

**KNOWLEDGE, ATTITUDES AND PRACTICES OF BLACK
AFRICAN MALES TOWARDS THE USE OF SUN
PROTECTION: A CASE STUDY OF A UNIVERSITY OF
TECHNOLOGY IN KWAZULU-NATAL**

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Sciences in the Faculty of Health Sciences at the Durban University of
Technology

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Date : September 2021

Declaration

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

13 September 2021

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Abstract

Background

Although there may be some Black African males who are informed about sun protection and may be practicing it, there is still a lack of information amongst many Black African males on sun protection. It is generally recognised that some still think that it only applies to females.

Aim of the study

The aim of the study was to assess the knowledge, attitudes and practices of Black African males towards the use of sun protection at a University of Technology in the province of KwaZulu-Natal.

Methodology

This study was guided by a quantitative research design. A quantitative research approach is methodical and unbiased research that utilises numerical information from a selected sample from a universe or population to generalise the findings only to the population that is being studied. The quantitative research design was selected for this study as it the most suitable, scientific, more controllable, less biased and deals with larger samples to provide more accurate information/results.

The study was conducted at a University of Technology. The participants comprised of Black African male students. The sample size of the study was 409 participants. Descriptive statistics, in the form of tables and graphs, were used to describe the data graphically. In order to test for significant trends in the data, inferential statistics were applied. These included Pearson's correlation, t-tests, Analysis of variance and chi-square tests. Where the conditions were not met for the application of these tests, non-parametric equivalent tests or exact tests were used. Throughout, a p-value of 0.05 was used to indicate significance. The analysis was carried out using SPSS, version 26.

Results

Results revealed that black communities, especially males need to be taught about sun protection. A certain percentage of the participants displayed that they have knowledge about sun protection, but they do not practice it. The study showed that there is still a lot to do in terms of educating the South Africans, especially those that are dark-skinned, about the vitality of sun protection.

Conclusion

In conclusion, skincare sun protection is vitally important for everyone to practice. It is not made for a specific gender; therefore, it is advised to be practiced by everybody, regardless of gender and/or race. Even though black skin has its natural shield (melanin) to protect against harsh sun's ultraviolet(UV) rays, it is still important for Black people to protect themselves from UV radiation. This will help in reducing the chances of developing skin cancer in the long run.

Keywords: Attitudes, knowledge, practices, sunburn, sun protection, skin cancer.

Dedication

This dissertation is dedicated to Mr. BB. and Mrs. MS Mayeza (My parents). They have been my pillar of strength, my providers, my protectors, my advisors, my mentors and my support system. Without them, I would have never made it this far. I would like to thank you for your love that you have shown me and that you still have for me, my siblings and your grandchildren. I love you my parents, may the Good Lord bless you, protect you and keep you for many years. I want you to see your son prevailing in prosperity.

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Glossary of terms

Ultraviolet Radiation

Ultraviolet Radiation (UVR) is divided into two categories, which are Ultraviolet A (UVA) and Ultraviolet B (UVB).

- **UVA:** Cressy (2010: 295) implies that UVA is the lower energy rays that can deeply penetrate the dermis of the skin. They are accountable for aging and they cause disintegration of the collagen fibres and elastin fibres, which maintain the skin's structural integrity, therefore creating lines and creases.
- **UVB:** These are only able to penetrate the superficial layer of the skin (epidermis) and these are rays that are mostly emitted by the sun which are responsible for sunburn (Cressy 2010: 295).

Sunscreen

Sunscreen is any shield that protects the body from the sun. The aim is to prevent the skin damage that comes with UVR from the sun, which in turn can cause skin cancer. Sunscreens are products made by cosmetic companies; they can come in the form of creams or sprays. These products contain different Sun Protection Factors (SPF), depending on, company's preference. Some facial moisturisers and sometimes body lotions/creams contain SPFs. The different other forms of sunscreens may be long-sleeved clothing that covers the body from getting the direct sun. Traditional sunscreens (red clay) are used by people in rural areas who cannot reach supermarkets or pharmacies to purchase the westernised sunscreens.

Sun Protection Factor

Sun Protection Factor (SPF) is a relative measure of how long a sunscreen will shield an individual from ultraviolet (UV) B rays emitted by the sun (MacGill

2018:1). The sunscreens differ in numbers, ranging from SPF 15, 25, 30, 40, 50, 60 up to SPF 100. However, some companies believe that the higher the SPF number (more chemicals), the more detrimental to the skin instead of protecting the skin from UVB from the sun; they prefer lower numbers of SPFs.

Acronyms

Acronym	Full word/sentence
AIDS	Acquired Immune Deficiency Syndrome
ALN	Acral Lentiginous Melanoma
ANOVA	Analysis of Variance
BCC	Basic Cell Carcinoma
CANSA	Cancer Association of South Africa
DUT	Durban University of Technology
HIV	Human Immunodeficiency Virus
KC	Keratinocyte Carcinoma
KZN	KwaZulu-Natal
LMM	Lentigo Malignant Melanoma
MCC	Markel Cell Carcinoma
NM	Nodular Melanoma
SCC	Squamous Cell Carcinoma
SPF	Sun Protection Factor
SPSS	Statistical Package for the Social Sciences
SSM	Superficial Spreading Melanoma
UPF	Ultraviolet Protection Factor (UPF)
UVA	Ultraviolet A
UVB	Ultraviolet B
WHO	World Health Organization

CHAPTER 1: OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

The spread of skin cancer is seen as a universal health problem (Henley *et al.* 2016: 2). According to the Cancer Association of South Africa (CANSA), skin cancer is the most common cancer in South Africa, with about 20,000 reported cases and 700 deaths each year (CANSA 2010: 1). South Africa has the second-highest occurrence of skin cancer in the world following Australia. Evidence shows that South Africans are not adequately practicing protective measures in the sun (Parker 2018: 1). Norval and Wright (2017: 15) argue that while surveys in developed countries have produced information on the occurrence of cutaneous melanoma, the subsequent impermanence, and the changes in the structures over time, data from South Africa is inadequate.

Cancer incidence rates continue to take their toll among persons of lower socioeconomic status and older men. De Castro-Maqueda *et al.* (2019: 2) denotes that sun-related damage that occurs during the initial years of life plays a significant role in the development of skin cancer in later life. Sunburn in childhood and adolescence is the main risk factor for melanoma. The means of photoprotection most commonly espoused, by all age groups, is the use of sunscreen. However, many people apply it insufficiently or incorrectly, thus increasing their exposure to the sun and heightening the risk of sunburn. Consequently, these individuals may have a poor sense of the actions they need to take to reduce or prevent the risk of future skin cancers. Norval and Wright (2017: 8) state that the occurrence of cutaneous melanoma in Black Africans is about 10% less, as opposed to whites, attributed to the protection offered by cutaneous melanin. The incidence has risen in whites over the past 40 years but seems to remain stationary in Black Africans.

Melanoma risk factors are multifaceted, likely to be correlated as well as differences between inhabitant groups and anatomical sites(Norval and Wright 2017: 2). The most common risk factor for skin cancer is sun exposure. There are millions of workers in outdoor occupations who are susceptible to overexposure to solar ultraviolet radiation (UVR), placing them at higher risk of developing skin cancer. UVR can be classified into two groups, which are UVA and UVB. UVA affects the inner layer of the skin (dermis) and UVB affects the topical layer of the skin called the epidermis (Nahar *et al.* 2013: 17).

This study is significantly important especially in KwaZulu-Natal (KZN) as it is one of the provinces with very hot summers, particularly in eThekweni, as temperatures can go up to 35 degrees Celsius. When exposed to these high temperatures, the unprotected skin is more prone to being affected by skin cancer, hence it is important to educate our Black African males about sun protection.

1.2 PROBLEM STATEMENT

Although there may be some Black African males who are knowledgeable about sun protection and may be practicing it, there is still a lack of information amongst many Black African males on sun protection. It is generally recognised that some still think that it only applies to females. It is still a huge concern that the levels of sun protection used are still very low amongst this group which could lead to high levels of skin cancer amongst males due to susceptibility. Todd *et al.* (2019: 25) indicate that more than 11 784 invasive melanoma cases was reported to the National Cancer Registry (NCR). The overall incidence of melanoma for South Africa was 2.7% per 100 000 people for the period of between 2000 and 2013. From these statistics, males accounted for 51% of the cases. Melanoma incidences in the white and black populations were 23.2 and 0.5 per 100 000, respectively. Most cases (73%), were diagnosed at private pathology laboratories. Superficial spreading melanomas (47%) and nodular melanomas (20%) were most predominant.

The chief risk factor for the occurrence of white and probably black skin cancer is sun exposure. Thus, refraining from direct sun exposure at times of highest sun intensity is of supreme importance (Singer, Karrer and Berneburg 2019:46). Bandurek (2020: 2) finds that exposure to UVR is the primary cause of skin cancer. This can be directly from the sun or through man-made sources such as sunbeds and other UVR emitting sources. The role of sun damage is underpinned by the association between measures of sun sensitivity and skin cancer incidence, which is higher in people who have pale skin that burns without tanning, blue eyes and fair hair. Several studies conducted, for example, Singer, Karrer and Berneburg (2019:25) and Bandurek (2020:2), indicate that the most dominant skin cancer contributor is sun exposure. Gruber, Shah and Zito (2019: 7) articulate that there are misconceptions that dark-skinned people do not get skin cancer which may lead to the diagnosis of it in an individual at very late stages. Gohara (2015: 17) conveys that when approaching Black African populations, issues related to skin cancer might not be the priority in their minds. Although cutaneous malignancies are not enormously mutual within this group, mortality rates remain much higher when equated with that of the white counterparts. It can be inferred that these discrepant outcomes may be accredited to both late detection and/or biologically more aggressive tumours.

1.3 AIM OF THE STUDY

The aim of this study was to assess the knowledge, attitudes and practices of Black African males towards the use of sun protection at a University of Technology in the province of KwaZulu Natal(KZN).

1.4 RESEARCH OBJECTIVES

The objectives of the study were to:

- Assess the knowledge of Black African males regarding the use of sun protection.

- Determine the attitudes of Black African males towards the use of sun protection.
- Determine the practices of Black African males with the use of sun protection.

1.5 RESEARCH QUESTIONS

- What is the knowledge of Black African males regarding the use of sun protection?
- What are the attitudes of Black African males towards the use of sun protection?
- What are the practices of Black African males with the use of sun protection?

1.6 SIGNIFICANCE OF THE STUDY

This study is vitally important as it aims to educate men, especially Black African males, about skincare and the importance of preventing skin damage that may be caused by excessive sun exposure and other extrinsic factors. This will increase awareness amongst South African males and all persons about skin conditions that may be due to ultraviolet radiation (UVR) exposure that is emitted by the sun.

Additionally, this study will equip males with skincare practices to protect the skin against harsh environments. The wellness sector may benefit from this study, as it will be specifically educating males on skincare routine. Many skincare products for men are available. This study may further trigger other product houses to also develop sun-protective skincare products for men. This study is also done to generate data that can be useful towards pinpointing knowledge gaps, cultural beliefs, as well as behavioral arrays that may identify needs, problems and barriers to assist plan and implement interventions. It will also help in deepening the understanding of commonly accepted information, the attitudes and factors that influence behavior. This study also aims at generating baseline levels and measure changes that result from the interventions.

1.7 STRUCTURE OF DISSERTATION

Chapter 1	Orientation to the study.
Chapter 2	Literature review.
Chapter 3	Theoretical framework.
Chapter 4	Research design and methodology.
Chapter 5	Presentation of results.
Chapter 6	Discussion of results.
Chapter 7	Conclusion, limitations and recommendations.

1.8 SUMMARY OF THE CHAPTER

This chapter has presented the background of the study, which also emphasised that there is a huge need for South African males to be educated on skincare routines as it is generally known that females are the ones who tend to take care of their skin more than males do. Sun protection has been identified as the main subject of education to males, in order to prevent the occurrence of skin cancer and other skin conditions/disorders that develop, following overexposure to UVR. Chapter 2 presents the literature review .

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The literature review is an organised, written presentation of what the researcher finds when one reviews the literature. This summarises what has been published on a topic by scholars and presents relevant research findings. It provides the background for conducting the study and interpreting the findings (Gray, Grove and Sutherland 2017: 120). This chapter deliberates on reviewing the existing literature and discusses the skin and its function, the impact of the sun on the skin and existing cancers and other skin conditions that are caused by prolonged sun exposure as well as those that are more dominant in males. This review provides updated, evidence-based recommendations on sunscreen application, safety, and sun protection regarding the physical barriers, sunscreen properties, sunscreen application, and risk-benefit analysis, for which there appears to be an uncertainty (Li *et al.* 2019: 357).

2.2 SOURCES OF THE LITERATURE

Research requires a vast number of sources of information in order to develop a dissertation or a thesis. In this study, this chapter contains information that has been obtained from online sources (Online magazines, google scholar, online dissertations, e-books), books, dissertations and the library. The keywords used to search for the literature included: skincare, sun protection, UVR, skin cancer and sunburn.

2.3 THE SKIN

The integumentary system plays a vitally important role in the human body and other living organisms. The skin is the largest organ in the body that covers and protects the body organs and parts. It is a washable, waterproof, stretchable and permanent-press organ (Torrison and Cameron 2019: 5). Newman (2018b:1) asserts that the human skin comprises of three main layers. These are:

- Epidermis is the outermost layer that is also divided into five strata. It is entirely made up of epithelial cells with no blood vessels.
- Dermis is also referred to as true skin which contains a framework of connective tissues and has several blood vessels, nerve endings and glands.
- Hypodermis is also referred to as the subcutaneous layer which consists of loose connective tissue and fat.

2.3.1 The importance of melanin in sun protection

EiObeid, Kamal-Eldin, Abdelhalim and Haseeb (2017: 515) aver that melanin produced by melanocytes (skin cells producing melanin) has been reported to retain a broad spectrum of biological activities. These include protection against UV radiation, enzymatic lysis (breaking down of cell membrane), damage by oxidants, resistance to drugs by pathogens, protection against bacteria and antiviral protection. Many manufacturers have adopted the utilisation of melanin in cosmetics and sunscreens in an attempt to simulate the natural role of these molecules in the skin. The protective effect of sunscreen is rated using the Sun Protection Factor (SPF) scale, and it is thought that a higher SPF value indicates a better protective capacity. Huang *et al.* (2011:475) revealed that the SPF value of gel formulations amplifies with the addition of melanin extracts from the berry of *Cinnamomum burmannii* and *Osmanthus fragrans*.

2.4 CLIMATE AND SKIN

According to Balato *et al.* (2018: 135), several articles have been written, grounded on observations and numerous predictive models, of how climate change could affect social, economic and healthy systems. Only limited studies exist about the effects of these changes on skin physiology and diseases. However, the skin is the most uncovered organ exposed to the environment; thus, cutaneous diseases are inclined to have a high climate sensitivity. Global warming, deforestation, and fluctuations in precipitations have been associated with variations in the geographical distribution of vectors of some infectious diseases (leishmaniasis, Lyme disease) by changing their spread. Moreover, warm and humid environments can also encourage the colonisation of the skin by bacteria and fungi.

2.5 THE IMPACT OF THE SUN ON THE SKIN

The sun emits UV rays which are dangerous to the skin if one gets sunburnt continuously. The rays emitted by the sun are Ultraviolet A (UVA) and Ultraviolet B (UVB). UVA rays penetrate the epidermis and reach the dermis whilst UVB rays are shorter. UVB is seen as more harmful as it affects the epidermis which causes sunburn and Deoxyribonucleic Acid (DNA) damage; hence increasing the risk of cancer (Kim *et al.* 2019: 907). Gruber, Shah and Zito (2019: 2) argue that ultraviolet (UV) solar radiation is the huge etiologic factor in the development of cutaneous malignancies. The majority of cases of non-malignant skin cancer and melanomas are related to UV exposure. UV exposure initiates carcinogenesis (formation of cancer cells) by a two-way mechanism. It generates DNA damage that leads to mutation formation and reduces the ability of the host immune system to recognise and remove malignant cells. Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are the most frequent forms of non-malignant skin cancer and both are derived from mutated epidermal keratinocytes. The progressive lifelong UV exposure is directly correlated with the risk for developing BCC and SCC.

Gupta (2019: 521) articulates that increases in cases of skin cancer are evident throughout the world in the recent few decades. Sun exposure and photo-protection-associated behavior and knowledge are imperative traits in the prevention of skin cancer. Overexposure to sunlight is extensively acknowledged as the basic cause for damaging effects on the skin, eye and immune system. Experts believe that four out of five cases of skin cancer could be prevented, as UV damage is mostly avoidable (Li *et al.* 2019: 368).

2.6 THE EFFECTS OF SUN EXPOSURE (FAVOURABLE EFFECTS)

The sun supports and maintains all life on earth as it provides earth with light, warmth and energy. In addition, it enables us to see as sunlight contains ultraviolet (UV) and infrared (IR) rays. Over the past two centuries, sun exposure fashions have fluctuated between the poles of sun avoidance and sun worship (Bahakim *et al.* 2016: 1528). The subject of safe sun exposure appears to have slithered down the health agenda in modern times. Many of the health promotion messages about sun exposure have been undesirable ones, outlining the dangers and health risks of over-exposure. However, it is imperative to be aware of the crucial and advantageous effects of sunlight, as well. Studies have suggested that sun exposure could protect against various diseases such as hypertension, diabetes mellitus, multiple sclerosis, cutaneous tuberculosis, psoriasis and cancer. UV exposure has been shown to convey beneficial effects in several autoimmune disorders including multiple sclerosis. Among men, there was a contrary association between occupational UV exposure and the risk of renal cell carcinoma (Karami *et al.* 2016: 2001).

2.7 THE EFFECTS OF SUN EXPOSURE (DETRIMENTAL EFFECTS)

Fleury, Geldenhuys and Gorman (2016:999) declare that the negative health effects of exposure to UVR have been closely examined. These include sunburn and increased risk of skin cancers (melanoma, lip cancer, and keratinocyte

cancers) and ocular diseases (cataracts, pterygium, ultraviolet keratitis and conjunctival neoplasm). Excessive skin exposure can cause skin erythema (reddening of the skin) with edema and tissue inflammation. The total amount of exposure to UVR and excessive exposure resulting in sunburn in childhood and adolescence significantly increases an individual's risk of developing melanoma. Sub-erythemal (non-burning) doses of UVR also have biological effects.

2.8 DIFFERENT SUN PROTECTION METHODS

Different means can be practiced towards sun protection, which helps prevent sun exposure that induces skin cancer. These include minimising the time spent in the sun during the day, wearing protective gear/clothes and using sunscreen (Singer, Karrer and Berneburg 2019:46).

2.8.1 Minimising time spent in the sun

This can assist prevent most types of skin cancers. It is crucial to avoid spending time in the sun for elongated periods. This also applies even when one is wearing sunscreen. This however does not imply that one must avoid the sun completely as the body needs Vitamin D produced by the sun (University of California 2015: 1).

2.8.2 Wearing protective gear

Protection from UV radiation (UVR) is of paramount importance in preventing skin cancers (Milch and Logemann 2017: 89). A reusable, economical and truly simple measure of personal protection that greatly reduces exposure to UVR, thereby reducing the risk for developing skin cancers, can be achieved. This involves, for example, the use of long-sleeved clothing and wide-brimmed hats. In some areas of the world where sunny climates are prevalent and exposure to UVR is part of everyday life, fashion trends, policy, and public health initiatives are in synchrony

and photo-protection with wide-brimmed hats is embraced as a common and fashionable practice (Milch and Logemann 2017: 90).

2.8.3 Using sunscreen

Frothingham (2019: 1) affirms that sunscreen is a chemical defense that acts as a shield by penetrating the skin and absorbing the UV rays from the sun before they reach and damage the dermal layers. Some sunscreens include avobenzene, oxybenzone, and para-aminobenzoic acid, which are active ingredients utilised to absorb the sun's rays.

2.9 DIFFERENT SUNSCREENS

Sunscreens are topical formulations that contain chemicals that diminish solar UVR. Global regulatory authorities have described the sun protection factor (SPF) of sunscreen as a universal quantitative index of protection against erythema, evaluated after a single exposure of solar-simulated radiation. According to Wizemann and Maglente (2021:1), there are two main types of sunscreens namely, chemical sunscreens and mineral sunscreens. However, these are not the only forms of sunscreens; there are other various forms of sunscreens, which include red clay, long-sleeved clothing and shade.

2.9.1 Chemical sunscreens

These are most likely to be the type that most people are more familiar with or use the most. Chemical sunscreens are capable of absorbing UV rays from the sun even before they reach the skin. The only slightly unfavourable side is that, even though they are excellent, they need to be reapplied more often than mineral ones would (Wizeman and Maglente 2021: 1).

2.9.2 Mineral sunscreens

These types form a barrier on one's skin that reflects or filters UVA and UVB rays. The distributed zinc oxide and/or titanium dioxide formulas can be more difficult to spread on the skin and leave behind a white cast, but usually last longer than chemical formulas (Wizeman and Maglente 2021: 1).

2.9.3 Shade

Silecchia (2019: 1) articulates that few things are better than resting under a tree or lounging on a breezy porch on a hot day. Shade provides important aspects of sun protection when considered for that particular moment on a hot day. Not only it does give one a reprieve from the heat, but also it can assist in protecting one from the sun's hazardous UV rays, which can induce skin damage and lead to skin cancer. Silecchia (2019: 1) continues to assert that not all shade structures are the same and the level of sun protection offered can differ a great deal.

There are things to consider when choosing shade as a sun protection method for that day/time:

a) Shade is not enough

When using an umbrella for shade for example, on the beach, one may need to constantly maneuver the umbrella to cover their body as the sun does not stand still, but it moves during the day and may pose a unique challenge for many shade structures. Trees can provide most coverage when the sun is directly overhead, but less coverage as it rises or sets, allowing the rays of the sun to hit the body from different angles (Silecchia 2019: 1).

b) Not all shade is created equal

Factors that govern the effectiveness of a shade structure at providing sun protection involve:

c) Size of the structure

Larger shade areas such as a wraparound porch or large awning provide more protection than small ones, like an umbrella.

d) Proximity to buildings or other shade structures

A single tree is going to provide less UV protection than a tree, surrounded by other trees in a dense forest.

2.9.4 Long - sleeved clothing

Richard (2019:2) indicates that clothing may be able to shield a body from the sun, but not all types of fabrics and colours can provide such protection. The factors that need to be taken into consideration when purchasing clothing are colour and Ultraviolet Protection Factor (UPF). Dark or bright colours keep the UV rays from accessing the skin by absorbing them, rather than granting them access to infiltrate. These colours render better protection than lighter shades of colours. Some clothes come with UPF labels that specify how much sun rays the garment can block.

2.9.5 Red clay

Exposure to harmful UV radiation from the sun is a problem faced by everyone, irrespective of skin colour, background, cultural heritage or profession. With global warming and damage to the earth's ozone layer, this exposure is only set to become worse, making protection from the sun's rays a critical requirement. The application of red/orange clay (*ibomvu*), or soil paste, used as a low-cost sunscreen to protect one's face and arms from the harsh sun, is a common practice amongst field workers in the Zulu tribe (Genomics Africa 2019:1).

Benedetti (2019:2) denoted that, skin undertakes certain changes when visible to ultraviolet (UV) light, to shield against harm. The epidermis (the skin's superficial layer) thickens, blocking UV light. The melanocytes (pigment-producing skin cells) produce more melanin, a brownish-colored pigment that darkens the skin, resulting in a tan. If an individual has freckles, excessive sunlight can turn them into brown sunspots and increases wrinkles and sagging, which becomes unsightly. Mancuso, Maruthi, Wang and Lim (2017: 643) stipulate that sunscreens have been broadly used by the public for their photo-protective properties, including prevention of photocarcinogenesis (development and growth of tumour), photoaging, and management of photodermatoses (group of cutaneous disorders that presents an abnormal reaction to sunlight). Superlative sunscreens should have highly efficient filters against both UVB and UVA radiation, be photo-stable, and be made in formulations that are cosmetically acceptable to the public. The formulations should have no detrimental effects on the environment or humans when used.

2.10 CLINICAL BENEFITS OF SUNSCREEN

The role of sunscreens as effective photo-protective agents in preventing the adverse outcomes of exposure to sunlight, and has been well studied and documented. A landmark study demonstrated that daily use of sunscreen could prevent the development of melanoma (Mancuso *et al.* 2017: 644). Sunscreens have different levels of sun protection factors (SPF) ranging from SPF 5 up to SPF 100. The sun protection factor means the amount of time the sunscreen can protect the skin from the sun when exposed.

2.11 GLOBAL SUN CARE PRODUCTS MARKET

Morganti, Morganti, Chen and Gagliardini (2019: 3) indicate that the global sun care products market is projected to reach 10.4 billion United States dollars (USD) by 2024. The sun care products market is predicted to be the fastest-growing

segment within the personal care industry, motivated by the rise in consumer awareness related to skin cancer and aging associated with exposure to UV rays. The demand for self-tanning products is expected to flood in the foreseeable future, and the majority of the demand is likely to be concentrated across North America and Europe.

2.11.1 Scope of the report

The global sun care market is segmented into self-tanning products, after-sun products and sun protection products. It is also divided into distribution channels, which include offline and online retail stores. Offline stores include specialty stores, supermarkets, drug stores and pharmacies (Sambit 2020: 6).

2.11.2 Key market trends

Morganti *et al.* (2019: 3) stipulate that it is estimated that Americans spend more than 600 Billion USD each year in outdoor recreational activities. Consumers from Western countries prefer using sun care products during their outdoor activities, especially on beaches, hence the higher participation rate in the outdoor recreational activities has sponsored the rise in sales of sun products (Morganti *et al.* 2019: 3).

According to Sambit (2020: 1), augmenting the prevalence of non-melanoma skin cancers due to significant UV radiation is chiefly impacting outdoor laborers and athletes due to high exposure to the sun. It is for this reason the people are increasingly utilising sun care products, according to dermatologists, for protecting the skin against the harmful effects of the sun rays. Israeli citizens are engrossed in a tanned look and heavily use tanning beds in salons as a solution to achieve the look. The extensive distribution channels of international players such as Beiersdorf in countries, such as Turkey, Kenya, Morocco and Ghana are leading

the product accessibility and shelf visibility of products in stores, thereby allowing consumers to choose the needed products with ease.

Sambit (2020:1) states that the market in North America accounted for the highest market share in the global sun care market followed by Europe when it comes to income. This can be ascribed to augmenting awareness about sun care products that render protection to the skin. In terms of the Compound Annual Growth rate, the market in the Asia Pacific region is anticipated to emerge as the fastest-growing market in the global sun care market, owing to the rising demand for sun care products in countries in the region.

2.12 SUN PROTECTION AND MEN

Newman (2018a: 1) asserts that men between the ages of 15 to 39 have more chances of dying of melanoma as compared to their female peers, and dermatologists suspect hesitancy to wear sunscreen is part of the issue. This author stipulates that most dermatologists approve that wide-ranging sun protection should include antioxidants, which limit free radical damage for aging skin. Yi Gao, Arron, Polcari and Mansh (2018: 477) articulate that Sexual Minority Men (SMM), including gay and bisexual men, report increased rates of skin cancer and indoor tanning, whereas sexual minority women report decreased rates of skin cancer and indoor tanning. Indoor tanning has been associated with other risky behaviors, including decreased use of protective clothing and shade when outdoors. However, no data exist on these other skin cancer risk behaviors among SMM.

Wright *et al.* (2017: 1142) state that informal workers in the African market trade have little formal protection against sun exposure. The study was conducted amongst workers in the Warwick Junction market in eThekweni, where they were interviewed about their workplace and the impact of sun exposure on their skin. They were also asked about eye sensitivity and skin colours they have, symptoms

of sun exposure faced in summer due to heat, and preventive procedures they practice. Out of the 236 participants that were examined, 234 were Black African, and 141 (59.7%) were female. Portable shade was the most used form of sun protection (69.9%). Glare from the sun (59.7%) and excessive sweating (57.6%) were commonly reported sun-related health symptoms.

Sun protection is vitally imperative for all humans and genders to prevent the development of skin cancers in the long- run. This study is a new study that has not been done before. The paucity of literature limits the information to be gathered for this study. Thus far, only one study has been done in South Africa, which did not specifically investigate Black African males but all genders, and could be relevant in this chapter.

2.13 SKIN DISORDERS CAUSED BY SUN EXPOSURE

Extreme sun exposure, (which may include spending long hours in the sun) can result in detrimental effects, which are skin conditions/ disorders, and which can lead to skin cancer in the long run (Brazier 2017:1). Below are a few listed skin disorders that can result from overexposure to the sun.

2.13.1 Sunburn

This skin injury shows up immediately after the skin is exposed to UV radiation. Some people hardly ever turn “ lobster red”; they are those with more of a brown pigment called melanin that protects the skin from the effects of UV radiation. A fair-skinned individual can burn and blister in the dead of winter (Kraft 2017: 2).

2.13.2 Rosacea

When an individual is affected by rosacea, the face becomes red due to increased blood flow in the venules. This may be due to many things. Rosacea is a chronic, inflammatory skin condition that frequently affects the face. Brazier (2017: 1)

stipulates that rosacea worsens with time if left not treated. It is often mistaken for acne, eczema, or a skin allergy. This condition appears on the face as though one has been hit in the face multiple times. While that may be the case, about 14 million Americans credit their rosy face to the inflammatory skin disease called rosacea (Johnson 2019: 3).

2.13.3 Skin conditions most common in males

Wright, Mundackal, Oosthuizen and Albers (2014: 1) articulate that the benefits of personal solar UVR exposure in South Africa include feelings of well-being, related mainly to the sensation of heat, and a reduction in the incidence of seasonal affective disorder. The main positive outcome is Vitamin D production, which protects against rickets, osteomalacia and osteoporosis. Due to its effects on the immune response, Vitamin D may also play a protective part in common diseases such as multiple sclerosis, diabetes mellitus, cancer, for example, colorectal and breast cancer, infectious diseases such as tuberculosis and cardiovascular disease. Dark-skinned individuals need roughly six times more solar UVR exposure than fair-skinned persons to yield the same amount of Vitamin D.

Howard (2019: 1) indicates that male skin significantly differs from female skin. It is 25% thicker than female skin. The simple fact that it can grow a beard also distinguishes it from a female's skin. Howard (2019: 1) continues to indicate that male skin's collagen is denser than a woman's and the skin texture is rougher than female's skin. Male skin has conditions that specifically affect males and not females.

2.14 SKIN TYPES

There are five basic skin types namely, normal, oily, dry, combination and sensitive.

a) Oily skin

Lowe (2019:3) specifies that the skin secretes natural oils (sebum) to keep itself well moisturised. When one has oily skin, the skin overdoes the process of sebum secretion and in most cases, the skin has open/large skin pores. When the skin pores are large, the sebaceous glands (oil glands) become more active and secrete more sebum.

b) Dry skin

According to Moore (2019:2), dry skin is presented by an uncomfortable condition marked by scaling, itching and cracking. It can occur for a variety of reasons. One might have a naturally dry skin type. Dry (dehydrated) skin can develop over time, even one has oily skin, especially in winter where the climate is not favourable to the skin. Dry skin can be seen in any part of the body. In most cases, it is seen on hands, face, arms, and legs. In many cases, lifestyle changes and over-the-counter moisturisers may be all that is needed as a treatment for this skin type (Moore 2019:2).

c) Combination skin

Sharkey (2020: 1) specifies that there is not a universal definition of a combination skin type. Some skin doctors assume that this is not a true skin type like other types, for example., oily or dry skin types. Other dermatologists believe that skin type can alter seasonally, meaning that a combination skin type, can be dry in winter and oily in summer. Other dermatologists contend that combination skin is a separate skin type distinguished by various amounts of oil (sebum) production on the face.

d) Normal skin

Whitely (2020: 2) asserts that skin is generally classified as “normal” if it is not excessively oily or dry and does not encounter any persistent skin concerns and/or conditions. This well-balanced healthy skin type has even levels of moisture and hydration, uniform texture and no obvious problem areas. With this information being portrayed, normal skin can experience slight variations in oiliness and dryness and even the occasional breakout - when exposed to environmental stressors like UV rays and pollution.

e) Sensitive skin

Dancer (2019:1) indicates that sensitive skin is the most reactive type of skin than other types of skin. It is defined as an easily irritated skin type by natural elements like wind, heat, cold and especially the sun. In some cases, sensitivity is triggered by topical applications, lack of sleep or hormones. Most people with this type of skin usually get acne, rosacea or contact dermatitis, a type of red and itchy rash. Sensitive skin may also be prone to stinging and burning from products with harsh ingredients.

2.15 FITZPATRICK SKIN TYPES

The Fitzpatrick skin type model is able to assist in predicting who has augmented chances of experiencing sunburn by categorising skin according to how much melanin it has. The skin types that contain little/ less melanin are less protected from the UV rays from the sun and are more prone to burning quickly. As the skin burns, the chances of developing skin cancer are augmented (Burgess 2020:1).

Table 2.1 illustrates the types of skins according to how much melanin it holds.

Table 2.1: Fitzpatrick Skin Type Model

Type	Features of unexposed skin	Tanning and burning
1	Very pale white skin, often with green or blue eyes and fair or red hair.	Burns without tanning.
2	White skin, often with blue eyes.	Burns and does not tan easily.
3	Fair skin with brown eyes and brown hair.	Burns first, then tans.
4	Light brown skin, dark eyes, and dark hair.	Burns a little and tans easily.
5	Brown skin, dark eyes, and dark hair.	Easily tans to a darker colour and rarely burns.
6	Dark brown or Black skin, dark eyes, and dark hair.	Never burns, but tans darker.

2.16 MOST DOMINANT SKIN TYPE IN MALES

Amongst the skin types, oily skin is known to be the most problematic skin (Kumar 2019: 1). Researchers have evaluated skin parameters in different parts of the body in men and women separately (Rahrovan *et al.* 2018:122). The knowledge of sex-linked cutaneous variances might assist in study planning and the development of female- versus male-specific products for more appropriate dermatological treatments or cosmetic intervention. Concerning skin disorders, infectious diseases present more in men but psychosomatic problems, pigmentary disorders, certain hair diseases, and autoimmune and allergic diseases are more common in women (Rahrovan *et al.* 2018:123).

2.17 TYPES OF SKIN CANCERS

Melanoma is the leading cause of death among all cutaneous diseases in the United States of America (USA) (Qiu *et al.* 2019: 450). It is a malignant tumour that progresses from melanocytes, most commonly dark brown to black, owing to

melanin deposition. When the malignant melanocytes cannot produce mature melanin granules, it results in the development of amelanotic melanomas, which are skin-coloured or red. Although it accounts for 5% of all skin cancers, melanoma is responsible for 75% of skin cancer deaths (Qiu *et al.* 2019: 450). The development of melanoma is multifactorial, but data strongly support exposure to sporadic UV radiation as a causative role.

The four major subtypes of primary cutaneous melanoma present different growth patterns, but do not predict prognosis:

- Superficial spreading melanoma (SSM) is the mutual type in light-skinned persons, accounting for 60% to 70% of all melanomas. It is most commonly seen on the trunk in men and on the legs in women. SSM begins as an asymptomatic dark brown to Black macule with irregular borders (Mitchell, Karakousis and Schuchter 2020: 1).
- Nodular melanoma (NM) is the second mutual type in light-skinned individuals, accounting for 15% to 30% of all melanomas. It is frequently seen in men and is most commonly found on the head, neck and trunk. NM appears as a blue to black nodule that may ulcerate (Qiu *et al.* 2019: 460).
- Lentigo malignant melanoma (LMM) accounts for 10% of all melanomas. It is most frequently seen on the nose and cheek and appears as a brown to Black macule with an irregular border and colour variation (Marks and Miller 2019: 7).
- Acral lentiginous melanoma (ALM) accounts for 5% of all melanomas but accounts for a disproportionate number of melanomas found in Asians (45%) and African Americans (70%). ALM appears as a brown to black asymmetric macule with irregular borders and pigmentation variation (Marks and Miller 2019: 7).

Wright *et al.* (2019a: 634-636) affirm that located at the southern tip of Africa, South Africa spans from approximately 22°C to 34°C and consists of nine provinces. The country's topography includes coastal plains at sea level and a central plateau, known as the Highveld, at an average altitude of 1200 metres . A stationary high-pressure cell over the Highveld and interior of the country results in relatively cloudless skies, which together with the altitude, contributes to high solar UVR levels. South Africa's multi-ethnic population is officially grouped into Black African, Mixed Ancestry (mixed European (white) and African (black) or Asian ancestry, with skin colour ranging from pale to dark brown), Asian/Indian and White (Norval and Wright 2017: 5). Wright *et al.* (2019b: 941-942) inform that the 2018 mid-year population estimated that the South African population was 57.7 million, of which 81% were Black African, 9% Mixed Ancestry, 8% White and 2% Indian/Asian.

Skin cancer can be broadly divided into two types: cutaneous melanoma (CM), Merkel cell carcinoma (MCC) and keratinocyte carcinoma (KC). KCs are the most common malignancies worldwide, with basal cell carcinoma (BCC) being the most frequent followed by squamous cell carcinoma (SCC). All skin cancers have shown an increase in incidence worldwide over the past decades, although many of the cancer registries exclude KCs due to their low mortality rates and, in those that do include them, under-reporting is common (Skin Cancer Foundation 2019: 2). An increase in the incidence of CM and KC in White and Black African men and women was demonstrated when the data from 2000-2004 were compared with the 2014 data. The age-related mortality rates for the period 1997-2014 due to CM in South Africa showed an increasing trend of 11% per year in men between 2000 and 2005, rising from 2 to 3 per 100,000 after which the rate saturated (Wright *et al.* 2019b: 1).

Harvard Medical School (2018: 2) reports that sun allergy is an immune system reaction to sunlight, most frequent, a pruritic red rash. The most common locations include the "V" of the neck, the dorsal aspect (back) of the hands, the outside

surface of the arms and the lower legs. In rare cases, the skin reaction may be more severe, producing hives or small blisters that may even spread to the skin in clothed areas.

2.18 SUMMARY OF THE CHAPTER

This chapter reviewed the existing literature on sun protection as an important subject for this study. It also discussed the factors affecting the skin condition, for example, common skin conditions affecting men, the skin itself and other contributors of skin cancer as a result of not practicing skin care and skin protection. The next chapter presents the theoretical framework that guided the study.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 INTRODUCTION

The previous chapter presented the literature review. This chapter will dwell on the theoretical framework for the study. Adom, Hussein and Adu-Agyem (2018: 6) report that theoretical framework clarifies the route of research and grounds it firmly in theoretical constructs. The overall aim of the framework is to make research findings more meaningful, acceptable to the theoretical constructs in the research field and ensures generalisability. It assists in stimulating research while ensuring the extension of knowledge by providing both direction and motivation to the research inquiry.

3.2 THEORETICAL FRAMEWORK

Grant and Osanloo (2014: 16) state that theoretical frameworks are sometimes denoted as conceptual frameworks; however, these terms are neither identical nor tantamount. They can be imprecise and lead to confusion for students and dissertation committee members as well. As such, it is imperative and necessary to distinguish these terms. These terms are distinguished by clarifying that a theoretical framework is derived from an existing theory (or theories) in the literature that has already been tested and validated by others and is considered a generally accepted theory in the scholarly literature.

Traditionally, a theoretical framework is developed prior to data collection in quantitative designs. However, a theoretical framework may also encompass a theory that is developed during the dissertation development. Quantitative research designs may begin with a structured, or possibly less structured theoretical framework to keep the researcher from compelling prejudices on the findings (De Vos, Strydom, Fouche and Delpoit 2011: 36).

On the other hand, Grant and Osanloo (2014: 16) articulate that the conceptual framework renders a rational structure of allied concepts that help offer an image or visual display of how ideas in a study relate to one another within the theoretical framework. It is not simply a string of concepts, but a way for the reader to identify and construct the epistemological and ontological worldview and approach to the topic of study. De Vos, Strydom, Fouche and Delport (2011: 36) state that conceptual framework also renders a prospect to stipulate and define concepts within the problem.

3.3 THEORETICAL FRAMEWORK THAT GUIDED THE STUDY

The theoretical framework that guided this study was the Knowledge, Attitude and Practice (KAP) Model. Rav-Marathe, Wan and Marathe (2016: 4) indicate that in the KAP model/theory “K” represents knowledge of the problem or disease, “A” is the attitude towards the problem or disease, and “P” representing practice or preventive behavior to protect against the problem or disease. These authors further state that researchers presume that knowledge, attitude and practice are related and that knowledge and attitude have a direct influence on preventive practice. Surveys are utilised to measure what individuals know about the disease or problem. Attitude instruments measure the feelings and beliefs of survey participants about the disease or problem, and information on practice measures and the preventive behaviours that individuals follow to avoid a problem or disease (Rav- Marathe, Wan and Marathe 2016: 3).

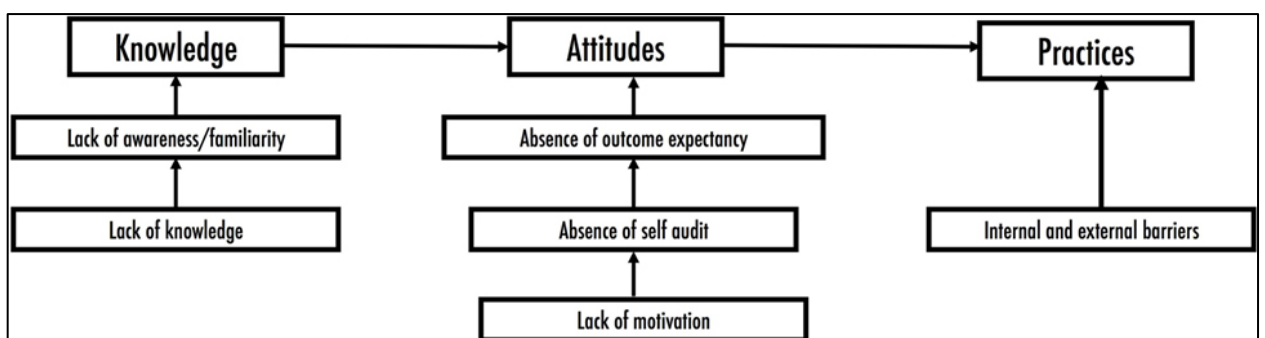


Figure 3. 1: A theoretical framework of knowledge, attitudes and practice on sun protection.

3.3.1 Constructs definitions

3.3.1.1 Knowledge

Rav-Marathe, Wan and Marathe (2016: 4) define knowledge as an acquirement, preservation and employment of information or skills. Cognisance, through which knowledge is acquired, is a process of comprehending and is distinguished from the experience of feeling. Knowledge accumulates from both education and experience (Kaliyaperumal 2015: 7).

In this study, knowledge assesses the extent to which individuals from the selected population understand public health concepts regarding sun protection usage. This was not limited to knowledge of sun protection facts but also included understanding of different types of sun protection, beliefs as well as awareness of rights to access the sun protection methods (Muleme *et al.* 2017: 8).

3.3.1.2 Attitude

Rav-Marathe, Wan and Marathe (2016: 9) cite Eagly and Chaiken's (1993) description of attitude in "The Psychology of Attitudes", as a psychological propensity that is articulated by assessing a certain unit with some degree of favor or unpopularity. Attitude consists of three components: cognition, affect and behavior. Cognition comprises true and false beliefs about the attitude object; health education may change such beliefs.

Males may not be motivated to practice sun protection as skincare or sun protection itself is generally known to be practiced by females more than males (Muleme *et al.* 2017: 9). This study aims to educate Black African males about the importance of sun protection use, the detrimental effects of sun exposure and the available sun protection methods. This may motivate the males to practice sun protection and overall skincare.

3.3.1.3 Practice

Practice displays the attainment of knowledge (augmented comprehension of a problem/disease) and any change in attitude caused by the removal of fallacies about problems or disease that translates into preventive behaviours. Thus, that display may reflect a mutual relationship between knowledge and attitude (Sinha 2017: 10). Internal barriers may include forgetting to use sun protection when going out or experiencing discomfort when using the sun protecting gear. External barriers may involve one not feeling good about how they look when wearing sun protecting clothes or looking oily after sunscreen application (Sinha 2017: 11).

3.4 SUMMARY OF THE CHAPTER

This chapter discussed the theoretical framework that was used to guide the study. The next chapter presents the methodology that was used to guide and direct the study.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

This chapter presents the research design and methodology that guided the study. The aim of this study was to assess the knowledge, attitudes and practices of Black African males towards the use of sun protection at a University of Technology in KZN. A Knowledge, Attitude and Practice (KAP) survey is normally conducted to collect information on the knowledge (what is known), attitudes (what is thought), and practices (what is done) about general and/or specific topics of a population. In surveys related to the case of sun protection practices, sunscreens, sun-protective gear, skincare topics would be included. Data may be collected through interviews or structured, standardised questionnaires, and may include both quantitative and qualitative data. In this study, a quantitative approach was utilised.

4.2 RESEARCH DESIGN

Baran (2020: 1) defines research design as a framework or blueprint which renders structure and direction to display how all the paramount parts of the research project work collectively to address the research question. It is the logical structure of an inquiry grounded in the research purpose and research question(s). The author further states that research design does not denote or dictate any method of collecting data or any type of data. How the data is gathered is irrelevant to the logic of the design. The main purpose of the research design is to reduce the opacity of research evidence giving a step-by-step approach to the whole research plan, plummeting the possibility for faults to be made. This study was guided by a quantitative research design. A quantitative research approach is a methodical and unbiased research that utilises numerical information from only selected samples from a universe or population to generalise the findings only to the population that is being studied

(Maree 2007: 97). A quantitative research design is scientific, more controllable, less bias and deals with larger samples in order to provide more accurate information/results (De Vos *et al.* 2011: 142).

4.3 RESEARCH SETTING

Given (2008:2) states that the research setting can be viewed as a physical, social and/ or cultural site where the research can be conducted. The Durban University of Technology consists of seven (7) campuses. Five of the campuses are situated in the eThekweni District, namely, Steve Biko Campus, Ritson Campus, ML Sultan Campus, Brickfield and City Campus. Two campuses Indumiso and Riverside campuses are in Midlands, Pietermaritzburg, KZN. All campuses were included in the study. The questionnaires were sent electronically to Black African male students from all campuses.

4.4 POPULATION

According to Banerjee and Chaudhury (2013: 60), a population is any precisely defined body of people or objects under consideration for research purposes. The population selected for this research was Black African males that were registered as students at the Durban University of Technology in 2020. The . The total number of Black African males enrolled at all faculties was 13511(Table 4.1). The numbers of Black African male students for each faculty was obtained from the department of Management Information of the Durban University of Technology.

Table .4 1: Number of enrolled Black African male students per faculty who are registered in 2020

Faculty	Population
Accounting and Informatics	3441
Applied Sciences	1145
Arts and Design	1279
Engineering and Built Environment	3356
Health Sciences	665
Management Sciences	3625
Grand Total	13511

4.5 SAMPLING PROCESS

At the commencement of the study, the intention was to use a simple random sampling method and the questionnaires to be handed out physically to participants. Due to the Corona Virus (COVID 19) pandemic and the restrictions on the number of students that can be present on campus, the sampling method selected for this study was a non-probability, voluntary response method. A voluntary response sample is defined as a type of sample made up of self-chosen participants. These participants volunteer to take part in different research studies to share their opinions on topics that are of interest to them. The researcher puts out a request for members of a population to join the sample, and people decide whether or not to be in the sample (McCombes 2019:1).

The advantages of a voluntary response sample include it being an inexpensive, simple way to conduct a study and data is easy to gather. The participants are easy to access. The disadvantages include the researcher has no control over the makeup of the sample and the sample is likely to be comprised of strongly opinionated people (McCombes 2019:1).

4.5.1 Inclusion criteria

- Black African males who are 18 years and above.
- Black African males who consent to participate in the study
- Black African males who are registered as students at DUT

4.5.2 Exclusion criteria

- African males who are below 18 years old.
- Black African males who do not consent to participate in the study
- Males students at DUT who are not of the Black African race

4.5.3 Sample size

Cochrane's formula was used to calculate the sample size. The sample is calculated assuming an alpha value of 0.5 and a margin error of 0.5. The minimum sample required for a population size of 13511 is 374. The final sample size was calculated based on the received responses that fitted or complied with the study's inclusion and exclusion criteria. The questionnaires were distributed online to all 13511 students. A time frame of 30 days was set as the cut-off date for the submission of completed questionnaires. All responses received were checked to ensure that the respondents were above 18 years of age. Furthermore, only those questionnaires that had signed consent forms attached were accepted and included in the sample. Incomplete or incorrect questionnaires were not used for the data analysis. A total of 409 completed and usable questionnaires were received at the end of the submission period.

4.6 DATA COLLECTION TOOL

An online survey was conducted and data was collected by using questionnaires (Appendix 5). Ponto (2015: 168) defines a survey as a method of selecting a sample of participants prior to the dissemination of questionnaires or conducting interviews to gather data about their attitudes, values, habits, ideas, demographics, feelings, opinions, perceptions, plans and beliefs. The

literature review informed the development of the survey questions. The questions assessed the knowledge, attitudes and practices of Black African males regarding the use of sun protection. The questionnaire was segmented into different categories, that were based on the “factors” affecting the usage of sun protection which are included in the topic and it also contains the demographic (individual data). These segments include knowledge, attitudes and practices. This made it easy for the participants to understand the questions asked and for the researcher to know which of these “factors” (knowledge, attitudes and practices) have more effect on the usage of skin protection by Black African males.

The questionnaire was divided into four sections. Section A requested information on demographic data. In Section B, questions related to the objective of knowledge of sun protection were included. Section C comprised of questions related to the objective of attitudes towards sun protection and Section D asked questions on practices of sun protection, related to objective three.

4.6.1 Data collection process

The names and email details of all students that met the study criteria were obtained from the Communications Department of the institution. The letter of information, consent form and questionnaires were distributed online to the study participants through the Universal email (DUT Pinboard). The questions were constructed based on the constituents of this study’s topic which are “Knowledge, Attitudes and Practices”.

4.7 PRE-TESTING OF THE QUESTIONNAIRE

Pre-testing of the data collecting tool via a pilot study was done to identify any flaws such as ambiguous questions and those that may need more clarity. The questionnaire was pre-tested on ten students. Questionnaires were randomly sent to ten students using their student emails. These ten students were selected from the population of students that met the study criteria. These

participants did not participate in the main study. There were no changes to be made to the questionnaires. The participants understood all the questions clearly and the questions were well structured.

4.8 DATA ANALYSIS

Descriptive statistics, in the form of tables and graphs, were used to describe the data graphically. To test for significant trends in the data, inferential statistics were applied. These included Pearson's correlation, t-tests, Analysis of Variance (ANOVA) and chi-square tests. In conditions where these tests were not applicable; non-parametric equivalent tests or exact tests were used. Throughout, a p-value of 0.05 was used to indicate significance. The analysis was carried out using Statistical Package for the Social Sciences (SPSS) version 26.

4.9 RESEARCH RIGOUR

Krefting (2020:1) reports that researchers need alternative models suitable for qualitative designs that ensure rigour without sacrificing the significance of the qualitative research. Guba and Lincoln's (2013: 5) model is based on the identification of four aspects of trustworthiness that apply to both quantitative and qualitative studies: (a) truth value, (b) applicability, (c) consistency and (d) neutrality. Based on the philosophical differences between qualitative and quantitative approaches, the model outlines dissimilar strategies of evaluating these criteria in each type of research. These strategies are imperative to researchers in designing ways of augmenting the rigour of their qualitative studies and also for readers to utilise as a means of examining the value of the findings of qualitative research. The researcher ensured research rigour through adhering to all the principles of quantitative research, such as making sure that the sample was representative of the population. The questionnaires were precise and measured the knowledge, the attitudes and also the practices of skincare amongst the Black African males. Questionnaires were created with a statistician's assistance.

4.9.1 Truth value

Krefting (1991: 215) citing Lincoln and Guba (1985) states that the truth value asks whether the researcher has inaugurated self-assurance in the truth of the findings for the subjects or informants and the context in which the study was undertaken. It inaugurates how self-assured the researcher is with the truth of the findings grounded on the research design, informants and context. In quantitative studies, truth is frequently evaluated by how well threats to the internal validity of the study have been managed as well as the validity of the instruments as a measure of the phenomenon. The researcher ensured the truth value by creating the questionnaires that pried on the knowledge of the participants about sun protection.

4.9.2 Applicability

Applicability denotes the extent to which the findings can be applied to other contexts and settings or with other groups. It is the ability to generalise the findings to larger populations (Krefting 1991:215). In the quantitative viewpoint, applicability refers to how well the threats to external validity have been managed. External validity refers to the ability to generalise from the study sample to the larger population and note the importance of the sampling technique in its establishment (Krefting 1991: 216). Applicability for this research is possible as the findings of the study can be applied to other contexts. Generalisability can be applied from the findings to larger populations as the findings on the knowledge and attitude would almost exert the same impact on the practice of skincare amongst the respondents.

4.9.3 Consistency

The third criterion of trustworthiness considers the consistency of the data, that is, whether the findings would be consistent if the inquiry were replicated with the same subjects or in a similar context. In quantitative research, reliability is the criterion concerned with stability, consistency. and equivalence in the study (Krefting 1991:220).It is the degree to which recurring administration of a

measure will deliver the same information or the extent to which a measure directed once, but by different people, produces corresponding results. The questionnaire was created in a manner that when duplicating it with the same subject, would yield the same results as it asks about the respondents' knowledge, attitude and the practice of sun protection.

4.9.4 Neutrality

The fourth principle of trustworthiness is neutrality, the freedom from bias in the research procedures and results. Neutrality refers to the extent to which the results are a function merely of the informants and conditions of the research and not of other biases, motivations and perspectives (Guba and Lincoln 2013: 5). In quantitative research, objectivity is the criterion of neutrality and is achieved through the rigour of methodology through which reliability and validity are established (Krefting 1991:221).

4.10 VALIDITY AND RELIABILITY

Mohajan (2017:58) denotes that reliability and validity are the two most vital and essential structures in the assessment of any measurement instrument or tool for research. Validity and reliability of the data collection instruments are necessary to shrink the risk of any inexactitudes that may occur within the research study.

4.10.1 Validity

Heale and Twycross (2015: 8) define validity as the scope to which a concept is accurately measured in a quantitative study. An example of this will be, a survey intended to explore depression, but in turn measures anxiety, which would not be regarded as valid. The second measure of quality in a quantitative study is reliability or the exactitude of a tool. De Vos *et al* (2011: 171) elaborate that in quantitative research, validity is enhanced through attentive sampling, appropriate instrumentation and appropriate statistical handling of the data. These were addressed to ensure validity.

Validity has four elements that underpin its content. These include face validity, content validity, construct validity and criterion validity.

4.10.1.1 Face validity

This element merely asks questions like “does the test simply measure what it is supposed to measure?”. One of the advantages of face and content validity is that it is easily applicable (Kumar, 2019: 271). Face validity has an imperative public relations purpose, which implies that the participants are more likely to complete questionnaires that look as though they are credible measures of the topic under investigation (Hicks 2004: 243). Face validity was ensured through including the knowledge and attitude sections in the questionnaire as the study aimed to measure these attributes.

4.10.1.2 Content validity

De Vos *et al* (2011: 174) state that content validity is the element of validity that focuses more on representativeness or sampling adequacy of the content of an instrument. Validity is more concerned about whether the full content of a conceptual definition is represented in the measure. The three attributes (knowledge, attitudes, and practice) in the questionnaire had equal chances of being asked

4.10.1.3 Criterion validity

This element renders more objective evidence of validity as opposed to face validity which provides subjective assessment. This includes multiple measurements and is established by comparing scores on an instrument with an external criterion known to measure the concept, trait or behaviour being studied (De Vos *et al.* 2011: 174).

4.10.1.4 Construct validity

De Vos *et al.* (2011:174) affirm that construct validity includes the extent to which the tool magnificently measures a theoretical construct. Construct

validity should validate that scores on a test do predict the theoretical trait it says it does. This was ensured through the usage of questionnaires.

4.10.2 Reliability

Reliability is referred to a research instrument or tool that is able to render equivalent outcomes when utilised repeatedly under same conditions. Reliability indicates accuracy, stability and predictability of a research instrument: the higher the reliability, the greater the accuracy (Kumar 2019: 273). Graziano and Raulini (2004: 8) assert that reliability is categorised into different types: interrater reliability, test-retest reliability and internal consistency reliability. In this research, internal consistency was employed, where applicable. Heale and Twycross (2015: 11) denote that internal consistency is also known as homogeneity. It is evaluated using item-to-total correlation, split-half reliability, Kuder Richardson coefficient and Cronbach's alpha(α). In split-half reliability, the results of a test, or instrument, are divided in half. Reliability for this research was ensured through creating questionnaires that resulted in findings that can be applied to other contexts. Generalisability can be applied from the findings to larger populations as the findings on the knowledge and attitudes would almost exert the same impact on the practice of skincare amongst the respondents.

4.11 ETHICAL CONSIDERATIONS

Ethics clearance was granted by the Institutional Research Ethics Committee (IREC) of the study institution before data collection was conducted. Permission to conduct the study was sought and granted by the DUT Gatekeeper Permission Committee (Appendices 2a and 2b). The participants were given a letter of information that outlined the details of the study (Appendix 3) and written consent was sought from the participants (Appendix 4). The questionnaires were created in a way that if the consent is not signed, the participant could not continue to answer the rest of the questions.

Research participants need to be respected and protected against harm. Any study, like all the forms of research, is subject to the Codes of Ethics and Good Practice for the protection of the participants (Polit and Beck 2012: 152). Ethical codes are based upon a few generally accepted moral values of respect for individual beneficence, respect for human dignity and justice. The following principles of ethics were considered during the study:

4.11.1 Beneficence

According to Polit and Beck (2012: 152), beneficence imposes a duty on a researcher to minimise harm and maximise benefits. The principle means doing good, acts of kindness or goodness and avoiding harm. To adhere to this principle, the researcher needs to secure the well-being of the participants (Brink, van der Walt and van Rensburg 2012: 36). The right to freedom from harm and discomfort was maintained as participants were not subjected to any risk of harm or injury. Before the study was conducted, ethical clearance was sought from IREC (Appendix 1). The information about the purpose of the study, the process of data collection and analysis and how the findings would be disseminated was included in the letter sent to all students (Appendix 3). The participants were allowed to ask questions about the research procedure and the purpose before giving consent to be part of the research study (Appendix 4).

4.11.2 Self-determination

Polit and Beck (2012: 154) describe self-determination as the right to participate or withdraw from the study. To enable the participants to make informed decisions to participate in the study, the researcher provided a detailed explanation on the study, including but not limited to, the purpose of the study, consequences of participation or refusal to participate and possible gains or risks associated with participating in the study (Appendix 3). Following the full disclosure of information regarding the study, participants were asked to voluntarily sign a written consent to participate in the study (Appendix 4).

4.11.3 Justice

Justice refers to fair treatment and the right to privacy (Polit and Beck 2012: 155). According to the principle of justice, participants' selection should be based on study requirements and not on group vulnerability (Polit and Beck 2012: 155; Brink, van der Walt and van Rensburg 2012: 36). To ensure that justice is maintained, the study population for the current study was all Black African male students registered in 2020. The researcher ensured that sampling was inclusive and that those selected represented the diversity of the population (Rees 2011: 110). To ensure the right to privacy, data collected was kept in a computer that was password protected and can only be accessed by the researcher. Participants' details were not written in the research report. Anonymity and confidentiality were maintained by not recording participants' names. There were no spaces or sections on the questionnaires that asked the participants to write their names, therefore anonymity was maintained. The right to self-determination was also maintained as participants have a right to ask questions, refuse to give information and withdraw from the study as indicated in the information letter and consent.

4.12 SUMMARY OF THE CHAPTER

This chapter discussed or sketched the stages that were followed during the collection of data. This includes the methodology that guided and directed the study during the collection of data. In the following chapter, the results or findings discussion will be outlined.

CHAPTER 5: PRESENTATION OF RESULTS

5.1 INTRODUCTION

This chapter presents the results attained from the structured questionnaires with the participants of DUT. This study aimed to obtain the understanding of males about sun protection. It also sought to assess their knowledge, attitudes and practices on sun protection. The participants were Black African male students at the Durban University of Technology.

5.2. RESPONSE RATE

Structured questionnaires were disseminated online to the entire study population. Out of the 13511 questionnaires distributed, only 409 completed and usable ones were received at the end of the study period. The response rate was 30 %. The sample size was suitable for the study as a minimum of 374 was calculated as sufficient. The respondents sent their responses to the researcher's email which is password protected.

5.3 DEMOGRAPHIC DATA OF THE PARTICIPANTS

5.3.1 Age

The participants' ages were categorised into four sections, which were 18-21 years old, 22-25 years old, 26-29 years old and 30+ years old. The majority of the participants were between the ages of 22-29 (55.7%) followed by the 18-21 old participants. Table 5.1 displays the demographic data of the participants' age. The highest number (41.3%) of participants was between the ages of 22 and 25 years, 14.4 % was between the age of 26-29 years old, followed by 34.5% being between 18 and 21 years of age, whilst 30 years and above was the lowest number of respondents (9.8%).

Table 5.1: Age of participants

Age	Frequency	Percent
18-21	141	34.5
22-25	169	41.3
26-29	59	14.4
30+	40	9.8
Total	409	100.0

5.2.2 Study programme

The demographic data displayed above refers to the programmes the participants were registered under. A total of 55.7% of the participants were registered for degree qualifications, 42.1% were registered for Diplomas and 2.2% were registered for certificate qualifications.

Table 5.2 Study programme

	Frequency	Percent
Certificate	9	2.2
Diploma	172	42.1
Degree	228	55.7
Total	409	100.0

5.3.3 Residential location during the study period

Table 5.3 below represents the residential location of the participants during the study period. The purpose of this data was to explore the possible impact of attitudes towards sun protection that may result from the behaviour of the population residing in each area. A total of 44.3% was from the urban areas, 26.9% was from township areas, 20.3% was from rural areas and 8.6% was from semi-urban areas.

Table 5.3: Residential location during the study period

	Frequency	Percent
Urban	181	44.3
Township	110	26.9
Rural	83	20.3
Semi-urban	35	8.6
Total	409	100.0

5.4 ASSESSMENT OF KNOWLEDGE OF SUN PROTECTION

Figure 5.1 depicts that the majority (51.6%) of participants had heard of sun protection but had little knowledge about it. On the other hand, 21.8% had a lot of knowledge regarding sun protection. Of the total, 16.6% indicated that they lacked knowledge about sun protection whilst 10% have never heard of sun protection.

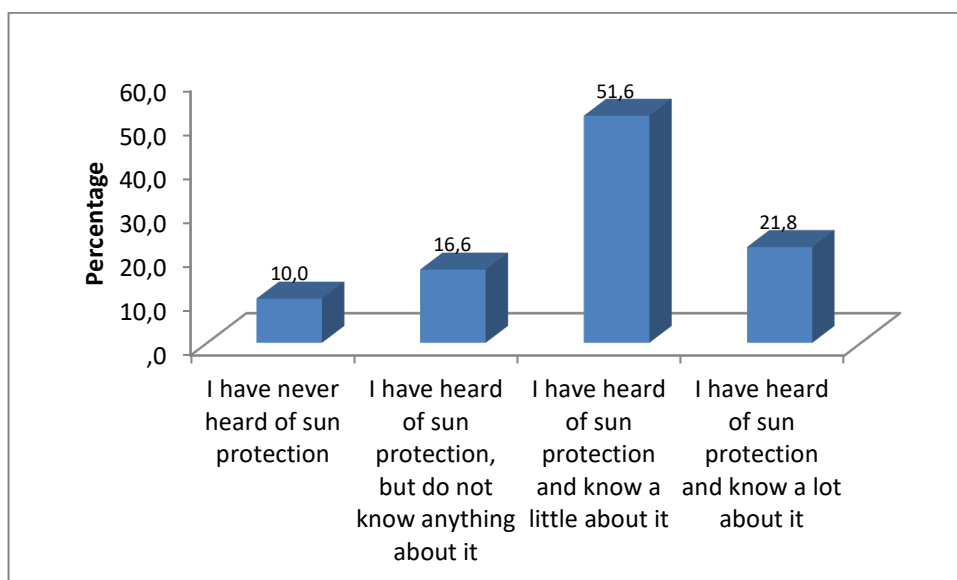


Figure 5.1: Indicate your level of awareness and knowledge of sun protection

5.4.1 Source of knowledge about sun protection

Sun protection can be taught to people through different means, which can include media adverts, social media, information from friends, Health Practitioners and skin doctors (Dermatologists). Table 5.4 below displays a substantial 84% of participants who have gained knowledge about sun protection from media adverts and 79% who have heard of sun protection from social media (including Facebook, WhatsApp, Instagram), while 47% of participants have heard from their friends and 24% of participants have heard of sun protection from the skincare therapists. A total of 33% have heard from health care practitioners and 20% have heard from dermatologists (skin doctors).

Table 5.4: Source of knowledge about sun protection

		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
B2.2 I have heard of 'sun protection' from a friend	Group 1	No	215	.53	.50	.323 ^a
	Group 2	Yes	194	.47		
	Total		409	1.00		
B2.3 I have heard of 'sun protection' from a Skincare Therapist	Group 1	Yes	97	.24	.50	.000 ^a
	Group 2	No	312	.76		
	Total		409	1.00		
B2.4 I have heard of 'sun protection' from a Health Care Practitioner	Group 1	Yes	136	.33	.50	.000 ^a
	Group 2	No	273	.67		
	Total		409	1.00		
B2.5 I have heard of 'sun protection' from a Dermatologist	Group 1	No	325	.80	.50	.000 ^a
	Group 2	Yes	83	.20		
	Total		408	1.00		
B2.6 I have heard of 'sun protection' from media adverts	Group 1	Yes	345	.84	.50	.000 ^a
	Group 2	No	64	.16		
	Total		409	1.00		
B2.7 I have heard of 'sun protection' from social media	Group 1	Yes	322	.79	.50	.000 ^a
	Group 2	No	87	.21		
	Total		409	1.00		

a = Z Approximation level

5.4.2 Open-ended questionnaires

For the question that assessed participants' knowledge of the meaning of SPF, the respondents were grouped into three (3) sub-groups according to how they responded to the question. The first group indicated they have an idea of what the SPF abbreviation means and its importance in sunscreen. They displayed to have a slight knowledge about SPF numbers as they denoted that it means "the amount of time one would need before they have to reapply the sunscreen again". Similarly, Group 2 stated that SPF numbers stand for "the level of protection of the sunscreen against the sun" and some indicated that it stands for "the level of effectiveness of the sunscreen on the skin." Group 3 displayed to entirely have no idea of what SPF or SPF numbers mean as they have indicated "I have no idea". During data analysis, these responses were not measured in numbers or percentages, they were analysed and presented as they were.

5.4.3 Correctness and incorrectness testing (Binomial test used)

A binomial test was conducted to test if a significant proportion got each question correct or incorrect hence the participants were divided into two subgroups. Group 1 was of the participants who answered incorrect (No) and group 2 was of the participants who answered correct (Yes). Table 5.5 shows that substantial percentages of the first three questions that were marked correct (that were answered Yes) were 61% for the first, 89% for the second and 69% for the third question. The rest of the questions were 14%, 8%, 12% and 11%. The major and substantial percentages of the four questions that were marked incorrect (that were answered No) were 86% for the fourth question, 92% for the fifth, 88% for the sixth and 89% for the seventh question. The first three questions that were marked incorrect (answered No) were 39% for the first question, 11% for the second and 31% for the third question. The p-value indicated that there was no significant difference between these two groups as it was less than 0.005.

Table 5.5: A binomial test to test if there is a substantial proportion answered each question correct or incorrect

Item	Frequency (%)		n	p-value
	Correct	Incorrect		
Females are more likely to get sunburnt than	249 (61)	160 (39)	409	<.0005*
Dark-skinned people do not have to worry about	364 (89)	45 (11)		
When it is overcast (cloudy), one does not	282 (69)	127 (31)		
Sunburn can result in a temporary change in	58 (14)	351 (86)		
Sunburn can cause small fluid-filled blisters	31 (08)	378 (92)		
Sunburn can result in skin cancer over time	50 (12)	359 (88)		
Sunburn can cause pain and tenderness to the	45 (11)	364 (89)		

* indicates significance at the 95% level

5.4.4 Analysis of the overall knowledge score

Table 5.6 below presents the overall score of knowledge (%). The total number of participants (N) was 409 and there were zero (0) missing. the mean percentage was 37.72%, the standard deviation was 15.236%. The average knowledge percentage that was calculated from these questions of this section was 37.72%. This is one of the indicators that there is still a paucity of information amongst Black African males.

Table 5.6: Overall knowledge

	Frequency	Percent	Valid Percent	Cumulative Percent
0	5	1.2	1.2	1.2
14	41	10.0	10.0	11.2
29	128	31.3	31.3	42.5
43	197	48.2	48.2	90.7
57	12	2.9	2.9	93.6
71	13	3.2	3.2	96.8
86	13	3.2	3.2	100.0
Total	409	100.0	100.0	

5.5 THE ATTITUDES TOWARDS SUN PROTECTION

A one-sample t-test was conducted to test for significant agreement/disagreement in the questions of this section. In this test, the average agreement score was tested against the central score of 3.5. If the result was significant and the mean was <3.5 , the result was interpreted as significant disagreement and if significant and mean was >3.4 , the result was interpreted as significant agreement. This information is displayed in Table 5.7 and the percentages of the responses to each question are displayed below.

Table 5.7: One-Sample statistics

	N	Mean	Std. Deviation	Std. Error Mean
C1 It is important for men, in general, to practice sun protection	409	4.48	1.591	.079
C2 My cultural/religious beliefs/practices do not allow me to use sun protection on my skin	409	1.75	1.093	.054
C3 I don't believe it is necessary for me to practice sun protection	409	2.28	1.529	.076
C4 South African males need to be informed about sun protection	409	4.81	1.636	.081
C5 It is as important to protect male skin as it is to protect female skin	409	4.64	1.688	.083
C6 It is important to educate Black African males on sun protection to motivate them to practice sun protection	409	4.77	1.636	.081

5.5.1 Percentages of agreements and disagreements

In the above figure (number), a reliable single measure for attitude towards sun protection was found by combining items 1, 4, 5 and 6. The reliability was tested using Cronbach's alpha. The alpha value for these 4 items was 0.911, which indicated a very reliable composite measure for attitude. The attitude was formed by averaging the scores from the four items. Having combined the four questions in this set, there was a significant agreement among the participants that it is vital for males in general to practice sun protection.

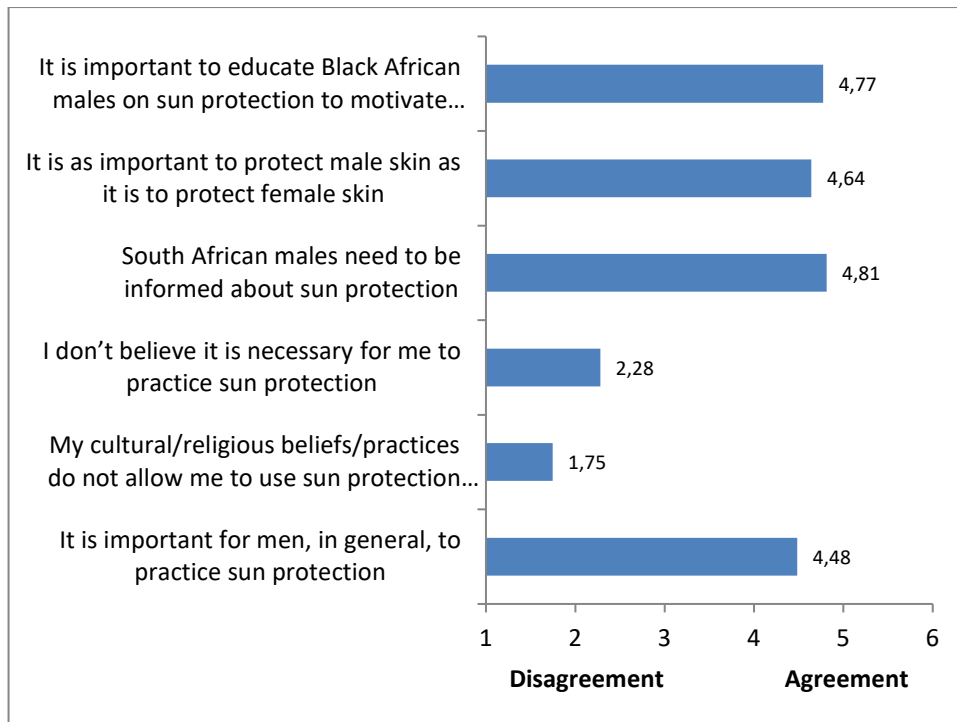


Figure 5.2: Percentages of agreement and disagreement

5.6 SUN PROTECTION PRACTICES

Table 5.8 displays evidence that a certain percentage of participants use the store-bought sunscreen, they also wear wide-brimmed hats when outdoors and they stay in shade or out of the direct sun when that is possible. A significant 31.5% of participants indicated that they stay in the shade or out of the direct sun during sunny days whenever it is possible, a substantial 28% alluded that they mostly utilise store-bought sunscreen. A sizeable 27.1% stipulated that they wear a wide-brimmed hat in the sun, 10% denoted that they wear long-sleeved clothing during the day in the sun and 3.5% apply red clay on their skin as a measure to protect their skin from the sun.

Table 5.8: Types of sun protection methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Apply store-bought sunscreen	95	23.2	27.9	27.9
	Apply red clay to my skin	12	2.9	3.5	31.5
	Wear long sleeved clothing	34	8.3	10.0	41.5
	Wear a hat when outdoors in the sun	92	22.5	27.1	68.5
	Stay in the shade/out of the direct sun whenever possible	107	26.2	31.5	100.0
	Total	340	83.1	100.0	
Missing	System	69	16.9		
Total		409	100.0		

5.6.1 Hours spent outdoors during the week

A total of 33.7% of participants spend 1-<3 hours outdoors, 26.4% spends 3-<5 hours outdoors, 19.6% spends 5-<10 hours outdoors, 13% spends only 1 hour outdoors and 6.6% spends 10+ hours outdoors on a typical week as shown in figure 5.3. This indicates that those that spend more hours outdoors are more susceptible to getting sunburnt if they do not protect their skin from the sun.

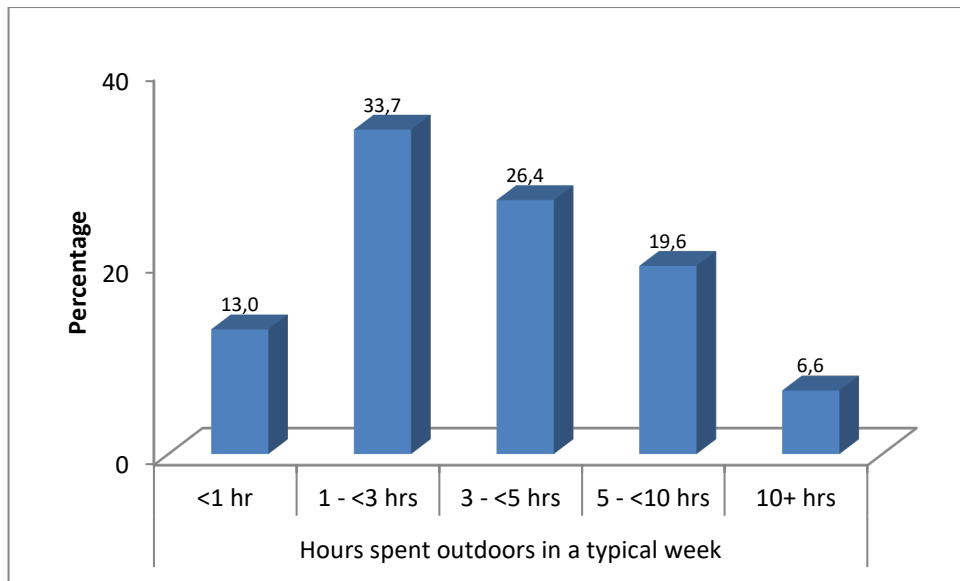


Figure 5.3: Hours spent outdoors during the week (Monday – Friday)

5.7 SUMMARY OF THE CHAPTER

This chapter focused on presenting the results that were found during data collection. Based on the results discovered, the practice of sun protection amongst Black African males in South Africa is still an issue. Chapter 6 will present the discussion of the results.

CHAPTER 6: DISCUSSION OF RESULTS

6.1 INTRODUCTION

In the previous chapter, the focus was on the presentation of the results found during data collection. This chapter focuses on the discussion of the results presented in the previous chapter. In finalising this study, it is necessary to recap the objectives and guidelines of this research, utilising the theoretical framework that guided the study. These will be deliberated independently in this chapter. This study assessed the knowledge, attitudes and practices of Black African males towards sun protection.

6.2 RESEARCH OBJECTIVES

The following research objectives were assessed utilising structured questionnaires, to which 409 students from DUT responded which was the sample size of the study. Due to the paucity of literature on sun protection in Africa and South Africa, the objectives were to:

- Assess the knowledge of Black African males regarding the use of sun protection.
- Determine the attitudes of Black African males towards the use of sun protection.
- Determine the practices of Black African males on the use of sun protection.

Conclusions will be drawn; limitations and recommendations will be presented in the next chapter following the data presentation and discussion.

6.3 DEMOGRAPHIC DATA

6.3.1 Age

The results showed that 41.3% of the participants were between the ages of 22-25 years old and the minor percentage was of the participants who were between the ages of 30 and above (9.8%).

6.3.2 Study programme

The majority of the participants were registered for the degree qualification (55.7%) with the certificate qualification being the lowest (2.2%).

6.3.3 Residential location during the study period

A total of 44.3% of the participants lived in urban located homes during their studies. This involved, largely, the participants who live in student residences. The lowest percentage was that of the participants who live in semi-urban areas (8.6%).

6.4 KNOWLEDGE OF BLACK AFRICAN MALES REGARDING THE USE OF SUN PROTECTION

During data analysis, for this particular set of questions that were based on the knowledge of participants, participants were grouped into two groups. Between the two groups, the second group (group 2) was the group with most participants who have heard about sun protection. This was displayed by a significant 73.4 % of participants who have heard of sun protection.

Sun protection can be taught to people through different means, which can include media adverts, social media, information from friends, health practitioners and dermatologists. A substantial 84% of participants have gained knowledge about sun protection from media adverts and 79% have heard of sun protection from social media (including Facebook, WhatsApp and

Instagram). A total of 47% of participants have heard of sun protection from their friends and 24% of participants have heard of sun protection from skincare therapists. A total of 33% have heard from health care practitioners and 20% have heard from dermatologists.

6.4.1 Themes

The theoretical framework of this study has identified principal themes for each objective constructing this study.

6.4.2 Theme: Lack of knowledge

In this study, knowledge assessed the extent to which individuals from the selected population know public health concepts regarding sun protection usage. This was not limited to knowledge of sun protection facts but also included knowledge of different types of sun protection measures and beliefs as well as awareness of rights to access the sun protection methods (Muleme *et al.* 2017:1). Wright, Reeder and Albers (2016:247) conducted a study in 2012 in 24 South African urban schools where they explored schools' sun-related efforts and school children's sun-related knowledge, attitudes and behaviours. One of the study's recommendations was that schools are the best and most reasonable platform, to put measures in place to curb skin cancer and reduce incidence rates. In the above-mentioned study, it was discovered that over 10 million children attend government schools daily. Up to this stage, it has been noted that persuasive topics such as nutrition and violence have been prioritised over sun protection. This pronounces that if Blacks can be taught about sun protection at stages as early as primary schools, they can carry the vital knowledge till the end as they would be practicing sun protection throughout. Another study done by Cestari and Buster (2017: 113) explored photo-protection in specific populations: children and people of colour. The findings noted that the United States Preventive Services Task Force recommends skin cancer counselling on sun-protection behaviour for children,

adolescents, and young adults aged 10 to 24 years with fair skin, grounded on inadequate proof from clinical trials showing a small advantageous effect. Notwithstanding this recommendation, which is supported by many medical organisations, only a small percentage of physicians appear to be implementing it into their practice. This data serves as a recommendation that sun protection would be effective if it can be taught in schools as a strong tool to educate people about sun protection.

6.5 ATTITUDES OF BLACK AFRICAN MALES TOWARDS THE USE OF SUN PROTECTION

A reliable single measure (one-sample test) for attitude towards sun protection was found by combining items 1, 4, 5 and 6 of a set of questions that examined the attitudes of participants. The reliability was tested using Cronbach's alpha. The alpha value for these 4 items was 0.911, which indicated a very reliable composite measure for attitude. Attitude was formed by averaging the scores from the four items. Having combined the four questions in this set, there was a significant agreement among the participants that it is vital for males in general to practice sun protection. The participants displayed different attitudes towards sun protection usage. There was a significant agreement that men need to practice sun protection. There was also a significant agreement that males need to be informed about sun protection.

6.5.1 Theme: Lack of motivation

The results indicated that the participants had significantly positive attitudes towards sun protection. However, there was an inverse relationship between practice and attitudes. Muleme *et al.* (2017: 1) assert that males, when compared to females, may not be motivated to practice sun protection or skincare which is generally known to be practiced by females more than males. This study aims to educate Black African males about the importance of sun protection use, the detrimental effects of sun exposure and the available sun

protection methods. This may motivate the males to practice sun protection and overall skincare.

Buchanan- Lunsford *et al.* (2018: 203) stipulate that Black and Hispanic populations seem to have a lower risk of contracting skin cancer, even though they do not use any sun protection, hence they are less likely to practice sun protection. In their study, Buchanan - Lunsford *et al* (2018: 203) had 18 focus groups that contained Black and Hispanic participants (aged 18-44 years). It was discovered that most of the respondents considered themselves to be at low risk of skin cancer due to their darker skin tone or lack of family history of skin cancer. Skin cancer signs and symptoms were more paradoxically reported by Blacks than Hispanics. Few participants reported regular sun protection behaviours. Those who did, use sunscreen, wear protective clothing and had elevated risk based on sun sensitivity or UV exposure.

The information above highlights a lack of motivation in many individuals, especially Blacks to practice sun protection due to their perceptions about sun exposure complications. This is witnessed in the study conducted by Wright, Reeder and Albers (2016:250), which found that the risk of UVR exposure is not well comprehended by all individuals. As such, there is a belief by some dark-skinned individuals that sun protection is not essential. It is clear that more specific guidance and education about sun protection is needed.

6.6 PRACTICES OF BLACK AFRICAN MALES ON THE USE OF SUN PROTECTION

Sunscreens come in different forms, some are man-made, some are natural, and some are things that can be used as sunscreens (for example long-sleeved clothes, wide-brimmed hats, shade). It was evident from the results that 23.2% of the participants utilise store-bought sunscreen and 26.2% stay in the shade or out of the direct sun whenever possible. This indicated that there is a shortage of knowledge about sun protection as high percentages depend on

staying in the shade or out of direct sunlight when possible. Wadyaka (2020: 1) denotes that to have darker skin does not exempt one from having to worry about sun protection as the sun's violent rays are colour blind, they reach each skin colour equally.

There are different methods or types of sun protection that can be utilised. These include store-bought sunscreen, red clay, long-sleeved clothes, wide-brimmed hats, staying in the shade or out of the direct sun (Gallagher 2020: 1). A substantial 33.7% of the participants indicated that they spend three to more than five hours in the sun on a typical weekend. This highlights that these individuals are more susceptible to get sunburnt which may lead to skin cancer in the long run. This is supported by Gallagher (2020: 1) who states that one may tan or burn in as little as ten minutes if exposed to the sun without any form of sunscreen, especially the one with SPF

6.6.1 Practices and outcomes

People with darker skin colour may tan faster, as their skin contains extra melanin, and this may lead to additional tanning as the sun triggers melanin production by melanocytes which leads to darker skin (Wadyaka 2020: 1). The rate at which one burns or tans is inclined by a sunscreen's SPF which means the higher the SPF, the longer it takes for one to burn or tan. It was also evident that 6.6% of participants spend ten or more hours in the sun on a typical weekend. A significant 13% of the current study's participants stated that they spend roughly one hour in the sun during a typical weekend. This group of participants is less prone to get sunburnt, depending on their skin tone and types. Even though this group of participants has fewer chances of burning in the sun as compared to those spending longer periods in the sun, they still can get sunburns.

6.6.2 Theme: Barriers affecting the practice of sun protection

It has long been known that compliance with recommended sun safety practices is suboptimal, yet few surveys have explored the barriers that people face in practicing good sun safety (Boggild and From 2003: 296). In a study conducted by Weig *et al* (2020:403), who assessed factors affecting sunscreen use and barriers to compliance, it was found that while sunscreen is effective in curbing skin cancer, civic sunscreen use and acquiescence are low. The findings in their study were that the general numerous barriers (personal barriers) to use sunscreen involved dislike of sunscreen's feel or appearance, time constraints and cost. This is in agreement with the study conducted by Boggild and From (2003: 296) in Toronto where the participants acknowledged several barriers to their own sun protection and seemed to consider them in equal occurrences. The most notable barriers were inconvenience, eagerness to be tanned, forgetting sun-protective clothing or protective clothing being too hot or uncomfortable and lotion being too sticky or greasy.

This information given above denotes that sun protection is indeed not practiced across the globe, especially in the Black population. This may be influenced by the notion that skin has a natural barrier that shields it from sunburns and Blacks do not have to practice sun protection. This specifies the need to address the attitudes and practices of sun protection which are affected by lack of knowledge.

6.7 SUMMARY OF THE CHAPTER

This study has revealed that several males have no clear understanding of sun protection and skincare whilst some have incomplete knowledge about sun protection and skincare. This chapter discussed the key findings of this research study. The following chapter will seek to draw relevant conclusions while providing recommendations and portraying any limitations that may have been identified for further studies.

CHAPTER 7: SUMMARY, LIMITATIONS AND RECOMMENDATIONS AND CONCLUSION

7.1 INTRODUCTION

This chapter summarises the study. It displays limitations and also provides recommendations. The aim of this study was to explore the use of sun protection amongst the Black African males their knowledge, attitudes and practices towards sun protection.

7.2 SUMMARY OF THE STUDY

This study assessed all the three aspects of the topic being knowledge, attitudes and practices of the Black African males regarding sun protection. The participants (students) were recruited at the Durban University of Technology, from all seven campuses of the institution. The study findings discovered that sun protection is known to Black African males while some have not heard of sun protection. Even though it is known, a certain percentage does not fully practice sun protection. Some do not practice it at all. The study also revealed different attitudes towards sun protection amongst Black African males.

In this study, the participants that were assessed were from different regions of the province, being urban, rural, semi-urban and townships. This may have influenced knowledge, attitudes and also practicing sun protection, for example, the rural area residents are not adequately exposed to fundamental knowledge of many things.

7.3 LIMITATIONS OF THE STUDY

Limitations are barriers that weaken or decrease the credibility of the study results. These could be the research design, sample of the study, or research methods (Botma, Greeff, Mulaudzi and Wright 2010: 107; Burns and Grove 2011: 48). According to De Vos *et al.* (2011: 288), limitations of the study are to be explicit so that precautionary measures may be applied to reduce any possible negative impact that the study could have. This study contained some limitations which suggest further research on this study's topic. The study was only conducted at one higher education institution; therefore, findings cannot be generalised to other higher education institutions. Data was collected from Black African males only whilst skin cancer or any skin conditions related to overexposure to the sun can affect all races and genders. This is considered to be a limitation to the study. There are other universities in the province that may be included in the study. The study was conducted only at the Durban University of Technology due to the COVID-19 restrictions. It is not only the university's community that the study was conducted at who can experience detrimental effects of excessive sun exposure; any person can experience the same. Thus, this also was a limitation to the study in terms of sample size.

This study was only limited to the students and the staff members were excluded. It could have improved the rigour of the study if staff members were included. Due to the COVID-19 restrictions, online questionnaires were used to collect data. The main reason for conducting online data collection was that there were not many students who were on campus physically, most of them were studying online. The questionnaires were sent to the participants via the Student Pin Board email. Furthermore, online surveys are completed only by persons who have access to the internet, and by those who are sufficiently biased to be interested in the subject.

7.4 RECOMMENDATIONS

In conclusion, the principal aim and objectives were to assess the knowledge of Black African males, their attitudes and the level of practice towards sun protection. Following the limitations addressed above in the chapter, some recommendations may be helpful to create a concrete conclusion on the KAP towards sun protection.

7.4.1 Introduction of education on sun protection at primary schools

Teaching about sun protection to children at a primary school level can be beneficial in terms of practicing and instilling the knowledge in them at an early age. The results of the study have emphasised the need for more health orientation and education programmes. Childhood is an excellent time to form life-long prevention habits as attitudes and lifestyle patterns are still being formed and are most malleable during this period. Public health interventions need to provide not only the knowledge but also promote attitude change and preventative behaviour through consistent and repeated sun education messages. Planning of education campaigns, health education needs to begin in-school period, when students start making independent choices.

7.4.2 Health practitioners to educate communities on sun protection

The researcher is of the view that occurrences of skin cancer can be lowered if sun protection is taught to communities. Even though the Black community has very low occurrences, teaching the community about sun protection can be beneficial.

7.4.3 Training the community caregivers about sun protection

Having the community caregivers equipped with sun protection knowledge can be beneficial. Since they work on a door-to-door basis in the communities, they can be a good medium to relay sun protection to the homes they visit in the community.

7.4.4 Education in the universities to teach staff and students about the importance of sun protection

It is recommended that the students and staff are taught about sun protection in the universities. This can be done online to staff and students. Implementation of sun protection measures at the university, such as shaded areas for students, even staff when outdoors could be beneficial. The option of environmental intervention, particularly shade should be considered. An efficient policy of education on the effective use of sun protection methods must be developed to increase the level of sun protection. Public awareness campaigns can also be initiated to convince people that it is worthwhile to protect themselves from the sun.

7.4.5 Changing behaviour and attitudes

General knowledge may negatively or positively influence the behaviour or attitude towards something. In this study, the Black African males' behaviours and attitudes were influenced by the peers (friends), health professionals (skincare therapists, dermatologists and other health professionals) and media. In this study, 47% of participants have heard about sun protection from friends. Those who heard from health professionals, especially skincare therapist (24%) and dermatologists (20%) was the lowest as compared to heard from media (84%). Media is one of the most powerful tools to relay messages across the globe, however, it can be anyone who can post anything that they use as means to protect the skin from the sun. What works for a certain individual, may or may not work for another person. A recommendation to change the attitude and behaviour of Black African males and all the communities towards sun

protection is to encourage health professionals to educate people about sun protection. If they can visit the schools, especially rural primary schools, they can achieve the goal of getting people to know and practice sun protection.

7.5 FURTHER RESEARCH

The topic of this study permits further research. This study is restricted in its generalisability due to the small sample size, which suggests the need for further research. Further studies can include females to gather more information. It can also be conducted as a comparative study where the study can compare races as to how active are they in taking care of their skin and in practicing sun protection. This can give a bigger picture of KAP across the province or even across the country. Furthermore, additional data that can assist in making further studies reliable can include:

- **Extending the research to other universities**
It may be useful if this study can also be conducted at other universities within the KZN province. This is to access Black African males from all over the province as regions may differ in terms of temperatures. The level of heat may differ among the areas (coastal and inland). This would provide more solid data.
- **To repeat the study in other municipalities**
Collecting more data from other municipalities can increase the chances of getting a clearer picture on KAP towards sun protection.
- **A comparison study on females, urban versus rural knowledge**
A comparison study can be done to compare rural and urban females in terms of their knowledge and to assess how their background affects their knowledge of sun protection.

7.6 CONCLUDING REMARKS

In conclusion, skincare sun protection is vitally important for everyone to practice. It is not made for a specific gender, therefore, it is advised to be practiced by everybody, regardless of gender and/or race. Even though dark skin has its natural shield (melanin) to protect against the sun's harsh ultraviolet rays, it is still important for Black people to protect themselves from UV radiation. This will help in reducing the chances of developing skin cancer in the long run.

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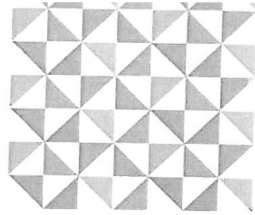
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APPENDICES

Appendix 1: University ethics clearance certificate



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Durban University of Technology

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http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

20 October 2020

Mr Z E Mayeza
12 Pavo Court
15 Woodburn Place
Glenwood
Durban
4001

Dear Mr Mayeza

Knowledge, attitude and practices of Black African males towards the use of sun protection: A case study of a University of Technology in KwaZulu-Natal.
Ethical Clearance number IREC 101/20

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letter.

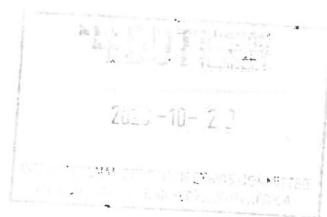
Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

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



Appendix 2a: Letter of request for gatekeeper permission from the Gatekeeper Permission Committee

12 Pavo Court
15 Woodburn Place
Glenwood
Durban
4001
[Date]

The Director: Research and Postgraduate Support
Durban University of Technology
PO Box 1334
Durban
4000

Request for Permission to Conduct Research

Dear Dr Liganiso

My name is Zamani Mayeza, a Master of Health Sciences student at the Durban University of Technology. The research I wish to conduct for my master's dissertation involves **Knowledge, attitudes and practices of Black African males towards the use of sun protection: A case study of a University of Technology in KwaZulu-Natal.**

I am hereby seeking your consent to collect data for the study from students of the university.

I have provided you with a copy of my proposal which includes copies of the data collection tool, letter of information and consent to be used in the research process. A copy of the provisional ethics clearance is provided.

If you require any further information, please do not hesitate to contact my supervisor, Prof Sibiyi on 031-373 2284 or you can email her on nokuthulas@dut.ac.za

Thank you for your time and consideration in this matter.

Yours sincerely,

.....
Mr. Zamani E. Mayeza
Durban University of Technology
073 037 2608
21004674@dut4life.ac.za

Appendix 2b: Approval letter from the Gatekeeper Permission Committee



*Directorate for Research and Postgraduate Support
Durban University of Technology
Tromso Annex, Steve Biko Campus
P.O. Box 1334, Durban 4000
Tel.: 031-3732576/7
Fax: 031-3732946*

8th October 2020
Mr Zamani E. Mayeza
c/o Department of Somatology
Faculty of Health Sciences
Durban University of Technology

Dear Mr Mayeza

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research and Innovation Committee (IRIC) has granted **Full Permission** for you to conduct your research "Knowledge, attitudes and practices of Black African males towards the use of sun protection: A case study of a University of Technology in KwaZulu-Natal." at the Durban University of Technology.

The DUT may impose any other condition it deems appropriate in the circumstances having regard to nature and extent of access to and use of information requested.

We would be grateful if a summary of your key research findings would be submitted to the IRIC on completion of your studies.

Kindest regards.
Yours sincerely

DR LINDA ZIKHONA LINGANISO
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT DIRECTORATE

Appendix 3: Letter of information for study participants



Title of the Research Study: Knowledge, attitudes and practices of Black African males towards the use of sun protection: A case study of a University of Technology in KwaZulu-Natal.

Principal Investigator/s/researcher: Mr. Zamani Effort Mayeza (Master of Health Sciences Candidate).

Co-Investigator/s/supervisor/s: Professor M.N. Sibiyi, D Tech: Nursing (Supervisor); Ms M.U Makgobole, M Tech: Somatology (Co-supervisor).

Brief Introduction and Purpose of the Study: Skin cancer is the most common cancer in South Africa, with about 20,000 broadcasted cases every year and 700 deaths. South Africa also has the second-highest occurrence of skin cancer in the world following Australia, so this states that South Africans are not adequately practicing protective means in the sun. Therefore, the purpose of this study is to assess the amount of knowledge and also the attitudes amongst Black African males in South Africa which affect the practice of sun protection products. The results drawn from this study will create an awareness among South African Black African males on the importance of practicing sun protection in order to prevent development of skin cancer.

Greeting Hello, how are you?

Introduce yourself to the participant I am Zamani Mayeza, a first-year student at the Durban University of Technology (DUT), I am doing research for my Master's Degree in Health Sciences.

Invitation to the potential participant I would like to invite you to participate in the research.

What is Research (Research is a systematic search or enquiry for generalized new knowledge).

You are entitled as a participant to ask any questions about this research. This will allow you to be able to fully understand the study. You are also notified that you are entitled to discuss the study with your family/friends and under no obligation to commit at this stage. For this purpose, you will be given a copy of the letter of information.

Outline of the Procedures: The spread of skin cancer is seen as one of the universal health issues. According to the Cancer Association of South Africa (CANSA), skin cancer is the most common cancer in South Africa, with about 20,000 broadcasted cases every year and 700 deaths. South Africa has the second-highest occurrence of skin cancer in the world following Australia. There is evidence that South Africans are not adequately practicing protective means in the sun. In developed countries, there is information on the occurrence of cutaneous melanoma, the subsequent impermanence, and the changes in the structures over time, data from South Africa is inadequate. The use of inadequate levels of sun-protective behavioral practices has been commonly found amongst males. This study is significantly important especially in KwaZulu-Natal (KZN) as it is one of the provinces with places that become very hot in summer, particularly in eThekweni, as the degrees of heat can go as far as 35 degrees Celsius. This is important, to educate males about skin protection. When we are exposed to those degrees, the skin is more prone to be affected by skin cancer if not protected, thus important to educate our Black African males about sun protection.

Procedure: You are requested to complete the questionnaire and return it to the researcher.

Responsibilities: You are responsible for the accurate information you provide on the questionnaire. You are also asked to provide as honest information as possible.

Venue: You will complete the questionnaire in your own comfortable space.

Duration: You are asked for only 30-45 minutes of your time for the session (it may take less than that).

Inclusion criteria

Black African males who are 18 years and above.

Exclusion criteria

Black who are below 18 years old and female students will be excluded.

Risks or Discomforts to the Participant: There will be no risks or discomforts caused, before, during or after the you have taken part in this research.

Explain to the participant the reasons he/she may be withdraw from the Study:

You may withdraw at any time, at which ever stage they feel they may withdraw. This may be due to that the participant does not want to continue anymore due to illness or any personal reasons. Should you wish to withdraw at any time, you will still receive the appropriate standard of care and the research may be terminated during those circumstances. The researcher also may decide to withdraw you under certain significant circumstances. During your withdrawal, the consent form, letter of information and the questionnaire will be scratched out and be shredded straight after the session.

Benefits: This research aims to educate or raise awareness on sun protection. You may benefit from this ad they will be enlightened on the importance of sun protection.

Remuneration: There will be no remuneration of any kind to the participants, they will be participating according to their will.

Costs of the Study: You will take part in this research at no cost

Confidentiality: All the information will always be kept confidential and there will be no names mentioned in the dissertation or the publication. Participant codes will be utilized to identify the participants.

Results: The results will be disseminated in a research report

Research-related Injury: The study will result in no injuries at all.

Storage of all electronic and hard copies including tape recordings Research material will be stored under lock and key. These will be kept for 5 years thereafter they will be destroyed by shredding. Data will be kept in the password protected computer and will be deleted after 5 years. . A copy of the study will be available in the institutional repository and the results of the study will upon request be shared with the study participants.

Persons to Contact in the Event of Any Problems or Queries: Please contact the researcher, Mr. Zamani Mayeza on 031-373 2703 or 073 037 2608, my supervisor, Prof Sibiya on 031-373 2284) or the Institutional Research Ethics Administrator on 031-373 2375. Complaints can be reported to the Director: Research and Postgraduate Support Dr L Linganiso on 031 373 2577 or researchdirector@dut.ac.za.

Appendix 4: Consent



Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Mr Zamani E. Mayeza 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 into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised 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, Zamani E. Mayeza herewith 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

Appendix 5: Questionnaire

Please respond to ALL the questions and answer them as honestly as possible. Please **TICK** the response that best applies to you. Should you not understand any question(s), feel free to ask.

Section A: DEMOGRAPHIC DATA

A1. Age

18 - 21	22 – 25	26 – 29	30+

A2. Programme Registered for

Certificate	Diploma	Degree

A3. Home Location while you are studying (Tick ONE option only)

Urban	Township	Rural	Semi-urban

Section B: KNOWLEDGE of Sun Protection

B1. Indicate your level of awareness and knowledge of 'sun protection'. Select ONE option only.

I have never heard of 'sun protection'	I have heard of 'sun protection' but do not know anything about it	I have heard of 'sun protection' and know a little about it	I have heard of 'sun protection' and know a lot about it

B2. Indicate which of the following apply to you. Respond YES or NO to each item/question.

	YES	NO
B2.1 I have heard of 'sun protection'		
B2.2 I have heard of 'sun protection' from a friend		
B2.3 I have heard of 'sun protection' from a Skincare Therapist		
B2.4 I have heard of 'sun protection' from a Health Care Practitioner		
B2.5 I have heard of 'sun protection' from a Dermatologist		
B2.6 I have heard of 'sun protection' from media adverts		
B2.7 I have heard of 'sun protection' from social media		

B3. Sun protection products (Sunscreens) that are purchased in stores contain a Sun protection Factor (SPF). These SPFs differ in numbers, i.e. SPF 10, 15, 20, 25, 30, 40, 50, 60 etc. what do you think these numbers indicate? Please answer below.

B4 Indicate your agreement with the following statements:

	True	False	Not sure
B4.1 Females are more likely to get sun burnt than males			
B4.2 Dark-skinned people do not have to worry about protecting their skin from the sun			
B4.3 When it is overcast (cloudy), one does not need to protect one's skin from the sun when outdoors			
B4.4 Sunburn can result in a temporary change in skin colour			
B4.5 Sunburn can cause acne (inflamed pimples with pus)			
B4.6 Sunburn can cause small fluid-filled blisters that may break			
B4.7 Sunburn can result in skin cancer over time			
B4.8 Sunburn can cause pain and tenderness to the skin			

Section C: ATTITUDE to Sun Protection

Indicate your agreement with the following statements:

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
C1 It is important for men, in general, to practice sun protection						
C2 My cultural/religious beliefs/practices do not allow me to use sun protection on my skin						
C3 I don't believe it is necessary for me to practice sun protection						
C4 South African males need to be informed about sun protection						
C5 It is as important to protect male skin as it is to protect female skin						
C6 It is important to educate Black African males on sun protection to motivate them to practice sun protection						

Section D: SUN PROTECTION PRACTICES

D1. Indicate if you ever use any of the following Sun Protection practices (Tick ALL that apply)

D1.1 I apply a store-bought Sunscreen product (Spray/Lotion) to my skin	
D1.2 I apply red clay to my skin	
D1.3 I wear long sleeved clothing	
D1.4 I wear a hat when outdoors in the sun	
D1.5 I stay in the shade/ out of the direct sun whenever possible	

D2. How many HOURS, on average, do you spend outdoors/in the open, in a typical week (Monday to Friday) between sunrise and sunset?

Less than 1 hour	1 - <3 hours	3 - <5 hours	5 - <10 hours	10+ hours

D3 How many HOURS, on average, do you spend outdoors/in the open on a typical weekend (Saturday and Sunday) between sunrise and sunset?

Less than 1 hour	1 - <3 hours	3 - <5 hours	5 - <10 hours	10+ hours

THANK YOU FOR TAKING PART IN THIS RESEARCH

Appendix 6: Letter of confirmation from the statistician

Gill Hendry B.Sc. (Hons), M.Sc. (Wits), PhD (UKZN)
Mathematical and Statistical Services

Cell: 083 300 9896
Email: gillhendrystats@gmail.com

24 May 2021

Re: Assistance with statistical aspects of the study

Please be advised that I have assisted Zamani Effort Mayeza (Student number 21004674), who is currently studying for a Masters of Health Science at DUT, with the statistical aspects of his study: the questionnaire development, sampling and data analysis.

Yours sincerely

Dr Gill Hendry
Private Consulting Statistician

Appendix 7: Certificate from the professional editor

DR NELLIE NARANJEE

Doctorate Nursing, MBA, MCur (Health Sciences)
Freelance academic editor: Blackford Institute, UK

Contact details
Office 031 3732036
After hours 031 7643815
Mobile 0825776126
Email naranjeen@gmail.com
NellieN1@dut.ac.za

EDITING / PROOFREADING CERTIFICATE

Student: Mr Zamani Mayeza

Student Number: 21004674

Masters thesis: Knowledge, attitudes and practices of black african males towards the use of sun protection: A case study of a university of technology in KwaZulu-Natal.

I confirm that I have edited this thesis for writing style, clarity, language, sentence structure and layout. The document is formatted according to the prescribed guidelines. I returned the document to the author with track changes. The author remains responsible for the correct application of the changes in the text and references.

I am a freelance editor specialising in proofreading and editing of academic documents. I have a Doctorate Degree in Nursing from Durban University of Technology. I have a Master's Degree in Business Administration (Public Health) and a Master's Degree in Health Sciences. I have a Diploma in Proofreading and Copy Editing with Distinction from the Blackford Institute, UK.

I wish the student all the best.

DR NELLIE NARANJEE

24 May 2021

DATE

Appendix 8: Turnitin report

ev.turnitin.com/app/carta/en_us/?lang=en_us&is=1&u=16632674&o=1592922691&ro=103

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KNOWLEDGE, ATTITUDES AND PRACTICES OF BLACK AFRICAN MALES TOWARDS THE USE OF SUN PROTECTION: A CASE STUDY OF A UNIVERSITY OF TECHNOLOGY IN KWAZULU-NATAL

Zamani Effort Mayeza (21004674)

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