A prospective pilot investigation of the Zulu translation of the Numerical Pain Rating Scale (NRS-101) and the Patient-Specific Functional Scale (PSFS) with respect to their concurrent validity when compared to their English counterparts

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BY

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I solemnly declare that this is my own work in compilation and execution.

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Abstract

The purpose of this study was to determine concurrent validity of the Zulu translations of the English Numerical Pain Rating Scale-101 and the Patient Specific Functional Scale. The Numerical Pain Rating Scale-101 and the Patient Specific Functional Scale (ENRS-101 and the EPSFS) were translated into Zulu (ZNRS-101 1.0 and ZPSFS1.0) and were tested for face validity by means of a focus group session.

A sample of 60 volunteers over the age of 18 years, whose first language was Zulu and who suffered either from neck, lower back, shoulder or foot/ankle pain, took part in the study. The participants were given the Zulu versions of the scales to be completed first at the beginning of the consultation. This was followed by a detailed case history taking session at the end of which they were asked to complete the English versions. The need for a time lapse between completion of the questionnaires was to ensure that participants where less likely to rely on memory or compare/transfer answers from one questionnaire to the next.

The level of correlation between the Zulu and the English versions of each respective questionnaire was tested at the alpha level of significance ($\alpha = 0.05$) using the Spearman's correlation coefficient and the weighted Kappa statistics.

The Zulu translations of the respective scales that were tested revealed a high level of correlation ($p < 0.001$ for both scales). The numerical ratings listed in the patient specific functional scales for each activity also revealed a high level of correlation ($p < 0.001$ for each rating).

The study found that the Zulu versions of the respective scales showed concurrent validity with their English counterparts due to the high level of correlation that was found between them.

Definition of terms

1. **Dysfunction:** Unable to function normally i.e. performance (Mosby's Medical, Nursing, and Allied Health Dictionary, 4th Ed., 1994).

2. **Focus group:** The focus group is defined as a discussion in which a small group of informants (6 to 12 people), guided by a facilitator, talk freely and spontaneously about themes considered important to the investigation. The participants are selected from a target group whose opinions and ideas are of interest to the researcher (or discussion) group, to assess their face validity (Streiner et al. 1995:17).

3. **Function:** the ability to perform activities normally (Mosby's Medical, Nursing, and Allied Health Dictionary, 4th Ed., 1994).

4. **Impairment:** Any disorder in structure or function resulting from anatomic, physiologic, or psychologic abnormalities that interfere with normal activities (Mosby's Medical, Nursing, and Allied Health Dictionary, 4th Ed., 1994).

List of abbreviations

ENRS-101: English Numerical Pain Rating Scale

ZNRS-101: Zulu Numerical Pain Rating Scale

EPSFS: English Patient Specific Functional Scale

ZPSFS: Zulu Patient Specific Functional Scale

LBP: Low Back Pain

ENRSWP: English Numerical Pain Rating Scale Worst Pain

ZNRSWP: Zulu Numerical Pain Rating Scale Worst Pain

ENRSLP: English Numerical Pain Rating Scale Least Pain

ZNRSLP: Zulu Numerical Pain Rating Scale Least Pain

EPSACT1: English Patient Specific Functional Scale Activity 1

EPSACT2: English Patient Specific Functional Scale Activity 2

EPSACT3: English Patient Specific Functional Scale Activity 3

EPSACT4: English Patient Specific Functional Scale Activity 4

ZPSACT1: Zulu Patient Specific Functional Scale Activity 1

ZPSACT2: Zulu Patient Specific Functional Scale Activity 2

ZPSACT3: Zulu Patient Specific Functional Scale Activity 3

ZPSACT4: Zulu Patient Specific Functional Scale Activity 4

CHAPTER ONE- INTRODUCTION

1.1 INTRODUCTION

Zulu is spoken by 8.5 million people as their first language in South Africa, making it the most widely spoken first language in the country (www.linx.co.za.2002). Approximately 8 million Zulu speakers reside in Kwa-Zulu Natal (www.peopleteams.org.2001).

A study conducted by Campbell and Mzaidume (2002: 229-32), on the impact of HIV and AIDS found that certain health interventions, such as condom distribution, did not prove successful because of community contexts that frowned on this practice. These findings concur with those of Miller (2003: 17) who highlighted the need of health interventions to be relevant to the specific social and cultural context that they are addressing.

A study conducted by Van der Meulen (1997) and Worku (2000) found that a high level of disability was associated with low back pain amongst the indigenous Southern African populations. An accurate assessment of the level of disability can only be done if sufficient tools exist that are sensitive and specific enough for this purpose. A review of the literature revealed that no validated, subjective measurement tools, in the Zulu language, exist.

According to Jensen et al. (1986:125) and Downie et al. (1978: 379), the Numerical Pain Rating Scale (NRS-101) is the questionnaire of choice when assessing pain intensity of patients. The studies found that the NRS-101 had advantages over the other scales because it was simple to administer, simple to score and it can be administered in either written or verbal form.

According to Chatman (et al. 1997: 828) and Westaway et al. (1998: 336), the PSFS is a time-efficient and appropriate tool when assessing clinical disability of the patient.

A Zulu translation of these questionnaires was undertaken resulting in the Zulu NRS-101 1.0 and the Zulu PSFS 1.0 of the respective scales. The translations were done by a Zulu linguist (Miss Zama).

Translations however pose inherent problems. Even if words are translated accurately, the meaning of a phrase or combination of words may be unclear, as meaning is not only determined by words or phrases, but also in their interpretation by others (Scollen and Scollen, 1995: 6). This is because when words are taken out of context they will lose their meaning (Baynham, 1995: 37). Thus meaning will differ between cultures, even if the same words are used. Consequently, with translation some validity will be lost as the questions themselves may not be understood and errors can be introduced in the results of the questionnaire.

The validity of a data collecting tool is determined by the degree to which the tool reflects reality (Mouton, 1996). This is important in order to ensure that future research utilising the tool is accurate i.e. that the tool is designed to collect the intended data. (Bernard, 2000: 51).

Validity comprises several components viz. face validity, content validity, construct validity, and criterion validity (Bernard, 2000: 207,210). The definitions of these concepts and how they are addressed in the English scales and their Zulu counterparts will follow

The definitions were taken from Bernard (2000: 207,210) unless otherwise stated.

1*. Face validity*, the simplest type of validity, is determined by agreement between researchers and those with a vested interest (patients, medical

professionals, chiropractic students) in the questionnaire, that ‘on the face of it’ the tool seems valid. This was achieved prior to the study by subjecting a Zulu translation of the NRS-101 and the PSFS (i.e. the ZNRS-101 1.0 and the ZPSFS 1.0) to a focus group. This focus group comprised of individuals that were;

a. bilingual,
b. from a variety of backgrounds (age and work experience),
c. that would have a vested interest in the results that the questionnaire would ultimately capture.

The translation was discussed in terms of the language accurately reflecting the meaning of the ZNRS-101 and the ZPSFS. Suggestions for change were analysed, and these changes made to the translation, yielding the versions used in this study (i.e. ZNRS-101 1.1 and the ZPSFS 1.1).

2. An instrument has *content validity* when the content of the questionnaire is considered effective, and well rounded enough to be able to assess a particular concept.

3. *Construct validity* measures how accurately answers to questions in a scale reflect theoretical predictions of a particular construct (in this case lower back pain).

4. *Criterion validity* is measured when a particular tool produces similar results when compared with another tool already known to be trustworthy. This is also called *concurrent* validity by Mouton (1996: 127). Predictive validity falls under this category as well. If a tool can predict a future situation accurately it has predictive validity (Mouton, 1996: 127).

Construct validity and content validity of the ZNRS-101 1.1 and the ZPSFS 1.1 remained intact as they have been established in the ENRS-101 and the EPSFS (Jensen et al. 1986 and Chatman et al. 1997). In addition, the focus group session ensured that the meaning is apparent in both the ZNRS-101 1.1 and the ZPSFS 1.1.

The type of validity that remained to be assessed with respect to the Zulu translations of the 2 English scales was Criterion/Concurrent validity therefore the purpose of this investigation was to determine whether the ZNRS-101 1.1 and the ZPSFS 1.1 has criterion/concurrent validity with the tested English versions.

1.2 THE OBJECTIVES OF THE STUDY:

1.2.1 OBJECTIVE ONE

To assess whether the Zulu translations of the Numerical Pain Rating Scale- 101 and the Patient Specific Functional Scale display criterion/concurrent validity with respect to each other.

1.2.2 OBJECTIVE TWO

To make any recommendations for further improvement of the Zulu translations if deemed necessary.

CHAPTER TWO- REVIEW OF THE RELATED LITERATURE

"Real education is impossible through a foreign medium … the vernacular medium alone can stimulate originality in thought in the largest number of persons" (Mahatma Gandhi: 1920).

2.1. INTRODUCTION

The purpose of this literature review is to summarise the relevant literature with respect to concurrent validity of the English NRS-101 to the Zulu NRS-101 and the English PSFS to the Zulu PSFS. It also discusses the importance of having the Zulu translated versions of these questionnaires.

2.2 THE CASE OF ISIZULU

The largest number of people in South Africa speaks IsiZulu. In the Gauteng province, which has the largest concentration of people in South Africa, the majority of people speak IsiZulu (www.safrica.info/ess info/sa_glance /dempgraphics/popprov.htm). In Kwa-Zulu Natal, 80% of the population speak IsiZulu as their mother tongue (Deprez and Du Plessis, 2000: 152).

Deprez and Du Plessis (2000: 153) stated that, "For one to be at home and function well in the modern world, his mother tongue must be a proficient vehicle for conducting modern life".
Therefore in the health care sector, as in all facets of society, it is imperative that the needs of the Zulu speaking population be addressed.

If there is a high correlation between the questionnaires, this study seeks to facilitate the collection of medical data (pain intensity and levels of dysfunction) from Zulu speaking patients who visit the Chiropractic Day Clinic at the Durban Institute of Technology (D.I.T.) as well as at other research institutions and clinics.

2.3 LITERATURE REVIEW

The act of measurement is an essential component of scientific research, whether in the natural, social, or health sciences (Streiner et al. 1995: 1). Pain measurements are the most challenging and difficult area of subjective health measurement and it can be argued that that pain is a private and internal sensation that cannot be directly observed or measured, but whose measurement depends wholly on the subjective response of the person experiencing it (Streiner et al. 1995: 2).

There are several classifications of health measures. According to McDowell et al. (1996:12), health measures fall within three broad classifications, namely:

- *Functional classifications*: these measurements focus on the purpose or the application of the research method.
- *Descriptive classifications*: these measurements focus on their scope of application.
- *Methodological classifications*: focuses on technical aspects, such as the methods used for recording the data.

When pain is equated to the level of health of an individual, the simplest way to quantify estimates of the level of health is to ask directly for a numerical estimation i.e. “On a 0-100 scale, how severe is your pain?” Pain is a common presenting complaint of patients seeking care and a

measure used frequently by clinicians to assess change a patient's perception of pain (Westaway et al. 1998: 332).
The measurement requires the assignment of numerical scores to descriptions such as mild or severe, and this can be achieved by using a scale such as the Numerical Pain Rating Scale-101 (McDowell et al., 1996:18).

By contrast, the measurement of physical dysfunction is more direct where the measurement is defined in terms of observable behaviours such as walking a certain distance or climbing stairs as in assessing intermittent claudication (McDowell et al. 1996:335). Improvement or deterioration of a patient's physical condition can be monitored if there is a visible change in the functional ability of that patient.

2.4. EVOLUTION OF A QUESTIONNAIRE

There are many methods in gathering data, ranging from the methods of observation to in-depth interviews and questions to active interventions with data sheets. The questionnaire is by far the most common and widely used technique of data collection because it can be used in any setting whether formal or informal. According to Korporaal (2002:30), there are certain set principles that need to be incorporated into the development of each new questionnaire that will be used as a research tool. These are:

1. Inclusion of the research question into the questionnaire (measure of the dependant variable).

2. Inclusion of indicators that have been established through consultation with literature, to ensure that any possible relation can be detected (measures of independent variables).

3. The inclusion of the hypothesised relationships, which are being tested (measure of the test variables).

4. The inclusion of simple language concepts to allow for understanding and ease of completion of the questionnaire by the participant in the research process, as well as generic background variables (demographic variables).

2.5. VALIDITY OF THE SCALES/QUESTIONNAIRES

Questionnaires have been used to conduct quality of life assessments and most of these have been compiled in the English language to be used within the English speaking population, thereby having a specific cultural scenario (da Mota Falcao et al. 2003: 397).

When these measures are used in other countries, cultures, and languages; the translation should not be exclusively linguistic, but it must be culturally adapted to maintain the same measurement properties (da Mota Falcao et al. 2003: 397).

Though these questionnaires are valid in their country of origin, they may not be directly applicable elsewhere due to cultural differences amongst nations (da Mota Falcao et al. 2003: 381).

Guillemin (et al. 1993: 1421-1424) suggested a standardized guideline for the translation of Questionnaires from the English language to any other mother tongue. These guidelines are divided into 5 sections namely:

1. Translations (Translators should preferably translate into their mother tongue).
2. Back-translations by qualified people (They should also translate into their mother tongue).
3. Committee review of those translations and back translations (Bilingual individuals are of value to such committees and their

input is likely to result in measures better adapted in terms of idioms and colloquialisms than that which will be produced by higher educated people).

4. Pre-testing for equivalence using adequate techniques (With bilingual or monolingual individuals where the final version is submitted in order to detect possible discrepancies).
5. Re-evaluation of the weighting of scores, if relevant (Using judgement, the cross-cultural validity of the weighting of items is re-examined by experts, who may be health care professionals, patients or lay people).

Pitfalls may arise when the above generally accepted methodological steps are not applied in a uniform manner when translating and adapting quality of life questionnaire to culturally different scenarios (Ferraz et al. 1997: 2067). According to Guillemin (et al. 1993: 1423), there are four equivalences that need to be followed:

1. Semantic equivalence: is the equivalence in the meaning of words, therefore grammatical alterations are sometimes necessary in sentence construction.

This is supported by a study conducted by Mkoka (et al. 2003: 265-266), where an English Questionnaire was translated into Xhosa and difficulty was experienced with the direct translation of certain words. For a translation to be semantically equivalent, it has to convey the same meaning and achieve a similar effect on the respondents as the original Questionnaire.

2. Idiomatic equivalence: it is often required to translated idioms and colloquial terms in order to incorporate the emotional dimension.
3. Experiential equivalence: the emotion/s evoked in the original should be depicted in the translated version of the Questionnaire.

4. Conceptual equivalence: a word can be directly translated from English into another language, but the concept in which the original word is understood, may be lost.

Zulu speaking South Africa would fit into the last context, where both the language and culture are different to that of the source country of the questionnaire.

2.6. THE QUESTIONNAIRES

The following two Questionnaires were chosen for the purpose of data collection for this study:

1. The Numerical Pain Rating Scale 101 (Appendix D) because it is easy to administer, and the scale can be given in verbal or written form (Jensen et al. 1986: 125).

2. Chatman (et al. 1997:828) stated that, the Patient-Specific Functional Scale (Appendix F) was applicable to a large number of clinical conditions (any condition where there dysfunction occurred that hindered normal activities); efficient and easy to administer; easy to record and have sound measurement properties (reliability, validity and sensitivity to change).

2.7. THE NUMERICAL PAIN RATING SCALE (NRS-101)

The NRS-101 can be used in a clinical setting by medical practitioners to help indicate the level of a patient's pain by means by means of a number (0 to 100). The intensity of the pain perceived by an individual at the time before treatment is given, when the pain is at its worst, and when it is at its least (Jensen et al. 1986: 119). An average between these two numbers will produce an indication of the experienced pain intensity (Bolton et al. 1998: 2).

Jensen et al. (1986: 122), compared six methods of evaluating pain intensity, namely, the Visual Analogue Scale; the 11-point Box Scale; the 6-point Behavioural Rating Scale; 4-point Verbal Rating Scale; the 5-point Verbal Rating Scale and the 101-point Numerical Pain Rating Scale in patients suffering from chronic pain i.e. had pain for more than 6 months. The scales were assessed according to five criteria. These criteria were as follows:

1. Ease of administration and scoring.
2. Relative rates of correct responding.
3. The relative sensitivity of the scales as defined by the number of response categories they provide.
4. The relative sensitivity of the scales as defined by their ability to detect treatment effects.
5. The magnitude of the relationship between each scale and a “best possible” combined measure of subjective pain intensity.

The study found that the NRS-101 had advantages over the other scales because it was simple to administer, simple to score and it can be administered in either written or verbal form.

Another advantage of the NRS-101 is that it has 101 response categories compared to the limited categories for example, the Visual Analogue Scale (VAS) that can only be assessed in written form and takes two steps to score, and the 11-point Box Scale which can also only be assessed in written form (Jensen et al. (1986: 125).

A study conducted by Downie (et al. 1978: 379), found that the NRS-101 appeared to have advantages over other scales e.g. VAS (both the

horizontal and vertical form) and the Simple Descriptive Scale (SDS) as far as accuracy in taking pain assessments was concerned.

2.7.1. Clinical Application Procedure of the NRS-101:

The NRS-101 includes two visual lines, each ranging from 0 to 100. The scale consists of asking the patient to rate his or her perceived level of pain intensity on a numerical scale from 0 to 100, with the 0 representing one extreme (e.g. “no pain”), and the 100 representing the other extreme (e.g. “pain as bad as it could be”). The number stated by the patient as his or her level of pain intensity is the basic datum for the NRS-101 e.g.

0_____100

2.8. THE PATIENT SPECIFIC FUNCTIONAL SCALE (PSFS)

The PSFS was intended to supplement the findings of condition-specific measures (which are used to compare the health status among patients at the same point in time and to assess change over time). The shortcomings are that they are limited to small disabilities and changes in disability over time (Chatman et al. 1997: 822).

For example, consider a runner who only experiences knee discomfort only after running several kilometres over hilly terrain. A condition-specific measure may incorporate many questions that are not sensitive to the problem. A patient specific measure, however, would best assist a clinician in documenting and evaluating change concerning the specific problem (Chatman et al. 1997: 822).

Sensitivity to change is a form of validity (Chatman et al. 1997: 824). According to Chatman (et al. 1997: 824), there is no gold standard against which to evaluate sensitivity to change of a health status measure. Methodology to measure this attribute relies on hypothesis and constructs, for change, against which a health status measure is tested. These constructs for change vary in strength and a weak but popular construct for change would be, for example, a patient's health would improve with time and treatment (Chatman et al. 1997: 824). A stronger construct for change however, is that patients randomly assigned to a group where a treatment is given that is known to be effective will demonstrate greater change than will patients receiving a placebo treatment (Chatman et al. 1997: 824).

In the absence of a gold standard for assessing functional status, the validation of the measures designed to do this properly is dependant on the construct validity of the data collecting tool (Westaway et al. 1998: 336).

Westaway (et al. 1998: 336) stated that the construct validity of the Patient Specific Functional Scale had been evaluated by comparing the scale to the Roland-Morris scores in persons with knee dysfunction and low back pain (Chatman et al. 1997:820). These studies have yielded positive results that suggested that the PSFS has effective measurement properties (Westaway et al. 1998: 332).

Patients are asked to list their present functional status rather than their change in functional status i.e. the loss of function (due to injury, disease, etc.) these functions are is assessed and recorded on the questionnaire and then re-evaluated on subsequent visits to monitor changes in the functions listed previously (Westaway et al. 1998: 331).

This study aims to correlate the 2 questionnaires only in terms of the responses given in the Zulu and English versions rather than to evaluate the treatment interventions.

According to Chatman et al. (1997: 822), there were several goals considered when developing the PSFS. These goals were:

1. That it be efficient and easy to administer
2. That it be easy to record in the medical record
3. That it yield reliable measurements
4. That it yield valid measurements, including that it assess important change over time
5. That it provide a comparison of a patient's specific important activity level at any given point in time with respect to the pre-disability state, and
6. That it be applicable to a large number of clinical presentations (e.g. conditions, diseases, problems and ages).

The study appeared to support the first and second goal in that the PSFS can be administered and recorded in a short period of time (approximately 4 minutes). The study also found that reliability for both the individual activity and average score was excellent. The PSFS was sensitive enough to measure change in the patient's functional status and it could differentiate among activities of varying difficulty at both the initial and follow-up evaluations (Chatman et al. 1997: 827-828).

According to Chatman et al. (1997: 822) where, in order to provide a method for eliciting, measuring and recording descriptions of patients' disabilities, the PSFS can be used to guide treatment and assess patients' outcome.

2.8.1. Clinical Application Procedure of the PSFS:

The PSFS should be administered at the initial assessment, during the history taking, and prior to the assessment of any impairment measures (Chatman et al. 1997:823).

The rationale for administration of the PSFS prior to the physical examination is to maximise the patient's focus on their function. ("I have difficulty walking down stairs") rather than impairment ("I can't flex my knee"). Patients are asked to identify up to five activities that they are having difficulty to perform. In addition to specifying the activities, patients are asked to rate, on an 11-point scale, the current level of difficulty associated with each activity.

The scale anchors are 0 ("unable to perform activity") to 10 ("able to perform activity at same level as before injury or problem"). The clinician's role is to read the script (instructions) to the patient and record the activities, the corresponding numerical difficulty ratings, and the assessment date.

At subsequent re-assessments, the clinician reads the follow-up script, which reminds the patients of the activities that they identified previously. Once again, the clinician records the rating specified by each patient and the date. The form also provides space for additional activities to be added. Because patients identify between one and five activities and this activity set is unique to each patient, the PSFS is not a comprehensive measure of disability and was not designed to compare disabilities among patients.

The PSFS may also assist the clinicians in planning treatment as well as help in making decisions on whether or not to continue a particular treatment protocol.

According to Chatman (et al. 1997: 828), the PSFS is a time-efficient and appropriate tool when the goal is the assessment of a persons dysfunction.

2.9 THE FOCUS GROUP DISCUSSION/FORUM:

Before comparing the four questionnaires as to their concurrent validity, the quality of the Zulu translation needed to be assessed at face value, i.e. face validity needed to be established. In order to accomplish this, a focus group was set up.

The focus group is defined as a discussion in which a small group of informants (six to twelve people), guided by a facilitator, talk freely and spontaneously about themes considered important to the investigation. The participants are selected from a target group whose opinions and ideas are of interest to the researcher. Sessions are usually tape-recorded and an observer (recorder) also takes notes on the discussion (Streiner et al. 1995:17).

The purpose of the focus group is to elicit ideas and to stimulate people's thinking about a particular idea or specific topic (Salant et al. 1994: 29).

The participants of focus groups are not randomly selected and do not represent a sufficiently large enough sample to yield reliable estimates therefore they cannot reveal a proportion of the population that has a particular attribute or opinion (Salant et al. 1994: 30). Focus groups can however provide a head start on knowing which questions to ask in a

survey (Salant et al. 1994: 30). Researchers can then use such information as a guide to develop their Questionnaires.

With health scale developing, the participants of the focus groups would be comprised of participants who are patients or who are representatives of those opinions that will be elicited by the instrument.

The advantages of such a group are many, according to Krueger (1994: 37), including being a socially orientated research method capturing real-life data in a social environment, possessing flexibility, high face validity, relatively low cost, potentially speedy results, and a capacity to increase the size of a qualitative study. The disadvantages however, lie with the limitations set upon the researcher namely: it produces data that is difficult to analyse, requires special skills of moderators, afford the researcher less control than in individual interviews, can result in troublesome difference among groups, may be difficult to assemble and requires a conductive environment (Krueger: 1994:37-38).

The focus group for this study proved advantageous because the questionnaires that were evaluated were subsequently changed to be to better suite the objectives of the study. Any ambiguities in the language was clarified and changed.

In this investigation, the scales used were translated from their English versions into their Zulu versions in order to ascertain clinical information from Zulu speaking patients.

According to Scollen and Scollen (1995:6), the translation of any questionnaire has its inherent complications because, even though the words are translated accurately, the meaning of a phrase or combination

of words may be unclear, as meaning is not only determined by words or phrases alone but also in their interpretation by others.

This is because when words are taken out of context they will loose their meaning (Baynham, 1995:37). Thus the meaning will differ between cultures, even if the same words are used. Scollen and Scollen (1995) did not cite any examples of these.

Therefore, the focus group session in this investigation was used as a validity check of the questionnaires. The session critiqued, assessed and reformatted the questionnaires to represent the norm in the Zulu speaking population. This process is a qualitative process, in which individuals discuss all points of view related to the themes that the questionnaire addresses. This allows for the assessment of the questionnaires weaknesses and strengths when it is translated into the relevant new language.

CHAPTER THREE- MATERIALS AND METHODS

3.1 INTRODUCTION

This chapter deals with the collection of data and the research methodology used. The process of statistical analysis is also discussed.

3.2 BACKGROUND TO THE STUDY

The Numerical Pain Rating Scale-101 (NRS-101) (Appendix D) and the Patient Specific Functional Scale (PSFS) (Appendix F) were translated by a Zulu linguist into Zulu to be assessed as a tool for data collection pertaining to the Zulu speaking patients who visit the Chiropractic Day Clinic at the Durban Institute of Technology (D.I.T.).This yielded the Zulu NRS-101 1.1 (Appendix E) and the Zulu PSFS 1.1 Appendix G).

The questionnaires were then pre-tested on a small focus group consisting of 8 individuals who were bilingual in both Zulu and English, with Zulu being their 1st language, who were from a variety of backgrounds and that would have had a vested interest in the results that the questionnaire would ultimately capture.

This was done in order to weed out any ambiguities, to solve any potentially problematic questions to check the structure of the questionnaire before executing the study.

3.2.1 Advertising:

A non-probability sampling technique was used to attract participants. The study was limited to participants who were bilingual in both Zulu and English. Advertisements (Appendix C) were placed at the Durban Institute

of Technology Chiropractic Day Clinic and at the Durban Institute of Technology campus. Word of mouth was also used.

3.3. THE DATA FOR THE STUDY WAS COLLECTED AS FOLLOWS:

3.3.1. DATA COLLECTION

3.3.1.1. COLLECTION PROCESS

The data was collected from Zulu speaking patients at the Durban Institute of Technology's Chiropractic Day Clinic.

3.3.1.2 STUDY PROTOCOL AND DESIGN

The data in this study was gathered by means of the Numerical Pain Rating Scale-101 (NRS-101) and the Patient Specific Functional Scale (PSFS), which have already been validated by Jensen (et al.1986: 125) and Chatman (et al. 1997: 827) as efficient and reliable tools for the assessment of an individuals perceived level of pain and the level of their dysfunction.

The Zulu NRS-101 1.1 and the Zulu PSFS 1.1 along with their English counterpart was used to gather information from patients who spoke both Zulu and English and who also suffered from either cervical, lower back, shoulder or ankle/foot pain. The inclusion of the four anatomical regions was due to the fact that these questionnaires are applicable to any physical or pain related condition that the patient might present with in these areas (Jensen et al. 1986: 125 and Chatman et al. 1997: 827).

Before participating in the study, subjects were asked to read and sign both an information letter (Appendix A) and informed consent form (Appendix B).

The participants were required to answer all four questionnaires. The Zulu NRS 101 1.1 and the Zulu PSFS 1.1 were handed out first, and the questionnaires were collected after each participant had completed them.

The researcher then proceeded with a detailed case history taking session that lasted approximately half an hour. The patient was then required to complete the English NRS-101 and the English PSFS. The need for a time lapse between completion of the questionnaires was to ensure that participants where less likely to rely on memory recall or compare/transfer answers from one questionnaire to the next.

Once all four questionnaires had been completed, the participant was given a free assessment, which included a physical examination and a regional examination of the related area of complaint. Thereafter one free treatment was administered. This consultation was performed by the researcher at the Durban Institute of Technology's Chiropractic Day Clinic as an incentive for participating in the study.

The information gleaned from the each of the questionnaires was analysed to establish the concurrent validity of the questionnaires.

3.3.1.3. ALLOCATION OF SUBJECTS

Sampling:

A non-probability sampling technique was used to attract participants. Advertisements (Appendix C) were placed at the Durban Institute of

Technology Chiropractic Day Clinic and the Durban Institute of Technology campus. Those who expressed an interest in the study were screened via a telephonic interview or a personal interview at the Chiropractic Day Clinic to establish whether they fulfilled the inclusion criteria (discussed later). They were screened using questions for example, how old are you?, is Zulu your 1st language?, are you able to read and write both Zulu and English?, and do you suffer from either neck, shoulder, low back or foot pain?. If they met the inclusion criteria, they were admitted onto the study.

Sample size:

The sample group consisted of 60 participants. This sample group was divided into 4 convenient sub-groups of 15 participants each and were comprised of patients having one of the following conditions:

- Cervical pain
- Lower back pain
- Shoulder pain
- Ankle/foot pain

These regions were selected for the following reasons:

1. Neck pain with a decrease in range of motion of the cervical spine is a very common disorder (Cassidy et al.1992:495).
2. Lower back pain presents as a common disorder, with between 60% and 80% of the general population being affected (Kirkaldy-Willis, 1992:2).
3. Shoulder pain is a common complaint in general medical practice, impairing the quality of life and job performance (Berrazueta et al. 1995: 63).

4. The foot/ankle complex is one of the most frequently injured in the human body (Heit et al. 1996: 206).

This study looked at four different problem areas because the questionnaires used could be applied to a variety of different conditions (i.e. any physical condition that may result in pain or physical impairment), Jensen (et al. 1986:125) and Chatman (et al. 1997:827).

3.4. CRITERIA FOR ACCEPTANCE OF COMPLETED QUESTIONNAIRE

Patient Inclusion Criteria, in terms of this investigation:

1. The participant had to be 1st language Zulu and 2nd language English speaking.

2. The participant had to have the ability to read and understand both Zulu and English and whose mother tongue was Zulu.

3. They had to be 18 years of age or older.

4. The patient's condition had to fall within the treatment capabilities of primary contact practitioners (i.e. the participant would be able to receive care from a general practitioner, chiropractor, homeopath or physiotherapist- who are also considered to be primary contact practitioners (www.physiotherapy.ca/pdfs/ HHRBackground Paper.pdf).

Patient Exclusion Criteria, in terms of this investigation:

1. Participants were excluded if they were under the age of 18 years.

2. Participants were excluded if they required secondary, tertiary or quaternary health care for their particular condition.

3. Participants were excluded if they had participated in the focus group involved in the testing of the face validity of the Zulu NRS-101 1.1 and the Zulu PSFS 1.1.

Only a fully completed questionnaire was used for the purpose of data analysis in the study.

If the respondents omitted any information on the questionnaire, the questionnaire was excluded from data analysis in the study.

3.5. CONFIDENTIALITY CLAUSES

Participant Confidentiality:

Each of the questionnaires used in the study was coded, so as to make the association of the participant's names inaccessible to the researcher, once the data had been captured. Participants were asked not to write their names on the questionnaires.

Focus Group Confidentiality:

All data discussed or used within the focus group to arrive at discussions and or trends were kept confidential. The participants of the focus group were required to sign an informed consent form and receive a letter of information.

The focus group would at all times be kept anonymous and all documents would be kept confidential and destroyed as appropriate (incineration or shredding) at the time.

3.6. DETAILED DATA COLLECTION AND INTERPRETATION PROCEDURE

The Zulu NRS-101 (Appendix E) and the Zulu PSFS (Appendix G) was drawn up in order to gather clinical information from Zulu speaking

patients that visited the Chiropractic Day Clinic at the Durban Institute of Technology as well as at other medical institutions and clinics.

In this study, the first 15 valid set of questionnaires in each group were used for data capturing and analysis.

3.7. THE DATA AND ITS ANALYSIS

The data collected was captured in a coded SPSS (version 11) spreadsheet for analytical purposes.

Analysis of the data was made using non-parametric tests of correlation by using the Spearman's Correlation Coefficient for the numerical pain ratings and the activities listed in the PSFS.

Weighted Kappa Coefficients for the numerical ratings of the activities in the PSFS were used to determine the strength of inter-rater agreement of the responses given.

The Spearman's correlation coefficient was used in preference to the Pearson's correlation coefficient because of the naturally skewed distribution of the patient's pain or dysfunction responses (each patient had a unique level of pain or dysfunction). This was also as a result of the selection criteria i.e. the patients who were suffering from any one of the conditions would be skewed towards reporting higher levels of pain.

The weighted Kappa statistic is used to calculate the proportion of chance (or expected) agreement (i.e. the proportions of time raters would agree by chance alone). As a test statistic, weighted Kappa can verify that agreement exceeds chance levels and Kappa statistics are therefore ideal for testing whether agreement exceeds chance levels for binary and nominal ratings.

The calculations only consider exact matches between observers. If the categories (A, B, C, etc.) are according to an order, one may also wish to

consider close matches. In other words, if one observer classifies a subject into group B and the other into group C, this is closer than if one classifies into group A and the other into group D. The calculation of weighted kappa assumes the categories are ordered and accounts for how far apart the two raters are.

The levels of agreement for weighted Kappa ranges from “poor”; “fair”; “good”; “very good” to “perfect” depending on how closely the orders were matched (www.graphpad.com/quickcalcs /kappa2.cfm and www.faculty.vassar.edu/lowry.kappa.html).

Thus, the study aimed the compare how closely the response of the Zulu scales matched the English counterparts. This was done using the Spearman’s correlation coefficient and the weighted Kappa coefficient as outlined above.

The level of significance in this study is set at alpha (α) = 0.05. If the Spearman’s correlation coefficient (rho) is close to 1, it means that a very high degree of correlation exist between the two variables. The further the Spearman’s correlation coefficient (rho) is from 1 the more discordance there is between the 2 variables. If the p-value is less than alpha for these 2 scenarios it means that the result is statistically significant and not purely due to chance.

Thus, if the Spearman’s correlation coefficient (rho) is close to 1 and the p-value for that correlation is less than alpha (0.05) then the correlation between the 2 variables is statistically significant at the 95% level.

The weighted Kappa is interpreted in the same way as the Spearman correlation coefficient, with values close to 1 meaning a high degree of reliability. If the p-value of the Kappa statistic is less than alpha (0.05) it means that the correlation is significant and not purely due to chance. The 95% confidence interval for the Kappa statistic is the range of values, which one can be 95% sure contains the true population kappa value. Thus a narrow range of values (or a narrow 95% confidence interval)

implies a precise estimate and a wide range of values implies a less precise estimate.

3.8. THE FOCUS GROUP DISCUSSION/FORUM

Before comparing the four questionnaires as to their concurrent validity, the quality of the Zulu translation needed to be assessed at face value, i.e. face validity needed to be established. In order to accomplish this, a focus group was set up.

The focus group participant's were enlisted via word of mouth, with 13 participants coming forward and expressing an interest in the focus group. From the outset, the focus group only had 8 participants in total (5 of the respondents did not arrive for the focus group).

The participants of the focus group had a broad area of expertise ranging from students to people working in the medical field as well as laypersons who had a vested interest in the questionnaires. This sample size was adequate because the traditionally recommended size of the focus group has ranged from six to twelve participants (Krueger, 1994:78).

The composition of the focus group was characterised by homogeneity (i.e. bilingual Zulu and English speaking participants) with sufficient variation i.e. coming from various backgrounds, being of different ages and work experience, to allow for contrasting opinions (Krueger. 1994:77).

This variation ensured that the participants were not affiliated in any way (i.e. relatives or business associates). The researcher and the participants decided on a date, time and location for when they would discuss the proposed questionnaires.

The researcher had the role of facilitator and moderator, keeping the discussion focused and introducing new ideas, based on the common

themes of the questionnaires. All responses were recorded on tape, and were later transcribed verbatim for the purposes of this dissertation.

According to Fowler (et al. 1990:135), participants do not mind being recorded and that it does not affect the focus group experience from the participant's point of view. According to Fowler (et al. 1990:135), tape recording of a focus group has a positive effect on the quality of data, which indicates that it is a valuable tool of a good data collection effort.

All 8 participants in the focus group agreed unanimously that the questionnaires addressed all the pertinent issues concerning the grammatical translation of the questionnaires and that there were no ambiguities or any problematic questions. The participants were comfortable with the structure of the questionnaires as well.

Once the language pre-test was done, the questionnaires were finalised and were ready to be used as tools for data collection in the study.

3.9. FOCUS GROUP TRANSCRIPT

Researcher: Good evening…..the purpose of this focus group is to look at two questionnaires ……err…..the aims and objective are similar to that of Corrine's study (this was a combined focus group and Corrine's questionnaires were addressed first)……err…..we translated two questionnaires from English into Zulu…..err…. the Numerical Pain Rating Questionnaire from English into Zulu as well as the Patient Specific Functional Scale….err…..the uniqueness of these questionnaires is that you can apply it to anybody in any condition so its not specifically to the neck or the back…….it can be applied to any joint for that matter……the reason why we are having this focus group is to ensure that the translation of the English questionnaire to Zulu….err… grammatically, basically fits the English version and whether we can use it as a tool……to gather information from the Zulu speaking population

…err…. Especially those coming to the clinic as well Zulu speaking patients in other clinics….so….err….basically can we start reading the English version……. we will start off with the Patient Specific Functional questionnaire which is this one over here……this one with the table….okay. I'll start reading the English version……is it okay if I sit over here?.....is it okay if I start?.....Is everybody ready?....I'll start with the first sentence.

Researcher: patient to read and fill in below… (In brackets: on the questionnaire)- complete at the end of the history and prior to physical examination).

Translator: Funda bese ugcwalisa ngenzansi… Qewalisa ekugcineni komlandо wesiguli ngaphambi kokuxilongwa.

Participant: Qewalisa…..ngendlela….yokubhalo kubalule kile giru ielinicial. Sithi onomphilo ngoba basuke bengebona onurse. Bafano nabantu. nje abasizayo.

Researcher: Okay….. I am going to ask you to identify up to three important activities that you are unable to do or having difficulty with as a result of your __dash…_ problem.

Translator: Ngizocela usho izinto ezintathu ongakwazi ukuzenza noma ezikunika ubunzima ngenxa yenkinga ye __dash…__.

Participant 2: ok that's fine.

Researcher: fine. Today, are there any activities that you are unable to do or having difficulty with because of your _dash…_ problem?
(Clinician: show scale to patient and have the patient rate each activity)

(Laughing).

Translator: namuhla zikhona yini izinto/umsebenzi ongakwazi ukuwenza ngenxa yalokhu kugula…..Nompilo… khombisa isiguli isikali bese siyachaza ngokwesikal……
ngenxa yokungakwazi…..bhelo isiqlo ufuna ukubo…na …..iweght ukala ngesikalo kodwa manje usebenzi isikali……..1 to10.

Participant 2: oh…..all right.…ya.

Researcher: the next heading is called the follow up assessment

Participant 1: fine…..okay.

Researcher: When I assessed you on (state previous assessment date), you told me you had difficulty with …read all activities from list at that time.

Translator: Ngenkathi ngikuhlola ngo mhlaka…(shono usuku lokuhlolwa okwedlule), wathi unenkinga ye.

Partcipant: wathi unenkinga kwi…..phela uzobe ungayibhali ngesizulu uzobe uyibhala ngenzinamba uthi ngomhloka….shona usuku lokulola ukudlule wathi unenkinga….unenkinga yesisu…..unenkinga yekhonda…..unenkinga yegolo,,,,,iqolo….yesiso. umgala ngigogwa ngokulandelayo yegolo….yesisu besikhaluma ngenki yesisu nomgala isiuumelwano leso sifaka uye…..sifake uyo ngizozwa ngo kulandelayo qsipake uye….sifake uyo ngizozwa ngo kulandelayo qsipake uye….sifake uyo ngizozwa ngo

Participant 2: okay…..next sentence.

Researcher: Today, do you still have difficulty with…read and have patient score item in the list.

Translator: Ungamphindela uhla lolo ilokhuga yakho iyasilahla nokuthi usenayo yini inking efanayo kokunye kwakho…..nqmhla usenayo yini inkinga funda.

Participant 3: Uhle lezinto akade angakwa ukuyenza nouhle usena…yo yini inkinga bekuyi last ….usenayo yini inkinge kokunye kwale…ngobe ngesikhathi ngikuhlola wawankinga yegolo…..bekuyi last namhlenje usenayo yini inkinga ngesikhi ngikuhlo wawunenkinge isisu…..ikhanda iglo nomgala funda uhle iwezinto besekuthi usenayo yini inkinga efanayo kokunje kokunye kwa lokhu ukungenhla…..usenayo yini inkinge yalo….khu esengikubalile ngiyafika la kudokotela ngiphethwe ikhanda ngiphethwe indlebe….. ngice la ungibalele izinto ongakwazi ukugenga kulokhu……esengikubalile elkukuphethe ngibesengiya kutshela ke ukuthi….. nokuthi….nokuthi….ukungi phethe kukunye kwako mawusuthi nokunye usuya….eda….. usengasho ukuthi usenenki ayi kwako kokwiye okungenhla…..kakunye kwa ukuze kucace ukuthi sikhunhuma ngani yikubhi uku right……sithi kungenhla yikuphi uku….right….ngizofuna usho izinto ezinta isikunika inkinga sesiya shintsha…… qmaboakert ngigocele ukusho izinkinge onazo…..ukushu kuthi lesosikkha kushu kuthi…usuyafaka lokhayane ukungenhla okade ukusho ngole sikhathi….utshele udokotela ukushu kuthi sesiyakufe nalokho okungenhla.

Participant 2: okay….right….next one

Researcher: Patient-specific activity scoring scheme…point to one number……..ha….ah…..0,1,2,3,4,5,6,7,8,9,10.

Translator: umphumela ngokwamaphuzu emisebenzi yesiguli….Khomba inamba eyodwa……0,1,2,3,4,5,6,7,8,9,10

Participant 4: umphumela okushukuthi….okay….patient specific …….. positive… phekamisa ingane upatiance lebhe ungenqbhi….2…3….4….5….. ngoba sikhulume nawe nje sagi ukuthi ngo kwesiguli ipain yana uzokwa ukuthi kushukuthi upatiance ”mumbling” ……bekufanele ungene nayo….kuthiwa yini.

Participant 1: if you say patient specific activity…..could you just elaborate on that……then we can understand this well for the translation.

Researcher: patient specific activity…example….somebody will come in with shoulder pain and will say that I can do this and not do that (demonstrates with arm)…..this would be very specific to that patient……another patient would probably come in with shoulder pain as well ……and say…..they cant do this (demonstrates with arm)……the activity that the patient cant do is very specific to the patient itself……and now as far as the scoring scheme goes…….err…. if the patient tells you I can do this(demonstrates with arm)….. then…. on a scale of 0 to 10…..0 being unable to perform activity….and 10……able to perform activity at same level as before injury or problem…….then the patient might say…..like….two…..so I’m pretty much close to not being able to do it….the activity will be very specific to the patient as well as the score….so the patient will then tell you…..I think it’s a two or I think it’s a 1.

Participant 4: igoma umphunelel wesiguli cha akashongo kenjalo umphumela wamabhuzu ugaba kugona intokufuneka umuntu uzosho

ugulala onga….understand….. English kufanele kubekhone usokhuluma ngesizulu asho abhale la….8….. maseyabanoke umlungu ukuthi ngokwamaphuza udokotela…..ngoba masizonga andastendani abatntu abaningi….. benza umsebenzi wabo….mayebhola lo 8….kushuku kumele ubona ukuthi abhale lo 8.

Participant 2: Kushukuthini….ok…..asighubele…….next one

Researcher: Unable to perform activity.

Translator: imisebenzi/Izinto ahlulekayo ukuzenza.

Participant 2: okay.

Researcher: able to perform.....activity at same level as before injury or problem

Translator: imisebenzi/Izinto asakwazi ukuzenza njengoba ayezenza engakalimali.

Participant 2: okay……imininingwane namaphuzu…..
okay…..imisebenzi/izinto…..okay….. okokuqala……..ya that's fine.

Researcher: And the last two at the bottom would be additional.

Participant 2: okunye……..ya that's fine.

Researcher: that's one done……last one.

Participant 1: we need a bonus for this one
(laughing).

Researcher: numerical pain rating scale….101.

Translator: Isikali Sokulinganisa Izinga Lobuhlungu Ngokwezinombolo….101.

Participant 1: 101 is part of the name of the scale.

Researcher: yes

Participant 5: izinhlungu azikho sokulinganisa isikalo sizokulinga nisa ngokwezinamba 101….usho kanje enzathi kuncono lokho ukushoyo igama lsizulu……..101.

Participant 2: next.

Researcher: patient name.

Participant 4: ilqembu igama lesiguli……..lesizulu.

Researcher: file number.

Participant 1: is this designed different?

Researcher: ya.

Participant 2: okay.

Researcher: date and group.

Participant 1: what's that?

Researcher: the group is the research group…..you see……some research you will probably like….have a group A and a group B.

Participant: inumber yokuakasha group A igembu….okay.

Researcher: okay…… I'm gonna read the next paragraph now.

Participant 2: okay.

Researcher: please indicate on the line below the number between 0 and 100 that best describes the pain of your major problem at this point, when it is at its WORST.

Translator: Cacisa kulomugqa ongezansi, inamba phakathi kuka 0 no 100 okuyiyona echaza kangcono ubuhlungu obuzwayo uma busezingeni elibi kakhulu

Participant 2: that is fine.

Researcher: A zero (0) would mean "no pain at all" and one-hundred (100) would mean, "pain as bad as it could be."

Translator: Uziro (0) uzochaza ukuthi "abukho ubuhlungu", (100) ikhulu elilodwa lizochaza "ubuhlungu obubi kakhulu".

Participant 2: that's fine.

Researcher: please write only one number

Participant: sicela ubhale inamba eyodwa kuphela.…bola inamba oyedwa kuphelo…..ligochaga ubuhlungu…..ububi kakhulu….bhala inamba eyodwa kuphela….sicela…..sesikokubi kakhu sesiya khipha ukungaba khona.
(laughing).

Participant 2: okay...the next paragraph

Researcher: Please indicate on the line below the number between 0 and 100 that best describes the pain of your major problem at this point, when it is at its LEAST. A zero (0) would mean “no pain at all” and one-hundred (100) would mean, “pain as bad as it could be”.

Translator: Cacisa kulomugqa ongezansi, inamba ephakathi kuka 0 no 100 okuyiyona engachaza kangcono ubuhlungu obuzwayo uma bubuncane elibi. Uziro (0) uzochaza ukuthi abukho nhlobo ubuhlungu, kuthi ikhulu elilodwa (100) lizosho ukuthi “ubuhlungu obubi kakhulu”…..sicela ubhale inamba eyodwa kuphela.

Participant 2: I think that’s fine.

Researcher: the last sentence is the same as the sentence from above……. A zero (0) would mean “no pain at all” and one-hundred (100) would mean, “Pain as bad as it could be.”……please write only one number…….that and that is the same thing.

C: okay ….. finally …… guys…..before we disband….please ensure that you have signed the relevant forms for both Corrine and Zhakir…..Corrine will pass around the forms……thank you so much for your time.

End of Session

CHAPTER FOUR- RESULTS

A comparison of the responses to the Zulu and English NRS-101 and the PSFS Questionnaires

4.1. A BRIEF DESCRIPTION OF THE EXPERIMENT AND THE DATA

In this study, 60 bilingual patients (able to understand both English and Zulu) consisting of 15 with neck problems, 15 with shoulder problems, 15 with lower back problems and 15 with foot/ankle problems were asked to provide the following information.

(i) Age and gender.

(ii) Worst and least NRS-101 pain rating in reply to similar questions in both Zulu and English

(iii) Discomfort experienced when performing specific activities in reply to similar Zulu and English questions.

(iv) Patient Specific Functional Scale rating (on scale 0-10) when performing the activities referred to in (iii).

General demographic characteristics of the participants

4.2 Age

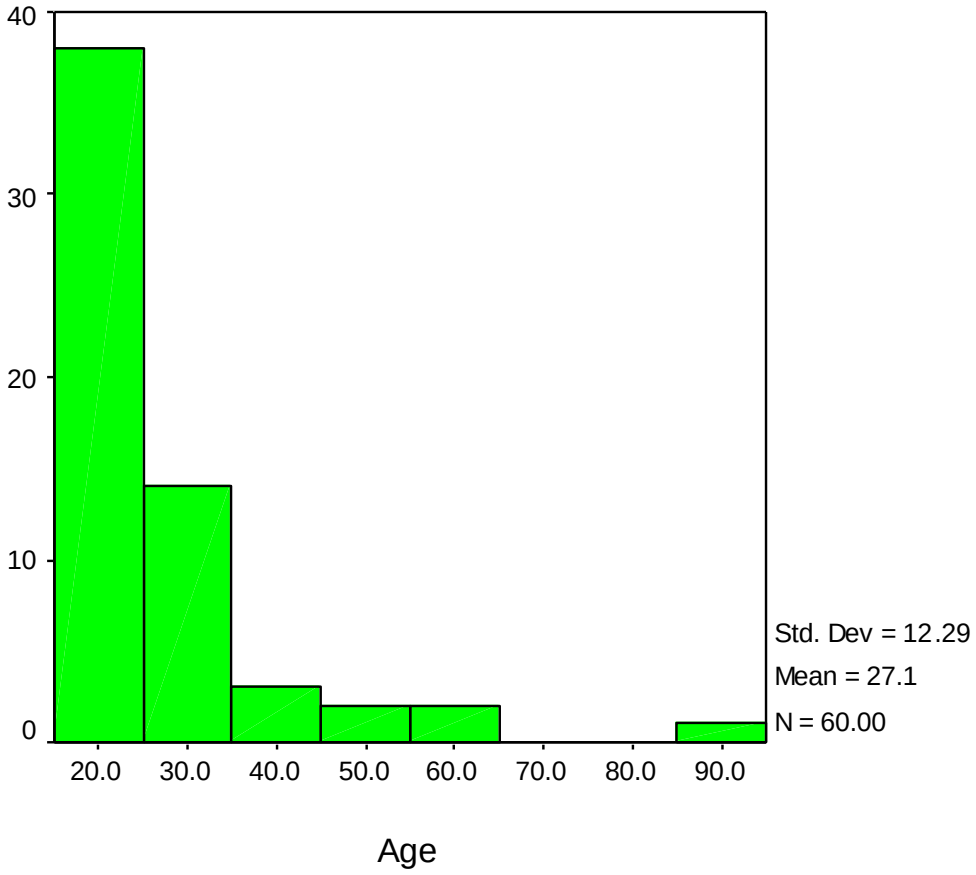
4.2.1 Age range

Table 1: Age groups of male and female participants

Age group	Males n (%)	Females n (%)	Total n (%)
18-35	18 (30.00)	34 (56.66)	52 (86.66)
36-55	2 (3.33)	3 (5.00)	5 (8.33)
56-75	0	2 (3.33)	2 (3.33)
76-90	0	1 (1.66)	1 (1.66)

Table 1 reveals that in the 18-35 year age group there were 18 male participants and 34 female participants. The majority of subjects were found in this age range.

Graph 1: Age vs. Number of participants



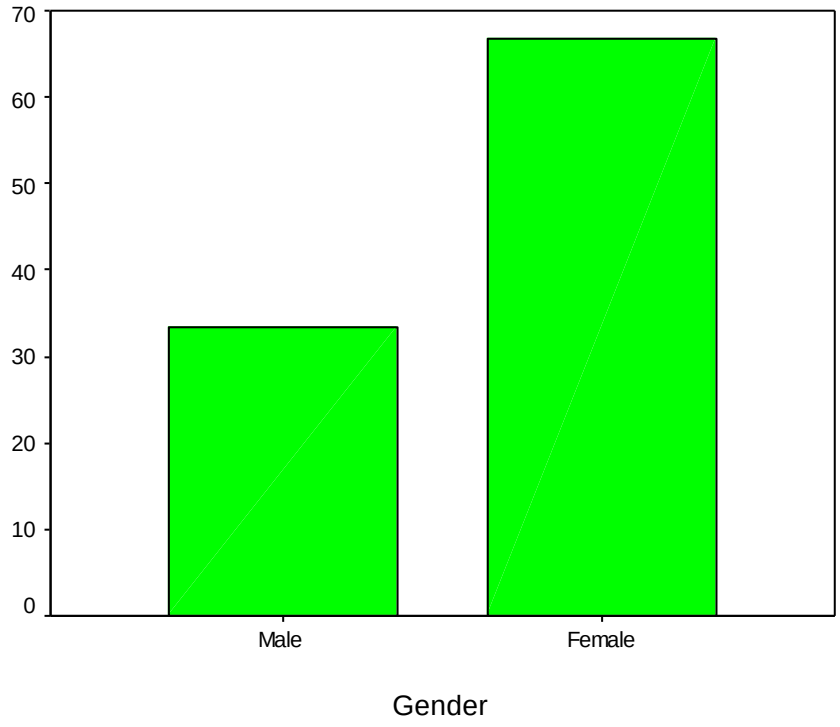
Graph 1 is a graphical presentation of table 1 and it reveals that most participants were between the ages of 18 and 35 years.

Table 2: Gender and Condition

Condition	Male n (%)	Female n (%)	Total n (%)
Shoulder	5 (8.33)	10 (16.66)	15 (100.00)
Neck	5 (8.33)	10 (16.66)	15 (100.00)
Low Back	4 (6.66)	11 (18.33)	15 (100.00)
Foot/ankle	6 (10.00)	9 (15.00)	15 (100.00)

Table 2 indicates that each of the four categories of conditions had fifteen participants making up a total of 60 participants. The male to female ratio for these conditions were 5 males to 10 females presenting with shoulder conditions, 5 males to 10 females presenting with neck conditions, 4 males to 11 females presenting with lower back conditions and 6 males to 9 females presenting with foot and ankle conditions.

Graph 2: Gender vs. Number of Participants (%)



Graph 2 reveals that the majority of the participants in the study were female (66.66%) followed by male participants (33.33%).

4.3 Correlations of the Zulu NRS-101 1.1 and the English NRS-101

Table 3: **Numerical Pain Rating Scale-101 (Spearman's Correlations)**

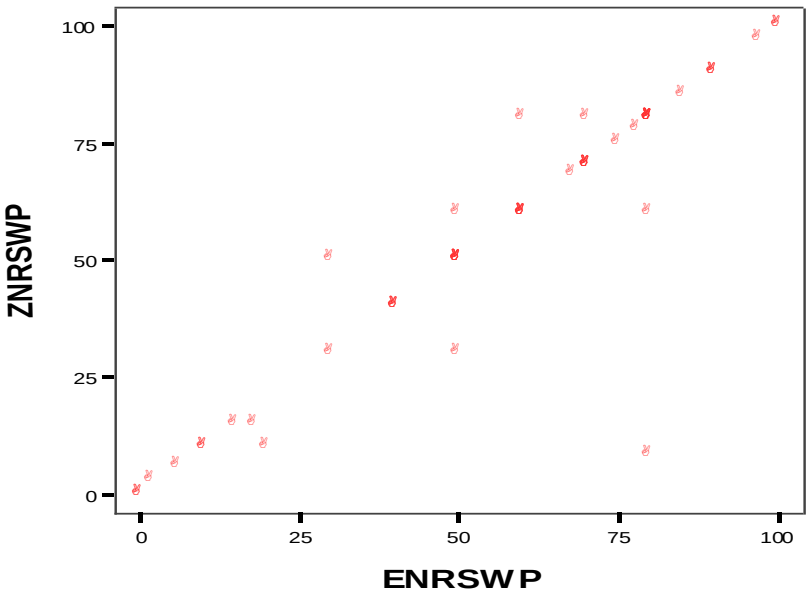
Variables	Rho-correlation coefficient	p-value
ENRSWP-ZNRSWP	0.914	<0.001*
ENRSLP-ZNRSLP	0.904	<0.001*

* sig. at 0.01 level (level of significance of =/> 95%)
ENRSWP – English NRS-101-Worst pain, ENRSLP – English NRS-101-Least pain, ZNRSWP – Zulu NRS-101-Worst pain, ZNRSLP – Zulu NRS-101-Least pain.

Table 3 reveals that the correlation coefficients for the Zulu NRS-101 1.1 and English NRS-101 for the worst pain was 0.914 and for the least pain was 0.904. According to the rules as outlined in chapter 3 (Page 36) this means that there was a high level of correlation between the Zulu and English worst pain and the Zulu and English least pain because their respective correlation coefficients were close to 1. The p values for both these correlation coefficients were <0.001, which is less than alpha (0.05). Therefore this correlation was not due to chance and is statistically significant.

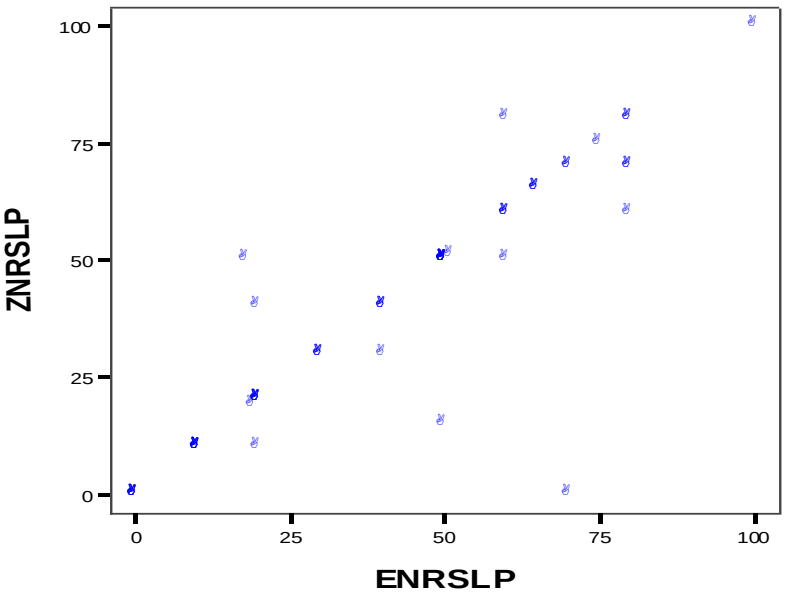
The following scatter plot graph for the Zulu NRS-101 1.1 and the English NRS-101 gives a visual representation of the Spearman's correlation coefficients (rho) for both the worst and least pain.

Graph 3: <u>Scatter plot depicting pain ratings of the NRS-101 scales-worst pain</u>



Graph 3 reveals that there is a strong linear relationship between the Zulu NRS-101 1.1 and the English NRS-101 for the worst pain. This depicts the high level of correlation.

Graph 4: <u>Scatter plot depicting pain ratings of the NRS-101 scales-least pain</u>



Graph 4 reveals that there is a strong linear relationship between the Zulu NRS-101 1.1 and the English NRS-101 for the least pain. That also depicts a high level of correlation.

4.4 The Patient Specific Functional Scale

4.4.1 Patient Specific Functional Scale Activities

The participants were asked to list up to 3 activities they had difficulty with the option of adding additional activities. The maximum amount of activities listed was 4 (See table 4).

Table 4 – Number of activities listed

Activity	Count (%)
1	27 (45)
2	24 (40)
3	6 (10)
4	3 (5)
Total	60 (100)

Table 4 indicates the number of activities listed by the participants on the Patient Specific Functional Scales in the study. 27 of the participants listed only 1 activity, 24 of the participants listed 2 activities, 6 of the participants listed 3 activities and 3 of the participants listed 4 activities.

The list is a combination of responses given by the participants for both the Zulu and English questionnaires: (See table 5 below)

1. Standing	17. Neck pain when reading
2. Walking long distances	18. Lifting arms
3. Jogging	19. Carrying objects
4. Running	20. Reading
5. Jumping	21. Lifting up hand

6. Bending 7. Lifting objects 8. Lying on back 9. Lying on stomach 10. Lying on side 11. Left rotation of neck 12. Right rotation of neck 13. Flexion of neck 14. Extension of neck 15. Throwing 16. Painful back	22. Poor sleeping posture 23. Sitting for long 24. Writing 25. Playing sport 26. Squatting 27. Swimming 28. Stretching 29. Tip toeing 30. Ironing clothes 31. Sitting up straight 32. Unable to turn neck

Table 6: <u>Patient Specific Functional Scale (Spearman's Correlations)</u>

Variables	rho-correlation coefficient	p-value
EPSACT1-ZPSACT1	0.836	<0.001*
EPSACT2-ZPSACT2	0.948	<0.001*
EPSACT3-ZPSACT3	0.970	<0.001*
EPSACT4-ZPSACT4	1.000	<0.001*

* sig. at 0.001 level (level of significance of =/> 95%)

EPSACT1-4 – English Patient Specific Activity 1 to 4, ZPSACT1-4 – Zulu Patient Specific Activity 1 to 4

Table 6 reveals that the correlation coefficients for the Zulu PSFS 1.1 and English PSFS for the activities (activity 1 to activity 4) were 0.836, 0.948, 0.770 and 1.000 respectively. According to the rules as outlined in chapter 3 (Page 36) this means that there was a high level of correlation between the Zulu and English activities 1, 2,3 and 4. This is due to the correlation coefficient being close to 1 for each of the activities. The p values for these correlation coefficients were < 0.001, which is less than

alpha (0.05). Therefore this correlation was not due to chance and is statistically significant.

4.5. Cross Tabulations of the Patient Specific Functional Scale Ratings- and Weighted Kappa

Table 7: Results of the EPSFS and the ZPSFS 1.1 Activity Ratings

Activity Rating	Weighted Kappa	95% - Confidence Interval	p-value	Classification of Correlation
1	0.797	0.586 to 0.838	<0.001*	Good
2	0.906	0.634 to 0.941	<0.001*	Very good
3	1.000	1.000 to 1.000	<0.001*	Perfect
4	1.000	1.000 to 1.000	<0.001*	Perfect

* sig. inter-rater agreement at 0.001 level (level of significance of =/> 95%)

The above table reflects the activity numerical ratings for each activity (activity 1 to activity 4). The 95% confidence interval provides a range of values which one can be 95% confident contain the true population value. The p value of the weighted Kappa for each activity rating is < 0.001, which is less than alpha (0.05). Thus a high agreement exists between the numerical ratings given for each of the activities listed by the participants in the Zulu and the English PSFS activity numerical ratings. This agreement correlation is statistically significant ($p < 0.001$) and is not purely due to chance.

CHAPTER FIVE- DISCUSSION OF RESULTS

5.1. The First and Second Objectives

The first objective was to interpret the data from the statistical tests in order to assess whether the Zulu translations of the Numerical Pain Rating Scale- 101 and the Patient Specific Functional Scale display criterion/concurrent validity with respect to each other.
Secondly, to make any recommendations for further improvement of the Zulu translations if deemed necessary. The second objective will be discussed in the following chapter (6).

5.2 The Demographic Data

5.2.1. Age

The ages of participants in this study ranged fro 18-88 years of age. The largest category was that of 18-35 years of age, with 52 participants falling into this group. The results for the lower back pain (LBP) category concurs with those found by Miller (2003) where the highest preponderance of LBP patient's were within this range as well.

5.2.2 Female to Male Preponderance

In this study there was a preponderance of female LBP sufferers (76% female: 24% male). According to Miller (Zulu translation of the Roland-Morris Questionnaire with respect to its concurrent validity when compared to its English counterpart, 2003: 75) female to male occurrences are similar (60% female: 40% male). The study done by Van der Meulen's study (1997) revealed similar statistics of 41.7%male sufferers to 58.3% female sufferers. There was a preponderance of female neck pain sufferers (66% female: 34% male) as well as for the shoulder and foot conditions (66% female: 34% male) and (60% female: 40% male) respectively.

5.3 Comparisons to other similar studies

An extensive search of the literature revealed a paucity of information relating to studies similar to the one that was conducted. This made comparison of the data generated difficult. Miller (2003) conducted a study where the Roland-Morris Questionnaire was translated into its Zulu version and was tested for concurrent validity. However, the results of this study could not be compared to Miller's study because the parameters of the 2 studies are very different.

5.4 ENRS-101 and the ZNRS-101 1.1

The Zulu and English numerical pain rating scales show a high level of correlation (rho close to 1, $p < 0.001$). This indicates that the correlation between the Zulu version and English version of the scale is statistically significant and not purely due to chance. No further adaptation of the questionnaire is required.

A possible reason for the high level of correlation could be attributed to the fact that the Numerical Pain Rating Scale-101 is a simple scale that didn't require much translation into the Zulu language and therefore made its Zulu counterpart fairly similar to the English version.

Another possible reason for the high correlation could be that the participants could have remembered the format of the Zulu and English NRS-101 (i.e. seeing a line with a 0 and 100 on either end which represented their worst and least pain) and could thus have remembered their responses and simply copied them over to the English version.

5.5 The Patient Specific Functional Scale

5.5.1 Data Analysis of the PSFS

The Activities

The Zulu and English versions of the Patient Specific Functional Scale show a high level of correlation of the listed activities (rho close to 1, $p < 0.001$). This indicates that the correlation between the Zulu version and

English version of the scale is statistically significant and not purely due to chance. No further adaptation of the questionnaire is required.

A possible reason for the high level of correlation could be attributed to the fact that the Patient Specific Functional Scale required to list of only a few activities. Since the majority of the participants listed only a single activity, it could have been easy to remember and transfer the listed activity onto the English version of the scale (see table 4 on page 53 in chapter 4).

The Ratings

The Zulu and English versions of the Patient Specific Functional Scale show a high level of correlation of the activity numerical ratings (rho close to 1, $p < 0.001$). This indicates that the correlation between the Zulu version and English version of the scale is statistically significant and not purely due to chance.

Correlation classifications using the weighted kappa were found to be ‘good’, ‘very good’, perfect and perfect for the four activities respectively. These results were obtained because the weighted Kappa fell within the 95% confidence interval range. The p-value for those ranges were less that alpha (0.05) and therefore the results were statistically significant and not purely due to chance. No further adaptation of the questionnaire is required.

The results of this study suggest that the Zulu NRS 1.1 and the Zulu PSFS 1.1 have been translated accurately enough to gather information from the Zulu speaking population. These questionnaires showed a high correlation with their English versions and therefore, concurrent was established.

CHAPTER SIX- CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 The Numerical Pain Rating Scale

The study found a high level of correlation and thus concurrent validity between the Zulu and the English NRS-101 (as per objective 1).

The NRS-101 scale is considered a simple and effective tool to determine the perceived pain levels of patients (McDowell et al., 1996:18). However, the high correlation of the Zulu and English NRS-101 scales may be as a result of only 2 variables ("worst pain" and "least pain") asked of the participants in the study. These responses, once filled in on the first questionnaire, could easily have been remembered and simply have been transferred onto the second questionnaire irrespective of a time lapse between the two questionnaires.

This task was further simplified since the majority of the participants listed whole numbers when asked to complete the questionnaires. (i.e. 85% responded with whole numbers for the Zulu NRS-101 1.1 and 89% responded with whole numbers for the English NRS-101). This may not necessarily reflect the true worth of the questionnaire as a measuring tool and a longer delay between the questionnaires may be required to ensure a more accurate reflection. However, if a very long delay is instituted (e.g. 1 day or more) the patient's level of perceived pain might change and this will affect correlation between the two scales.

6.1.2 The Patient Specific Functional Scale

The study revealed a high level of correlation and thus concurrent validity between the Zulu and the English PSFS (as per objective 1).

According to Chatman et al. (1997:827), the PSFS may be an important component of the functional assessment in a clinical setting.
The PSFS was found to be a useful tool to help assess which activities the participants had difficulty with as well as assessing their level of discomfort when performing these activities. The study showed that this questionnaire should be considered for use in a clinical setting and can be used to assess the patient's progress or response to treatment (better or worse) on subsequent visits.

6.2 Recommendations

6.2.1 The Numerical Pain Rating Scale-101

It may be advisable for future studies, where correlations between two questionnaires are required, that these questionnaires be administered with a longer intervening period.

This would allow ample time for the participants of the study to "forget" their responses to the first questionnaire and without receiving any treatment i.e. chiropractic, medical, etc., the perceived pain levels should theoretically be the same as the day before thereby ensuring a more accurate reflection. However, if a very long delay is instituted (e.g. 1 day or more) the patient's level of perceived pain might change and this will affect correlation between the two scales.

6.2.2 The Patient Specific Functional Scale

It is recommended that the PSFS requires a proper definition of the word "activity" since this confused some participants in both the English and Zulu version of the questionnaires. A case in point was one participant asking if blurred vision and headaches could be listed as activities. The researcher had to point out that these were symptoms and not activities.

The English PSFS and the Zulu PSFS 1.1 can be used as an effective measuring tool provided that instructions are given clearly and that the patient is allowed to take his/her time in answering the questionnaire since the questionnaire aims to monitor patient progress on subsequent visits.

Another recommendation would be that the researcher should be proficient in both languages that are involved in the translation exercise.

It is also suggested that any further research of this type apply a stratification model in terms of literacy level, age and other relevant categories pertinent to the study, to ensure that the demographic data gathered is more representative of the Zulu speaking population.

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Appendix A

LETTER OF INFORMATION

Dear Participant,

Welcome to my study. Thank you for your interest.

The title of my research project is:
A prospective pilot investigation of the Zulu translation of the Numerical Pain Rating Scale (NRS-101) and the Patient-Specific Functional Scale (PSFS) with respect to their concurrent validity when compared to their English counterpart.

Name of Supervisor: Dr. A. Docrat (M-Tech: Chiropractic, C.C.F.C.)
Name of Research Student: Zhakir Ali Mowzer
Name of Institution: Durban Institute of Technology

The purpose of the study:

1. The aim of this prospective pilot investigation is to analyse and critique the Zulu translation of the Numerical Pain Rating Scale 101 (NRS-101) and the Patient-Specific Functional Scale (PSFS) in order to establish their face validity as well as their concurrent validity.
2. The study will produce research tools in the form of Zulu Questionnaires that can be used amongst the Zulu speaking population.

Procedures:
You will be required to complete four questionnaires. At the start of the consultation you will be given the English version of the questionnaires to complete and after the case history, you will be required to complete the Zulu version of the questionnaires. The average time for to complete the questionnaire will be 5-10 minutes after which you will receive a free assessment and one free treatment for your participation.

Benefits:
The participants will be given a free assessment and one free treatment as an incentive for participating in the study.

Risks/ Discomforts and Cost:
There is no risk / discomfort or cost involved from your participation in the study.

Confidentiality:
All patient information is confidential and the results will be used for research purposes only. You have the right to be informed of any new findings that are made and you may ask questions of an independent source if you so wish. If you are not satisfied with any area of the study please feel free to contact the Durban Institute of Technology Research Ethics Committee.

Thank you for your participation,
Yours sincerely,

Zhakir Ali Mowzer (Chiropractic Intern)

Dr. A. Docrat (Supervisor) (M-Tech: Chiropractic, C.C.F.C.)

Appendix B
Informed Consent

Date: 2003-Augaust

Title of research project: A prospective pilot investigation of the Zulu translation of the Numerical Pain Rating Scale (NRS-101) and the Patient-Specific Functional Scale (PSFS) with respect to their concurrent validity when compared to their English counterpart.

Name of Supervisor: Dr. A. Docrat (M-Tech: Chiropractic, C.C.F.C.)
Name of Research Student: Zhakir Ali Mowzer
Name of Institution: Durban Institute of Technology

Please circle the appropriate answer

1. Have you read the patient information sheet? YES/NO
2. Have you had opportunity to ask questions regarding this study? YES/NO
3. Have you received satisfactory answers to your questions? YES/NO
4. Have you had an opportunity to discuss this study? YES/NO
5. Have you received enough information about this study? YES/NO
6. Who have you spoken to regarding this study?

_____

7. Do you understand the implications of your involvement in this study? YES/NO
8. Do you understand that you are free to withdraw from this study? YES/NO

a) At any time?
b) Without having to give a reason for withdrawing?
c) Without affecting your future health cares?

9. Do you agree to voluntarily participate in this study? YES/NO

IF YOU HAVE ANSWERED NO TO ANY OF THE ABOVE, PLEASE OBTAIN THE NECESSARY INFORMATION FROM THE RESEARCHER AND / OR SUPERVISOR BEFORE SIGNING. THANK YOU.

PLEASE PRINT IN BLOCK LETTERS

SUBJECTS NAME_____SIGNATURE_____

WITNESS' NAME _____SIGNATURE_____

RESEARCHERS' NAME _____SIGNATURE_____

Appendix C
Advertisement

NGABE UNAYO INKINGA YEQOLO, UMQALA, IHLOMBE AMAQUKALA NOMA UNYAWO?

NGABE UYASIKHULUMA YINI ISIZULU NESINGISI?

Okuzodingeka ukuba ukwenze ukugcwalisa izimpendulo ngesiZulu nangesiNgisi.
Uma usuqedile ukuba nathi kuloluphenya uzothola ukuhlolwa kanye nokwelasha kwamahala kwalokhu okungenhla kwegolo lakho ngesikhathi esingangesonto kusukela manje.
Uma ungathanda ukwazi kabanzi ungaxhumana no

Zhakir (Zack)

(Owengamele lolucwaningo) kwizinombolo ezilandelayo:

083 4793357 / 204 2205

DO YOU HAVE LOWER BACK, NECK, SHOULDER OR FOOT/ANKLE PAIN?

DO YOU SPEAK ENGLISH AND ZULU?

All you need to do is fill in a few pain questionnaires in Zulu, and then English.
As a result of participation in my study, you are entitled to a FREE assessment and treatment of your lower back, neck, shoulder or foot/ankle pain.
If you would like to know more, please contact

Zhakir (Zack)

On:

083 4793357 / 204 2205

Appendix D

ENGLISH Numerical Pain Rating Scale- 101

PATIENT NAME: _____

FILE NUMBER: _____ **DATE:** _____

GROUP: _____

Please indicate on the line below the number between 0 and 100 that best describes the pain of your major problem at this point, when it is at its **WORST**. A zero (0) would mean “no pain at all” and one hundred (100) would mean, “pain as bad as it could be.”

Please write only one number.

0 100

Please indicate on the line below the number between 0 and 100 that best describes the pain of your major problem at this point, when it is at its **LEAST**. A zero (0) would mean “no pain at all” and one-hundred (100) would mean, “pain as bad as it could be.”

Please write only one number.

0 100

Appendix E

Zulu Numerical Pain Rating Scale – 101 1.1

Isikali Sokulinganisa Izinga Lobuhlungu Ngokwezinombolo – 101

Usuku: _____ Inamba yefayela: _____ Ilgembu

Igama lesiguli:

Cacisa kulomugqa ongezansi, inamba phakathi kuka **0** no **100** okuyiyona echaza kangcono ubuhlungu obuzwayo uma busezingeni elibi kakhulu. Uziro (0) uzochaza ukuthi “abukho ubuhlungu”, (**100**) ikhulu elilodwa lizochaza “ubuhlungu obubi kakhulu”

Sicela ubhale inamba **eyodwa** kuphela.

0 100

Cacisa kulomugqa ongezansi, inamba ephakathi kuka **0** no **100** okuyiyona engachaza kangcono ubuhlungu obuzwayo uma bubuncane elibi. Uziro (0) uzochaza ukuthi abukho nhlobo ubuhlungu, kuthi ikhulu elilodwa (**100**) lizosho ukuthi “ubuhlungu obubi kakhulu”.

Sicela ubhale inamba **eyodwa** kuphela.

0 100

Appendix F
English Patient Specific Functional Scale

PATIENT TO READ AND FILL IN BELOW: Complete at the end of the history and prior to physical examination.

Initial Assessment:

I am going to ask you to identify up to three important activities that you are unable to do or having difficulty with as a result of your _____ problem. Today, are there any activities that you are unable to do or having difficulty with because of your _____ problem? (Clinician: show scale to patient and have the patient rate each activity.)

Follow-up assessment:

When I assessed you on (state previous assessment date), you told me you had difficulty with (read all activities from list at a time). Today, do you still have difficulty with: (read and have patient score item in the list)?

PATIENT-SPECIFIC ACTIVITY SCORING SCHEME (Point to one number):

0 1 2 3 4 5 6 7 8 9 10

Unable to perform activity.

Able to perform activity at same level as before injury or problem.

(Data and Score)

Activity	**Initial**					
1.						
2.						
3.						
4.						
5.						
Additional:						
Additional:						

Appendix G
Zulu Patient Specific Functional Scale 1.1

FUNDA BESE UGCWALISA NGENZANSI: Qewalisa ekugcineni komlando wesiguli ngaphambi kokuxilongwa.

Ukuhlolwa kokuqala:

Ngizocela usho izinto ezintathu ongakwazi ukuzenza noma ezikunika ubunzima ngenxa yenkinga ye _____. Namuhla zikhona yini izinto/umsebenzi ongakwazi ukuwenza ngenxa yalokhu kugula. (Nompilo: khombisa isiguli isikali bese siyachaza ngokwesikal).

Ukuhlolwa Okulandelayo

Ngenkathi ngikuhlola ngo mhlaka…(shono usuku lokuhlolwa okwedlule), wathi unenkinga ye…..
(funda uhla lwezinto/imisebenzi yezinto ayengakwazi ukuzenza). Namuhla usenayo yini inkinga efanayo kokunye kwakho. (ungamphindela uhla lolo bese ephinda eyasho ngokwezikalo).

Umphumela ngokwamaphuzu emisebenzi yesiguli (Khomba inamba eyodwa):

0 1 2 3 4 5 6 7 8 9 10

Imisebenzi/Izinto ahlulekayo ukuzenza

Imisebenzi/Izinto asakwazi Ukuzenza njengoba ayezenza engakalimali.

(Imininingwane namaphuzu)

Imisebenzi/Izinto	**Okokuqala**					
1.						
2.						
3.						
4.						
5.						
Okunye:						
Okunye:						

Appendix H

Focus Group Transcript

Please see pages 39 - 47