	Y	N
22.3	Caregivers	Y	N
22.4	Food Handers	Y	N
22.5	Other (please specify)	Y	N

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20. Does the budget change? ____________________________

21. Is your budget enough to cover the year?

Yes	Y	
No	N	

22. Have you ever overspent on the budget?

Yes	Y	
No	N	

23. Have you ever had to stop providing food because there was no money available towards the end of the year?

Yes	Y	
No	N	

24. Do you anticipate this problem in 2016?

Yes	Y	
No	N	

25. Do you have a business plan *I* service level agreement for the food supply at your centre?

Yes	Y	
No	N	

26. How often do you monitor your staff regarding their food preparation?

Daily	1	
Weekly	2	
Monthly	3	
Once a term	4	
Seldom	5	
Never	6	

27. Do you delegate any of the monitoring duties to any other staff members?

Yes	Y	
No	N	

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27.1. If yes, to whom? (Answer all options).

28.1.1	Founders of the centre	У	N
28.1.2	Mangers	У	N
28.1.3	Food handers	У	N
28.1.4	Care givers	У	N
28.1.5	Community Volunteers	У	N
28.1.6	Youth	У	N
28.1.8	Other (please specify)	У	N

28. Are there written policies and procedures regarding each of the following? (Answer all options).

29.1	Receiving	У	N
29.2	Storage	У	N
29.3	Serving	У	N
29.4	Hygiene	У	N
29.5	Administration	У	N
29.6	Other (please specify)	У	N

29. What menu is used? (Answer all options).

30.1	Department of Social Development	У	N
30.2	Own	У	N
30.3	None	У	N

30. Why is this menu used? (Select one).

Economical foods	1
Locally acceptable foods	2
Locally available foods	3
Favourite foods	4
Other (please specify)	5

31. How do you overcome general problems

32.1	Contact supplier	У	N
32.2	Contact Department of Social Development	У	N
32.3	Make a plan	У	N
32.4	Ask for local businesses help	У	N
32.5	Ask parents for help	У	N
32.6	Ask community for help	У	N
32.7	Other (please specify)	У	N

32. Are there sufficient staff members available to run the food service at the centre?

Yes	Y	
No	N	

33. If more staff is needed, what do you need?

35.1	Receiving	Y	N
35.2	Food Preparation	Y	N
35.3	Serving	Y	N
35.4	Administration	Y	N
35.5	Other (please specify)	Y	N

34. Is there sufficient administrative support for the food service?

Yes	Y	
No	N	

PURCHASING:

35. Where do the supplies come from? (Select one).

Commercial supplier	1
Local community member	2
Both 1 & 2	3
Other (please specify)	4

36. Has a special effort been made to purchase supplies from local businesses (within this community)?

Yes	Y	
No	N	

36.1. If yes, which of the following do you purchase from local businesses? (Answer all options).

38.1.1	Bread	Y	N
38.1.2	Rice	Y	N
38.1.3	Mealie meal	Y	N
38.1.4	Dried beans	Y	N
38.1.5	Sugar	Y	N
38.1.6	Vegetables	Y	N
38.1.7	Peanut butter	Y	N
38.1.8	Oil	Y	N
38.1.9	Soya powder/mince	Y	N
38.1.10	Milk/milk powder	Y	N
38.1.11	Other (please specify)	Y	N

37. Are there contracts with the suppliers?

Yes	Y	
No	N	

42. Do you get to choose who you can purchase items from?

Yes	Y	
No	N	

43. Who delivers the supplies? (Select one).

Commercial supplier	1
Local community member	2
Both 1 & 2	3
Other (please specify)	4

RECEIVING:

44. Is there a planned delivery schedule?

Yes	Y	
No	N	

45. Do you receive deliveries of or collect any of the following? Indicate on what day(s) the supplies are delivered? (Answer all options)

				Day(s)
45.1	Bread	y	N	
45.2	Groceries	y	N	
45.3	Vegetables	y	N	
45.4	Milk (if applicable)	y	N	

46. Is the food of adequate quality?

Yes	Y	
No	N	

47. How is the quality of the food assessed? (Mark all relevant options).

Brand	1
Expiry date	2
Grade	3
Visually	4
Other (please specify)	5

48. What happens to the food that is judged to be of inadequate quality? (Mark all relevant options).

Returned to supplier	1
Received and used	2
Received and thrown away	3
Other (please specify)	4

49. Who receives the deliveries? (Answer a

49.1	Manager	y	N
49.2	Caregivers	y	N
49.3	Food handers	y	N
49.4	Youth	y	N
49.5	Other (please specify)	y	N

50. Is it the same person every time?

Yes	Y	
No	N	

51. Does the delivery note *I* invoice get checked?

Yes	Y	
No	N	

52. Is the documentation adequately completed?

Yes	Y	
No	N	

53. Are all the food items checked?

Yes	Y	
No	N	

53.1. If yes, how? (Mark all relevant options)

Weighed	1
Counted	2
Other (please specify)	3

54. Is the delivery moved / transferred to the correct storage area immediately after delivery?

Yes	Y	
No	N	

STORAGE:

55. Where are the food supplies stored? (Mark all relevant options).

Kitchen	1
Classroom	2
Designated store room	3
Site manager's office	4
Other (please specify)	5

56. Is there a regular cleaning schedule for the storage area?

Yes	Y	
No	N	

57. How often is the storage area cleaned? (Select one)

Less than once a week	1
Once a week	2
Twice a week	3
Three times a week	4
Four times a week	5
Every day of the week	6

58. How often is the stock checked? (Select one).

Not checked	1
Once a month	2
Twice a month	3
<Once a week	4
Once a week	5
Twice a week	6
Three times a week	7
Four times a week	8
Every day of the week	9

59. How often is a stock-take done? (Select one).

Not done	1
Once a month	2
Twice a month	3
<Once a week	4
Once a week	5
Twice a week	6
Three times a week	7
Four times a week	8
Every day of the week	9

60. Describe what is done during a stock-take? i.e. how is the stock-take done?

____

____

____

____

____

61. Is a stock rotation system in place?

Yes	Y	
No	N	

61.1. If yes, how is this done? (Select one).

Delivery dates	1
Expiry dates	2
Correct storage on delivery	3
First in first out	4
Other (please specify)	5

62. Is the storage area kept locked?

Yes	Y	
No	N	

63. Is theft a problem?

Yes	Y	
No	N	

64. Who has access to the storage area?

64.1	Manger	y	N
64.2	Food handers	y	N
64.3	Community Volunteers	y	N
64.4	Caregivers	y	N
64.5	Youth	y	N
64.6	Other (please specify)	y	N

65. Are daily issues done? i.e. are all the supplies for the day given to the food handlers at one time e.g. the day before or in the morning.

Yes	Y	
No	N	

VEGETABLE GARDENS:

66. Does the centre have its own vegetable garden?

Yes	Y	
No	N	

66.1. If yes:

66.1.1. How long has the vegetable garden been going? (Select one)

< 1 year	1	
1-2years	2	
2-3 years	3	
3-4 years	4	
4-5 years	5	
> 5 years	6	

66.1.2. What vegetables are grown here?

Cabbage	1	
Butternut	2	
Pumpkin	3	
Onions	4	
Potatoes	5	
Spinach	6	
Other (please specify)	7	

66.1.3. Approximately how much of the required vegetables are produced here? (Select one).

100%	1	
75% (¾)	2	
50% (½)	3	
25% (¼)	4	
Less than 25%	5	

66.1.4. Who is in charge of the Garden? (Answer all options)

66.1.4.1	Manager	У	N
66.1.4.2	Food handers	У	N
66.1.4.3	Community Volunteers	У	N
66.1.4.4	Caregivers	У	N
66.1.4.5	Youth	У	N
66.1.4.6	Youth and Children	У	N
66.1.4.7	Other (please specify)	У	N

66.1.5. Who does the gardening? (Answer all options)

66.1.5.1	Manager	У	N
66.1.5.2	Food handlers	У	N
66.1.5.3	Community Volunteers	У	N
66.1.5.4	Caregivers	У	N
66.1.5.5	Youth	У	N
66.1.5.6	Youth and children	У	N
66.1.5.7	Other (please specify)	У	N

66.2. If no:

66.2.1. Has there ever been a vegetable garden?

Yes	Y	
No	N	

If yes, why is it no longer being used? (Mark all relevant options).

Lack of staff	1	
Lack of seeds	2	
Poor crops	3	
Lack of time	4	
Other (please specify)	5	

FOOD SAFETY & HYGIENE:

67. Has any training about food safety and hygiene been provided?

Yes	Y	
No	N	

67.1. If yes,

67.1.1. Who provides /provided the training? (Mark all relevant options).

Department of Social Development	1	
Department of Health	2	
Community volunteer	3	
Youth who live at the centre	4	
Previous employer	5	
Other (please specify)	6	

67.1.2. Who is the training provided to? (Mark all relevant option).

Centre Manager	1
Caregivers	
Food handler	4
Community volunteer	6
Learners	7
Other (please specify)	8

67.2. When last was training conducted? (Select one).

Ongoing	1	
Last week	2	
Last month	3	
Last term	4	
Last year	5	
Never	6	

67.3. How frequently is training conducted? (Select one).

Ongoing	1	
Weekly	2	
Monthly	3	
Once a term	4	
Once a year	5	
Never	6	

68. Do the children and youth receive any information on the following? (Answer all options). [Stipulate "food related" under "none" and "other"]

68.1	Personal hygiene	Y	N
68.2	Food safety	Y	N

68.3	Nutrition	y	N
68.4	None	y	N
68.5	Other (please specify)	y	N

DEPARTMENT OF SOCIAL DEVELOPMENT SUPPORT

69. Is there sufficient administrative support from the Social Development?

Yes	Y	
No	N	

70. In the past, how frequently did a representative from the Department of Health/ Social Development visit the centre to assess health related issues? (Select one).

Once a month	1	
Once a term	2	
Twice a year	3	
Once a year	4	
Less than once a year	5	
Never	6	
Do not know (not here at that time)	7	

71. How frequently does a representative from the Department of Social Development visit the centre to assess the food service issues? (Select one).

Once a month	1	
Once a term	2	
Twice a year	3	
Once a year	4	
Less than once a year	5	
Never	6	

72. Any additional comments regarding the food safety and preparation or this study?

____

____

____

____

____

Food handler's questionnaire

FOOD HANDLER'S QUESTIONNAIRE

Centre#:	

Information to be obtained from the Food Handlers at the child and youth care centres
Imininingwane edingekavo kubapheki ezikhungweni zokunakekela izingane

Explain the following to the interviewee:
Chazela umuntu ohuzwayo loku okulandelayo:
The following set of questions aims to investigate some of the aspects of the day to day running of the Child and Youth Care Centres.
Lemibuzo elandelayo ihlose ukuphenya nokwenzeka nsukuzonke ezikhungweni zokunakekela izingane.

Please answer only Yes or No or answer one of the choices you are given. You will be given the chance to make other comments at the end.
Ngicela uphendule ngo Yebo noma Cha noma phendula okukodwa kulokhu okunikeziwe. Uzonikezwa ithuba lokuphawula ekugcineni.

Please insert the interviewee's answer to the following questions by placing a cross (X) in the right hand box or filling in the relevant information e.g. number. Y = Yes and N = No.
Faka izimpendulo zobuzwayo e mibuzweni elandelayo ngokubeka isiphambano ebhokisini elingakwesokudla noma ugcwalise imininingwane efanele njenge nombolo, Y=Yebo kanye no C=Cha

GENERAL:
OKUJWAYELEKILE:

1. How many cooks / food handlers are there?
1. *Bangakhi abapheki abakhona?*

Number	*Nombolo*	

2. How long have you been a cook / food handler for? Record the number of years and months.
2. *Sewunesikhathi esingakanani upheka? Bhala inani leminyaka kanye nezinyanga.*

		FH 1	FH2	FH3	FH4	
Years	*Iminyaka*					
Months	*Izinyanga*					

3. Do you have previous experience in food service?
3. Unalo yini ulwazi lwangaphambilini lokusebenza ngokudla?

Yes	*Yebo*	Y	
No	*Cha*	C	

4. Is there a menu?
4. Likhona yini iphepha okubhalwa kulo uhlu lokudla okuzodliwa ngokulandelana kwakho?

Yes	*Yebo*	Y	
No	*Cha*	C	

FOOD STORAGE
INDAWO YOKUGCINA UKUDLA

5. Are the expiry dates checked on the foods?
5. Kuyakuqikelelwa yini ukubheka imibhalo emaphaketheni okudla eshoyo ukuthi ukudla konakala nini?

Yes	*Yebo*	Y	
No	*Cha*	C	
Not applicable	*Akufanele*	*AIF*	

6. If the expiry date on the food packaging is 16 AUG 07, what does this mean? (take a sample and show it to the cook / food handler)
6. Uma usuku lokonakala ephaketheni lokudla lingu 16 AUG 07, kusho ukuthini? (Thatha isampula utshengise umpheki)

____

____

FOOD PREPARATION
UKULUNGISA UKUDLA

7. Where is the food prepared? (Select one).
7. Kulungiselwa kuphi ukudla? (Khetha okukodwa).

Designated kitchen	*Endlini yokuphekela*	1
Temporary /makeshift kitchen	*Ekhishini lesikhashana*	2
Outbuilding / "Lean-to"	*Endlini engaphandle*	4
Outside	*Ngaphandle*	5
Other (please specify)	*Okunye (Chaza)*	6

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8. Who prepares the food?
8. Ubani olungisa ukudla?

Centre manager	*Umphathi wesikhungo*	1	
House Mothers / Fathers	*Umama noma ubaba*	2	
Cook/Food handler	*Umpheki*	3	
Community volunteer	*Ilunga lomphakathi elisizayo*	4	
Other (please specify)	*Omunye (Chaza)*	5	

9. Is there adequate space for food preparation?
9. Yanele yini indawo yokulungisela ukudla?

Yes	*Yebo*	y	
No	*Cha*	c	

10. Is there adequate space for cooking?
10. Yanele yini indawo yokuphekela?

Yes	*Yebo*	y	
No	*Cha*	c	

11. Is there enough water for food preparation?
11. Anele yini amanzi okulungisa ukudla?

Yes	*Yebo*	y	
No	*Cha*	c	

12. Are there enough food preparation utensils? (Answer all options).
12. Zanele yini izitsha zokulungisa ukudla? (Phendula konke okunikiwe).

12.1	Knives	*Imibese*	y	c
12.2	Boards	*Amabhodi okuqobela*	y	c
12.3	Measuring equipment	*!zitsha zokukala*	y	c
12.4	Spoons	*Izipuni*	y	c
12.5	Mixing tools	*Amathuluzi okuhlanganisa*	y	c

13. Are recipes available?
13. Ikhona yini indlela yokupheka ukudla ebhalwe phansi? (Kusho amarecipe)

Yes	*Yebo*	GO to Q14	Y	
No	*Cha*	Go to Q16	C	

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SERVING:
UKUPHAKWA KOKUDLA:

19. Is there adequate space for serving / portioning?
19. Yanele yini indawo okuphakelwa kuyo?

Yes	*Yebo*	Y	
No	*Cha*	C	

20. Are there adequate food serving utensils? (Answer all options).
20. Zanele yini izitsha zokuphaka? (Phendula konke okunikiwe).

20.1	Ladles	*Izipuni ezinkulu*	Y	C
20.2	Measuring equipment	*Izitsha zokukala*	Y	C
20.3	Spoons	*Izipuni*	Y	C
20.4	Tins	*Amakopi*	Y	C
20.5	Cups	*Izinkomishi*	Y	C
20.6	Saucers	*Amasoso*	Y	C

21. Are there adequate eating utensils? (Answer all options).
21. Zanele yini izitsha zokudlela? (Phendula konke okunikiwe).

21.1	Plates	*Amapuleti*	Y	C
21.2	Bowls	*Izindishi*	Y	C
21.3	Spoons, forks, knives	*Izipuni, izimfoloko, imibese*	Y	C

22. How is the food allocated following cooking? (Select one).
22. Kuphiwa kanjani ukudla emuva kokuphekwa? (Khetha okukodwa).

Groups portioning?	*Kuphakwa ngamaqoqwana*	Go to Q23	1
Individual portioning (served directly to each learner)	*Kuphakelwa umfundi ngayedwa*	Go to Q25	2
Other (please specify)	*Enye indlela abadla ngayo (Chaza)*		3

CHECK ABOVE
23. Do all children and youth get the same amount regardless of the number in a house?
23. Ngabe zonke izingane zithola ukudla okulinganayo ngaphandle kokubheka inani labo endlini ngayinye?

Yes	*Yebo*	Y	
No	*Cha*	C	
Not applicable	*Akufanele*	A/F	

24. Do all children and Youth get the same amount regardless of the age?
24. Ngabe zonke izingane zithola ukudla okulinganayo ngaphandle kokubheka iminyaka yazo?

Yes	*Yebo*	Y	
No	*Cha*	C	
Not applicable	*Akufanele*	A/F	

25. What time is the meal normally served?
25. Kuvame ukudliwa ngasiphi isikhathi?

Time	*Isikhathi*	

26. Who serves the food? (Answer all options).
26. Ubani ophaka ukudla? (Phendula konke okunikiwe).

26.1	Centre manager	*Umphathi wesikhungo*	Y	C
26.2	House Mothers / Fathers	*Umama noma ubaba esikhungweni*	Y	C
26.3	Cook/Food handler	*Umpheki*	Y	C
26.4	Community volunteer	*Ilunga lomphakathi elisizayo*	Y	C
26.5	Other (please specify)	*Omunye (Chaza)*	Y	C

27. How long does the service take? (Select one).
27. Kuthatha isikhathi esingakanani ukuphaka? (Khetha okukodwa).

Less than 15 minutes	*Ngaphansi kwemizuzu engu15*	1	
15-30 minutes	*Phakathi kwemizuzu engu15 kuva kwengu30*	2	
More than 30 minutes	*Ngaphezulu kwemizuzu engu30*	3	

28. Is the same amount of food served to each child? (Standardised portion size)?
28. Ngabe ingane ngayinye iphakelwa isilinganiso sokudla esilinganayo?

Yes	*Yebo*	Y	
No	*Cha*	C	

29. Are the children? Happy with the amount of food they get most of the time?
29. Ingabe isikhathi esiningi izingane ziyasijabulela isilinganiso sokudla abasitholayo?

Yes	*Yebo*	Y	
No	*Cha*	C	

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WASTE:
UKUDLA OKUMOSHEKILE

30. Do the children? Finish their food?
30. Ingabe izingane ziyakuqeda ukudla kwazo?

Yes	*Yebo*	GO to Q33	Y	
No	*Cha*	Go to Q31	C	

31. How much food is served but not eaten? (Select one).
31. Kungakanani ukudla okuphakwayo kodwa kungadliwa? (Khetha okukodwa).

None	*Akukho*	1	
Minimal/little	*Kuncane*	2	
About ¼	*Kungangekota*	3	
About ½	*Kungangohafu*	4	
More than ½	*Kungaphezulu kukahafu*	5	
Don't know	*Angazi*	6	

32. What happens to the food that is served but the children and youth do not finish? i.e. plate waste. (Mark all relevant options).
32. Kwenzekalani ngokudla okuphakwayo kodwa izingane zingakuqedi? (Kushiwo okusala endishini). (Faka uphawu kokufanele).

Thrown away (plate waste)	*Kuyalahlwa*	1
Given to a friend	*Kunikezwa umngani*	2
Taken home	*Kuyiswa ekhaya*	3
Other (please specify)	*Okunye (Chaza)*	4

33. What happens to the leftover food (not served)? (Mark all relevant options).
33. Kwenzekalani ngokudla okusalile (okungaphakwanga)? (Faka uphawu kokufanele).

None left	*Akukho okusalayo*	1
Thrown away	*Kuyalahlwa*	2
Cooks/Food handlers eat it	*Abapheki bayakudla*	3
volunteers eat it	*Othisha bayakudla*	4
Sent home with the volunteers	*Kuthunyelwa ekhaya nabafundi*	5
Other (please specify)	*Okunye (Chaza)*	6

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34. How much left-over food is thrown away after serving i.e. left over / not served? (Select one).
34. Kungakanani ukudla okulahlwayo emuva kokuphakwa, kusho okungaphakwanga. (Khetha okukodwa).

None	*Akukho*	1
Less than a quarter	*Ngaphansi kwekota*	2
Half	*Uhafu*	3
More than half	*Ngaphezulu kukahafu*	4
Don't know	*Angazi*	5

35. Is left over food reheated and served the following day?
35. Ngabe ukudla okusalile kuyafudunyezwa bese kuyaphakwa ngosuku olulandelayo?

Yes	*Yebo*	Y	
No	*Cha*	C	

36. Do any of the following factors affect the amount of food left over? (Answer all options).
36. Ingabe lokhu okulandelayo kuyizimbangela zokuba ukudla kusale? (Phendula konke okunikiwe).

36.1	Menu item	*Izinhlobo zokudla ezisohlelweni oluzophekwa*	Y	C
36.2	Time of the month	*Isikhathi senyanga*	Y	C
36.3	Centre activities	*Imisebenzi eyenziwa esikhungweni*	Y	C
36.4	Other (please specify)	*Okunye (Chaza)*	Y	C

37. Is there a designated rubbish area?
37. Ngabe ikhona yini indawo eyakhiwe yokulahla udoti?

Yes	*Yebo*	Y	
No	*Cha*	C	

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TRAINING & FOOD SAFETY:
UKUQEQESHA NOKUPHEPHA KOKUDLA

38. Has any training about food safety and hygiene been provided?
38. Ngabe lwake lwanikezwa uqeqeshwa ngokuphepha nangokuhlanzeka kokudla ?

Yes	*Yebo*	Y	
No	*Cha*	C	

39. Have you received training regarding the following? (Answer all options).
39. Usuke wakuthola yini ukuqeqeshwa mayelana nalezinto ezilandelayo? (Phendula konke okunikiwe)

39.1	Menu planning	*Ngohlelo olulandelwayo lokupheka*	Y	C
39.2	Food preparation	*Ngokulungisa ukudla*	Y	C
39.3	Preventing food contamination	*Ngokuvikela ukundla emagciwaneni*	Y	C
39.4	Preventing cross-contamination of food	*Ngokuvikela ukuthelelana kokudla ngamaciwanegciwane*	Y	C
39.5	Illness in the workplace	*Ngokugula endaweni yokusebenza*	Y	C
39.6	Injury in the workplace	*Ngokulimala endaweni yokusebenza*	Y	C
39.7	First aid	*Ngosizo lokuqala*	Y	C
39.8	Personal hygiene	*Ngokuhlanzeka komuntu*	Y	C
39.9	Hand washing	*Ngokugeza izandla*	Y	C
39.10	Other (please specify)	*Ngokunye (Chaza)*	Y	C

40. If you have received training, whom did you receive the training from? (Answer all options).
40. Uma wake waqeqeshwa, ngabe uluthole kuphi uqeqeshoi? (Phendula konke okunikiwe)

40.1	Department of Social Development	KuMnyango weZokuthuthukiswa koMphakathi	Y	N
40.2	Department of Health	*KuMnyangowezeMpilo*	Y	N
40.3	Centre Manager	Kumphathi wesikhungo	Y	N
40.4	Social Workers	KoSozonhlakahle	Y	N
40.5	Another cook/food handler	*Komunye umpheki*	Y	N
40.6	Community member	*Ilunga lomphakathi elisizayo*	Y	N
40.7	Previous employment	*Emsebenzini owawuwenza ngaphambili*	Y	N
40.8	Other (please specify)	*Omunye (Chaza)*	Y	N

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41. When last was training conducted? (Select one).
41. Ukuqeqeshwa kwakugcine nini? (Khetha okukodwa).

Ongoing	*Kusaqhubeka*	1	
Last week	*Ngeviki eledlule*	2	
Last month	*Ngenyanga eyedlule*	3	
Last term	*Ngethemu edlule*	4	
Last year	*Ngonyaka odlule*	5	
Never	*Akukaze kubekhona*	6	

42. How frequently is training conducted? (Select one).
42. Ngabe ukuqeqeshwa kwenziwa kangaki? (Khetha okukodwa).

Ongoing	*Kusaqhubeka*	1
Weekly	*Njalo ngeviki*	2
Monthly	*Njalo ngenyanga*	3
Once a term	*Kanye ngethemu*	4
Once a year	*Kanye ngonyaka*	5
Never	*Akukaze kubekhona*	6

43. Is there soap available for hand washing?
43. Ngabe ikhona insipho yokugeza izandla?

Yes	*Yebo*	Y	
No	*Cha*	C	

44. Is there running tap water available for hand washing? (Answer all options).
44. Ngabe akhona yini amanzi ompompi okugeza izandla? (Phendula konke okunikiwe).

41.1	Hot	*Ashisayo*	Y	C
41.2	Cold	*Abandayo*	Y	C
41.3	None	*Awekho*	Y	C

45. How frequently are utensils washed? (Mark all relevant options).
45. Zigezwa kangaki izitsha? (Khetha konke okufanele).

During preparation	*Ngesikhathi kulungiswa ukudla*	1	
After the food is ready	*Uma ukudla sekulungile*	2	
After the work is finished	*Ekugcineni komsebenzi*	3	

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46. How frequently is the stove cleaned? (Mark all relevant options).
46. Sihlanzwa kangaki isitofu? (Khetha konke okufanele).

During preparation	*Ngesikhathi kulunRiswa ukudla*	1	
After the food is ready	*Uma ukudla sekulungile*	2	
After the work is finished	*Ekugcineni komsebenzi*	3	
No stove	*Asikho*	4	

47. Are the correct cleaning chemicals available to clean the kitchen?
47. Ngabe imithi eyiyona yokuhlanza ikhishi ikhona?

Yes	*Yebo*	Y	
No	*Cha*	C	

48. Are there enough cleaning tools to clean the kitchen e.g. broom, mop, cloths, sponge, etc?
48. Anele yini amathuluzi okuhlanza ikhishi njenge mishanelo, imophu, izindwangu zezitsha, isiponji nokunye?

Yes	*Yebo*	Y	
No	*Cha*	C	

49. How often is the food preparation area cleaned? (Mark all relevant options).
49. Indawo yokulungisa ukudla ihlanzwa kangaki? (Khetha konke okufanele).

During preparation	*Ngesikhathi kulungiswa ukudla*	1	
After the food is ready	*Uma ukudla sekulungile*	2	
After the work is finished	*Uma kuphela umsebenzi*	3	

50. Are the work areas ever sanitized?
50. Iyasetshenziswa yini imithi yokubulala amagciwane?

Yes	*Yebo*	Y	
No	*Cha*	C	

50.1 If yes, how often? (Select one)
50.1 Uma kunjalo, kangaki? (Khetha okukodwa)

Frequently	*Njalo*	1	
Daily	*Nsukuzonke*	2	
Weekly	*Masonto onke*	3	
Seldom	*Akuvamile*	4	

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51. Any comments regarding the Child and Youth Care Centre?
51. Ngabe kukhona ongakuphawula mayelana nesikhungo sokunakekela izingane?

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ANNEXURE G

NUTRITION KNOWLEDGE QUESTIONAIRE

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INSTRUCTIONS

THE FOLLOWING QUESTIONNIRE CONTAINS TWO TYPES OF QUESTIONS,

MULTIPLE CHOICE AND TRUE/ FALSE

1. MULTIPLE CHOICE: CHOOSE **ONE** THAT YOU THINK IS THE CORRECT ANSWER AND TICK THE CORRESPONDING NUMBER THAT IS NEXT TO THE ANSWER

2. TRUE/ FALSE: CHOOSE THE **TRUE** OR THE **FALSE** AND TICK THE ONE THAT YOU THINK IS THE CORRECT ANSWER

THE QUESTIONS REFER TO TO A HEALTH PERSON WHO IS NOT ON ANY MEDICATIOON OR SPECIAL DIET

Please answer all the questions before moving on to the next ones.

Do not page back!

	YY	MM	DD
DATE			
SUBJECT NUMBER			
INTERVIEWER			

1 You should eat a lot of sugar to have enough energy | TRUE | FALSE | 11A

2 Cooked meat/ fish/ chicken sold on the street may not always be safe to

It may have been undercooked	1	
The cook may not have used fresh meat	2	
It may have been kept for a long time before being	3	
All of the above	4	6D

3 What a pregnant woman eats during pregnancy has no effect on her health and health of her unborn baby | TRUE | FALSE | 12

4 You should not have starches at most meals because

They are not important for your health	1	
Even eating small amounts can cause weight gain	2	
They cause diseases	3	
None of the above	4	3B

5 How much water should you drink a day

You don't have to drink water everyday	1	
1 to 3 glasses	2	
4 to 6 glasses	3	
7 to 9 glasses	4	9A

6 You should add extra salt to your cooked food before you even eat it | TRUE | FALSE | 8A

7 What is a portion of cooked vegetables?

I Tablespoon	1	
Half a cup	2	
I Cup	3	
2 Cups	4	4A

8 Which of the following is a low fat snack

"Simba" Chips	1	
Popcorn	2	
Fried chips	3	
"Niknaks"	4	7A

9 From which group of foods should you eat the most every day?

Bread, samp, rice, porridge	1	
Apples, bananas, spinach, carrots	2	
Milk, yogurt, cheese	3	
Chicken, fish, beans, eggs	4	3A

10 Drinking a lot of wine, beer, cider can cause weight gain | TRUE | FALSE | 10B

11 Which one of the following is not healthy for a pregnant woman to do

Be physically active	1	
Eat different kinds of foods	2	
Sleep most of the day	3	
Drink lots of water	4	12

12 Women must try not to gain weight when they are pregnant | TRUE | FALSE | 12

13 It is not healthy for a pregnant woman to eat foods like milk, cheese, yoghurt | TRUE | FALSE | 12

14 People who are overweight should not be physically active | TRUE | FALSE | 2B

15 It is usually not necessary to wash vegetables before you cook them | TRUE | FALSE | 4D

16 The key to a healthy way of eating is to

Eat many different kinds of foods	1	
Eat some foods more than other foods	2	
Eat certain kinds of foods in moderate or small amounts	3	
All of the above	4	1A

17 The following foods must not be eaten at all when one is trying to lose weight

Bread and rice	1	
Meat and fish	2	
Margarine	3	
None of the above	4	1A

18 Which foods contain a lot of calcium?

Chicken and eggs	1	
Milk, yoghurt	2	
Pilchards	3	
2 and 3	4	6C

19 The healthiest snack is:

A glass of milkshake	1	
A tub of unbuttered popcorn	2	
A slab of chocolate	3	
2 and 3 above	4	7A

20 To which of the following foods has iodine been added?

Bread	1	
Maize meal	2	
Table salt	3	
Powdered milk	4	8C

21 If you were trying to increase the amount of fiber in your diet, which one of the following foods should you eat more of?

Cakes and biscuits	1	
Apples and carrots	2	
Chips and pies	3	
Chicken and fresh fish	4	4C

22 Being physically active means

Going to the gym	1	
Walking a lot	2	
Playing sports like soccer or netball	3	
All of the above	4	2A

23 Which of the following choice of foods prevent certain diseases

Fish, Chicken without skin, and lean meat	1	
Beef sausage, bacon, and lean mince	2	
Fried fish, fried chicken, and regular mince	3	
All of the above	4	6A

24 Which foods contain a lot of fibre?

Oats, apples, beans	1	
Milk, yogurt, cheese	2	
Beef, chicken, mutton	3	
Butter, margarine	4	1C

25 How many fruits and vegetables should be eaten

1 fruit and vegetable a day	1	
3-4 fruits and vegetables a day	2	
5 or more fruits and vegetables everyday	3	
There is no need to eat fruits and	4	4A

No.	Statement			
26	If you are eating a healthy diet there is no need for you to be physically active	TRUE	FALSE	2A
27	Drinking boiled water is a good way to lose weight	TRUE	FALSE	9B
28	Salt should be added to all foods except fruits	TRUE	FALSE	8A
29	If one wants to lose weight there is no need to be physically active, it is better that one simply diets	TRUE	FALSE	2B
30	All water is safe to drink	TRUE	FALSE	9A
31	You can drink as much wine, beer, ciders as you want provided you have eaten	TRUE	FALSE	10A
32	A little sugar can be eaten when one is trying to lose weight	TRUE	FALSE	11B

33 How much milk or maas should you have a day?

None	1	
Half a cup	2	
One cup	3	
Two cups	4	6A

34 Your body only needs a little bit of salt to be healthy TRUE | FALSE 8A

35 A well- balanced diet

Consists mostly of meat, with smaller amounts of starch, fruits, vegetables, and dairy products	1	
Consists mostly of vegetables, and smaller amounts of meat and dairy products	2	
Consists mostly of starches, vegetables and fruits, with smaller amounts of meat and dairy products	3	
None of the above	4	3A

36 Sugar and foods that contain sugar should be eaten in small amounts TRUE | FALSE 11A

37 Eating a lot of different kinds of foods is healthier than eating only a few kinds foods TRUE | FALSE 1A

38 Overweight women should try to lose weight when they are pregnant TRUE | FALSE 12

39 Sugar contains a lot of vitamins and minerals TRUE | FALSE 11A

40 It is impossible to get all the vitamins and minerals you need from food, you need a vitamin and mineral pill TRUE | FALSE 1A

41 It is not healthy for a pregnant woman to drink a lot of wine, beer, cider TRUE | FALSE 12

42 Which one of the following groups of nutrients are found in large amounts in fruits and vegetables?

Fibre, Vitamin A	1	
Starches, fat, Vitamin D	2	
Fats, Iron, Calcium	3	
None of the above	4	4C

43 Which of the following breakfast menus contain little fat

Whole-wheat toast with thinly spread margarine	1	
Weet-Bix with 2% fat milk	2	
Bacon and egg	3	
1 and 2	4	7A

44 It is important for a pregnant women to avoid eating different kinds of foods TRUE | FALSE 12

45 Which food has the most fibre?

White rolls	1	
Brown bread	2	
White bread	3	
Whole wheat bread	4	3C

46 The best place to defrost meat from a frozen state is to

leave it at room temperature	1	
leave it in the fridge	2	
leave it in sunlight	3	
Meat should never be defrosted	4	6D

47 Starchy foods should not be eaten when one is trying to lose weight TRUE | FALSE 3B

48 To make sure that you stay healthy you should eat

Lean meat, fruits and vegetables, low fat dairy products, and breads and cereals	1	
Fruit and vegetables only	2	
Bread, cereals, fruit and vegetables only	3	
Low fat dairy products and lean meat only	4	7A

49 Eating bread always causes weight gain | TRUE | FALSE | 3B

50 Which of the following foods are the lowest in fat:

Corn flakes and full cream milk	1	
Grilled lean steak and boiled carrots	2	
Pizza and milkshake	3	
Fried lamb chops and creamed spinach	4	7A

51 To protect yourself from disease you should avoid eating many different kinds of foods | TRUE | FALSE | 1B

52 It is healthy to snack on foods that contain a lot of sugar | TRUE | FALSE | 11B

53 Which of the following should a pregnant woman eat more of?

Milk, cheese, maas	1	
Meat, chicken, fish	2	
Fruits and vegetables	3	
All of the above	4	12

54 Dry beans, peas, and lentils should be eaten often | TRUE | FALSE | 5A

55 Soya mince is as healthy as meat | TRUE | FALSE | 5A

56 You can eat as much meat as you want everyday | TRUE | FALSE | 5A

57 Which group of foods has the most Vitamin A?

Oats, whole wheat bread, rice	1	
Carrots, spinach, sweet potatoes	2	
Pies, cakes, pudding	3	
None of the above	4	4C

58 Dry beans, peas, lentils are a healthy choice to eat in place of meat | TRUE | FALSE | 5A

59 Meat/ fish/ chicken will not spoil if you store them

In the cupboard for a few days	1	
In the fridge for 2 days only	2	
In the freezer for 3-4 months	3	
In 2 and 3 above	4	6D

60 The reason why beans, peas and lentils are good for you is that

They contain only small amounts of fat	1	
They contain a lot of fibre	2	
They can protect you from some diseases	3	
All of the above	4	5B,C

SELECT YES OR NO FOR ALL THE CHOICES

1. From where do you get your information about nutrition?

	YES	NO	
School	1	2	13F
Peers/ Friends	1	2	13F
Parents	1	2	13F
Radio/ TV/ Magazines	1	2	13F
Other (Specify)			
	1	2	13F

SELECT 1 OR 2 OR 3 OR 4 FOR ALL THE CHOICES THAT YOU CHOSE YES TO IN QUESTION 1

2. Of the choices you have selected above, how would you rate them as
   1= very unreliable
   2= unreliable
   3= reliable
   4= very reliable

	very unreliab le	unreliab le	reliable	very reliable	
School	1	2	3	4	13G
Peers/ Friends	1	2	3	4	13G
Parents	1	2	3	4	13G
Radio/ TV/ Magazines	1	2	3	4	13G
Other (Specify)					
	1	2	3	4	13G

Annexure H

INTERVIEW QUESTIONNAIRE

Please fill this sheet out to the best of your ability. If you do not wish to provide an answer and/or do not have an answer, leave blank. Thank you very much for your time and consideration. (Please fill out the back)

1. Focus Group Demographic Information

1.1 Gender

Male	Female

Specify the number of each gender.

1.2 Race / ethnicity ______________________

1.3 Do not answer if you prefer not to answer. Tick your age group for the column.

Age	**Tick**	**Number**
18 – 24		
25 – 34		
35-44		
45 – 54		
– 64 65+		
Other		

Specify the number of respondents involved per age category.

1.4 What is the highest of education completed.

Qualification	**Number**
No formal school	
Completed some high school	
High school graduate	
Completed some college	
Associate degree Bachelor's degree	
Completed some postgraduate	
Other	

Specify the number of respondents involved per qualification category.

1.5 Please fill in your current positions in the center.

Positions	**Number**
Manager	
Coordinator	
Food Handler	
Caregiver	
Volunteer	
Other	

Specify the number of respondents involved per position category.

2. Training Needs

2.1 Which of the following type of education material will you find useful in your workplace?

Posters	
Pamphlets	
Calenders	
Manuals	
Workbooks	
Fridge magnets	
Desk calendar	

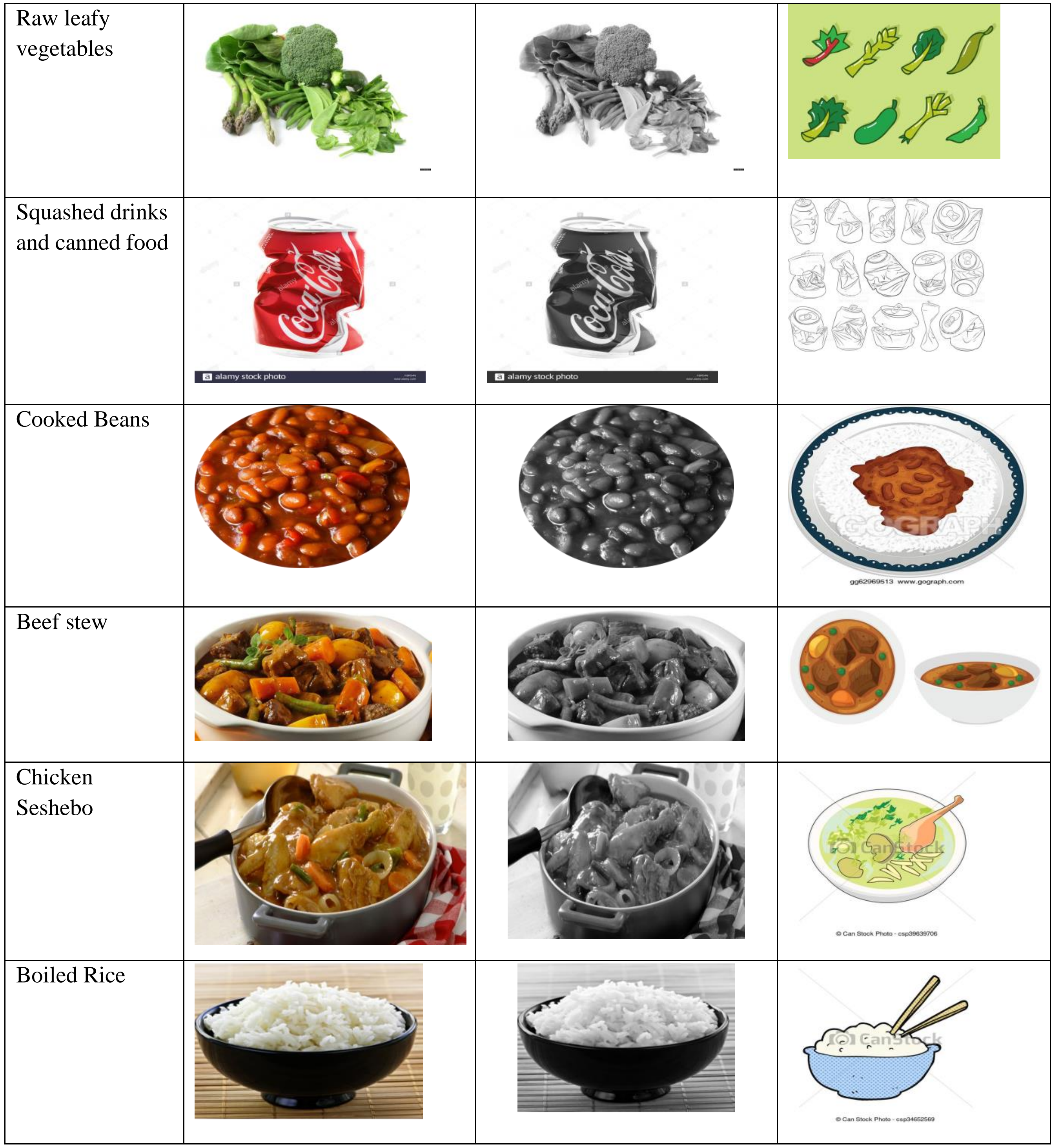
Other : (please write down) ____

2.2 Do you like using education material with (PLEASE CHOOSE **ONE** ONLY)

Drawings/pictures/photos only	
Words only	
Drawings/pictures/photos and words	

2.2.1 Choose from the pictures, listed below, the one you like most. Please tick your answer.

Description	**Colour Pictures**	**Black/white Pictures**	**Drawn Pictures**
Samp and Beans			
Cut corn, mealie			
Breakfast cereal			
Soft Porridge			



Raw leafy vegetables			
Squashed drinks and canned food			
Cooked Beans			
Beef stew			
Chicken Seshebo			
Boiled Rice			

2.3 What language would you prefer the education material to be in? (PLEASE CHOOSE **ONE** ONLY)

Zulu	
Xhosa	
English	
It does not matter	

Other: (please write down)____

2.4 Which information do you think should be covered by the manual? (Tick more than one)

Information on nutrition and healthy eating	
How to prepare food and manage a kitchen	
Health and Hygiene	
Healthy Recipes	

Other (Please write down)____

Thank you very much for your time!

Annexure I

OBSERVATION CHECK LIST

OBSERVATION	YES	NO	COMMENTS
GENERAL/MANAGEMENT			
1. Did all children participate / eat on the day of the visit?	Y	N	
2. Is there a menu?	Y	N	
3. Obtain copies of the school menu (if available) or record what was served on the day of the visit.			
4. Obtain copies of the school recipes (if available)			
5. Are the menu items served on the day of the menu in accordance with the prescribed Recommended Dietary Allowance (RDA) for children?	Y	N	[to be assessed by the researcher]
6. Is there evidence of monitoring procedures?	Y	N	
7. Is there evidence of policies and procedures? (ask)	Y	N	
8. Is there evidence of a business plan/service level agreement for the food suppliers? (ask)	Y	N	
9. Is there an organizational chart illustrating positions and lines of authority for the food supply, preparation and serving? (ask)	Y	N	
10. Does the child care facility has its own vegetable garden	Y	N	Vegetables grown?
RECEIVING			
11. Is the delivery date written onto the product packaging?	Y	N	
STORAGE			
12. Is the food stored in a separate room?	Y	N	
13. Are cleaning items or materials stored with the food?	Y	N	
14. Is there adequate security for the storage area?	Y	N	
15. Is the storage area kept locked? (ask)	Y	N	
16. How many people have keys to the storage area? (ask)	Number?		
17. Is there adequate light in the storage area?	Y	N	

OBSERVATION	YES	NO	COMMENTS	
18. Is there adequate space in the storage area?	Y	N		
19. Is the food stored in the original packaging?	Y	N		
20. Are the products clearly labelled?	Y	N		
21. Are there expiry dates on food items?	Y	N		
22. Have some food items passed their expiry dates?	Y	N	Not available	
23. If products are transferred into storage containers, is the expiry date recorded?		N	N/A	
24. Are any foods that are past their expiry dates used?	Y	N	Unknown	
25. Are all containers covered?	Y	N		
26. Is any of the food old / stale?	Y	N		
27. Is there any evidence of decay in the fresh produce?	Y	N		
28. Is the storage area clean?	Y	N		
29. Is there a regular cleaning schedule for the storage area?	Y	N		
30. Is the storage area neatly arranged?	Y	N		
31. Is any food stored directly on the floor?	Y	N		
32. Is refrigerated storage available at the school?	Y	N		
33. If yes, is the refrigerated storage in working order?	Y	N		
34. Is a stock sheet kept? (ask)	Y	N		
35. Is the old stock of food used before the new stock (FIFO)? (ask)	Y	N		
36. Is there any evidence of pest (rodents / insects) infestation?	Y	N		
37. Are there any unpleasant odours in the storage area?	Y	N		

Annexure J

MENU

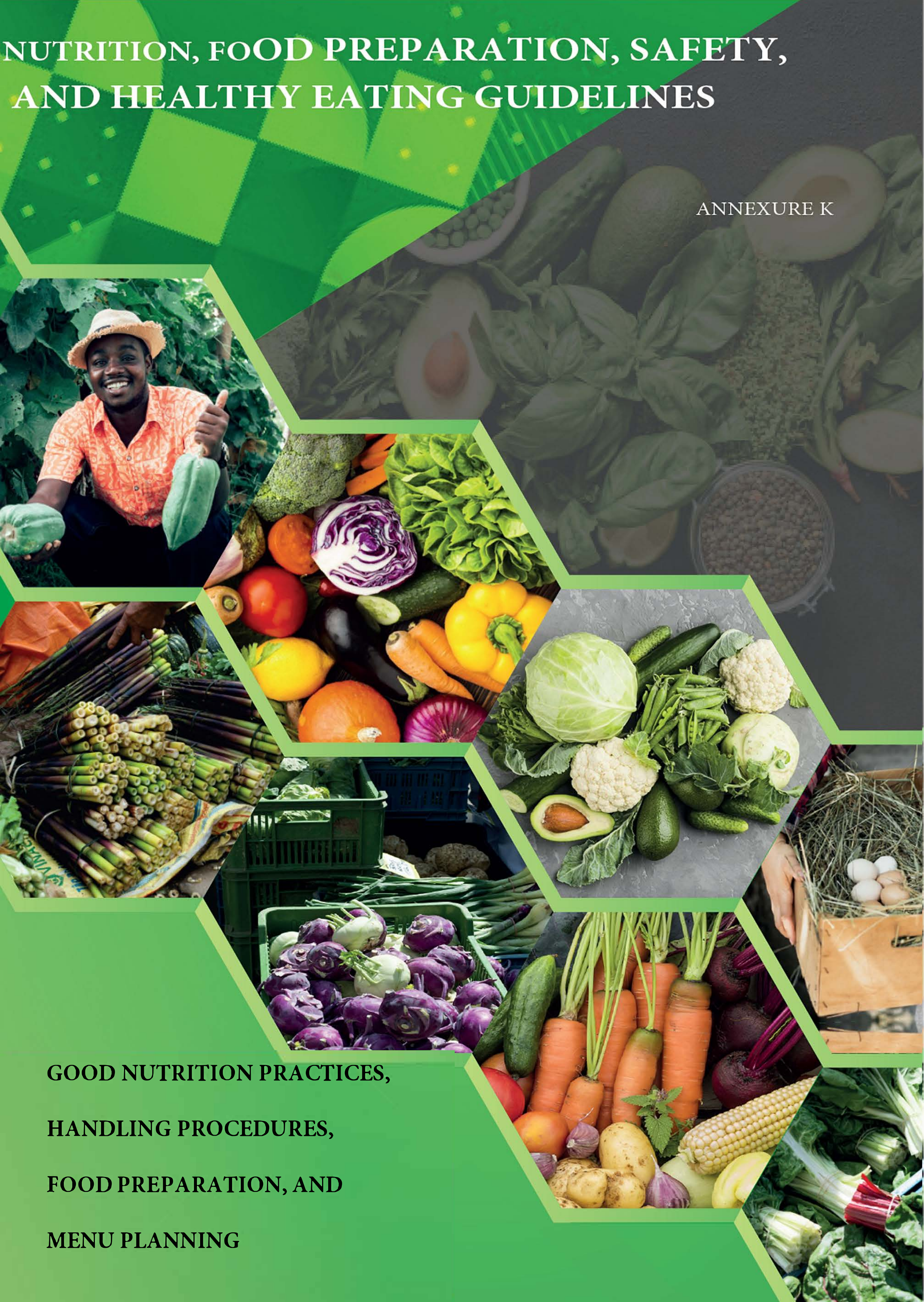
WEEK 1

TIME	MENU	MONDAY	TUESDAY	WEDNSDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
6:00-6:30	BREAKFAST	OATS	CORNFLAKES	WHITE PORRAGE	MOVITE	MALTABELLA	CORNFLAKES	WHITE PORRAGE
6:30-7:00	BREAKFAST	B READ,RAMA & TEA	BREAD, PEANUT BUTTER & TEA	RAMA, JAM 7 TEA	BREAD, POLONY & TEA	BREAD , JAM & TEA	FISH FINGERS , FRIED EGGS& TEA	BREAD , EGGS & TEA
10:30-11:00	LUNCH	FISH & RICE	CORN BEEF &RICE	AMASI	MACARONI& FISH	NOODLES& MASH	SAMP	ROASTED CHICKEN, MASH ,SOUP & RICE
18:00-18:50	SUPPER	SOURSAGE, CHUTNEY & RICE	UJEQE, MINCE	UJEQE & BEANS	BOILED EGGS ,CHUTNEY AND RICE	UPHUTHU & AMASI	BEEF CURRY & RICE	WORS, PAP & SOUP

MENU

WEEK2

TIME	MENU	MONDAY	TUESDAY	WEDNSDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
6:00-6:30	BREAKFAST	WHITE PORRAGE	OATS	MOVITE	MOVITE	CORNFLAKES	MALTABELLA	WHITE PORRAGE
6:30-7:00	BREAKFAST	B READ, JAM & TEA	BREAD, PEANUT BUTTER & TEA	RAMA, BREAD, TEA	BREAD, CHEESE & TEA	BREAD , JAM & TEA	FISH FINGERS , FRIED EGGS& TEA	BREAD , EGGS & TEA
10:30-11:00	LUNCH	UPHUTHU NAMASI	BOILED EGGS,CHUTHNEY &RICE	PAP & FISH	AMASI	NOODLES& MASH	SAMP	ROASTED CHICKEN, MASH ,SOUP & RICE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18:00-18:50	SUPPER	BULLL BRAND & RICE	CHICKEN ; RICE BUTTERNUT	CABBAGE & UPHUTHU	VIENNA & RICE	BOILED EGGS ,CHUTNEY AND RICE	BEEF CURRY & RICE	WORS, PAP & SOUP


NUTRITION, FOOD PREPARATION, SAFETY,
AND HEALTHY EATING GUIDELINES
ANNEXURE K
GOOD NUTRITION PRACTICES,
HANDLING PROCEDURES,
FOOD PREPARATION, AND
MENU PLANNING

Authors:

Mumsy Chibe
Heleen Grobbelaar
Carin Napier

GUIDE FOR GOOD NUTRITION PRACTICE, HANDLING PROCEDURES, FOOD PREPARATION AND MENU PLANNING

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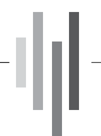

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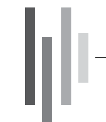
Definition of Terms

Term	Definition
Child and Youth Care Centre	– A facility for the provision of residential care to more than six children outside the child's family environment in accordance with a residential care programme suited for the children in the facility.
Child and Youth Care Manager	– A person who works in the living space of children and adolescents with both normal and special development needs to promote and facilitate optimum development through the planned use of everyday life events and programmes to facilitate their ability to function effectively within different context.
Food Handler	– A person who, in the course of his or her normal routine work on food premises, directly handles or comes into contact with packaged or unpackaged food, food equipment and utensils, or food contact surfaces and is therefore expected to comply with food hygiene requirements.
Hands	– For purposes of food handling and preparation, the forearm, or the part of the arm extending from the wrist to the elbow, is included in the definition.
Nutrition	– The science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism.
Nutrient	– A substance used by an organism to survive, grow and reproduce.
Food-Based Dietary Guidelines	– Positive dietary recommendation messages that are used to inform users on how to choose food and beverage mixtures that will lead to a diet that is adequate, meets the nutrient needs and at the same time prudent.
Food Safety	– Food safety refers to limiting the presence of those hazards, whether chronic or acute, that may make food injurious to the health of the consumer. Food safety is about producing, handling, storing and preparing food in such a way as to prevent infection and contamination in the food production chain, and to help ensure that food quality and wholesomeness are maintained to promote good health.
Clean	– Means that food should be free of any soil, food residues, dust, dirt, dung, impurity, grease or other objectionable matter or contamination to the extent that a state of hygiene is attained and "cleaning", "keep clean" and "cleaned".
Contaminate	– It is described as an effect exerted by any biological or chemical agent (including allergens), foreign matter, or other substances present in food.
Cross-contamination	– It is defined as the introduction of microorganisms or disease agents from raw food into ready-to eat food making it unsafe for consumption.
Perishable food	– Food that spoils within a short period of time, e.g. fresh fruits and vegetables, meat, fish etc.
Serve	– It means the provision of food whether for in return for either payment or otherwise.
Utensils	– Objects such as pots, pans, ladles, scoops, plates, bowls, forks, spoons, knives, cutting boards or food containers used in the preparation, storage, transport or serving of food.
Food hygiene	– All conditions and measures necessary to ensure the safety and suitability of food at all stages of the food-chain.
Food preparation	– The manipulation of food intended for human consumption by means of processes such as washing, slicing, peeling, shelling, mixing, cooking and portioning.

Abbreviation of Terms

CYCC	Child and Youth Care Centre
CYCM	Child and Youth Care Manager
CYCW	Child and Youth Care Worker
SAFBDG	South African Food-Based Dietary Guidelines
FBDG	Food-Based Dietary Guidelines
FEFO	First-to Expire, First-Out



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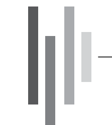

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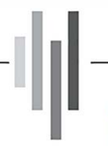
INTRODUCTION TO THE GUIDELINES



1.1 This guidelines has been prepared for:

- Child and Youth Care Managers (CYCMs) and Child and Youth Care Workers (CYCWs) in Child and Youth Care Centres (CYCCs).
- Food handlers needing education on sound food preparation, handling and serving procedures.

1.2 The purpose of the guidelines:

- The guidelines serves as a guide for good nutrition practice, menu planning and sound food preparation and handling procedures. It also includes a selection of recipes which can be used in a healthy eating plan.
- The guidelines will help in the planning and production of safe, high quality nutritious food, through implementing accurate planning and preparation of food.
- To improve food safety through optimal personal hygiene, proper food handling and food storage.

1.3 The objectives of the guidelines:

This guidelines contains information that will assist the child and youth care workers (CYCWs) to:

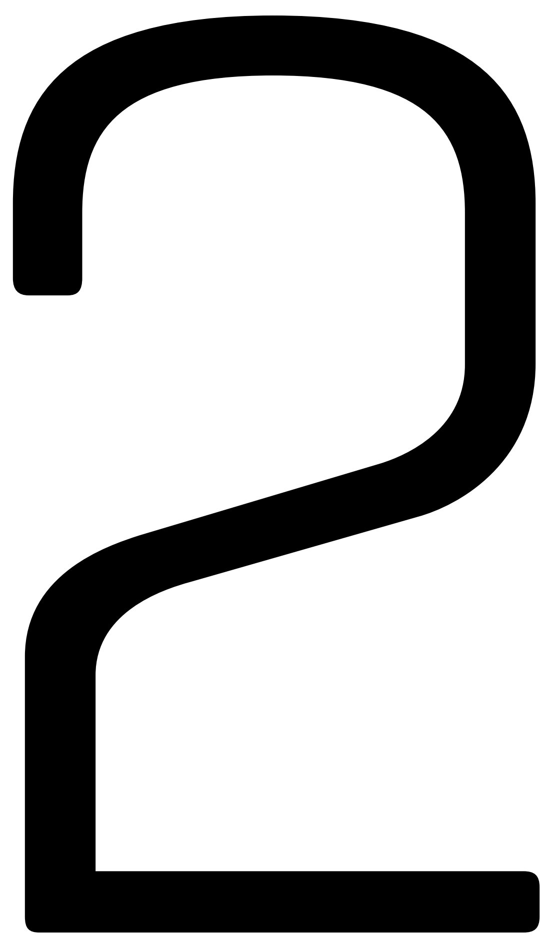
- Provide nutritious food guidelines, menu planning advice and recipes.
- Assist CYCWs to purchase, receive, store, prepare and serve high-quality healthy meals taking into consideration food safety and portion sizes for children (Section A, B, C).
- Provide information on safe food handling and personal hygiene in the kitchen (Section D).

1.4 The structure of the guidelines

The guidelines is presented in four sections as indicated below. Each section covers the topics outlined in Figure 1.1

Section A:	Section B:	Section C:	Section D:
Nutrition and the South African Food Based Dietary Guidelines	**Menu Planning, Meal Consumption and Recipes**	**Food Safety and Hygiene**	**Food production**
- Nutrition and Nutrients Description of South African Food-Based Dietary Guidelines (FBDGs) Nutrition requirements Food variety Variety of food on a plate - Food consumption - Benefits of a healthy eating plan - The South African Food Dietary Guidelines (FBDGs) - South African Food-Based Dietary Guidelines(FBDGs) and Estimated portion Sizes	- Menu planning Basic steps for menu planning Description of steps for menu planning - Daily meal consumption - Suggested affordable healthy recipes (Annexure A) Recipes standardisation - Planning a successful meal/ menu.	- Hygiene. - The benefits of good hygiene. - Consequences of poor food hygiene - Features of food preparation kitchen - Safety when preparing food - Food service facility checklist - Personal hygiene - Wearing of protective clothing - Procedure for keeping the food safe when preparing - Description of the food safety keys	- Standard procedures for food purchasing - Food purchasing procedures - The general procedures for receiving of stock - During receiving check for visible signs of food spoilage. - Storage of food - Use the following methods to store food Procedure for storing frozen foods Procedure for storing refrigerated foods - The issuing of food - Food preparation - Selection of a correctly coloured cutting board - Food defrosting procedures - Defrosting using a refrigerator Defrosting using water Defrosting using a microwave oven Cooking without thawing - Keeping food at a safe temperature after cooking - Food serving procedures - After cooking of food Treatment of leftovers Dishwashing techniques

Figure 1.1 The structure of the guidelines



SECTION A

NUTRITION AND THE SOUTH AFRICAN FOOD BASED DIETARY GUIDELINES

2 Contents of Section A

2.1 Nutrition and nutrients

2.1.1 Description of the South African Food-Based Dietary Guidelines (FBDGs)

2.1.2 Nutritional requirements

2.1.3 Food variety

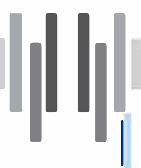
2.1.3.1 Variety of food on a plate

2.2 Food consumption

2.3 Benefits of a healthy eating plan

2.4 The South African Food-Based Dietary Guidelines

2.5 South African Food-Based Dietary Guidelines and estimated portion sizes.



2.1 Nutrition and nutrients

- Nutrition is the consumption of the correct amount of food needed to meet the dietary needs of a person.
- Food served should be sufficient and include a variety of food items.
- Nutrients are the substances that offer nourishment necessary for growth and the maintenance of life.
- Nutrients maintain good health and prevent diet-related diseases.
- Nutrients are essential for growth, survival and reproduction.

2.1.1 Description of the South African Food-Based Dietary Guidelines (FBDGs):

- The Food-based Dietary Guidelines (FBDGs) are short, positive, science-based messages.
- They describe eating patterns that meet energy and nutrient requirements and protect against the
- development of diet-related non-communicable diseases.
- The food-based dietary guidelines include local and affordable foods that are necessary for healthy eating.
- The guide does not contain items whose intake should be restricted, such as highly processed foods high in sugar, fat and salt.

2.1.2 Nutritional requirements

- The amounts of each nutrient needed by the body are known as the nutritional requirement.
- Nutritional requirements vary between individuals and life stages.
- Individual nutritional requirements for each nutrient are linked to age, sex, state of health and physical activity level.
- Each nutrient has specific functions in the body but they work together in the body, e.g. macronutrients (fat, protein, carbohydrate) work together with micronutrients (vitamins and minerals).
- Micronutrients are available in the everyday diet, hence a variety and the correct amount of food should be consumed daily. These nutrients include but are not limited to:
- Iron: Iron deficiency can delay psychomotor and cognitive functions, impair growth and increase susceptibility to infection.
- Zinc: a sufficiency of zinc promotes the growth of young children.
- Vitamin A: helps to reduce mortality, mostly from diarrhoea and measles.
- Calcium: Helps to maintain healthy teeth and bones.

2.1.3 Variety of food

In terms of the Food-Based Dietary Guidelines, a variety of food means to eat mixed meals:

- Eat foods from various food groups.
- Alternate the food preparation methods.

2.1.3.1 A variety of food on a plate

This plate contains portions from different food groups e.g.:

- Starchy foods (carbohydrates)
- Vegetables and fruits, dry beans, peas, lentils and soya (proteins, vitamins and minerals)
- Chicken, fish, meat and eggs (proteins)
- Milk, maas, yoghurt (proteins)
- Fat and oil (Fats)
- Water.

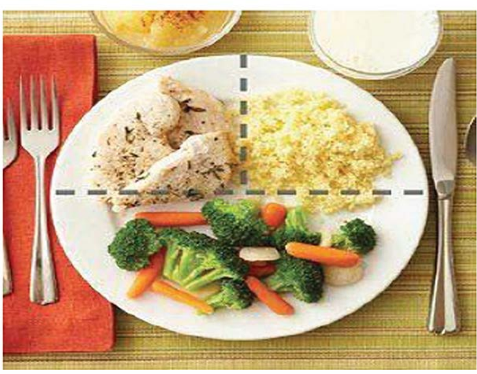


Figure 2:1 Example of a plate with a variety of food.

2.2 Food consumption

Food consumption includes the following:

- Do not overfeed children and youths.
- Not to force children and youths to finish meals if they are not hungry.
- Introduce healthy foods, especially fruits and vegetables and continue offering them even if they are initially rejected.
- Do not serve food that is not of good nutritional value.
- Children and youths should eat at least three meals a day and consume snacks in-between meals (morning, afternoon and evening and perhaps just before bedtime).
- Healthy snacks are just as important as the food served at mealtimes.
- Include unprocessed and fresh nutritious foods, for example, meat, poultry, fish, eggs, whole grains, legumes, fruits and vegetables.

2.3 Benefits of a healthy eating plan

A healthy eating plan balances the energy levels, which can result in weight loss where required and reduce the risk of chronic conditions:

- Eating a healthy diet may help prevent diseases such as heart disease, stroke and diabetes.
- It may also help reduce the risk of developing some cancers.
- Eating a healthy diet will speed up recovery from illness.
- A healthy eating plan will help prevent obesity and overweight.

2.4 South African Food-based Dietary Guidelines (FBDGs) for healthy eating

- Enjoy a variety of food.
- Be active by means of exercising.
- Drink lots of clean, safe water, about 8 glasses a day.
- Make starchy foods part of most meals.
- Eat plenty of fruit and vegetables every day.
- Eat dry beans, split peas, lentils and soya regularly.
- Have milk, maas or yoghurt every day.
- Fish, chicken, lean meat or eggs can be eaten daily.
- Use fats sparingly. Choose vegetable oils rather than hard fats.
- Use sugar and foods and drinks high in sugar sparingly.

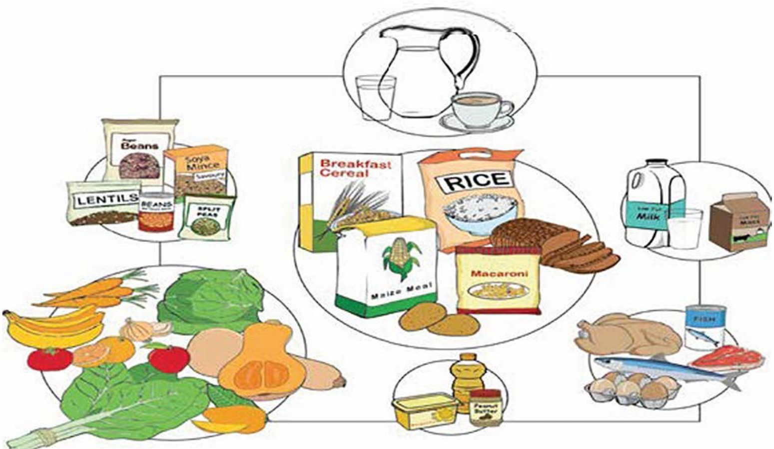


Figure 2.2 South African Food Guide (Department of Health, Directorate Nutrition).

2.5 South African Food-Based Dietary Guidelines (FBDGs) and estimated portion sizes

2.5.1 Enjoying a variety of foods:

- Make food appealing but ensure that the eating plan supplies all nutrients.
- Eat a variety of foods three times a day (breakfast, lunch and supper).
- Part of a healthy lifestyle is to eat a regular variety of food of similar portion size.
- Healthy eating plans must include a variety of foods. Each meal should include food from two or more food groups.
- Prepare food using different methods, e.g. boil, steam, grill etc.

Figure 2.3 Enjoy a variety of foods.

2.5.2 Be active!

- Increase the heart and breathing rate.
- Be involved in daily activities like gardening or walking for at least 30 minutes.
- Exercise helps burn energy, which helps with weight management and builds muscles.
- Being active strengthens bones, muscles and joints.
- Being active improves one's mood, helps one to relax and relieves concerns.
- Being active helps to regulate appetite.

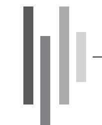
Figure 2.4 Example of physical exercise for children and youths.

2.5.3 Make starchy foods part of your diet.

- Starchy foods should be the main source of dietary energy.
- They contribute to the macronutrients and dietary fibre when eaten in minimally processed forms.
- Starchy foods cost less, and when used as part of most meals help satisfy the appetite.
- Fortified maize and bread are good choices of starchy foods as they have added vitamins and minerals.
- Add foods from other groups (protein, fat, minerals and vitamins) to starchy food to create a variety.
- Use minimally refined starchy foods.
- Include whole-grain choices as part of starchy food intake.
- Choose starchy foods that do not have added fat, sugar or salt; white bread, white rice and white flour pasta often have added sugar.

Table 2.3 Food items, portion sizes and images for 'Make starchy foods part of most meals'

Foods	Portion size	Image
Bread, brown/ white	1 slice	
Porridge, soft	½ cup	
Maize meal (stiff pap, uphutu)	½ cup	



Potatoes	1 medium	
Rice/ pasta/ samp (preferably whole grain), cooked	½ cup	
Breakfast cereal	½ cup	
Cut corn, mealie	½ cup	
Popcorn, popped, no salt or fat	2 cups	

2.5.4 Eat plenty of fruits and vegetables every day.

- Eating fruits and vegetables reduces the risk of disease such as heart conditions and stroke and prevents some types of cancer.
- Fruits and vegetables are rich sources of fibre, minerals and vitamins and they contain water.
- They make you feel full without adding too much extra food energy.
- Include vegetables in at least one or two mixed meals a day.
- Fruit can be eaten with meals or as a snack between meals.
- Carrots, pumpkin, butternut, spinach, *umfino*, mango, pawpaw, yellow peaches and nectarines are rich in beta-carotene (which becomes vitamin A in the body).
- Very little (if any) oil, sugar or salt is required to prepare vegetables and fruit.
- When making soup, use fresh vegetables instead of packet soup; this will be nutritious and low in salt.
- Canned vegetables, fruits and fruit juice cannot be a regular replacement for fresh vegetables and fruit. Canned fruit has a high sugar content and canned vegetables may have added salt.

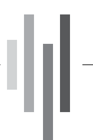


Table 2.4 Food items, portion sizes and images for 'Eat plenty of vegetables and fruit every day'

Foods	**Portion size**	**Image**
Fresh/ frozen vegetables	½ cup cooked	
Raw leafy vegetables	1 cup raw	
All fresh fruits	1-piece medium-sized fruit e.g. apple, banana	
	2 pieces of small fruits e.g. apricots, plums	
	½ piece large fruit e.g. grapefruits	
	½ cup chopped fruit/ juice	
Raisins	2 tablespoons raisins	

Eat dry beans, split peas, lentils and soya regularly.

- Add dry beans, split peas, lentils and soya to a meal to increase its nutrient value.
- Dry beans, split peas, lentils and soya decrease the risk of heart disease, diabetes and cancer.
- Dry beans, split peas, lentils and soya help combat overweight and help maintain healthy blood sugar levels.
- A menu should include dry beans or soya as an alternative to meat or chicken every week.
- Add dry beans, lentils, split peas or soya as one of the ingredients in mixed dishes, e.g. samp and beans, rice and lentils, beans in vegetable sauce with pasta, lentils and mincemeat.
- Dry beans or soya should be included in meat or chicken dishes, to improve the nutritional value of the dish (less fat, more fibre).
- Dry beans can be soaked overnight before cooking. Remember to cook dry beans in a slow cooker to save electricity.
- Remember to rinse the dry beans after soaking and before they are cooked.

Table 2.5 Food items, portion sizes and images for 'Eat dry beans, split peas, lentils, and soya regularly'.

Food	Portion size	Image
Dry beans, cooked	½ cup	
Lentils, split peas, cooked	½ cup	
Soya mince, cooked Soya mince, dry	½ cup 30g	

2.5.6 Have milk, maas or yoghurt every day.

- Use low fat or fat-free milk.
- Use low fat or skim milk to lower the amount of saturated fat in the diet.
- Use low-fat milk in tea/coffee instead of Cremora/ Ellis Brown coffee creamer.

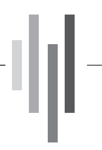


Table 2.6 Food items, portion sizes and images for ‘Have milk, maas or yoghurt every day’.

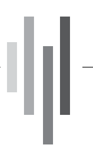
Foods	Portion Size	Image
Milk, low fat or skim	1 cup	
Maas, low fat	1 cup	
Yoghurt, low fat or fat- free	tub, 100ml	

2.5.7 Fish, chicken, lean meat or eggs can be eaten daily.

- If possible, serve fish, chicken, lean meat or eggs daily.
- Cheese should not be served too often as it is high in fat and salt.
- Serve internal organs (offal) such as liver and kidneys often.
- Serve fish such as pilchards, sardines, mackerel and tilapia as they are high in omega 3 fatty acids.
- Remove visible fat from meat.
- Remove fat and skin from chicken.
- Limit the use of processed meats such as bacon, ham, wors, corned beef and canned meat.

Table 2.7 Food items, portion sizes and images for "Eat fish, chicken, lean meat or eggs'

Foods	**Portion size**	**Image**
Whitefish	1 small portion	
Fish, with high-fat flesh, e.g. Tilapia, Tuna, Pilchards, Mackerel (Do not remove Pilchards bones they are high in calcium.)	1 small portion	
Chicken, with no skin	1 medium breast	
Lean meat	Size of palm, sliced 10mm	
Eggs	2	
Chicken liver	3	



Yellow cheese	Cubes 30mm^3/40g (matchbox size)	

2.5.8 Drink lots of clean, safe water.

- Each day, a body loses at least 2.5 litres of fluid through breathing, urinating and perspiring.
- Lost fluid should be replenished by drinking 8 glasses of water a day or through other fluids which can count as part of the 8 glasses.
- Water and low-energy drinks like tea can be drunk often.
- Reduce consumption of sugary cold drinks such as cola as they promote obesity.
- Drink more water during very active and hot conditions.

Figure 2.5 Drink lots of clean, safe water.

2.5.9 Use fats sparingly, choose vegetable oils rather than hard fats.

- The body needs oils and fats from foods.
- Oils and fats can be found naturally in plant foods (like peanuts and avocado) or animal-derived foods (like beef, chicken and fish).
- Oils and fats should be added to foods and meals by spreading tub-margarine on bread or using sunflower oil to brown onions for a stew.
- Use plant oils and foods made from plant oils; examples are sunflower, canola or tub margarine.
- Limit fat from animal foods (full cream milk, cheese, fatty meat, chicken skin, high fat processed foods, e.g. bacon, polony, vienna sausage and ham).
- Cook meals using fresh ingredients instead of buying readymade meals; they are likely to be cheaper, more nutritious and have a lower fat and salt content.
- Use cooking methods that require little or no added oil or fat.

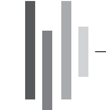


Table 2.8 Food items, portion sizes and images for 'Use fats sparingly, choose vegetable oils, rather than hard fats'.

Foods	Portion size	Image
Oil: sunflower, canola, or other plant oil	1 teaspoon	
Tub margarine	1 teaspoon	
Peanut butter	1 heaped teaspoon	

2.5.10 Use sugar and foods and drinks high in sugar sparingly.

- Only add a small amount of sugar to foods and drinks like soft porridge or tea.
- Foods made with sugar, like jam, may be used to make a mixed meal or a snack.
- Sweets and cold drinks may be consumed occasionally.
- Everyday consumption of sugar, especially between meals, is a risk factor for dental decay.

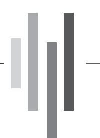
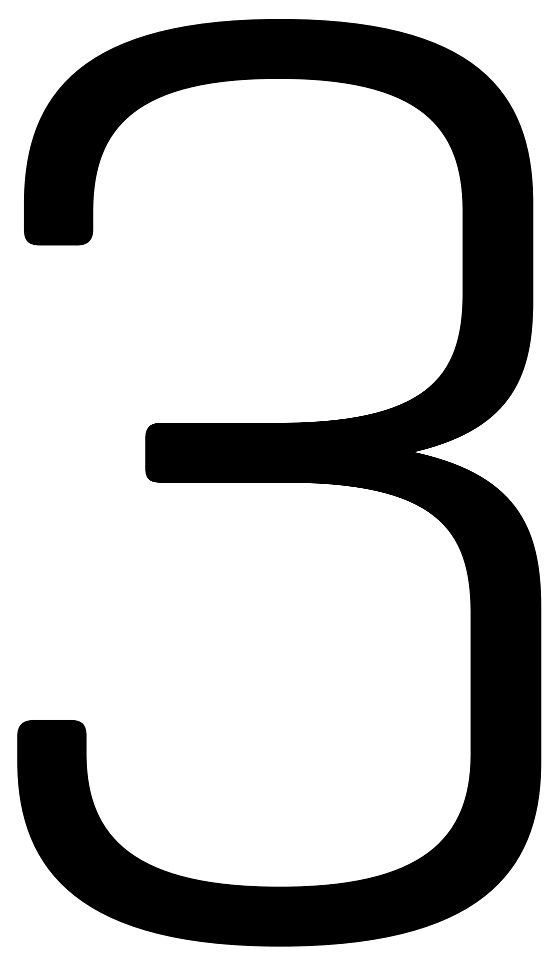


Table 2.9 Food items, portion sizes and images for Use sugar, foods and drinks high in sugar sparingly’.

Foods	Portion sizes	Image
Sugar, brown or white	1 teaspoon	
Jam	1 heaped teaspoon	



SECTION B

MENU PLANNING, MEAL CONSUMPTION AND RECIPES

3 Contents of Section B

3.1 Menu planning.

3.1.1 Basic steps for menu planning.

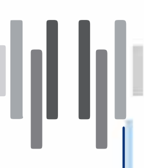
3.1.2 Description of steps for menu planning

3.2 Daily meal consumption pattern.

3.3 Suggested affordable healthy recipes (Annexure A)

3.3.1 Recipe standardisation

3.4 Planning a successful meal/menu



3.1 Menu planning

- Menu planning is a list of foods to be served at mealtimes.
- Menu planning determines a food to be purchased and the method of preparation.
- When planning a menu follow the eleven guidelines listed in the South African Food-Based Dietary Guide (Section A of the guidelines).
- The menu must be planned considering all aspects of the foodservice system (kitchen, utensils and availability/accessibility of the food). •

Meals should be served with beverages that are acceptable to children and youths e.g. serve water and tea instead of fizzy or squash drinks.

- Take stock of the available food – check the storage facility and fridge for the availability of staples that can be used. Compile a grocery list of the remaining ingredients you may need.
- Design a weekly menu. In addition to that have a theme for each day e.g. Monday (meatless), Tuesday (vegetables), Wednesday (meats), Tuesday (fish), etc.
- Provide freshly cooked foods.
- Serve other protein sources like beans or soya as an alternative to meat.
- Plan for leftovers e.g. use chicken breast for a salad, and other meats and vegetables can become a base for soups. Remember, leftovers can be ideal for a busy day.
- Plan ahead – devote a couple of hours per week to preparing and cooking ingredients for the meals.

3.1.1 Basic steps of menu planning.

- When planning the menu follow these five basic steps.

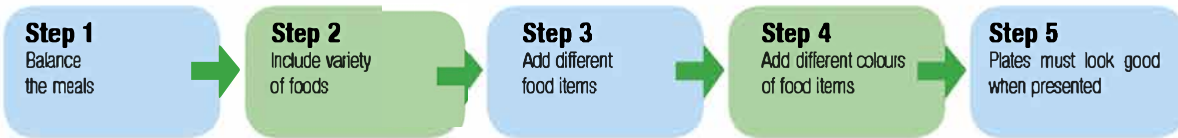


Figure 3.1 Steps of Menu Planning.

3.1.2 Description of steps for menu planning.

- Strive for balance as you plan nourishing, appealing, and good tasting foods. Select and combine foods following the simple steps described below:

Step 1:

Balance flavours in an appealing way.

- Make sure that foods like rice, pap/ phutu, potatoes are served with other food items to make an attractive combination.
- Strongly flavoured foods make a meal unacceptable to children e.g. foods that are too spicy.

Step 2:

Emphasize a variety of foods.

- One food group cannot provide all the nutrients that children and youths need for a healthy diet; they need a variety of foods.
- A variety of foods makes meals appealing and interesting.

Step 3:

Use different food items.

- Strive for differences in texture, flavour and method of preparation.
- Before cooking, think about the texture of food to be served, as well as the taste and appearance.
- For appeal, serve a raw vegetable with spaghetti/ macaroni or other pasta types.
- Add foods with different shapes to a meal, e.g. cubes, mounds, shredded, pieces or strips, for example, a meal with cubed meat, diced potatoes and strips of mixed vegetables it is a good option.

Step 4:

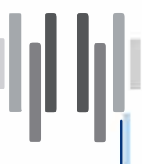
Use differently coloured foods.

- Consider the colour of food.
- Use a combination of colours that go together well, e.g. pap (white), chicken stew (yellow) and spinach (green).
- Strive for difference and maximum colour presentation.
- Avoid serving too many foods of the same colour on the plate.
- A meal with boiled chicken, rice and potatoes, would lack colour difference. A better combination would be chicken stew, rice and spinach.
- Add a reasonable amount of spices or herbs to the food to enhance the taste. (Children and youths are often not used to spicy food.)

Step 5:

A plate of food must look attractive and be presentable.

- Think of the overall plate presentation.
- Consider eye appeal. Children and youths form impressions based on what the meal looks like.
- The food you serve should look good and taste good.
- As you plan the colour of food, also consider the colour of the plates.
- Plan the way you will arrange the food portions on a plate. Visualise how the food will look when served and decide on the most attractive arrangements.



3.2 Daily meal consumption pattern

Table 3.1 Suggested daily meal consumption pattern (Please note there are other options to consider).

Breakfast	Morning snack	Lunch	Midday Snack	Dinner
Breakfast is the most important meal of the day.	Serve snacks like raw vegetable or a small sandwich	Serve legumes, mixed with pap, samp or rice with lentils	Serve something light before dinner instead of sweets or chips.	End the day by serving starch, vegetables, and meats or beans.
Make starches the most basic component of breakfast to provide energy and to improve brain function(concentration and memory).	Tomatoes, cucumber, and carrots make a healthy snack.	Don't forget to serve vegetables. Also, add lots of vegetables to stews and curries	Yoghurt and maas fill the stomach and strengthen the bones and teeth.	Overeating in the evening can cause poor sleep patterns. Encourage the drinking of water with every meal.
Serve a portion of dairy products such as milk with cereal, yoghurt or a slice of cheese. Include a piece of fruit.				Serve wholemeal (whole wheat or Brown) bread. Serve some vegetables and fruits.

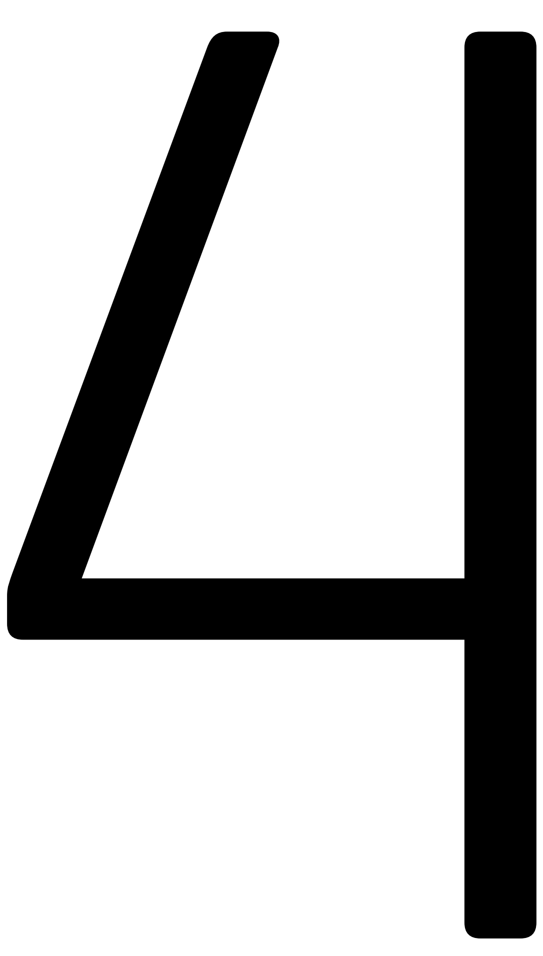
3.3 Suggested affordable healthy recipes (Annexure A)

- Suggested recipes are low-cost meals.
- They were developed based on the health needs of children and youths.
- They are healthy, accessible and affordable.
- Recipes are standardised to meet the estimated number of children and youth in a house or CYCC.

3.3.1 Method and processes for standardising a recipe

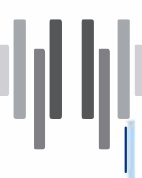
Knowing how much food the recipe will produce can help prevent food waste and shortages of food. Therefore:

- Standardising the recipe means adjusting the ingredient quantities to the amount needed.
- When standardising a recipe, you either increase or decrease the ingredient quantities as required.
- Standardise the recipe to meet the requirements of the number of children and youths you are planning to serve (e.g. for 21 children and youths you would need to increase the ingredients listed in a recipe that indicated it would serve 10 people).
- Standardising a recipe will help with knowing the amount of ingredients needed and the cooking or preparation method to be used.
- Use a conversion factor to decide on the desired quantity of ingredients; divide the desired number of servings for 21 children and youths by the original number of servings (10) as indicated in the recipe.
- Use the described FORMULA, which will be: desired servings (21 children and youths) divided by original servings of the recipe (=10), so a conversion factor of (2.1).
- Standardise by following this example (21/10=2.1). Multiply each ingredient contained in the original recipe (for 10 people) by 2.1 to calculate the quantity of the ingredient you would expect to use for 21 children and youths.
- Recipe standardization can also help in reducing food waste.
- Annexure A gives an overview of the standardized recipes you can also use as a guide for meal preparation.



SECTION C

FOOD SAFETY AND HYGIENE PRACTICES



4 Contents of Section C

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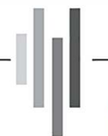
4.3.4.1 Description of the food safety keys.



4.1 Hygiene

Hygiene refers to the quality of living that is expressed in clean surroundings (environment).

- It is a way of life, something that should be an unconscious part of every person's routine.
- Failure to practise good hygiene can result in the spreading of harmful micro-organisms germs, which can be poisonous to children and youths.
- Good hygiene practice should be a way of life for the food handler.
- In some cases, food poisoning is caused by carelessness and ignorance about food handling.
- The kitchen should be clean and tidy with good ventilation and lighting.

4.1.1 The benefits of good hygiene

- Increases the shelf-life of food.

4.1.2 Consequences of poor food hygiene

- Food poisoning outbreaks which can sometimes lead to death.
- Food and pest contamination.
- Food waste caused by spoilage.
- Lack of concentration, poor performance and erratic school attendance, as a result of sickness such as food poisoning.

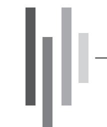
4.2 Features of food preparation area

Food preparation areas should have the following:

- Washing-up and handwashing facility with hot and cold running water.
- The kitchen must be rodent-proof.
- Provide effective means of preventing access by flies or other insects to the premises.
- Wastewater disposal system approved by the local authority.
- Waterproof, easy-to-clean refuse bins with close-fitting lids.
- Hygienic storage facility for food and equipment.
- An adequate supply of water for cleaning and drinking.

4.3 Safety when preparing food

- Food handlers must comply with health and hygiene regulations.
- Safe steps in food handling, cooking and storage are critical to avoid foodborne illness.
- Germs cause illness; therefore, wash hands and preparation surfaces using warm, soapy water.
- Wash hands before and after handling food or utensils, especially raw meat, poultry, fish or eggs.
- Wash fruits and vegetables before eating.
- Separate raw food from cooked and ready-to-eat food.
- Keep raw meat, poultry, fish and eggs away from other foods to prevent cross-contamination.
- If possible, use separate cutting boards for different food items. If not, wash cutting boards carefully with warm soapy water in-between use (see Table 5.2 for differently coloured cutting boards).



- Cook foods at a safe temperature using a food thermometer where possible. Uncooked or undercooked animal products can be unsafe.
- Keep hot foods above 140 degrees and cold foods below 40 degrees to prevent bacteria growth.
- Refrigerate foods within two hours of purchase or preparation (one hour if the temperature is higher than 90 degrees).
- If you are not sure that food has been prepared, served and stored properly or has been left out for more than two hours, discard it.
- Serve leftover food within four days.

4.3.1 Foodservice facility hygiene checklist

- Use a food safety and hygiene checklist (Annexure B).

4.3.2 Personal hygiene

- Keeping clean and grooming oneself is the first step to good health.
- It is one of the most important parts of our daily lives at home and in the workplace.
- It helps to protect us and keep us in good health.

4.3.3 Wear protective clothing

- Any person handling unpacked food should wear protective clothing (including head covering and footwear) designed and made from a material that cannot contaminate food.
- Protective clothing should be designed so that food does not come into contact with any part of the body except for the hands.

4.3.4 Procedure for keeping food safe during preparation.

Figure 4.1 Keys to safer food.

Use the following simple keys for food safety:

- ✓ Clean — Wash hands and surfaces often
- ✓ Separate — Do not cross-contaminate.
- ✓ Cook — Use the right cooking temperature.
- ✓ Chill — Refrigerate promptly.
- ✓ Safe — Use safe water and raw materials.

4.3.4.1 Description of the food safety keys.

Key 1

Keep hands clean.

- Wash hands before handling food and during food preparation – this is one of the most important steps to avoid spreading germs.
- If soap and water are not available, use an alcohol-based hand sanitizer.
- Wash and sanitize the surfaces and equipment used for food preparation.
- Protect kitchen areas and food from insects (flies, cockroaches etc.), pests (rats and mice), dogs and cats or other animals (such as monkeys and baboons).
- Wash your hands with running water and soap after using the toilet.
- For proper handwashing steps, follow the procedure below (Table 4.6).

Table 4.1 Procedure for washing hands.

Step	Image	Description
Step 1		Wet hands under warm running water.
Step 2		Soap hands, lathering well.
Step 3		Rub thoroughly.
Step 4		Rub between the fingers.
Step 5		Rub the palm and rub again the wrists.

Step 6		Continue again, to rub the palm and the wrists.
Step 7		Rinse in clean water.
Step 8		Dry thoroughly on a paper towel, leaving no moisture on the hands.

Methods of preventing food contamination

- Do not eat, sneeze, blow, cough, spit or smoke around food or food preparation surfaces.
- Take all practical measures to prevent unnecessary contact with ready-to-eat food.
- Tie back long hair, and take all practical measures to prevent hair contaminating food. N.B. All hair must be covered with a hairnet. Applies to males and females.
- Ensure that working clothes are clean.
- Remove loose jewellery and avoid wearing jewellery on hands and wrists.
- Avoid handling ready-to-eat food such as salads and cooked food; use tongs or other implements instead.
- Make sure bandages and dressings on exposed parts of your body (such as the hands, arms or face) are covered with waterproof coverings.
- Do not eat uncovered food or use equipment and utensils which were uncovered.

Key 2

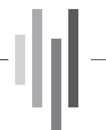
Separate raw and cooked food

- Separate raw meat (beef, lamb, pork), chicken and fish.
- Use separate equipment and utensils such as knives and cutting boards.
- Store foods in containers.
- Food poisoning is common in foods that have been stored, prepared, handled or cooked incorrectly.
- If food is not stored correctly, the germs can reproduce to dangerous levels.

Key 3

Cook food thoroughly

- Cook food thoroughly, especially meat, chicken, eggs and fish.
- Boil foods like soups and stews and make sure they reach about 70°C. For meat and chicken the juices should run clear and not be pink when the cooking process is completed. (Pierce the meat with a fork or skewer to test.)
- Always reheat cooked food thoroughly.



Key 4

Keep food at a safe temperature.

- Avoid leaving cooked food at room temperature for more than 2 hours.
- Refrigerate promptly all cooked and perishable food (preferably below 5°C).
- Keep cooked food piping hot (more than 60°C) prior to serving.
- Do not store food for too long even in the refrigerator.
- Do not thaw frozen food at room temperature; allow it to thaw in the refrigerator.

9) Storing food: Dry storage

- Non-perishable foods should not be exposed to moisture or extreme heat.
- Protect non-perishable foods from a pest infestation, such as insects or rodents.
- Foods should be stored in such a way as to avoid moisture or chemical contamination.
- Label the food containers.
- Store food in a cool, dry place at no more than 27º C.
- Store food off the ground on shelves or pallets.
- Store food separately from chemicals (separate shelves, cupboards, etc.).

Figure 4.3 Dry storage food stored in containers.

Figure 4.4 Dry storage with branded products.

10) Storing food in a refrigerator/freezer:

- Bacteria can reproduce on the perishable foods if they are left at room temperature for more than two hours.
- During summer, bacteria grow even more quickly - after one hour.
- Refrigerate food safely in good time to avoid illness among children and youths.
- Refrigerators should be kept running at between 3-4ºC.
- Foods that should be kept refrigerated or frozen include the following:
  - Frozen – Raw meat, poultry, seafood
  - Refrigerated - eggs or egg products, dairy products, fruits and vegetables, leftover food, open cans or jars.
- Freezing food prevents most bacteria from growing.

Key 5

Use safe water and raw materials.

- Use safe water or treat it to make it safe.
- Select fresh and wholesome foods.
- Choose foods processed for safety, such as pasteurized milk.
- Wash fruits and vegetables, especially if eaten raw.

Methods of shopping for food:

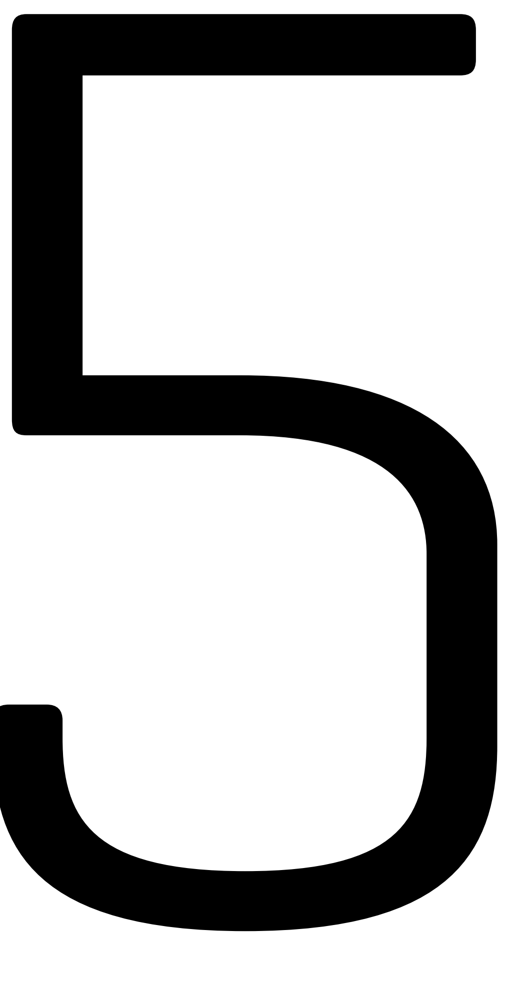
a. The correct method of shopping for food:

- Plan meals to be served a week in advance; it saves time and money.
- Write a shopping list and stick to it; avoid marked down products that are not needed.
- Buy fruits and vegetables in season as they are more affordable.
- When buying start with non-perishables (rice, canned food, spices etc.), followed by refrigerated or frozen items.
- Do not buy meat or chicken that is sold in packaging that is torn or leaking.
- Do not buy food older than the "Sell-By" or "Use-By" dates or any other expiry dates.
- Store food at the correct temperature (in the fridge or storeroom).

b. Avoid buying/ shopping products with signs listed below:

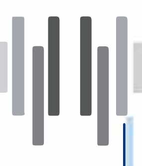
- Cans or containers are dented, swollen or leaking.
- Products have damaged or faulty packaging.
- Eggs are cracked or dirty.
- Chilled or frozen foods have been left out of the refrigerator.
- Products are stained or mouldy.
- Ready-to-eat foods are left uncovered on counters.
- Hot food, like take-aways, is not steaming hot.
- Do not buy any food products where you have doubts about the quality.

Figure 4.4 Do not buy food items with these signs.



SECTION D

FOOD PRODUCTION



5 Contents of section D

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5.1 Standard procedures for food purchasing.

Think of the following:

- Quality of food purchased (foods in season are usually of higher quality and have a longer shelf life).
- Amount of food purchased
- Prices at which food is purchased
- Determine correctly what quantity of food is required
- Use the set cycle menu (Example Annexure)
- Check food as it is received/ delivered.
- Familiarise yourself with perishable food which is fresh foods items that have a relatively short shelf life and non-perishables which are food items that have a relatively long shelf life (See Table 4.1).

5.1.1 Food purchasing procedures:

- Perishables: items that are fresh foods and have a relatively short shelf life (See Table 4.1).
- Non-perishables: food items that have a relatively long shelf life (See Table 4.1).

Table 5.1 Food and categories for purchasing

Perishable food	Semi-perishable food	Staple, or non-perishable, foods
Meat	Grain products (wheat, rice, oats, bread, pasta, maize meal)	Sugar
Poultry (chicken)	bread, cake, pies, pastries	Dried beans
Fish	Dry mixes (soups, spices)	Flour
Vegetables		Canned goods
Milk		
Many raw fruits		
Eggs		

5 .2 The general process for receiving stock

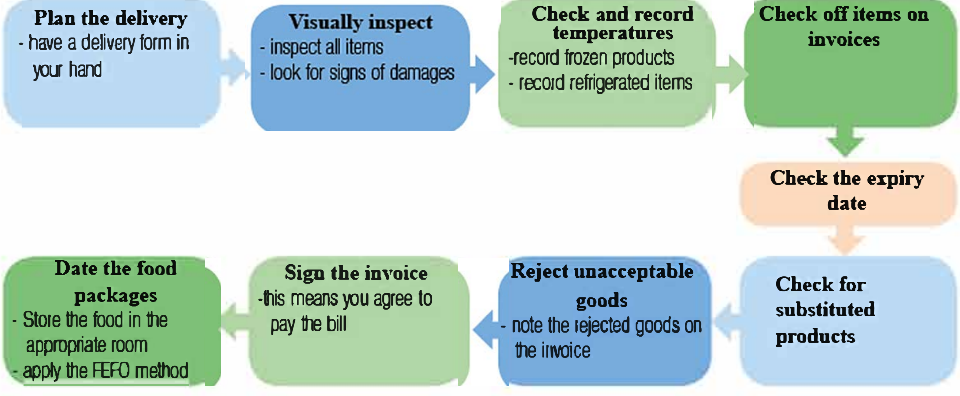


Figure 5.1 Receiving stock in the kitchen.

5.2.1 During receiving a check for visible signs of food spoilage.

When receiving deliveries, check for the following visible signs of spoilage:

- Change in the colour of food (e.g. mouldy bread).
- The smell of the food.
- Damaged or swollen cans.
- Frozen food products that are beginning to thaw.
- Products frozen together that should be frozen individually, e.g. mixed portions of chicken.

Figure 5.2 Signs of food spoilage

5.2.2 Food storage:

- Store dry foods in a well-ventilated room, at least 15 cm off the floor and away from the walls.
- The first-to expire, first-out (FEFO) principle should be applied at all times.
- Opened packages should be stored in closed, durable, labelled containers.
- Chemicals, cleaning products and pesticides should be stored away from food products.
- Shelving and floor should be kept clean at all times.

Figure 5.3 Food Storage

5.2.2.1 Use the following method to store food:

- Look at the expiry date of the products.
- Store items using the FEFO (first to expire, first-out) principle.
- Store new stock behind old stock on shelves and in cupboards so that the old stock is used first.
- If possible, store food and chemicals in different storerooms.
- Date new foods on delivery and store them behind the current stock.

- Store food in clean, secure containers to prevent pest and rodent infestation.
- Store food off the floor and away from the walls.
- Keep the shelves and floor clean.

a. Procedure for storing frozen foods:

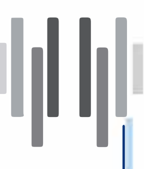
- Store frozen foods between 0°C and -12°C.
- Use the FEFO (first to expire, first-out) principle.
- Wrap food securely to prevent freezer burn.
- Defrost the freezer as required.
- Keep shelves and floor clean.
- Clean up spilt food immediately.

b. Procedure for storing refrigerated foods:

- Store foods at 5°C or below.
- Store raw meat on the bottom shelf in a leak-proof dish away from other foods.
- Store dairy products away from foods with a strong odour, if possible.
- Use the FEFO (first to expire, first-out) principle.
- Store foods to allow cool air circulation on all surfaces.
- Prevent condensation from dripping on food.
- Keep refrigerator and freezer doors closed.
- Keep the shelves and floor clean.

5.2.4 Issuing of food:

- Issue only the quantity of food needed for the day.
- One person should monitor the direct issuing of food from the storage area.
- All storage areas should be locked when unattended.
- Access to all storage areas should be limited to reduce theft.
- Unused food should be given back to the person responsible for the storeroom.
- Unannounced spot checks of inventory should be carried out.
- A physical inventory of all food on hand should be taken periodically.
- The total value of inventory on hand should be used to calculate the "cost of food used".



5.3 Food preparation:

- Wear protective clothing.
- Cover your hair with a hair net and remove jewellery! Hair and jewellery attract germs.
- Make sure that the kitchen and preparation surfaces are clean before you start cooking.
- Wash your hands thoroughly with hot soapy water.
- Gather all the food items you need and check that they are in good condition.
- Wash fruits and vegetables before cooking.
- Separate raw meat, poultry and fish from other foods.
- If possible, use separate equipment and utensils such as knives and cutting boards for different foods (see different colours of cutting boards below); alternatively, wash them thoroughly with soap and water.
- Store food in containers/ bowls to avoid contact between raw and prepared foods.

5.3.1 Selection of a correctly coloured cutting board:

- Prevent cross-contamination by using the correct colour-coded cutting boards or thoroughly wash cutting boards with soap and water.
- Cutting boards come in six different colours as displayed below.
- Each food type is assigned a different colour cutting board e.g. raw fish and seafood, raw poultry, dairy, raw meat, cooked meat, and fruits and vegetables.
- Use colour charts placed on the wall.
- Over time the use of the correct cutting board will become easier as you learn to remember the colours.
- Should you not have differently-coloured cutting boards, mark your boards in some way to indicate what it is to be used for; for example, meat, vegetables and bread etc.

Table 5.2 Differently-coloured cutting boards and items for use.

Cutting board	Colour	Usage
	White	Bakery and dairy
	Yellow	Cooked meat
	Blue	Raw fish

	Red	Raw meat
	Tan	Vegetables
	Green	Salads and fruits

- Food should be thawed on the open counter or in hot water and must not be left at room temperature for more than two hours.
- The safe ways to thaw food are in a refrigerator, in cold water or in the microwave.
- Appropriate safety measures must be observed during the meat defrosting process to avoid germs breeding.

5.3.2 Defrosting using a refrigerator:

- Plan ahead for a large frozen chicken as they need at least 24 hours for every 2kg.
- Small portions of frozen food — such as a gram of minced meat or chicken breasts — require a full day to thaw.
- Food requires a longer time to thaw in a refrigerator.
- Refrigerator-thawed minced meat, meat, chicken and fish should remain safe and in good quality for an additional day or two before cooking.
- Thawed red meat for stews (such as beef, pork or lamb/ mutton) should remain safe and of good quality for 3 to 5 days.

Figure 5.6 Refrigerator thawing

5.3.3 Defrosting using water:

- Defrosting in water is quicker than refrigerator defrosting but requires more attention.
- When defrosting frozen food, submerge the bag in a bowl or basin of cold tap water.
- Never use hot water, as that can cause the outer layer of the food to heat up to a temperature where germs can begin to multiply.
- The food must be placed in leak-proof packaging or a plastic bag.
- If the bag leaks, bacteria from the air or surrounding environment could be introduced into the food. Also, the meat tissue may absorb water, resulting in a watery product.
- The bag should be placed in a basin filled with cold tap water, which should be changed every 30 minutes so that the defrosting process continues.
- Small packages of meat, chicken or fish — about a kilogram — may thaw in 1 hour or less.
- A 1.8 kg package may take 2 to 3 hours. For a full chicken, estimate about 30 minutes per kilogram.
- Once thawed, food must be cooked immediately. Foods thawed by using the cold water method should be cooked before refreezing.

Figure 5.7 Cold-water thawing

5.3.4 Defrosting using a microwave:

- After defrosting in the microwave, always cook the food immediately, whether by microwave cooking, in a conventional oven, or by grilling.
- Keeping partially cooked food is not recommended because any bacteria present wouldn't have been destroyed and the food may have reached optimal temperatures for bacteria to grow.

Figure 5.8 Microwave defrosting

5.3.5 Cooking without defrosting:

- It is safe to cook foods from the frozen state.
- The cooking will take longer than the set time for fully defrosted or fresh meat and poultry.
- When the meat is defrosted, it means you are ready to start cooking.
- If you are using a recipe, read it carefully so that you do not overlook any ingredients.
- Remember the rules for healthy eating and stick to them when preparing the meal.
- Estimate the cooking time of each dish so that everything is ready at the same time.
- When you cut food, like meat and vegetables, be sure to use a different colour cutting board and to clean the cutting board and utensils thoroughly after use.
- Do not put dirty vegetables, such as earthy potatoes on your cutting board; soil contains a number of germs that can be harmful.
- Wash your hands' in-between tasks as they can get dirty or sticky from the food you touched or from working on another dish, touching yourself, after sneezing/coughing, after visiting the toilet.
- Cook everything thoroughly, especially meat, poultry, eggs and fish to make sure it is cooked throughout.
- When boiling food like soups and stews make sure that they reach 70°C.
- For meat and poultry, make sure that the juices run clear, not pink.
- Put sensitive food like meat and dairy products back into the fridge once you are done with them.
- Reheat cooked food thoroughly.

5.4 Keeping food at a safe temperature after cooking:

- Do not leave cooked food at room temperature for more than 2 hours.
- Refrigerate promptly all cooked and perishable food (preferably below 5° C).
- Keep cooked food piping hot (more than 60° C) prior to serving.
- Do not store cooked food for a long time even in the refrigerator.
- Do not thaw frozen food at room temperature; defrost it overnight in the fridge or in the microwave oven.

5.5 Food serving procedures:

- Serve food on a plate or in a bowl.
- Discard any cracked or chipped plates and bowls.
- Teach children and youths not to lick the utensils.
- If a utensil is licked, remove it and replace it with a clean utensil.
- Give children clean utensils and napkins if these items are dropped on the floor during the meal or snack time.

5.6 After food preparation:

- Clean up when you have finished cooking.
- Safely store all leftover food immediately after a meal.
- Make sure to wrap up open packages, for example, rice or pasta, or put the rest of the food you did not use into a container to keep it fresh and protect it from contamination.

- Put leftovers in containers/ bowls or bags and put them in the fridge to keep fresh.
- Leftovers stored at room temperature are likely to go off quickly.
- Clean up the kitchen and all preparation surfaces with hot, soapy water and a clean cloth.
- When food has burned in a pot or pan you can use the cooking water from pasta or potatoes to soak it. Starch will help with the cleaning.
- Wash all used items in hot, soapy water, dry them and put them back on the shelves.
- Make sure that cutting boards and wooden utensils are completely dry. Dampness is a breeding ground for germs and can cause the wood to grow mould.

5.6.1 Treatment of left-overs:

- Leave room for air to circulate around food stored in the refrigerator, freezer and storeroom.
- Cover all food in the refrigerator, freezer and storeroom.
- Date all foods/ containers and use the oldest foods first.
- Limit added salt, fat, and sugar in food preparation.
- Use herbs, spices, marinades, stocks and fruit and vegetable juices to add flavour.
- Make the shape, size, colour, texture, flavour and quality of foods appealing.

5.6.2 Treatment of food waste:

- Reuse the leftovers – e.g. grains and legumes: make rice salad etc.
- Leftover meats: add to soups or sandwiches by making chicken salads; thinly slice beef or pork, or shred it and make into mince-meat.
- Leftovers. Place leftovers in containers and label them using masking tape.
- Keep your refrigerator and pantry organised.
- Serve small portions (especially to children).
- Don't buy food without having a menu plan in mind.
- Consider having a 'leftover night' to eat up leftover food.

5.7 Dishwashing techniques:

- Rinse dishes and stack them in piles.
- Fill the sink with hot, soapy water (do not use too much soap).
- Wash glasses first before any other items.
- Place all the cutlery in the water to one side.
- Place 4-6 plates/ bowls at a time in the water (add more if you have a big sink).
- Allow time for the plates and the cutlery in the sink to soak.
- Then place glasses into the sink with warm water and soap; you can add as many as you wish.
- Keep placing more dirty dishes in the sink when space permits. If the water starts getting too dirty, change it.
- Rinse each item under running hot water.

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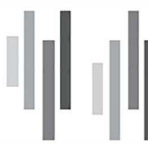
ANNEXURE A

RECIPES



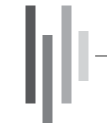
Samp and Beans (Isitambu)

Maximum portions: 15
Estimated portion size per person: 100g
Preparation time: 2h 10 minutes

10 Portions	15 Portions	Portion measure	Ingredients
6	9	cup	Samp
3	4½	cup	Beans
3	5	medium	Onions
2	3	medium	Green, red or yellow peppers (optional)
4	6		Bay leaves (optional)
4	6	tablespoon	Tomato purée
2	3	tablespoon	Garlic powder, ground red and black pepper and onion powder
2	3	tablespoon	Curry powder
	1	teaspoon	Salt to taste
1	1.5	Kg	Cubed beef (optional)
2	3	each	Beef stock cube

Preparation method

- ✓ Soak samp and beans in water overnight.
- ✓ Rinse and transfer into a large pot and start cooking.
- ✓ Boil water and salt.
- ✓ Boil the samp and beans for 45 minutes at medium heat.
- ✓ Check that the water does not evaporate. If it does, top it up with warm water. (Optional: after this time, add the beef).
- ✓ Cover and boil at medium heat for a further 1½ hours.
- ✓ Again, ensure that there is always enough water.
- ✓ When the samp, beans and beef are tender, cook further to allow the remaining water to evaporate. Remove from heat and set aside.
- ✓ In a separate pot, fry the onion and bell peppers together at low heat, adding the spice blend.
- ✓ Add the tomato purée and cook gently, adding a little water. After ± 10 minutes cooking time, stir this mixture into the samp, beans and beef.
- ✓ Cover and cook at low heat, stirring occasionally for 30 minutes.
- ✓ Add salt and pepper to taste.
- ✓ When ready the samp and beans should be soft and the meat should fall apart easily.



Uphuthu na Masi (Crumbly Mealie Pap with Amasi)

Maximum portions: 15
Estimated portion size: 100g (pap)/ 20ml Amasi
Preparation time: 45 minutes

4 Portions	15 Portions	Portion measure	Ingredients
450ml	6.7	litres	Boiling water
4	9.3	kg	Mealie meal
¾	1	teaspoon	Salt to taste Optional
3	5	teaspoon	Cooking oil
160ml	2.4	litres	Amasi

Preparation method

- ✓ Boil water and salt in a large pot.
- ✓ Add oil to the water and allow it to melt.
- ✓ Add the mealie meal.
- ✓ Remove from heat and stir with a fork until incorporated into a perfect, crumbly texture.
- ✓ Return to low heat and cover with a lid.
- ✓ Steam the maize meal, covered, at low heat, until the maize meal is cooked through, about 45 minutes.
- ✓ Fork through the mixture every 5 minutes to avoid big lumps from forming; rather, create small and crumbly pieces.
- ✓ Serve with Amasi

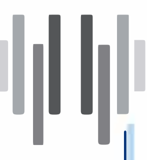
Boiled Rice

Maximum portions: 15
Estimated portion size: 100g
Preparation time: 30 minutes

10 Portions	15 Portions	Portion measure	Ingredients
475	712	g	Long-grain white rice
1	1.5	litre	Water
5	7.5	teaspoon	Salt

Preparation method

- ✓ Wash rice in cold water until water runs clear.
- ✓ Combine all ingredients in a heavy pot.
- ✓ Bring to the boil.
- ✓ Stir, cover and cook at very low heat.
- ✓ Cooking time should be 15-20 minutes.
- ✓ Test rice to see it is thoroughly cooked. If not, cook for a further 2-4 minutes.
- ✓ Remove the pot of rice from the heat
- ✓ Allow to cool down.
- ✓ Serve with a stew of your choice.



PROTEIN DISHES: MEAT, CHICKEN, FISH AND SOYA

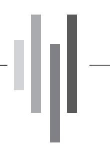
Beef Stew

Maximum portions: 15
Estimated portion size: 150g
Preparation time: 1 hour

10 Portions	15 Portions	Portion measure	Ingredients
8	12	tablespoon	Oil
4	6	each	Onions, chopped
1	2	tablespoon	Medium curry powder
1.2	1.7	kg	Stewing beef on bones cubed
2½	4	each	Beef stock cubes
1	1.5	litre	Boiling water
3	5	teaspoon	Tomato paste
4	6	each (large)	Potatoes, cut into chunks
4	6	each	Carrots
4	6	each	Green pepper
500	750	g	Green beans, cut diagonally
450	675	g	Peas, frozen
1½	2½	cup	Rice, uncooked
¾	1½	teaspoon	Salt
2	3	cup	Lentils, uncooked

Preparation method

- ✓ Heat oil, brown the onions then add green pepper and curry powder and shallow fry.
- ✓ Add the beef cubes and fry until browned on all sides.
- ✓ Dissolve the stock cubes in boiling water, add it to the stew together with the tomato paste and stir well.
- ✓ Simmer until the meat is almost tender, topping up with water if necessary.
- ✓ Once the meat is slightly tender, add the potatoes and simmer for 10 minutes or until potatoes are cooked.
- ✓ Add carrots and green beans and allow to boil for 10 minutes. Remove pot from the stove; making sure the lid is slightly closed.
- ✓ Add the peas and serve with rice.



Tomato Pilchard Pasta with Spinach

Maximum portions: 15
Estimated portion size: 200g pasta & pilchards
Preparation time: 25 minutes

4 Portions	15 Portions	Portion measure	Ingredients
Pasta			
200	750	g	Spaghetti/ Macaroni
400	1.5	ml/ litres	Water
½	1½	teaspoon	Salt
1	4	tablespoon	Sunflower oil
Tomato pilchard			
2	8	teaspoon	Crushed garlic
1	4	each	Onion
1	4	each	Red pepper (Optional)
2	5	tin	Pilchards in tomato sauce
½	1½	bunch	Spinach, chopped
1	2 (50g)	packet	Savoury mince, dry Cook-in-Sauce

Preparation method

- ✓ Bring salted water to the boil using a large pot (1.2 litres of water with 1½ teaspoons salt).
- ✓ Cook the spaghetti until al dente (cooked but firm to the bite) then drain and set aside.
- ✓ Heat oil in a large pot/ deep pan.
- ✓ Fry the garlic, onion and red pepper (optional) until soft.
- ✓ Add tinned pilchards (do not remove the bones, as they are high in calcium), water, and spinach to the garlic, onion and red pepper mixture.
- ✓ Stir in the mixture of savoury mince, dry and Cook-in-Sauce.
- ✓ Allow simmering for 15 minutes on a low heat while stirring occasionally until the spinach is cooked (be careful not to break up the pilchards too much when stirring).
- ✓ Combine the sauce with the cooked spaghetti and transfer to a serving dish and serve immediately.

Chicken Sishebo

Maximum portions: 15
Estimated portion size: 150g
Preparation time: 55 minutes

6 Portions	15 Portions	Portion measure	Ingredients
1	9	tablespoon	Cooking oil
1.5	9	each	Onions, chopped
2	3	tablespoon	Curry powder
2	3	tablespoon	Chicken spice
1	9	each	Tomato, chopped
2	9	each	Carrots, chopped
500g	7.5	kg	Mixed chicken pieces
2	9	each	Potatoes, peeled and chopped
1	9	cube	Chicken stock
2	9	cup	Water
2	2½	packet	Brown onion soup

Preparation method

- ✓ In a pot, fry the onions in oil until they turn brown and are soft.
- ✓ Add medium curry powder, chicken spice and tomatoes to the fried onion.
- ✓ Fry the mixture for about two minutes.
- ✓ Add carrots, potato, water and chicken stock cube.
- ✓ Stir well and allow to simmer for 30 minutes with the lid on, while stirring occasionally.
- ✓ Before serving, mix the brown onion soup with 4 tablespoons of water to make a smooth paste and add it into the pot.
- ✓ Allow it to simmer for further 5 minutes to thicken.
- ✓ Serve with pap, rice or any other starch of your choice.

Soya Mince Curry

Maximum portions: 15
Estimated portion size: 150g
Preparation time: 60 minutes

3 Portions	15 Portions	Portion measure	Ingredients
¾	10	each	Onions
2	5	teaspoon	Cloves garlic, crushed
1	5	teaspoon	Fresh ginger, grated
1	5	teaspoon	Oil
¾	2	teaspoon	Whole cinnamon stick Curry powder
¾	2	teaspoon	Ground cumin (jeera)
½	2	teaspoon	Ground coriander/ turmeric
2	5	each	Tomato skinned and finely chopped
½	2	cup	Soya mince (herb-flavoured), (Optional)
1	2½	cup	Peas

Preparation method

- ✓ Sauté onion, garlic and ginger using a little oil, until the onions are soft.
- ✓ Add a cinnamon stick and other seasonings and stir.
- ✓ Add tomato and soya mince to 2.5 litres of water and simmer until the soya is soft, for at least 15 minutes.
- ✓ Add peas just before the end of the cooking time and season with salt and pepper to taste.
- ✓ Simmer until the peas are heated through.
- ✓ Serve with rice, uphutu or any starch of your choice.

Soya Mince Stew

Maximum portions: 15
Estimated Portion size: 150g
Preparation time: 60 minutes

3 Portions	15 Portions	Portion measure	Ingredients
½	2½	cup	Soya mince
1	5	small	Onion, sliced into rings
½	2½	each	Green pepper (chopped)
2	10	each	Carrots (diced) Seasoning to taste
2	10	teaspoon	Curry powder
			Oil to cover the base of the pan
1	5	cup	Water

Preparation method

- ✓ Soak soya mince in cold water for 30 minutes.
- ✓ Sauté vegetables in heated oil and add curry powder, fry for 1 minute.
- ✓ Add soya mince, water and other seasonings.
- ✓ Simmer until the mixture is well cooked.
- ✓ Serve hot with pap/ rice/ mashed potatoes.

Soya Mince Balls

Maximum portions: 15
Estimated Portion size: 150g
Preparation time: 60 minutes

6 Portions	15 Portions	Portion measure	Ingredients
2	5	cup	Soya mince
½	2½	small	Onion (chopped)
2	10	slices	Brown bread (dry)
1	3	each	Eggs
Pinch	1	teaspoon	Salt and pepper
1	3	cup	Water (for soaking soya mince)
1	3	teaspoon	Oil
½	2½	cup	Flour for shaping

Preparation method

- ✓ Soak soya mince in water for 30 minutes.
- ✓ Remove crust from the bread and crumb it into the soya.
- ✓ Add seasoning together with chopped onion and egg to bind the mixture.
- ✓ Divide the mixture into equal parts and shape it into balls using floured hands.
- ✓ Place into a pan which is greased with oil and toss until the mixture turns golden brown.
- ✓ Serve with tomato gravy and rice.

Tomato Onion Gravy/Sauce

Maximum portions: 15
Estimated portion size: 50ml
Preparation time: 20 minutes

6 Portions	15 Portions	Portion measure	Ingredients
2	6	tablespoon	Cooking oil
2	6	each	Tomatoes (Chopped)
1	6	small	Onions (chopped)
1	6	teaspoon	Crushed garlic
1	6	teaspoon	Sugar
pinch	1	teaspoon	Salt and pepper

Preparation method

- ✓ Heat oil in a pot and fry onion until it is soft.
- ✓ Add chopped tomatoes, crushed garlic and sugar.
- ✓ Allow the mixture to cook on a medium heat for about 30 minutes, stirring every 5 minutes to ensure that it does not stick.
- ✓ Season with salt and black pepper for taste (optional).

Sweet and Sour Beetroot

Maximum portions: 15
Estimated Portion size: 60g
Preparation time: 60 minutes

4 Portions	15 Portions	Portion measure	Ingredients
4	15	each (medium)	Beetroot
1	4	each (medium)	Onion, sliced into rings
1½	5	tablespoon	Mild chutney
5½	20	tablespoon	Sugar
2	8	teaspoon	Corn flour
4½	16	tablespoon	Vinegar
3½	14	tablespoon	Water
			Pinch of salt

Preparation method

- ✓ Wash beetroot well and boil in water for 30 to 60 minutes, or until tender.
- ✓ Put cooked beetroot in cold water for few minutes before removing the skins.
- ✓ Slice beetroot into rings or dice.
- ✓ Add sliced onions.
- ✓ Mix together chutney, sugar, cornflour, vinegar, water and salt.
- ✓ Boil until sauce thickens.
- ✓ Pour sauce over beetroot and onion, and allow to cool before serving.

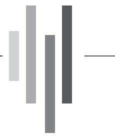
Classic Coleslaw Salad with Mayonnaise

Maximum portions: 15
Estimated portion size: 60g
Preparation time: 60 minutes

5 Portions	15 Portions	Portion measure	Ingredients
1 (500g)	3 (1.5kg)	medium	Cabbage
1	3	large	Carrots, grated
3	9	tablespoon	Mayonnaise
2	6	tablespoon	Sugar
½	2	teaspoon	Pepper
1	3	tablespoon	Lime juice (optional)
			Salt to season

Preparation method

- ✓ Slice the cabbage thinly.
- ✓ Grate carrots using the large-holed surface of the grater.
- ✓ Place cabbage and carrots in a large bowl.
- ✓ Add mayonnaise, sugar, lime (optional) to the bowl and combine all ingredients until the vegetables are completely coated with mayonnaise.
- ✓ Season with salt and pepper.
- ✓ Coleslaw tastes better when it is slightly cold (once the salad has been made, cover it with cling wrap and refrigerate).
- ✓ Before serving, mix through again and taste the mixture for seasoning (if not well seasoned, add seasoning).



ANNEXURE B

Food Safety Check List for Food Handlers

Food Safety Check List for Food Handlers

(For Managers' use)

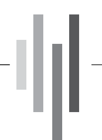
Date:____________________________________ **Assessed By:** ____

PERSONAL HYGIENE

No	Description	Yes	No	Corrective Actions
1	Food handlers are wearing a proper uniform: Chef's jacket, trousers, shoes, hat and shoes.			
2	Shoes are comfortable and clean.			
3	Hair is covered. Long hair is tied back.			
4	Fingernails are short, unpolished, and clean.			
5	Jewellery is limited to watch, small earrings and a wedding ring.			
6	Hands are washed before and during food preparation.			
7	Use soap allocated in the sink and towels.			
8	Gloves are changed when necessary.			
9	Open sores, cuts and bandages on hands are completely covered during food handling.			
10	Mannerisms are avoided all times, including running figures through the hair, chewing gum and scratching the face.			

Food storage

No	Description	Yes	No	Corrective Actions
10	All food supplies are kept 6 to 8 inches off the floor.			
11	Food items are labelled with names.			
12	Apply the first expired, first-out (FEFO) method of stock inventory.			
13	Check and remove bulging, dented or leaking canned goods in storage.			
14	Protect food from contamination; e.g. keep cooked meat separate from raw meat.			
15	Keep preparation surfaces and floors clean.			
16	Store chemicals away from food and other food-related supplies.			



Refrigerator and freezer

No	Description	Yes	No	Educative Actions
17	A thermometer is visible and accurate			
18	In a walk-in fridge, food must be stored 15 cm off the floor.			
19	Units are kept clean.			
20	Appropriate chilling procedures are practised.			
21	All foods are properly wrapped, labelled and dated.			
22	Apply the first expired, first-out (FEFO) method of stock inventory.			

Handling of food

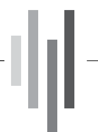
No	Description	Yes	No	Corrective Actions
23	Thaw frozen food under refrigeration or in cold water.			
24	Not allowing food to be kept in the temperature danger zone for more than 4 hours.			
25	Taste food, using the proper method.			
26	Food is not cross-contaminated.			
27	Food is not allowed to be handled without utensils, clean gloved hands, or clean hands.			
28	Utensils are used to avoid touching prepared portions of food.			
29	Wash reusable towels regularly.			
30	Foodservice unit is clean.			
31	Food is heated before placing in the holding area.			
32	Food is safe from contamination.			

Utensils and equipment

No	Description	Yes	No	Corrective Actions
30	Small equipment and utensils, including cutting boards, are sanitized after use.			
31	Equipment and utensils are air dried.			
32	Worksurfaces are washed and sanitized after use.			
33	Can-opener is clean to sight and touch.			
34	Small equipment is inverted, covered or otherwise protected from dust or contamination when stored.			

Cleaning and sanitation of equipment and utensils

No	Description	Yes	No	Corrective Actions
35	Double-sink sink is used.			
36	Sink is properly set up for washing and rinsing.			
37	The water temperature is accurate.			
38	Water is clean and free of grease and food particles.			
39	The utensils are allowed to air dry.			
40	Wiping cloths are clean and sanitised.			
41	Open windows and doors for air ventilation.			
42	Report any evidence of pests.			

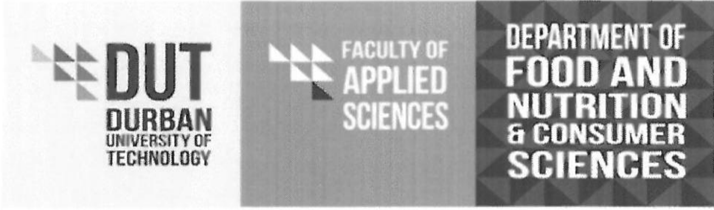


Garbage storage and disposal

No	Description	Yes	No	Corrective Actions
43	Kitchen refuse cans are clean.			
44	Refuse cans are emptied when necessary.			
45	Refuse cans are kept covered.			

Food Safety checklist for Food Handlers (USDA 2019).

Annexure L



Dear Professor Dr du Toit

Re: Request for expert contribution to the development of a food service operation manual and nutrition guidelines for child and youth care workers, working in residential care facilities in KwaZulu Natal.

My Name is Mumsy Chibe a registered Doctorate student at the Durban University of Technology. As part of working toward completing the qualification, an Operational manual which is approximately 60 pages long was developed with the aim of assisting Child and Youth Care Workers to improve food handling and hygiene practices and nutritional knowledge.

I am writing to humbly request your service and expertise to serve as an ``External Expert'' on the manual which is part of my Doctoral study titled: *Development of a food service operation manual and nutrition guidelines for child and youth care workers, working in residential care facilities for children in KwaZulu Natal.*

My supervisors and I believe that your knowledge and insights would be very valuable and would greatly enrich my work.

I am grateful for your time and consideration and I hope that you will be able to accept my request. A copy of the manual will be sent to you as soon as we receive back a letter of acceptance from you.

Should you have any questions or need any further information, please don't hesitate to contact Miss Chibe (073 162 1612)/ Professor Napier (031 373 2326).

Yours Sincerely,

Mumsy Chibe (PhD. Student)

Supported by,

Prof. C Napier	Dr. H Grobbelaar
Research Supervisor	Co-Supervisor

Annexure M

FOCUS GROUP DISCUSSION GUIDE

PRE -IMPLEMENTATION (DATA COLLECTION)

1. Today's topic is on the developed child nutrition, healthy eating, and food preparation guidelines which is focusing on menu planning, nutritious recipes suitable for children 5 to 18 years of age, nutrition guidelines for children and safe food handling practices and preparation, for CYCWs in CYCC's;
2. What are the specific issues you have with:
   - (a) Menu planning
   - (b) Nutritious recipes
   - (c) Following nutritional guidelines
   - (d) Food handling practices
   - (e) Food preparation
   - (f) concerns, or
2. What do you already know about these topics:
   - (a) Menu planning
   - (b) Nutritious recipes suitable for children 5 to 18 years of age
   - (c) Nutrition guidelines for children and
   - (d) Safe food handling practices and preparation
3. If these guidelines are implemented in the centre, how do you think it is going to assist you?

Annexure N

FOCUS GROUP DISCUSSION GUIDE

Aim: To develop guidelines on menu planning, nutritious recipes suitable for children aged between 5 to 18 years of age, nutrition guidelines for children and safe food handling practices and preparation, for CYCWs in the Child and Youth Care Centres.

Objective: To test the validity and usefulness of the child nutrition, healthy eating, and food preparation guidelines by conducting.

- Pre and post the use of the child nutrition, healthy eating, and food preparation guidelines. -
- Online focus group interview to determine the change in practices and knowledge.

- Make corrections to the guidelines.

- Finalise the child nutrition, healthy eating, and food preparation guidelines and bind.

DATA COLLECTION QUESTIONS

POST-IMPLEMENTATION (DATA COLLECTION)

1. How user friendly is the guidelines in terms of language, structure, and content?

2. How useful was the child nutrition, healthy eating, and food preparation guidelines in guiding the following;

(a) Menu planning

(b) Nutritious recipes

(c) Following nutritional guidelines

(d) Food handling practices

(e) Food preparation'

(f) concerns, or

3. What have you learn about these topics;

(a) Menu planning

(b) Nutritious recipes suitable for children 5 to 18 years of age

(c) Nutrition guidelines for children and;

(d) Safe food handling practices and preparation

4. What would be your specific views on the implementation process of the guidelines. in respect to the following aspects:

5. What are recommendations on the implementation process of the guidelines?

Annexure O

To Whom It May Concern

Re: Editing of Ph Dissertation:

Guidelines for child nutrition, healthy eating and food preparation in Child and Youth Care Centres in KwaZulu-Natal, South Africa

Written by: Ms Mumsy Evidence Chibe

I have recently edited this paper in terms of language usage and for grammatical correctness.

I am an experienced editor and proof reader and have edited several academic dissertations/theses and various academic papers.

My academic qualifications are as follows:

Bachelor of Arts (English and Afrikaans) (UN Durban)

University Education Diploma (UED) (UN Durban)

Diploma in Translation (Afrikaans/English) (Unisa)

Prior to my early retirement I was for several years initially a senior editor and subsequently a senior publisher with Via Afrika Publishers, which is the educational publishing arm of the Naspers/Media 24 company. I was subsequently employed as a publisher on a contract basis at Oxford University Publishers

Michael Vermeer
Editor Proofreader Translator

4 November 2022