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Setswana translation of the Leicester Cough Questionnaire

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A research report submitted to the Faculty of Health Sciences, University of Witwatersrand, Johannesburg, in fulfilment of the requirements for a degree in Master of Science in Physiotherapy.

Gauteng, 2025

DECLARATION

I, Cornelia Magrietha Kotze, declare that the work contained in this research report is my own work, except to the extent indicated in the acknowledgment sections.

This research report is being submitted for a degree of Masters in Physiotherapy at the University of the Witwatersrand, Johannesburg, South Africa.

This work has not been submitted for any other degree or examination in this or any other university.



16 October 2025

Name Surname Date

DEDICATIONS

Completing this research report was a marathon task. I dedicate this work to my two beautiful daughters, Adelaine and Emelia.

I hope this will serve as an example to them that social constraints do not limit you but that our mind is a beautiful, unlimited source they can apply to whatever their hearts desire.

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ABSTRACT

Background:

Chronic cough negatively influences those who suffer from it, often leading to poor health-related quality of life (QoL). The treatment options for managing chronic cough remain limited. The Leicester Cough Questionnaire (LCQ) is a patient-reported outcome measure (PROM). When used, it provides healthcare practitioners insights into the effect of chronic cough on patients' QoL. The LCQ evaluates three health domains: the physical, the psychological, and the social. This study aimed to create a preliminary Setswana version of the LCQ that can undergo further psychometric property testing in a patient population in the future. The specific objectives were to translate the original LCQ into Setswana, establish the content validity of the Setswana version, and describe the perceptions and experiences of experts when reviewing the preliminary Setswana LCQ. The availability of a Setswana LCQ will allow for testing the in Setswana population to prevent exclusion from future studies and possible treatment modalities.

Method:

The study consisted of two phases. Phase one was the forward translation, synthesis of this translation, back translation, and subsequent expert review to facilitate the cultural adaption of the LCQ into Setswana. Best practice guidelines for the translation and cross-cultural adaptation of a PROM were followed. During Phase Two of this study, the content validity of the Setswana LCQ was determined by expert review using the item content validity index (I-CVI) and the scale content validity index (S-CVI). Meetings were audio-recorded, transcribed verbatim, and analysed using thematic content analysis to create an audit trail, thereby enhancing the credibility of the process.

Results:

Five individuals participated in the translation and cross-cultural adaption of the original LCQ to the preliminary Setswana version. The majority of the participants were female (n=4, 80%), with a mean age of 48.60 (SD 12.01) years. Linguistic differences were highlighted during the translation process, and agreements between translators were reached that a more traditional Setswana dialect would be acceptable. Linguistic challenges were identified during the

translation and cross-cultural adaptation process when working with the LCQ instructions and the following questions: 2, 3, 6, 9, 12 to 15, and 18. Categories identified as barriers in the translation process included cultural alignment and aspects related to linguistics. The latter category was further divided into sub-categories consisting of the dialect, the descriptive nature of the language, and the mode of delivery. Items 9,13, and 17 did not translate well and scored 0.67 on the I-CVI, which is below the recommended score of 1.0. The S-CVI/Ave was 0.93, indicating excellent Scale content validity.

Conclusion:

A Setswana version of the LCQ with excellent S-CVI was compiled and is ready to be used in further studies to determine if it retains the psychometric properties of the original version. Using patient interviews can further assist in identifying whether terms and concepts on the Setswana version of the LCQ are understandable and highlight any risk of cultural bias.

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List of abbreviations

CF – Cystic Fibrosis

COPD – Chronic Obstructive Pulmonary Disease

CVI – Content Validity Index

GERD – Gastroesophageal Reflex Disorder

LCQ – Leicester Cough Questionnaire

I-CVI – Item content validity index

PROMS – Patient-reported outcome measures

S-CVI – Scale content validity index

SF-8 – Short Form 8

QoL – Quality of life

Chapter 1

1.1 Background and need.

1.1.1 Introduction

This chapter will introduce the study by discussing the etiology of chronic cough and its impact on the quality of life (QoL) of those who suffer from it. The impact of chronic cough far extends the physical impairments, and there are social and emotional aspects that need to be evaluated and managed to help improve the QoL for those who suffer from it. It will also introduce the Leicester Cough Questionnaire (LCQ) and discuss its source, current use, and translation benefits to a population's home language.

1.1.2 Background

Chronic cough is defined as having an unproductive cough that remains unchanged after treatment from a primary care physician for more than eight weeks (Farooqi et al., 2020). Coughing is a protective mechanism that humans possess to keep irritants out of the airways. Once this mechanism causes the cough to become chronic, without the need for airway protection, individuals' QoL becomes negatively affected (Won & Song, 2021). The impact has especially become more prevalent in a post-COVID society where there is a stigma around coughing in public (Won & Song, 2021). South Africa and other developing countries are still facing a Tuberculosis pandemic; this exacerbates the stigma that is associated with suffering from a chronic cough (DeSanto, Velen, Lessells, et al., 2023). Chronic cough can be idiopathic, or it can occur in a variety of conditions, including chronic obstructive pulmonary disease (COPD), asthma, gastroesophageal reflux disease (GERD), cystic fibrosis (CF), and bronchiectasis (Malesker, Callahan-Lyon, Madison, et al., 2020).

Chronic cough negatively influences those who suffer from it, and patients tend to have poor health-related QoL, not just because of the physical aspects but also because of the psychological elements that develop with the condition (Won & Song, 2021). An example of this includes the physical symptoms experienced among females suffering from a chronic cough, such as stress incontinence, which negatively impacts their QoL in the physical, social, and psychological domains (Won & Song, 2021). The treatment options for managing chronic cough remain limited (Michaudet & Malaty, 2017). For researchers and clinicians to

understand the impact of chronic cough on patients' everyday lives and improve the treatment approaches, an outcome measure needs to be used to determine the effects of treatment and change in their QoL. The LCQ and Cough Quality of Life Questionnaire are used as such outcome measures.

The LCQ was developed in 2002 in the United Kingdom (UK) and measures the effect of chronic cough on QoL in three health domains. These domains include individuals' physical, psychological, and social aspects (Birring et al., 2003). The questionnaire has been proven valid and reliable in testing individuals' QoL in various conditions (Berkhof et al., 2012; Murray et al., 2009; Ward et al., 2017). These conditions include COPD, non-CF, bronchiectasis, and CF. The LCQ contains 19 self-administered questions and takes about five minutes to complete (Birring et al., 2003). Participants use a Likert scale to indicate how relevant each question is to their circumstances. The higher the score, the better their QoL. Since its development, researchers created many different versions of the LCQ in many other languages, including Dutch, French, Korean, Mandarin Chinese, Polish, Portuguese, Spanish, Swedish, and Thai (Physiopedia contributors, 2020). The translated questionnaires maintained reliability and validity (Gao et al., 2014; Kurhan et al., 2018). The LCQ was determined to be a helpful and effective tool to measure chronic cough's effect on patients' QoL (Berkhof et al., 2012; Murray et al., 2009; Ward et al., 2017).

In 1993, Guillemin, Bombardier, and Beaton recommended that health-related QoL measures be adapted when the original questionnaire is unavailable in the individual's culture and/or language. This process is known as a cross-cultural adaption of the questionnaire. It entails more than just translating a questionnaire into a different language; it requires adapting the questionnaire to be relevant to the culture of the evaluated patient. Doing this allows for understanding the impact on individuals' QoL regarding a specific condition. It minimises the potential of exclusion of individuals from studies due to language specifications, which could potentially improve their health-related QoL (Guillemin et al., 1993). The LCQ was developed in the UK for an English-speaking population. It is important to adapt this outcome measure to make it assessable to a population in their home language and to have it be adapted to their respective cultures to prevent exclusion from important studies (Guillemin et al., 1993). The cross-cultural adaption of a questionnaire requires more than just the language translation. The wording and use of terms must be appropriate to the culture, including adapting phrases, idioms, and utensils (Guillemin et al., 1993).

Currently, South Africa has 12 official languages. These languages are isiZulu, isiXhosa, Afrikaans, Sepedi, English, Setswana, SeSotho, Xitsonga, siSwati, Tshivenda, isiNdebele, and a recent addition of Sign language (StatsSA, 2023). According to the 2022 census, 8.3% of the population noted their home language as Setswana, with Setswana being the dominant home language in the North West province (StatsSA, 2023). Setswana has a geographical footprint that stretches from Botswana, Namibia, and multiple provinces in South Africa (Bennett, Diemer, Kerford, et al., 2016). It is a language with wide variety and each area has a unique dialect where it is spoken. Nkosi et al., (2015) found that the elderly population living in surrounding areas close to mine dumps in both Gauteng province and North West province had a higher risk of developing chronic respiratory conditions. Therefore, the population being served in this area by physiotherapists and pulmonologists could be predominantly Setswana-speaking. Using a questionnaire not tailored to the target population can leave room for biased results due to the exclusion of participants (Beaton et al., 2000). Creating a Setswana version of the LCQ will ensure more inclusivity in this population when participating in research projects. It can also be a valuable outcome measure when treating patients in the area of the population the researcher is currently serving.

1.1.3 Problem Statement

Chronic cough may cause poorer QoL in individuals who suffer from it (Won & Song, 2021). Treatment modalities and management of chronic cough are lacking, creating an opportunity to investigate management strategies for this condition (Michaudet & Malaty, 2017). English is not the first language for many South Africans (StatsSA, 2023). Translating the LCQ into Setswana will allow patients to complete it in their home language, providing a better understanding of the questions and concepts and preventing exclusion from studies due to language barriers. Providing an outcome measure relevant to the testing population will allow the information to be tailored to the population and prevent less bias in results.

1.1.4 Aim of the Study

This study aims to create a preliminary Setswana version of the LCQ.

1.1.5 Objectives of the Study

The objectives of the study are to:

1.4.1.1 Forward-back translate the original English version of the LCQ into Setswana.
1.4.1.2 Determine the item-level content validity and scale content validity of the translated Setswana LCQ using an expert committee's rating on a Likert scale.
1.4.1.3 Outline the perceptions and experiences of an expert committee when reviewing the preliminary Setswana LCQ.

1.1.6 Significance of the Study

Creating a Setswana version of the LCQ will allow researchers to study possible management and treatment techniques in a Setswana population and the effect on patients' health-related QOL. Data collected with this Setswana version in the local context could be compared and contrasted with international findings when researchers used other versions of the LCQ. The availability of a Setswana LCQ could prevent patients from being excluded from possible studies due to language barriers. Having a preliminary Setswana version of the LCQ available for further testing allows a researcher to test the questionnaire on the target population.

1.1.7 Justification of the Study

The dominant home language in the North West province was Setswana, according to the 2022 census report (StatsSA, 2023). Availing a culturally adapted questionnaire to this community in their home language can facilitate further research on this population and allow for more inclusivity (Guillemin et al., 1993). Having a Setswana LCQ available can help healthcare workers paint a clearer picture of the QoL of the Setswana population who suffer from chronic cough and provide patient-specific treatment modalities. Data collected with standardised patient-reported outcome measures (PROMs) can also be included in data registries to allow for regional comparisons.

1.1.8 Organisation of this research report

This research report will discuss the need for this study, provide a literature review, and discuss the methodology for creating the Setswana version of the LCQ. After the methodology, the results are presented and then discussed and interpreted. The end of this research report presents a final version of the Setswana LCQ that is ready for psychometric testing.

Chapter 2

2. Literature review

This literature review has two parts. The first will focus on chronic cough, its pathophysiology, management strategies, and its impact on the health-related QoL of those who suffer from it. The second will focus on the LCQ, outcome measures, the importance of having a questionnaire in patients' home language, and other questionnaires successfully translated for a South African population. It will describe the area's historical context and outline the target population.

2.1 Introduction to Chronic Cough

The definition of a chronic cough is suffering from a cough that lasts eight weeks or longer (Yang et al., 2023). It is divided into three categories depending on its presentation and underlying causes. These categories include Refractory Chronic Cough and Unexplained Chronic Cough, including Cough Hypersensitivity Syndrome (Bali et al., 2024). Cough Hypersensitivity Syndrome is a more recent term used to describe chronic cough. This syndrome explains the neural impairment apart from the underlying respiratory conditions (Chung et al., 2013).

2.1.1 Categories of Chronic Cough

A Refractory Chronic Cough presents in people with an underlying condition that increases their chances of developing a chronic cough (Bali et al., 2024). These conditions most commonly include COPD, GERD, asthma, rhinitis, chronic bronchitis, and a post-nasal drip (Zhang et al., 2022). The development of a chronic cough can be the first sign of COPD in patients, and presenting with a productive chronic cough increases the mortality rate (Zhang et al., 2022). Zisi et al. (2022) stated that COPD was the leading cause of chronic morbidity and mortality in 2020. Although literature reviews regarding the prevalence of chronic cough do not include any studies from South Africa (Yang et al., 2023), around 46% of the population who suffer from chronic cough will present with an unexplained or idiopathic chronic cough with no underlying disease (Yang et al., 2023).

There are several risk factors involved in developing an Unexplained Chronic Cough. These risk factors include extrinsic risk factors like being a smoker or an ex-smoker, occupational exposure (including cleaning and maintenance personnel), being exposed to vehicle traffic and varying temperatures, and the use of Angiotensin-converting enzyme (ACE) inhibitors (Yang et al., 2023). Intrinsic risk factors include being female, obesity, increased age, dysfunctional breathing patterns while sleeping (including obstructive sleep apnoea), and having a lower education level (Yang et al., 2023). In patients presenting with either type of chronic cough, advocating for smoking cessation remains important (Malesker, Callahan-Lyon, Madison, et al., 2020).

2.1.2 Pathophysiology of Chronic Cough

A portion of the population presenting with an Unexplained Chronic Cough can be diagnosed with Cough Hypersensitivity Syndrome. This syndrome is classified as a neuropathic disorder and includes the abnormal upregulation of the cough reflex (Chung et al., 2013). This abnormal upregulation consists of a heightened sensory pathway that is more sensitive to stimulants such as citric acid and capsaicin inhalation and a dysfunction in inhibitory control once the reflex pathway is activated (Chung et al., 2013). The symptoms described by this population include intermittent or permanent irritation or tickling in the throat, rawness of the pharynx or the larynx, and a choking sensation in the throat (Chung et al., 2013). They do not describe a sensation in the chest that precedes a coughing fit. Literature for this syndrome supports neural modulation therapy as a treatment strategy, either with medication or therapy (Birring et al., 2017; Chamberlain Mitchell et al., 2019; Chung et al., 2013; Kum et al., 2023; Ribeiro et al., 2024). Literature is available describing the environment's effect on chronic cough.

2.1.3 Environmental effects of Chronic Cough

Nkosi et al. (2015) investigated whether the elderly population living near mine dumps in South Africa had a higher risk of developing chronic respiratory conditions. They found that the elderly population surrounding mine dumps in both Gauteng province and North West province had a higher risk of developing chronic respiratory conditions such as COPD and asthma than the elderly population living at different sites in the same provinces, making this population more vulnerable to developing a chronic cough (Nkosi et al., 2015). Possible causes for this occurrence were attributed to the environmental exposure in the community, smoking habits of the population, paraffin use inside the house for cooking purposes, and a lower level of

education in the community (Nkosi et al., 2015). A limitation noted in the survey was the inability to conduct the interviews in the participant's home languages.

2.1.4 Management Strategies for Chronic Cough

Treating a chronic cough remains challenging, and several algorithms are available to help practitioners classify different types of coughs and treat them accordingly (Irwin et al., 2018; Morice et al., 2020; Wallace, 2023). The first step is to determine the length of time that the cough has been present; if under three weeks, classify it as an acute cough; between three to eight weeks is a sub-acute cough, and longer than 8 weeks is a chronic cough (Irwin et al., 2018). All these guidelines highlight the importance of excluding red flags when evaluating a patient with chronic coughs such as hemoptysis, systemic symptoms, recurrent pneumonia, smokers with a sudden onset of coughing, persistent dyspnoea at rest and at night, abnormal chest imaging that correlates with the timeline of onset, hoarseness of the voice, and trouble swallowing or choking when eating (Wallace, 2023). If red flags are present, the patient should receive further investigation, such as a high-resolution CT scan, bronchoscopy, and workup for cancer and cardiovascular conditions (Wallace, 2023). If no red flags are present, patients should be evaluated for conditions such as asthma, COPD, and GERD and receive the appropriate treatment (Wallace, 2023). If none of these conditions are present, treatment strategies like the use of low-dose opioids, pregabalin, and gefapixant need to be considered (Kum et al., 2023; Morice et al., 2020).

Birring et al. (2017) found that when medication accompanies physiotherapy or speech therapy intervention like cough control and breathing exercises, the patients had a better QoL outcome when measured with the LCQ. Chamberlain Mitchell et al. (2019) hypothesised that non-pharmacological interventions work by desensitising the sensory input in the airway and increasing the voluntary inhibitory pathway control resulting in a decreased efferent output. However, Ilicic et al. (2022) found in a systematic review conducted in 2022 that using therapeutic techniques by physiotherapists and speech therapists was not more effective than education about a healthy lifestyle alone. Education about a healthy lifestyle includes healthy weight management and exercise, which decreases the prevalence of GERD and obstructive sleep apnoea in patients, anxiety, and behavior modification regarding chronic cough and smoking cessation (Chamberlain Mitchell et al., 2019). Guidelines published by the European Respiratory Society still recommend non-pharmacological interventions as a trial in their guidelines due to the low risk of side effects with these treatment modalities (Morice et al.,

2020). The use of medications to treat chronic cough is not yet approved, and the side effects experienced by the patients, especially alterations in taste, have been reported with the severity of the side effects increasing with the dose of the medication (Kum et al., 2023). These guidelines also strongly advocate for routine follow-up with these patients as well as using assessment tools to measure their QoL (Irwin et al., 2018; Morice et al., 2020; Wallace, 2023).

2.1.5 Impact of Chronic Cough on Health-related Quality of Life

Patients suffering from chronic cough tend to have poor health-related QoL (Song et al., 2015). It is a global condition that causes significant morbidity (Song et al., 2015). Females of around 50 years old are more affected than males, but the information about the epidemiology in Africa is limited (Yang et al., 2023). The LCQ is the most used outcome measure when assessing QoL in individuals with chronic cough as it asses the patient's life in three different domains (Bali et al., 2024). Some of the physical symptoms experienced by these patients include chest pain, retching and vomiting, stress incontinence, light-headedness, and, in some cases, syncope (Bali et al., 2024). Social factors involve the fear of disrupting a quiet environment like a restaurant or a cinema, having their partner sleep in a separate bedroom, and embarrassment at work or in public (Bali et al., 2024). Psychological factors include depression and anxiety felt by the patients regarding the chronic cough or because of the impact of chronic cough on their everyday lives (Bali et al., 2024). In the chronic cough population, 96% of patients report a significant decrease in their QoL when suffering from a chronic cough (Yang et al., 2023). Developing better treatment strategies is important, as some patients report no improvement in their QoL, even with the current treatment strategies (Bali et al., 2024).

Chronic cough also carries with it a significant disease burden. Patients suffering from chronic cough tend to utilise more healthcare resources and have a higher healthcare cost (Yang et al., 2023). Apart from the fact that these patients tend to have co-morbidities, they also require more testing and specialist visits to diagnose and treat their condition; if the patient presents with a productive chronic cough, the cost becomes higher (Yang et al., 2023).

2.2 Translation and Cultural Adaption

Language and culture are closely linked, and culture is learned through language from a very young age (Soken-Huberty, 2022), and in South Africa, culture and language are strongly linked (Pillay, Ncube, Moopelo, et al., 2023). Our language also influences how we perceive

the world around us (Shashkevich, 2019). The language and cultural barriers in South Africa, and even Botswana, are causing an exclusion of populations when information is gathered for research purposes (Nkosi et al., 2015). The need for questionnaires in other languages is growing, and it is incorrect to assume that a questionnaire will be well received by the intended population when directly translated or that it will retain its validity and reliability after the translation (Beaton et al., 2000).

From as early as 1993, Guillemin, Bombardier, and Beaton recommended cultural adaptation during the translation process. The translation process needs to include more than just the language translation; it also requires a cultural adaptation of the items, phrases, and idioms used.

The Setswana language, which is the target language for this study, is spoken by nearly four million people in South Africa; it has a wide geographical footprint that stretches from central South Africa to Botswana and Namibia (Bennett et al., 2016). The Setswana language is typically spoken and not written (Bennet et al., 2016). The nuance of the language lies in the phonetic use of the vowels and the tone of voice when spoken (Bennet et al., 2016). The speakers also use gestures as part of their communication to reinforce the meaning of concepts (Bennett et al., 2016). Because of the language's large footprint, other cultures have influenced the language over time, causing the language to have different dialects in certain parts of the country (Bennett et al., 2016). This phenomenon can also be known as urbanisation in some parts of the country (Pillay et al., 2023).

Apart from the cultural and language differences, the level of education in South Africa also plays a role in how questionnaires are received (Yazbek, Stewart, Becker, 2009). Literature suggests that only 37.6% of South Africans have completed a grade 12 education (StatsSA, 2023). This low level of education highlights that even when cultural adaption is applied during the translation process of a questionnaire, it remains important to test the psychometric properties of the translated questionnaire within the target population to determine whether they understand terms and concepts utilised (Yazbek et al., 2009).

2.2.1 Recommendations for Translation and Cross-Cultural Adaption of Questionnaires

Beaton et al. (2000) recommended a guideline to ensure that the cultural adaptions of questionnaires to the target culture and language; they also recommended that the psychometric properties of an adapted and translated questionnaire be tested within the target population to determine how it will be received and to calculate its psychometric properties.

The cross-cultural adaption method recommended by Beaton includes the forward translation from the original language into the target language, the creation of a preliminary questionnaire, and the back translation from the target language to the original language (Beaton et al., 2000). The translators recommended in these guidelines include a healthcare worker, two translators whose home language is the target language, and one translator whose home language is that of the original questionnaire. During this translation process, the translators need to keep a record of difficulties they encountered with the translation process and an account of how they overcame these difficulties; these accounts, along with the translated version of the questionnaire, are then discussed during an expert committee meeting, and a final version of the target language questionnaire is then created (Beaton et al., 2000). During this meeting, participants can report any items, idioms, or phrases in the questionnaire that might not fit well within the target culture (Beaton et al., 2000). The questionnaire must then be tested in the target population to determine if the translated version retained its psychometric properties.

In 2024, new guidelines published recommended an eight-step strategy for the translation, cross-cultural adaption, and validation of self-reported patient questionnaires (Cruchinho, Lopez-Franco, Capelas, et al., 2024). These eight steps are similar to the recommendations made by Beaton and include 1) Forward translation; 2) Synthesis of a preliminary translated version; 3) Back translation into the original language; 4) Harmonisation of the two questionnaires with the use of an expert committee; 5) Pre-testing in the intended population on a small number of participants; 6) Field testing in the intended population; 7) Validation of the newly synthesised questionnaire psychometric properties and 8) Analysis of the newly synthesised questionnaire psychometric properties (Cruchinho et al., 2024). These guidelines are similar to what Beaton et al. (2000) recommended. During this process, it is important to keep the translated version relevant to the target culture, and there is a need to determine the conceptual equivalence of the translated version in five different domains which includes

conceptual-, item-, semantic-, operational equivalence and the equivalence of measurement (Cruchinho et al., 2024).

2.2.2 Conceptual Equivalence

Conceptual equivalence is when the target version of a questionnaire has the same conceptual meaning as the original version with regard to the different concepts and items used (Cruchinho et al., 2024). In addition, it also determines whether the semantics are the same as in the original version, whether it will operate well in the target culture, and whether it will deliver the same equivalent of measure as the original version (Cruchinho et al., 2024). The recommendation also mentions preventing cultural bias during translation, as it can be a primary threat. Cultural bias is using two different concepts between the target and original cultures or when items have different meanings in the respective cultures (Cruchiho et al., 2024). This bias can also present itself if there is a need for the two questionnaires (original versus translated version) to be administered differently between the cultures (Cruchinho et al., 2024).

2.2.3 Face validity and content validity

Face validity is a term used since as early as 1926, indicating if a scale has the right look or feel on a superficial level (Royal, 2016). Since 1947, scientists have recommended that face validity is insufficient when used as the only validation of an outcome measure (Royal, 2016).

Determining the content validity of a PROM can provide better insight into the validity of the questionnaire. Polit & Beck (2004) recommended using the content validity index (CVI) to evaluate whether a scale and its items effectively measure the construct across the domains explored in a PROM. Assessment of content validity can happen at two stages. The first assessment happens through a priori effort, which involve conceptualising and analysing domains before item generation (Polit & Beck, 2006). The second assessment is done with a posteriori effort where the relevance of the items and the scale are evaluated by a group of experts (Polit & Beck, 2006). The a posteriori effort is used when existing scales are being adapted, and calculating the average of expert agreement on different items can indicate if the adapted scale has good content validity or if revision is needed to improve the content validity (Polit & Beck, 2006).

2.3 The Leicester Cough Questionnaire

Birring, Prudon, Carr, and Singh developed the LCQ in the United Kingdom in 2003. It is a self-reported patient outcome measure comprising instructions and 19 items. It measures the QoL of individuals who suffer from chronic cough across three domains: the physical, psychological, and social domains of the patient's life (Birring et al., 2003). The questionnaire is reliable in determining the QoL in patients suffering from a wide range of chronic cough conditions (Bali et al., 2024). Multiple other versions of the questionnaire exist in different languages, and some will be discussed further in this literature review.

2.3.1 Other Translations of the Leicester Cough Questionnaire

Thirteen different translations of the LCQ are available across the world.

Table 2.1: Translations of the LCQ in print.

Language Versions	**Reference**
Chinese Mandarin	(Gao, Guan, Xu, Gao, Lin, Tang, Li, Luo, Zhong, Birring & Chen, 2014)
Dutch	(Huisman, Wu, Uil & Van den Berg, 2007)
French	(Reychler, Schinkcus, Fremault, Liistro & Pieters 2015)
German	(Schupp, Fichtner, Frye, Heyduck-Weides, Birring, Windisch, Crée, Müller-Quernheim & Farin, 2018)
Italian	(Sorano, Fumagalli, Cinelli, Birring, Fontana & Lavorini, 2024)
Korean	(Kwon, Moon, Kim, Song, Wim, Kang, Lim, Lee S, Lee J, Jeong, Kim C, Cho & Lee B, 2015)

Norwegian	(Haukeland-Parker, Hasvik, Jelsness-Jørgensen, Birring & Johannessen, 2022)
Persian	(Rahdar, Kiani, Noorali, Bakhshandeh, Hosseini-Baharanchi, Shafaghi, Abedini, Behnam Kharazmi & Behnam, 2024)
Polish	(Dabrowska, Krakowiak, Radlińska, Rybka, Grabczak, Maskey-Warzęchowska, Korcyzyński, Birring & Krenke, 2016)
Portuguese	(Felisbino, Steidle, Gonçalves-Tavares, Pizzichini M & Pizzichini E, 2014)
Spanish	(Muñoz, Buxò, De Gracia, Olveira, Martinez-Garcia, Giron, Polverina, Alvarez, Birring & Vendrell, 2016)
Swedish	(Sönnerfors, Faager & Einarsson, 2018)
Thai	(Pornsuriyasak, Kawamatawong, Rattanasiri, Tantrakul, Pongmesa, Birring & Thakkinstian, 2016)

The French, Norwegian, and Swedish versions of these questionnaires were translated using the Beaton method for translation and cultural adaptation. The Dutch, Portuguese, Polish, German, Persian, Italian, and Chinese Mandarin versions followed a forward-back translation framework that is not standardised. These methods involve the researcher either partaking in the translation process or being involved in the validation of the questionnaire. The Korean, Polish, Thai, and Persian translators used physicians to assist with the questionnaires' forward and back translation process.

Six translated versions (Chinese Mandarin, Norwegian, Swedish, German, Portuguese, and French) reported that the questionnaires only required minor adjustments during cultural adaptation. The Chinese Mandarin translation process used cognitive debriefing interviews to

assist in creating the final version of the questionnaire. The other translations did not mention reviews by expert committees or indicate other provisions made to ensure cultural alignment.

Apart from the Norwegian version, all the other translations scored well on validity and reliability when considering face and construct validity, concurrent validity, internal consistency, test re-test reliability, and responsiveness. Measuring the translated versions of the LCQ to other self-reported patient outcome measures that measure health-related QoL ensures the concurrent validity of these questionnaires. The internal consistency was measured using Cronbach's coefficient. The Thai LCQ still needs to be tested for responsiveness. The questionnaire seems promising but is still a work in progress (Pornsuriyasak et al., 2016).

The Norwegian translation of the questionnaire was easy to understand and complete. However, its construct validity was acceptable but poor (Haukeland-Parker et al., 2022). The translated questionnaire did not capture the constructs of some of the questions well during testing, and these construct domains must be re-assessed (Haukeland-Parker et al., 2022). This provides another example of a questionnaire that is still easy to understand and administer but where the psychometric properties did not carry over equally well into the translated questionnaire.

A SeSotho version of the LCQ was forwarded by the original author, Prof S.S Birring. It was created in 2018, but no publication could be found regarding the translation process followed to create the version. Beaton et al. (2000) motivated the publication of translated questionnaires and their psychometric properties to have this information available to researchers or clinicians wanting to use the questionnaire.

2.3.2 Other self-administered patient questionnaires translated into Setswana.

The Short Form-8 (SF-8), used to assess general health-related QoL, was translated and culturally adapted into Setswana (Onagbiye, Moss & Cameron 2018). The translation process consisted of two forward translations by two native Setswana speakers and two back translations conducted by students from two different departments. There was no mention of an expert committee review of the questionnaire. Instead, the community reviewed the questionnaire to determine the face validity of the questionnaire (Onagbiye et al., 2018). Community-dwelling participants in Potchefstroom, North West, were identified and used to

test the questionnaire. The Setswana version of the SF-8 is feasible; it has acceptable concurrent validity and fair- to moderate test-retest reliability. The one limitation mentioned is that because community-dwelling participants validated the questionnaire, the question remains if the questionnaire can be used in other parts of the country (Onagbiye et al., 2018).

A Setswana version of the 28-item General Health questionnaire was created in Botswana (Segopolo, Selemogwe, Plattner, Ketlogetswe, 2009). This study highlighted the need for Setswana self-reported patient outcome measures. The researchers created a forward and back translation of the questionnaire. There is no indication if an expert committee evaluated the questionnaire to allow for cultural adaptations to be made. After being tested in the target population, the questionnaire was deemed valid with good internal consistency (Segopolo et al., 2009).

Nelson et al. (2020) conducted a larger translation study, translating the Parkinson's Disease Screening Questionnaire and the Parkinson's Disease questionnaire into three different African Languages. The target languages for the translations included Afrikaans, Setswana, and IsiZulu. During the forward translation of the questionnaires, modifications were made to the questions to improve their understanding while keeping the questions' meaning the same. The questionnaires were then back-translated and delivered in an interview manner to the test populations. Challenges indicated during the process were that in Setswana, there is often not a single word available to describe words found in English, the word balance being an example of this and a whole term will have to be used to understand the question possibly changing the construct of the question or the delivery method (Nelson et al., 2020). The low level of education in the population used for testing the questionnaire proved challenging; the participants had difficulty understanding the phrases and items to ensure they reported the correct answer. Both questionnaires showed good face and construct validity (Nelson et al., 2020). However, after completing the translation and testing process, the Parkinson's Disease questionnaire was accepted and showed good concurrent reliability, while the Parkinson's Disease screening questionnaire still required some amendments (Nelson et al., 2020).

A study conducted by Pillay et al. (2023) reported on the challenges faced when translating consent forms into isiZulu, isiXhosa, Setswana, and Sesotho in different areas of Gauteng, the Northern Cape and the Western Cape in South Africa. These challenges included words and phrases not translating well into the target language. In Setswana and Sesotho, no single word

was often available to relay concepts; the original text meaning versus how the target language interpreted it often differed, indicating a cognitive mismatch (Pillay et al., 2023). They also identified a strong association between culture and language in South Africa and that participants would indicate their culture and language preferences even if they were not proficient in their "home language" (Pillay et al., 2023). Another phenomenon noted was the urbanization of languages, where languages become mixed, and participants cannot understand the 'deep' words in the pure form of the language (Pillay et al., 2023). Inappropriate vocabulary use, a cognitive mismatch between the original and target population, and linguistical gaps in the language were identified as the main barriers when translating the African languages (Pillay et al., 2023).

2.4 Summary

Suffering from a chronic cough can be a debilitating condition, and the treatment options for the management of it are still lacking. It remains important to provide self-reported patient questionnaires to participants in their home language that is appropriate to their culture and education level. Translation of information into an African language poses its own unique challenges. After the translation and cultural adaption of patient-reported questionnaires, it is important to test the questionnaire in the target population to ensure that it is well received and relevant to the target population and that the questionnaire retains its psychometric properties. Providing these questionnaires allows researchers to study the effect of a condition in a specific population, allowing for the opportunity to improve their health-related QoL.

Chapter 3 will outline and explain the methodology followed in this study.

Chapter 3

3. Methodology

This chapter will explain the methodology used to address the objectives and aims of the study.

3.1 Type of Study

Phase one was a translation study including the forward translation, synthesis of the translated questionnaire, back translation into English, and an expert committee review (Beaton et al., 2000). Phase two was a validity study, which includes content validation and thematic content analysis (Beaton et al., 2000; Polit & Beck, 2006).

3.2 Ethical Considerations

Ethical clearance was obtained from the University of Witwatersrand Human Research Ethics Committee (M221102). Written informed consent was acquired from the translators and experts for their participation in the study (Appendix E), as well as for the audio recordings of the meetings (Appendix E). Participants were instructed to maintain the confidentiality of information from the focus groups and interviews and not to publicly identify other participants; this requirement was specified in the consent form (Appendix E). Demographic data was coded and participants received a participant number, the demographic questionnaires did not contain any identifying data. The translators were reimbursed according to the number of words translated in each questionnaire, the expert committee did not receive any additional reimbursement. Participants were free to withdraw at any stage during the process. Permission to complete the translation was granted by the original developer and author, Professor S.S. Birring, a consulting Respiratory Physician and Professor of Respiratory Medicine at King's College Hospital and King's College London.

3.3 Participants

Participants participated in phase one phase two of the study. The translators where also added to the expert committee with one addition of the methodology expert who did not participate in the translation process.

Table 3.1: Participants

Participant	Criteria for inclusion	Role	Inclusion in expert committee
Translator one (T1)	Home language Setswana; fluent in English Medical background and knowledge of questionnaire	Forward translation of LCQ from English to Setswana	Included as Medical expert (Health care professional)
Translator two (T2)	Home language Setswana; fluent in English No medical background	Forward translation of LCQ from English to Setswana	Not included in expert committee
Back-translator one (BT1)	Home language English; fluent in Setswana No medical background	Back-translation of T-12 from Setswana into English	Included as Language expert
Back-translator two (BT2)	Home language English; fluent in Setswana No medical background	Back-translation of T-12 from Setswana into English	Not included in expert committee
Methodologist	Previous experience of the methodology used in the translation study	Comment on methodology followed while creating the preliminary Setswana LCQ	Included as Methodology expert

3.3.1 Source of Participants

Participants included four translators and one additional expert reviewer. Three translators, including the language expert, were sourced from the Language Hub as the University of

Witwatersrand language school recommended. A liaison working with the language school was contacted, and the requirements of the translators were discussed. The liaison communicated with the suitable translators to complete the translations and arrange attendance for the interviews. The medical expert was a health care professional who is Setswana speaking and working in the Potchefstroom, North West area, and served as Translator one (T1). It was preferred to have a healthcare worker who encounters chronic cough patients regularly in their line of work, like a physiotherapist, nursing staff, or a doctor. For this study, a professional nurse who knows the intended participants' condition and culture was approached. The methodologist expert was sourced from the Department of Physiotherapy at the University of Witwatersrand, who has experience in translation studies using the Beaton method the inclusion of participants in the expert committee can be seen in table 3.1. The methodology expert was not the researcher's supervisor.

3.3.2 Sample Selection

Beaton et al. (2000) recommend four translators to translate and synthesize the intended questionnaire. They also recommend an expert committee to review the final version of the questionnaire. The expert committee consisted of three experts namely a language expert who is fluent in Setswana and English, a medical expert who was Setswana speaking a health care worker with knowledge of chronic cough, and a methodologist who has previously supervised a translation study.

Inclusion Criteria

Four translators were required. Two whose home language is Setswana (translation language), but who are proficient in English (source language), of which one being a healthcare professional. The other two translators' home language had to be English, but they needed to be proficient in Setswana without a medical background. This proved difficult to find, and the two backward translators included in this study's home language were Setswana. After this, an expert committee reviewed the translated version; this committee included a medical professional proficient in Setswana and English, a language professional, and a methodologist who has experience in translation studies.

3.4 Instrumentation and Outcome Measures

The instruments and outcome measures used for this study is summarised in table 3.2. Three of the Instruments was used in phase one, and one was used in phase two of this study.

Table 3.2 Instrument and outcome measure

Instrument and Outcome measure used	Use of Instrument and Outcome measure for this study
English LCQ (Appendix A)	The original source of translation (Phase 1)
Interview guide (Appendix C)	Completed during interviews with experts and translators to ensure all recommendations are amended. Recording of experts perceptions and expectations of the translation process and Setswana LCQ. (Phase 1)
Demographic Questionnaire (Appendix B)	To determine the demographic profile of the participants. (Phase 1)
I-CVI & S-CVI Likert scale (Appendix D)	To determine the item-content validity index (I-CVI) & scale-content validity index (S-CVI) of the Setswana LCQ. (Phase 2)

3.5 Procedure

3.5.1 Introduction

The translation and validation of the questionnaire were done following the guidelines set out in the study conducted by Beaton et al., (2000) . Phase one of the study was the translation of the questionnaire and the review of the expert committee to determine the face and content validity of the translated version. Before the process commenced, four translators and one additional expert were identified, and written consent was obtained from them to participate in the study and for audio recordings made during the meetings. Phase two of this study included the transcriptions and thematic content analysis of these recordings and content analysis from the meetings to describe the participant's perceptions and expectations from the translation process. The I-CVI and S-SCI were also calculated during phase two. The translators and experts participated in phase one (stage I-IV) of the study.

3.5.2 Phase one

Phase one consisted of IV stages as seen in figure 3.1. Stage I was the first translation process. Two translators were asked to forward translate the LCQ (Appendix A) into Setswana. They are referred to as T1 and T2. Emails were sent to the liaison, who sourced the translators, with the original English version of the LCQ; the liaison then distributed the questionnaire to the participants. The translation had to include the content of the questionnaire as well as the instructions. They had one week to complete the translation on their own time. During the translation process, the translators kept a record of difficulties experienced while creating the translations. These reports were discussed in the meeting that was concluded in stage II.

Once completed, an online Microsoft Teams meeting was held with the first two translators, the principal researcher, and the senior academic supervisor for this study. Reports of difficulties encountered during the translation process were discussed following an interview guide and noted on the interview capture sheet. A systematic approach was followed, and each item was discussed in the order that was noted on the interview guide. The goal of this meeting was to address discrepancies between translated versions T1 and T2, and to address difficulties encountered during the translation process. The outcome of this meeting produced a new translation-12 version (T-12) version of the questionnaire. During this online Microsoft Teams interview, a written report and recording of these interviews were kept and used in phase two of this study. The completion of T-12 completed stage II of the process.

In stage III the T-12 version was back-translated into English by two separate translators. This produced backtranslation one (B1) and backtranslation two (B2). Emails of T-12 were sent to the back translators via the liaison, who had one week to create B1 and B2 versions of the questionnaire. A record of difficulties encountered while doing the back translations was kept and discussed during the meeting that concluded stage III of this process. The Microsoft Teams interview followed the structure of the interview capture guide and items were systematically discussed in the order of the interview guide. During this online Teams interview, a written report and recording of these interviews were kept and were used in phase two of this study.

Stage IV of phase one was completed during an online Microsoft Teams meeting held between the principal researcher, the senior academic supervisor, and the expert committee composed of a language professional and a methodology expert. The healthcare professional was unable

to attend the meeting due to unplanned work responsibilities; the principal researcher met with this participant after the completion of the meeting to discuss the points raised during the previous meeting and during the translation process to ensure that the amendments made were in line with the medical expectations of the questionnaire. The interview guide and amendments made during the meeting with the healthcare worker were sent to the methodology expert for monitoring. The committee had access to all the versions of the questionnaire created during the translation process (T1, T2, T-12, B1, and B2), the original LCQ, and the interview guide notes of the meeting held at stages II and III. These reports were sent out to the participant's email via the liaison, and they had one week to review the information. The role of the committee was to discuss all the difficulties encountered during the back-translation process, and they had an opportunity to offer solutions to these difficulties. The notes of this meeting were discussed with the healthcare worker. After the meeting with the healthcare worker was concluded, the final version of the Setswana LCQ was compiled.

The expert committee's interview was conducted in an online Microsoft Teams meeting, following a systematic format from the interview guide, and noted on the interview capture sheet. The healthcare worker's meeting was conducted in person and recorded on the same interview capture sheet. The group also discussed their perceptions of the translation process and expectations for the Setswana LCQ. Completing these two meetings resulted in the translated version of the Setswana LCQ questionnaire.

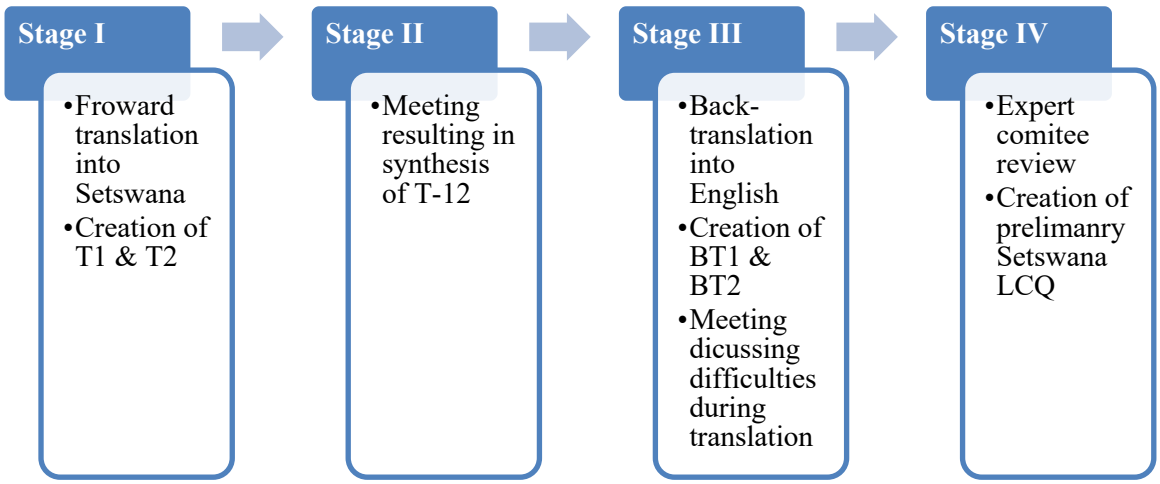


Figure 3.1 Stages of phase one

3.5.3 Phase two

Phase two of this study was the content validation of the Setswana version of the questionnaire, which consisted of two stages. Stage one was to determine the face and content validity of the items and scale. In this stage, the participants had to rate the relevance of the item, and the underlying construct being tested of each item in the questionnaire on a self-administered four-point Likert scale, with one being non-relevant, two being somewhat relevant, three being quite relevant, and four being highly relevant, leaving out a neutral answer (Polit & Beck, 2006). The experts received this Likert scale by email and completed it at the end of the last phase one meeting before returning it to the researcher on the same day. The completed Lickert scales were used for the calculation of the I-CVI; this was then used to calculate the S-CVI (Polit & Beck, 2006). The Setswana LCQ questionnaire and all relevant documentation were forwarded to the original developer and creator of the LCQ, Professor S. S Birring, for approval and endorsement of the questionnaire.

Stage two included the content analysis of the transcriptions. All three Microsoft Teams meetings were recorded and transcribed using an AI transcription software, Cockatoo. These transcripts were then correlated against the recordings by the researcher, and the necessary amendments were made to ensure the recordings were transcribed verbatim. Thematic content analysis was done on the transcriptions, and the data categories and subcategories that described the participant's perceptions and challenges of the translation process, as well as their expectation of the final version of the questionnaire, were identified. Cruchinho et al. (2024) recommend that the translation process be well documented and that the documentation be available for review to decrease the risk of bias during the translation process. Having the documentation available for review also helps to ensure the credibility of the process followed (Cruchinho et al., 2024).

After the final version of the Setswana LCQ was compiled, it was sent to a Setswana linguist who served in the expert committee to ensure the correct use of grammar and spelling.

3.6 Data Analysis

The demographic data gathered from the participants was analysed with descriptive statistics using IBM SPSS as described in table 3.3. Meetings held with translators were recorded on Microsoft Teams, and recordings were transcribed using Cockatoo AI software. The principal

researcher then correlated the transcriptions with the recordings. The interviews were guided by the use of an interview guide form where notations were made by the researcher of any difficulties encountered during the translation process and of the solutions offered during the meeting. The translation process's credibility was ensured through triangulation: using the verbatim recordings with the notations made on the interview guide form to reach conclusions.

Experts used a four-point Likert scale to determine the I-CVI and the S-CVI. To determine the I-CVI, at least three experts are required to rate the relevance of each item to the underlying construct of what is being tested. The I-CVI is calculated by the number of experts who scored an item 3 or 4, divided by the number of experts. Polit & Beck (2006) recommended that if an expert committee consists of five or fewer members, the I-CVI should be 1.00. The S-CVI refers to the portion of items scored relevant by all of the experts. For example, experts scored each item on the scale, and the portion of items scored as relevant or very relevant (3 and 4) by each expert was added and then divided by the number of experts. This is known as S-CVI/Ave. It is recommended that the S-CVI/Ave should be 0.90 (Polit & Beck 2006).

Thematic content analysis of the transcribed interviews was undertaken. Data from the interviews was divided into categories and subcategories, highlighting translators' perceptions and experiences of the translation process. Item-specific information regarding the questionnaire questions was also gathered (Cobo, Lòpez-Herrera, Herrera-Viedm, et al., 2011).

Table 3.3 Data Analysis Summary

Outcome	**Type of data**	**Data analysis/ Peer review**
Demographic profile of translators	Nominal and continuous	Descriptive and presentation of findings as frequencies, percentages, median (IQR), or mean (SD).
Translation study (Phase 1)	Qualitative data	Thematic content analysis of verbatim transcriptions. Subcategories and category formulation as able regarding perceptions, experiences, item-

		specific problems encountered, solutions offered.
Validity study (Phase 2)	Qualitative dat Ordinal and continuous data	Thematic content analysis of verbatim transcriptions of expert committee's experiences and perceptions. Calculation of I-CVI, S-CVI Submission to original author for review of the preliminary Setswana questionnaire.

3.7 Conclusion of the Methodology

The methodology followed to complete phase one of this translation is a well-known and valid method (Beaton et al., 2000). Similar translations of the LCQ have been made to numerous other languages following this method (Haukeland-Parker et al., 2022; Reychler et al., 2015). However, an additional interview was added in this translation process before the creation of the T-12 version. This was needed due to the wide discrepancies noted between the two forward-translated versions. The researcher had to create a cohesive preliminary version that could be back-translated. Unfortunately, the healthcare worker could not attend the expert committee meeting due to unforeseen work circumstances. This did not allow for a healthcare opinion to be present during the discussions of the expert committee, and the questionnaire had to be amended later.

Phase two of the study determined the content validity of the questionnaire and allowed for the description of the data regarding the participants' perceptions; no difficulties were encountered in this phase of the methodology.

Chapter 4 contains the results of the study.

Chapter 4

4. Results

4.1 Introduction

The aim of this study was to create a preliminary Setswana version of the LCQ This chapter contains the study results, guided by the study objectives, and will describe the two stages and four sections.

- Section one provides details regarding the study participants' demographic information gathered in phase one.
- Section two outlines the findings related to the forward- and back-translation and cultural adaption process gathered in phase one.
- Section three provides a content analysis of the meetings, including the perceptions and experiences of the study participants while participating in the translation process gathered in phase two.
- Section four provides the results related to the item-content validity and the scale-content validity of the newly formulated Setswana version of the LCQ gathered in phase one.

4.2 Section 1: Demographic information

Five participants were involved in the translation process of the LCQ as recommended by established guidelines. The majority of the participants were female (n=4, 80%), and their mean age was 48.60 (SD 12.01).

The participants' home language was divided into 80% (n=4) Setswana and 20% (n=1) English. All participants were proficient in English in both speaking and writing skills, 80% (n=4) of the participants were proficient in English and Setswana with speaking and writing skills, and one of the participants (20%; n=1) was proficient in English, Setswana and Afrikaans with both speaking and writing skills.

Two (40%) participants indicated that they were healthcare workers, and none had encountered the LCQ before the study.

Table 4.1 provides information on the demographic information of study participants.

Table 4.1: Demographic data

Participant	Age *(years)*	Gender	Highest Qualification	Skill
One	35	Female	Diploma	Registered Nurse
Two	63	Female	Honors Degree	Linguist
Three	57	Male	Master's degree	Linguist
Four	38	Female	Master's degree	Linguist
Five	50	Female	PhD	Physiotherapist

4.3 Section 2: Translation and adaption process of the LCQ

The LCQ consists of a general instruction section followed by 19 questions during which patients provide feedback according to Likert scoring (Birring et al., 2003). The results for this section are presented from the instruction and then followed through from question one to question nineteen of the LCQ.

4.2.1 LCQ Instructions

The general instructions were easily translated during the forward and back translation process. The forward translators reported that they encountered no difficulties in this section of the LCQ during the translation process. The two sets of translations received from the forward translators, however, differed significantly. The two forward translators used different Setswana dialects during the process. It was decided during the first meeting that more traditional Setswana wording (T2) would be used.

The second part of the instructions includes the Likert scale scoring that is used for answering the questions. This aspect of the translation process proved more challenging to translate into

Setswana. The Likert scoring as per the LCQ are "*all of the time"*, "*most of the time"*, "*a good bit of the time"*, "*some of the time"*, "*a little bit of the time"*, "*hardly any of the time"* and "*none of the time"*.

Many synonyms were available to describe the Likert scale scoring instructions, and the translators found it challenging to choose the right word. It was also difficult to differentiate between *"a good bit of the time"* and *"some of the time".* The translators noted that it is not a way of speaking that is commonly used in Setswana conversation. The translators noted that in conversation, the tone of a speaker's voice impacts the meaning of the words used. The back translators noted similar struggles with the back translations of the Likert scale scoring instructions, and it was difficult to differentiate between the different Likert scale instructions. The back translators reported that much of the wording sounds different when spoken than when read. It was, however, decided that the wording used in the preliminary forward translation used for the back-translation was the most suited to fit the description of *"a good bit of the time".* No changes were recommended during the second meeting with the back translators. The forward translators suggested that it would be easier to administer this questionnaire in an interview manner to avoid misinterpretations of the phrases.

During the expert committee meeting, the language expert recommended changing the word "Khuetso" to "Tshwaetso" because "Khuetso" was a Sepedi word and not a pure Setswana word. The second part of the instructions, indicating how often participants experienced symptoms, was not changed and accepted as is by the expert committee.

4.2.2 LCQ Question 1: "Have you had chest or stomach pains as a result of your cough?"

This question did not pose any difficulties during the forward translation process. In the back translation process, the back translators noted that Setswana has various dialects, which is evident in this question. The translators made an effort to remain as close to the original form of Setswana as possible. The expert committee did not recommend any changes to the question.

4.2.3 LCQ Question 2: "Have you been bothered by phlegm production when you cough?"

The forward translators did not encounter any challenges during the forward translation of this question. During the back translation process, the back translators noted that the wording could be challenging to understand if you consider the possible educational background within the

target population. A more commonly used word, “Segotlothla,” was suggested by the translators to ask more directly about the participant’s cough. The back translators mentioned that some Setswana words have more than one meaning, the meaning usually depends on the context in which the words are used, and the tone of voice used when spoken. During the expert committee meeting, the language expert recommended changing the word “sehuba” to “leletla” to describe phlegm production better when coughing.

4.2.4 LCQ Question 3: “In the last two weeks, have you been tired because of your cough?”

During the forward translation of this question, the forward translators mentioned that you had to consider the two weeks before, as it was mentioned in the instructions, “Mo dibekeng di le pedi” was added to the question to remind the participant of the fact that they should reflect over their symptoms of the last two weeks. During the back translation meeting, the translators again mentioned that some words can have multiple meanings. “O lapile” which is a Setswana word can cause confusion between “tired” and “hungry”, “kgatete” means tired but the word is influenced by the SeSotho Language. The methodology expert recommended using both words, “o lapile/kgatetse,” to improve the understanding in different areas using different dialects, and to avoid confusion when reading the question.

4.2.5 LCQ Question 4: “Have you felt in control of your cough?”

The forward translators did not encounter any difficulties in the translation process of this question. It was easily backtranslated, and the expert committee agreed that the question did not require any amendments.

4.2.6 LCQ Question 5: “Have you felt embarrassed by your coughing?”

The forward translators did not encounter any challenges during the translation of this question. The back translation described the question well. The expert committee suggested no changes.

4.2.7 LCQ Question 6: “My cough has made me feel anxious.”

During the forward translation process, the translators noted that the word “anxious” is not commonly used in Setswana during conversation. The feeling could be described by a phrase

rather than just one word. During the back translation, the translators interpreted the question as “feeling dizzy” or “feeling stressed out.”

The language expert suggested the use of the word “ketsaetsego”; however, the healthcare expert noted that this word is not commonly used and suggested amending it to “letsogo” as it is more commonly used and could better describe the feeling of being anxious. This question did not translate well, and the forward and back translators noted that it was difficult to express this in Setswana as it is a sentence that Setswana speakers would not commonly use in conversation.

4.2.8 LCQ Question 7: “My cough has interfered with my job or other daily tasks.”

The translators did not encounter any difficulties in the forward and back translation of the question; however, during the expert meeting, the language expert mentioned that the wording was not Setswana and recommended changing “kgorelediteе” to the word “sitisitse” to reflect the correct Setswana wording. The language expert noted the influence of a different dialect and other languages can have on Setswana. The methodology expert recommended adding both words, “sitisitse/kgorelediteе,” in the sentence to help improve the understanding of participants over a wider geographical area due to the difference in dialect over the regions. The healthcare expert agreed that this could prevent a misinterpretation of the question.

4.2.9 LCQ Question 8: “I felt that my cough interfered with the overall enjoyment of my life.”

This question did not raise any difficulties during the forward and back translation process. The expert committee accepted the first translated version.

4.2.10 LCQ Question 9: “Exposure to paint or fumes has made me cough.”

During the forward translation process of this question, the translators did not raise any difficulties. However, during the back translation, the word “lebagana” literally means to face. The language expert recommended that the word “kopana” be used to improve the understanding of the question so that it is more reflective of exposure or coming into contact with fumes and paint and not only a literal exposure to paint.

4.2.11 LCQ Question 10: “Has your cough disturbed your sleep?”

The expert committee accepted the translation without any amendments, and the translators found no difficulty translating the phrase during the forward and back translation process.

4.2.12 LCQ Question 11: “How many times a day have you had coughing bouts?”

During the forward translation of this question, one of the forward translators was unsure what the word “bouts” meant; however, the question translated well during the backward translation process, and the expert committee accepted the translation with only a correction in grammar recommended.

4.2.13 LCQ Question 12: “My cough has made me feel frustrated.”

During the forward translation of this question, the translators found no difficulties. During the back translation, the question differed in meaning; the question was back-translated as being “depressed” or “feeling confused,” not “frustrated.” The language expert attributed this difference to different dialects and words used in an urban and rural setting; the expert also mentioned that people in a rural setting would not likely use this phrase. The language expert recommended using two words, “tsielegile”, to better the understanding in an urban and rural community. The healthcare expert recommended using both the original translated word and the newly recommended word, “tsielegile/ tshwenyegile,” to ensure that the larger population will be able to understand the question.

4.2.14 LCQ Question 13: “My cough has made me feel fed up.”

During the forward translation process of the phrase, the translators mentioned that they had to be extra mindful to use the correct word to describe the feeling of being ‘fed up.’ The back translators noted that the translated term could be received differently in rural and urban settings, even being an offensive term in the rural community, and it could describe an emotion that the person would not want to associate themselves with. The new phrase recommended was “Go gotlhola ga me go mphetsa pelo” to describe the feeling of being tired of the cough, having had enough of the cough, and being impatient with this cough at the point of giving up. People in rural and urban settings should be able to understand this phrase. The healthcare expert agreed to change the sentence to improve understanding.

4.2.15 LCQ Question 14: “Have you suffered from a hoarse voice as a result of your cough?”

The forward translators had no challenges in translating this question into Setswana. During the back translation, the sentence's meaning changed to indicate losing your voice, “sha”, and not suffering from a hoarse voice. The methodology expert noted that the two do not have the same meaning. The language expert recommended a change in the wording of the phrase to describe the feeling of a burned voice, “swa” when the tone of one’s voice sounds different.

4.2.16 LCQ Question 15: “Have you had a lot of energy?”

This question was difficult to forward-translate because of the lack of reference to time. The translators recommended adding a reference to time, indicating that the lack of energy should refer to the last two weeks. During the back-translation, the translators interpreted the question as referring to the level of physical activity and not the level of energy. The use of the word “Matlhagatlhaga” was identified as being misleading as it means “physical activity,” and the translators recommended using the word “Maatla,” which translates to “energy.” All the members of the expert committee accepted this change.

4.2.17 LCQ Question 16: “Have you worried that your cough may indicate a serious illness?”

The forward and back translators did not experience any difficulties with translating this question. The expert committee accepted the first translation without any amendments.

4.2.18 LCQ Question 17: “Have you been concerned that other people think something is wrong with you, because of your cough?”

The question translated well into Setswana, but during the back translation, the methodology expert noted that the translated question referred more to something wrong with your cough than with you. The language expert recommended adding “ka wena” in the sentence to refer to the individual themselves rather than the cough.

4.2.19 LCQ Question 18: “My cough has interrupted conversations or telephone calls.”

The forward translators did not experience any difficulties in translating this question; however, during the back translation, the question only indicated trouble with telephone calls and not with conversations. The expert committee recommended changing the sentence to include two

instances, the telephonic calls and conversations. All the members of the expert committee accepted this amendment.

4.2.20 LCQ Question 19: “I feel that my cough has annoyed my partner, family or friends.”

None of the translators encountered any challenges in translating this question, which they noted was one of the easiest questions to translate. The language expert corrected a spelling error in the first version.

Following the translation process, the first Setswana version of the LCQ was completed and is available for review in Appendix H.

4.4 Section 3: Content analysis

The researcher analyzed the content of the recordings and transcriptions, which was reviewed by the senior academic advisor. Two main categories and three sub-categories were identified. The experts’ general perceptions and experiences of the translation process were also captured.

4.4.1 Category 1 – Cultural alignment:

During the first meeting, participant 2 noted aspects regarding the cultural alignment of the questionnaire: *“…did not evoke cultural constraints or feelings.”* However, there are some phrases used in the questionnaire that would not be used in Setswana, such as being “fed up”. It is an expression that Setswana speakers will not use to describe themselves.

Participant 4 noted in the second meeting that “*Fed up will be inappropriate to ask”.* The word is not used in conversation and that *“Setswana speakers would interpret being fed up as being impolite in rural Setswana”.*

Participant 3 noted that “*There's nothing culturally or not much culturally sensitive about it*” but that “*Some words that people find inappropriate in general conversation”, “I might, you know, become impatient. I might lose my temper or patience, but not really fed up as we normally use it.”* Participant 1 noted that “fed up” is not an emotion people will associate themselves with.

Participant 3 noted one other instance during the expert committee meeting: *"When you use the word 'go ntena' it comes across as insulting."* This was easily amended by using a more appropriate word.

4.4.2 Category 2: Aspects related to linguistics

Three subcategories related to the linguistic challenges of the Setswana language were identified: the dialect, the descriptive characteristics, and the modes of communication.

Sub-Category 2.1 - Dialect:

In the first meeting, participant 2 noted that different dialects are spoken in different parts of the country, and different languages influence Setswana. Therefore, the utility of the questionnaire could depend on where it is administered.

Participant 2 noted that *"it's important for any translation to be standardized because of the different dialects that exist within the language."* And that "*it depends on where it is going to be administered."*

Participant 3 also said in the second meeting, "*I think, you know, there's the urban Setswana, and there's also the rural Setswana, and there's the spoken Setswana".* Different parts of the country use what Participant 3 described as "*deep Setswana words"* that are more commonly used in the rural areas. Participant 3 noted in the third meeting that "*the rough distinction in Setswana is your northern Setswana, which probably starts from Rustenburg to Pretoria, and your more Southern Setswana, which starts from Rustenburg all the way to Mafikeng, Kimberley, Vryburg and Thaba nchu."*

The effect of other languages on Setswana was also noted by Participant 3 in the third meeting, *"in fact the (word) Lapile is more of a SeSotho influence, it's not standard Setswana, but because people have been intermingling in urban environments, they adopt other words as well."* The level of education was also considered during the translation process with participant 3 mentioning that *"I wanted to use easier, well, more accessible language and words. Not sure what the level of literacy of the subjects were going to be."* A solution to this was recommended by participant 5 in the third meeting: "*if it's only one word that is making*

the difference in understanding, then you can put the first word and in brackets like the second word in case if another person can well interpret it differently."

Participant 3 also mentioned when describing the experience of the translation process as the process being *"Challenging"*, pointing out the main thing to be difficult is, "*particularly with respect to Setswana, I often say to people that Setswana has probably the largest footprint of many of the other languages in South Africa. Not in terms of population, but just in terms of geography. If you look at where the Northern Cape is and you look where Pretoria, which is probably the last point of Setswana is. And I'm not even thinking of Thaba Nchu all the way to Bloemfontein, I'm not even including Botswana. So, if you bring that, you have different or many other variations of Setswana, but here in South Africa, if you just look at the South African landscape"*

Sub-Category 2.2- Descriptive nature of the language:

Participant 2 stated in the first meeting that Setswana makes use of phrases to describe certain things, sometimes making it difficult to find just one word to fit into the question. Participant 2 also stated that *"these are not the phrases that I would normally use, like a good bit of the time"* when referring to the translation of the instructions.

Another challenge noted by Participant 2 was that "*There are phrases that can be used as synonyms or they are synonymous phrases. When you say all the time and most of the time, as a translator, you can run the risk of translating them the same way."* Another example of the use of phrases noted from the first meeting by Participant 1 was at question 6; "*Anxious has a lot of phrases you can use to describe the feeling".*

There were a few instances where the placement of a Setswana word could have two different meanings. Participant 3 noted an example of this in the second meeting: "*Now, the word sehuba, somehow, you feel like it is not placed correctly. How the word is placed there, it can mean two things. It could either be chest or coughing."*

Participants 3 and 5 noted in the third meeting that the translation process had the risk of translating the words "too literal" and Participant 3 noted that this was something he had to be aware of when working on the document.

Sub-Category 2.3 – Communication method:

During the first meeting, Participants 1 and 2 said that the Setswana language is received differently when spoken than when read. Participant 1 noted that "*when you speak it, it sounds much easier, but when you write it, then it sounds a bit more difficult",* participant 2 added to this by saying that: *"Tswana it's easier to speak and to differentiate between some times in the timeline. But when you write it, and you have to translate it, it's a bit difficult, I must say*". They both mentioned that the tone in which something is spoken makes a difference in the meaning of a word or a phrase. They recommended that it would be good for this questionnaire to be administered via interview to avoid misunderstanding of the questions.

4.4.3 Expert committee general perception and experiences of the translation process

In general, the health care expert (Participant 1) found the translation process of the LCQ challenging:

"The process was more challenging than expected. You had to think about the written word because it is not the same as when spoken."

This sentiment was reinforced by the language expert (Participant 3):

"It wasn't easy, nor was it difficult, it was challenging to do the translation. One must get into the mind of the questioner and capture the meaning in Setswana as closely as you think the questioner is trying to gather. When you translate, you cannot be too literal and translate word for word. Setswana has the largest footprint in terms of geography. It is not an easy language to translate."

The methodology expert (Participant 5) highlighted that even though the translation was challenging at times, solutions for the challenges were found:

"It went really well. There are those words where there is no literal translation. We have been able to find the most appropriate wording. We have been able to alter the phrases to keep the meaning of the questions as close to the original as possible."

The expert committee's opinion of the questionnaire was as follows:

The health care expert (Participant 1) believed the newly created Setswana LCQ could be of benefit in the community:

"It will be received well by the community. Older and younger speakers will be able to understand and complete the questionnaire."

The language expert (Participant 3) highlighted the content of the questionnaire is appropriate and should be easily understood by patients:

"The questionnaire is very well structured. It seems to hit the right notes and will find the right information. Easily understandable and easy to read. Good usability."

The methodology expert (Participant 5) thought that the questionnaire could be beneficial in providing information on patients' QoL:

"The questionnaire definitely looks at the impact on their function and quality of life, at a personal and emotional level. You will be able to gather that information from the questionnaire."

4.4 Section 4: Content Validity of the Setswana LCQ

This part of the study focused on determining the content validity of the Setswana LCQ. The tool was validated by testing the I-CVI and the S-CVI.

4.3.1 Item content validity

The item validity of the questionnaire was rated on a Lickert scale from "not relevant" to "highly relevant". Table 4.2 outlines the I-CVI of the Setswana LCQ.

Table 4.2 I-CVI

Item	Expert 1	Expert 2	Expert 3	Number in agreement	I-CVI
Instructions	X	X	X	3	1.0
Q1	X	X	X	3	1.0

Q2	X	X	X	3	1.0
Q3	X	X	X	3	1.0
Q4	X	X	X	3	1.0
Q5	X	X	X	3	1.0
Q6	X	X	X	3	1.0
Q7	X	X	X	3	1.0
Q8	X	X	X	3	1.0
Q9	X	X	-	2	0.67
Q10	X	X	X	3	1.0
Q11	X	X	X	3	1.0
Q12	X	X	X	3	1.0
Q13	-	X	X	2	0.67
Q14	X	X	X	3	1.0
Q15	X	X	X	3	1.0
Q16	X	X	X	3	1.0
Q17	X	X	-	2	0.67
Q18	X	X	X	3	1.0
Q19	X	X	X	3	1.0
X = Relevant				Mean I-CVI	0.95

- = Not relevant					

All three experts rated the instructions and questions on a 4-point Lickert scale. Sixteen of the questions were rated as relevant (scoring 3 or 4 on the Lickert scale), scoring 1.0. Questions 9, 13, and 17 were rated as not relevant (scoring 1 or 2 on the Lickert scale) by one expert, making those three questions' I-CVI 0.67. The recommendation for a valid I-CVI score when less than 5 experts are included in the expert panel is 1.0 (Polit & Beck, 2006). Questions 9, 13, and 17 did not achieve a sufficient score and these items may need to be reviewed and revised following patient validation.

4.3.2 Scale content validity

The scale-content validity was ascertained using the S-CVI/Ave method, which serves as the preferred calculation for determining the S-CVI of a questionnaire, as advised by Polit and Beck (2006). This calculation involved summing the portions of items identified as relevant by each expert (0.9; 1.0; 0.9) and dividing this total by the number of experts, which amounted to three. The S-CVI/Ave for the Setswana Language Comprehension Questionnaire (LCQ) is 0.93. The threshold for a valid S-CVI/Ave is established at 0.9, signifying that the scale exhibits excellent validity.

Chapter 5 presents the discussion of the study.

Chapter 5

5. Discussion

The results chapter presents the data in four different sections, and the discussion of the results follows a similar structure. The first section is the demographic data, followed by section two and three which will discuss the cultural and language findings and finish with section four which discusses the content validity of the questionnaire.

5.1 Section 1: Demographic data

The majority of the participants (80%) were female, with a mean age of 48.60 (SD 12.01). The majority (80%) of the participants also noted that their home language is Setswana, with the only exception being Participant 5, the methodology expert. This is different than what is recommended in the Beaton guidelines. Beaton et al. (2006) recommended that 50% of the translator's home language should be the target language and 50% the original language. It proved difficult to find translators whose home language is English and who are proficient in Setswana. This difficulty could be attributed to the large number of official languages in South Africa, the cultural influence on language and the urbanisation of native Setswana speakers (Bennet et al., 2016).

All the participants had post-matric qualifications, which can have an influence on the level of Setswana used in the translation. As Yazbek et al., (2009) mentioned, in some of the communities where Setswana questionnaires are being used, the participants have a lower education level, and they have trouble understanding more academic Setswana words, considering that only 37.6% of all South Africans possess over a matric qualification, this may prove as an obstacle when the questionnaire is being tested (StatsSA, 2023). Yazbek et al., (2009) recommended that questionnaires be specially created for the South African population.

5.2 Sections 2 & 3: Culture and language findings

Section 2 of the results presented the challenges of the translation process. Eight of the 19 questions were translated easily, and no amendments were necessary during the process. The instruction, likert scale descriptions, and the remaining 11 questions provided some challenges

for the translators. Section 3 ties in well with section two of the results, and it will be described concurrently.

The categories identified in Section 3 included Category One, cultural alignment, and Category Two, aspects related to linguistic properties. Category two was then subdivided into three subcategories: sub-category one, dialect; sub-category two, the descriptive nature of the language; and sub-category three, the communication method.

5.2.1 Cultural alignment

In category one, cultural alignment, comments were raised during the discussions of Question 6, and Question 13. The comment noted in question 6 is that "*to feel anxious"* is not a common phrase that would be used to describe the feeling in Setswana. This is a challenge that was noted by Pillay et al., (2023) and Nelson et al., (2020) during their translation of consent forms and PROM for Parkinson's disease into Setswana. Cruchinho et al., (2024) noted that when there is a difference in phrases used between the original and target versions, the questionnaire may have an increased risk for cultural bias. Similarly, in question 13, the participants noted that the word "*fed-up"* is not a common word to use in Setswana and that the use of the phrase might even be considered impolite, and participants who complete the questionnaire would not want to associate themselves with that emotion. The use of the word "*fed-up"* also proved a challenge during the translation process of the Norwegian LCQ (Haukeland-Parker et al., 2022) and the Portuguese LCQ (Felisbino et al., 2014).

5.2.2 Dialect

The second category describes the linguistic aspects of the questionnaire. In Sub-category one, dialect, potential problems were identified in the Instructions, Question 3, Question 7, and Question 12.

In the instructions, the forward translators used the word *"Khuetso"* which was identified by the language expert to be a Sepedi word, the word was changed to *"Tshwaetso"* which is a commonly used Setswana word. In Question 3, the translation of the word "*tired"* raised a concern about misinterpretation; Participant 2 translated the word to *"O Lapile"*. During the back-translation meeting and the expert committee meeting, it was noted that even though "*o Lapile"* is a common Setswana word, because of the influence of SeSotho on the Setswana language, "*O Lapile"* could also mean that you are "*Hungry."* Another word, "*kgatetse*" was

suggested, the word also meaning tired, although not a pure Setswana word, a large geographical population will understand that it makes a reference to being tired. The methodology expert recommended the use of both words in the question, "*O Lapile/kgatetse",* to prevent a misunderstanding and to ensure Setswana speakers from different geographical areas will be able to understand the question. This solution is seen in similar studies to improve the understanding of the translated questions or statements as it allows for a large dialect and population to understand the word or the term used (Pillay et al., 2023). Question 7 presented a similar challenge: the word "*kgorelеditse"* was used in the forward translation; during the expert committee meeting, the language expert pointed out that it is a SeSotho that can be commonly mistaken for a Setswana word. It was decided to make use of the same solution as in Question 3 and use Setswana/SeSotho words, "*sitisitse/kgorelеditse*," to cater to a bigger geographical dialect. Question 12 also presented a challenge with the translation of the word "*Frustrated."* This was, however, attributed to the difference in dialect between the rural and urban Setswana speakers. It was recommended to use two words, *"tsielegile/ tshwenyegile",* to ensure that the question will be understood in both communities. The Norwegian (Haukeland-Parker et al., 2022) translation also found it challenging to translate Questions 7 and 12, as there was no proper word available to use in the translation.

The Setswana language has a large geographical footprint that stretches from Botswana, the Northern Cape, North West, Parts of the Free State, and Gauteng provinces, and even parts of Namibia (Bennett et al., 2016). The geographical footprint has allowed for the Setswana language to be influenced by other African Languages, such as Sesotho and Sepedi, with the urban areas being more influenced and the rural areas speaking a purer form of Setswana (Bennett et al., 2016). Urbanisation was also noted as a challenge during the translation process of Pillay et al. (2023), causing the urban population to have trouble understanding the 'deep' Setswana words used in rural areas.

5.2.3 Descriptive Nature of the Setswana Language

The second subcategory focused on the descriptive nature of the Setswana language as points of concern were raised in the instructions, *"A good bit of the time,"* Question 9, Question 14, and Question 15.

In the instructions, the phrase *"A good bit of the time"* is not a phrase that would be commonly used in Setswana. Cruchinho et al. (2024) stated that when phrases that appear in the original

translation are not known to the target culture or language, it increases the risk of cultural bias toward the original language culture, and using phrases not known to the population tested can be a cause for skewed result as participants will avoid choosing that option since it is unknown to them. This challenge was also seen on two other translation studies were English questionnaires and consent forms were translated to African languages, and the questions had to be modified to improve their understanding other the question while keeping the meaning the same (Nelson et al., 2020; Pillay et al., 2023).

In Question 9, it was noted that the translated version meaning of the expression *"to face"* was translated too literal, and the language expert noted that this is a risk when translating into Setswana. It was also mentioned that participants using the questionnaire could still have a literal interpretation of the word "*Lebegana"* and the word was changed to *"kopana"* which means to "*come in contact with."* The change of the word was done to hopefully prevent the reader from interpreting the sentence too literally, which could affect the scoring of the questionnaire.

In Question 15, the word used in the forward translation was not clear to what was being asked; a separate word, "*Maatla,"* was proposed and accepted to improve the understanding of this question. This section highlighted that Setswana words can have many different meanings and interpretations. Along with the dialect, it depends on where the questionnaire will be administered, which will determine how the question will be received. Attempts were made to use words that represent the original question as closely as possible, but there still remains a risk that the reader of the questionnaire can have a different interpretation of the words used.

5.2.4 Communication method

A point that was mentioned during the translation process a few times is that the Setswana language is not usually written; it is rather spoken because the tone of your voice and the accents in the words can change the meaning of a word or phrase (Bennett et al., 2016). Participant 1 also reported that it was challenging to translate the questionnaire since the language is easier to speak than write. A recommendation was made that it would be easier for this questionnaire to be administered in an interview format. However, this will change the delivery of the questionnaire and is another risk for increased cultural bias (Cruchinho et al., 2024).

Cultural bias can happen when phrases and idioms that are used are not representative of the culture that it is being used in but rather of another culture, like that of the original version of the LCQ (Haddad, Doherty, Purtilo, 2019). Cruchinho et al. (2024) identified three factors that will put a translated questionnaire at high risk for cultural bias: 1) the use of different phrases and concepts that are not known in the target culture, 2) the use of different items unknown to the target culture and, 3) a different method used to administer the questionnaire. A questionnaire is seen to have a high risk for cultural bias when two of the three factors are present, as was in the translation of this questionnaire. This can cause a problem when the questionnaire is being scored, as participants tend to avoid phrases that they are not familiar with or don't want to come over as being impolite (Cruchinho et al., 2024).

The challenges noted in this section are not uncommon when attempting to translate a document from English into Setswana. The use of interviews during the translation process to improve the understanding of the translated version was recommended by Pillay et al. (2023), Cruchinho et al. (2024), and Nelson et al. (2020) to help bridge the linguistic, cultural, and social gaps that exist due to these challenges and to mitigate the risk for cultural bias. The results from this content analysis reflect those identified by Pillay et al. (2023). The three main barriers that they identified were; inappropriate vocabulary use in the form of phrases that are not well received in the target culture, cognitive mismatch leading to questions not being understood by the target population as they were intended to by the original language, and linguistic gaps in the form of words not being able to be directly translated (Pillay et al., 2023). The use of cognitive interviews during the testing phase of the questionnaire can minimise this risk of cultural bias of the questionnaire (Cruchinho et al., 2024).

5.2.4 Experiences and Opinions

The participants reported that the translation process was not easy. It was challenging due to the different dialects, the nature of the language, and the fact that the Setswana language is not usually written but rather used in conversation. The participants noted that it was difficult to capture the meaning of the questions at times and that there are multiple words available to use, and they attempted to keep the language as simple as possible while still being linguistically correct.

It is expected of this questionnaire to be well received and easily understood, but even if this is the case it doesn't indicate that the psychometric properties of the original LCQ will carry

over, as seen in the Norwegian (Haukeland-Parker et al., 2022) translation of the LCQ and in other Setswana translated questionnaires tested on the population (Yazbek et al., 2009) due to the possible influence of cultural bias of the translated version.

5.3 Section 4: Content validity

The content validity of the Setswana LCQ was calculated as recommended by Polit & Beck, (2006). For an item to be seen as valid, the score of the I-CVI must be 1.0 when less than 5 experts are participating in the panel. Questions 9, 13, and 17 did not meet this criterion as they scored 0.67 and will need to be reviewed after the questionnaire is tested on a target population and interviews are held with patients who are diagnosed with chronic cough.

For the scale to have content validity, the recommendation is that the S-SCI/Ave score is used, and the score must be above 0.9 to be deemed valid (Polit & Beck, 2006). The Setswana version of the LCQ scored 0.93. This indicates good scale-content validity even though some of the items' scores did not meet the criteria.

It is recommended that construct validity of the Setswana LCQ questionnaire should be determined after the questionnaire has been tested on a target population (Cruchinho et al., 2024).

Chapter 6

6. Conclusion and recommendations for further research

6.1 Conclusion

The research around effective methods to manage chronic cough conditions is still growing, and having a valid questionnaire available to test the effects of the developing treatments is beneficial to South Africa and surrounding countries. The translations of standardised questionnaires also allow for research and treatment options to reach different participants, ensuring better treatment for a wider population.

The LCQ is a well-known, widely used questionnaire that has been translated into multiple other languages using various methodologies. Most of the translated versions maintained good psychometric properties. However, the translation process of questionnaires into Setswana has been known to face unique challenges that were not noted in other countries outside of South Africa.

The translation and cultural adaption process of the Setswana LCQ presented some unique challenges, and solutions were offered by an expert committee. A Setswana version of the LCQ with scale content validity was created and is ready to be tested in a Setswana population diagnosed with chronic cough.

6.2 Strengths of this study

The study followed the Beaton guidelines for translating and culturally adapting self-reported patient questionnaires. Thematic content analysis was done on the translation process to determine risk for possible cultural bias before the study is tested on the target population.

6.3 Limitations of this study

The Setswana language has a large geographical footprint, and the dialect used in the language differs among different areas. The translation of the questionnaire was done with the goal of keeping the Setswana as uniform as possible, but there is still a risk that the questionnaire will not be applicable to all the different areas of the Setswana community. There was also a risk

for cultural bias noted, and this will only be able to be determined and amended after the questionnaire has been tested on a target population. Because this study stopped with phase one of the Beaton guidelines, more focus could have been placed on the linguistic validation of the preliminary Setswana version in a patient population, as a fair number of amendments needed to be made.

6.4 Clinical recommendations

The Setswana LCQ is not ready for use in a clinical setting for routine clinical practice or inclusion in clinical registries. The psychometric properties of this questionnaire need to be determined after the questionnaire is tested in a Setswana community.

6.5 Recommendations for further studies

The Setswana LCQ is ready to be tested in a Setswana community diagnosed with chronic cough. It is recommended that the questionnaire be tested in a few different parts of South Africa to attempt to create a cohesive version of the questionnaire that will be understood in a wide area, regardless of the dialect used. Patient interviews should be held to determine if the terms and concepts used on the questionnaire are well understood and to determine if it will be possible to decrease the risk of cultural bias in the questionnaire (Cruchinho et al., 2024; Nelson et al., 2020; Pillay et al., 2023).

After testing in a pilot study and making the final amendments to the questionnaire, the questionnaire can be field tested. The results from the questionnaire should be compared to the results of other health-related QoL measures to determine concurrent validity, internal consistency, responsiveness, and test re-test reliability.

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List of Appendices

Appendix A: Leicester Cough Questionnaire

This questionnaire is designed to assess the impact of cough on various aspects of your life. Read each question carefully and answer by CIRCLING the response that best applies to you. Please answer ALL questions, as honestly as you can.

1. In the last 2 weeks, have you had chest or stomach pains as a result of your cough?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

2. In the last 2 weeks, have you been bothered by sputum (phlegm) production when you cough?

1	2	3	4	5	6	7
Every time	Most times	Several times	Some times	Occasionally	Rarely	Never

3. In the last 2 weeks, have you been tired because of your cough?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

4. In the last 2 weeks, have you felt in control of your cough?

1	2	3	4	5	6	7
None of the time	Hardly any of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time

5. How often during the last 2 weeks have you felt embarrassed by your coughing?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

6. In the last 2 weeks, my cough has made me feel anxious

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

7. In the last 2 weeks, my cough has interfered with my job, or other daily tasks

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

8. In the last 2 weeks, I felt that my cough interfered with the overall enjoyment of my life

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

9. In the last 2 weeks, exposure to paints or fumes has made me cough

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

10. In the last 2 weeks, has your cough disturbed your sleep?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

11. In the last 2 weeks, how many times a day have you had coughing bouts?

1	2	3	4	5	6	7
All of the time (continuously)	Most times during the day	Several times during the day	Some times during the day	Occasionally through the day	Rarely	None

12. In the last 2 weeks, my cough has made me feel frustrated

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

13. In the last 2 weeks, my cough has made me feel fed up

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

14. In the last 2 weeks, have you suffered from a hoarse voice as a result of your cough?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

15. In the last 2 weeks, have you had a lot of energy?

1	2	3	4	5	6	7
None of the time	Hardly any of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time

16. In the last 2 weeks, have you worried that your cough may indicate serious illness?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

17. In the last 2 weeks, have you been concerned that other people think something is wrong with you, because of your cough?

1	2	3	4	5	6	7
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

18. In the last 2 weeks, my cough has interrupted conversation or telephone calls

1	2	3	4	5	6	7
Every time	Most times	A good bit of the time	Some of the time	A little of the time	Hardly any of the time	None of the time

19. In the last 2 weeks, I feel that my cough has annoyed my partner, family or friends

1	2	3	4	5	6	7
Every time I cough	Most times when I cough	Several times when I cough	Some times when I cough	Occasionally when I cough	Rarely	Never

Thank you for completing this questionnaire.

Appendix B: Demographic questionnaire

Study participant's code:_____

Please complete and mark applicable box with an X

<table>
<tr><td>Gender</td><td colspan="2">Male</td><td colspan="2">Female</td><td></td></tr>
<tr><td>Age</td><td colspan="5">___years</td></tr>
<tr><td>Home language</td><td colspan="2">Setswana</td><td colspan="2">English</td><td>Other</td></tr>
<tr><td rowspan="2">Language competent (Mark all applicable)</td><td colspan="2">Setswana</td><td colspan="2">English</td><td rowspan="2">Other</td></tr>
<tr><td>Read</td><td>Write</td><td>Read</td><td>Write</td></tr>
<tr><td rowspan="3">If other, Please specify (Read/Write/Both)</td><td colspan="2"></td><td colspan="2"></td><td></td></tr>
<tr><td colspan="2"></td><td colspan="2"></td><td></td></tr>
<tr><td colspan="2"></td><td colspan="2"></td><td></td></tr>
<tr><td rowspan="4">Highest education completed</td><td colspan="2" rowspan="4">High school</td><td colspan="2" rowspan="4">Bachelor's degree</td><td>Hon.</td></tr>
<tr><td>PGDip</td></tr>
<tr><td>Masters</td></tr>
<tr><td>PhD</td></tr>
<tr><td>Specify degree/s where applicable</td><td colspan="5"></td></tr>
<tr><td>Healthcare worker</td><td colspan="2">Yes</td><td colspan="3">No</td></tr>
<tr><td>If yes, state profession</td><td colspan="5"></td></tr>
<tr><td>Have you ever encountered or used the Leicester Cough Questionnaire during clinical practice?</td><td colspan="2">Yes</td><td colspan="3">No</td></tr>
</table>

Appendix C: Interview Guide Form

Date:

Interview conducted:

Post-forward translation □

Post-backward translation □

Final expert group meeting □

1. **General opening question:**

Tell me about your perceptions and experiences when translating the questionnaire.

2. **Prompting questions:**

Now we are going to review each question on the questionnaire to identify specific question item problems encountered and the solutions that you might have to offer as a means of overcoming this problem.

Tell me whether you experienced any problems when translating question …… on the questionnaire.

Elaborate on a solution that you have to offer to overcome this problem related to question ……

Item	**Problems encountered**	**Solutions offered**
Instructions		
1		
2		
3		

4		
5		
6		
7		
8		
9		
10		

11		
12		
13		
14		
15		
16		

17		
18		
19		
General		

Appendix D: I-CVI & S-CVI Likert scale

To determine the item-content validity index and to calculate the scale-content validity index, rate the relevance of each item from 1 to 4. 1 being irrelevant to what is being tested and 4 being very relevant to what is being tested.

Study participant code:_____

Item 1	1	2	3	4
Item 2	1	2	3	4
Item 3	1	2	3	4
Item 4	1	2	3	4
Item 5	1	2	3	4
Item 6	1	2	3	4
Item 7	1	2	3	4
Item 8	1	2	3	4
Item 9	1	2	3	4
Item 10	1	2	3	4
Item 11	1	2	3	4
Item 12	1	2	3	4

Item 13	1	2	3	4
Item 14	1	2	3	4
Item 15	1	2	3	4
Item 16	1	2	3	4
Item 17	1	2	3	4
Item 18	1	2	3	4
Item 19	1	2	3	4

S-CVI:____

Appendix E: Participant Information and Consent form

Participant's full name:_____

Informed consent for Participation in a translation and validity study for the translation of the Leicester Cough Questionnaire

Principle investigator: Mrs. CM Kotze

Research supervisor: Associate Professor Ronel Roos

This Informed Consent Form has two parts:

• Information Sheet (to share information about the study with you)

• Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form.

STUDY INFORMATION DOCUMENT

Study title: Setswana translation of the Leicester Cough Questionnaire.

Greeting

I am Ms CM Kotze, a physiotherapist, completing my MSc Physiotherapy at the University of the Witwatersrand. I am creating a Setswana translation of the Leicester Cough Questionnaire (LCQ) as my research report of my MSc. The study will consist out of two phases. The first phase will be the translation phase of the (LQC) and the second part will be the validation study of the translated Setswana questionnaire. If you have any questions regarding the research process, please feel free to direct them to me at any stage.

I would like to invite you to participate in my study as either a translator or a member of the expert committee.

What is involved in the study. This could include but would not necessarily be limited to such features as:

1. The study consists out of a translation study and a validation study, the translation study will require you to forward or back translate the LCQ and attend two interviews, where the validation study will include being part one interview and completing one questionnaire.
2. The study is expected to last two months.
3. For the translation of the questionnaires each participant will have three weeks, two online Teams interviews of two hours each will be held at end of month one and two respectively.
4. Participants will be expected to complete a demographic questionnaire at the start of the research process, this will be done in an online manner. Interviews will be recorded and transcribed.
5. The interviews will entail the discussion of the translation process, difficulties encountered during the process and give an opportunity to offer solutions. Participants will also discuss the face and content validity of the questionnaire in the second meeting and score the relevance of the questions on a Likert scale.

Risks of being involved in the study: There are no risks expected with the participation in this study.

Benefits of being in the study: There will be no immediate benefits from participating in this study. Remuneration for the translations will be awarded by 1ZAR per word.

Participation is voluntary, deciding to withdraw from the study at any point will have no penalty, and translators will be paid for translation done up to the point of withdrawal.

Reimbursements for "out of pocket" expenses such as data usage during the interviews will be done at R30.00/hour.

Confidentiality: Personal information will be treated in the strictest confidence and will only be available to the Principal Investigator (PI), Mrs. CM Kotze, and her Supervisor, Associate prof. Ronel Roos. The only exceptions - and all of them are rare - would normally be:

1. Personal information may be disclosed if required by law
2. the Human Research Ethics Committees of the University may exceptionally require personal data to respond to a formal complaint, or for a compliance audit

There will be expected from the participants to keep the identity of other participants encountered during the interview confidential, this can however not be guaranteed.

If results are published, this may, exceptionally, lead to cohort, or more rarely, individual identification. All data collected in the course of the study will be securely retained for two (2) years, if a scientific publication arises from the study and six (6) years, if there is no publication. Thereafter it will be destroyed accordingly.

Contact details of researcher:

Mrs. CM Kotze, telephone no. 082 075 1946, or by e-mail at 1088214@students.wits.ac.za,

Associate Professor Ronel Roos, on telephone no. 011 717 3723, or by e-mail at ronel.roos@wits.ac.za

The preliminary translation of the Setswana LCQ will be available to all participants

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on

telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

September 2022

Part II: Certificate of Consent

PARTICIPANT CONSENT SHEET

Setswana translation of the Leicester Cough Questionnaire

1. I have been given a Participant Information Sheet which explains the nature and processes involved in this study, which is attached hereto;

1. I was given time to read it, or had it read to me, in the language I best understand;
2. I was given time to ask any questions I wanted to and found any answers given to me to be reasonable and satisfactory;
3. I believe I fully understand why the study is being conducted and what the intended outcomes will be;
4. I understand that there will be no immediate benefit to me, should I agree to participate.
5. I understand that, even if I initially consent to take part in the study, I may subsequently withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the purposes of the study would immediately be destroyed, unless I give consent for it to be retained
6. I have been given a range of contact details, listed below. If I require further information or become concerned about any aspect of this study I am free to speak to any of these contacts.
7. I consent that I will not share any personal identifying information of anyone else participating in focus groups. Personal identifying information includes names, professions, or any information that may identify them.

Contact details:

Mrs. CM Kotze, telephone no. 082 075 1946, or by e-mail at 1088214@students.wits.ac.za,

Associate Professor Ronel Roos, on telephone no. 011 717 3723, or by e-mail at ronel.roos@wits.ac.za

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za.

Ms. Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone nos.: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

CONSENT FORM FOR AUDIO RECORDING OF STUDY PARTICIPATION

Setswana translation of the Leicester Cough Questionnaire

I hereby consent to audio recording of the interview[1]

.

I understand that:

- The recording will be stored in a secure location (a locked cupboard or password protected computer) with restricted access to the researcher and the research supervisor.
- The recording will be transcribed and any information that could identify me will be removed,
- The recordings will be erased within either (a) two (2) years of the publication of the research findings, or (b) six (6) years, if no publications arise from this research
- Anyone wishing to access this information in the future will first have to obtain the approval of the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg
- Direct quotes from my interview, without any information that could identify me, may be cited in the research report or other write-ups of research.

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

Appendix F: Coding form

Participant name and surname: _____

Contact details – Number: _____

- Email: _____

Participation role: _____

Participant number: _____

Appendix G: Ethics clearance letter

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG	HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research and Innovation)

TO: Ms CM Kotze
School of Therapeutic Sciences
Department of Physiotherapy
Medical School
University

E-mail: corliaf@gmail.com

CC: Supervisor: Professor R Roos
<Ronel.Roos@wits.ac.za>
and <HREC-Medical Research Office@wits.ac.za>

FROM: Mr Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 2023/03/22

REF: R14/49

PROTOCOL NO: **M221102** (This is your ethics application reference number. Please quote it in all enquiries, oral or written, relating to this study.)

PROJECT TITLE: *Setswana translation of the Leicester Cough Questionnaire*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to Government funding of the University.



MSWorks2000/Iain0007/Clearscan.wps

Appendix F: Faculty approval letter

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

06 January 2023
Person No: 1088214
PAG

Mrs CM Kotze
12 Tuscan Villa
22 Rooibok street
Baillie Park
2531
South Africa

Dear Mrs Cornelia Kotze

Master of Science in Physiotherapy: Approval of Title

We have pleasure in advising that your proposal entitled *Setswana translation of the Leicester Cough Questionnaire* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

Appendix H: Setswana LCQ

Khweŝenere ya Leicester ya go Gotlhola (LCQ)

Ditaelo: Dipotso tse di diretswe go lekola tshwaetsego ya go gotlhola ga gago mo dikarolong di le mmalwa tsa botshelo jwa gago. Buisa potso nngwe le nngwe ka kelotlhoko mme o tlhophe karabo e e maleba le maitemogelo a gago mo **DIBEKENG DI LE PEDI** tse di fetileng.

		Ka dinako tsotlhe	Ka dinako tse dintsi	Ka gale	Ka dinako dingwe tse di mmalwa	Ka dinako dingwe nyana	Go le gonnye thata	Le goka
1	A o kile wa itemogela ditlhabi mo maleng le mo mafatlheng ka ntlha ya go gotlhola?	1	2	3	4	5	6	7
2	A o kile wa tshwenngwa ke go kgwa leleta fa o gotlhola?	1	2	3	4	5	6	7
3	Mo dibekeng di le pedi tse di fetileng, a o ne wa ikutlwa o lapile/kgathetse ka ntlha ya go gotlhola?	1	2	3	4	5	6	7
4	A o ne wa kgona go laola go gotlhola ga gago?	1	2	3	4	5	6	7
5	A o kile wa ikutlwa o swabisitswe ke go gotlhola ga gago?	1	2	3	4	5	6	7
6	Go gotlhola ga me go dira go re ke nne le letshogo.	1	2	3	4	5	6	7
7	Go gotlhola ga me go sitisitse/kgorelelditse tiro yame le mabaka a mangwe a me	1	2	3	4	5	6	7
8	Ke ikutlwa e kete go gotlhola go sitisa go itumelela botshelo ka kakaretso.	1	2	3	4	5	6	7
9	Go kopana le pente kgotsa monkgo wa yona go dira gore ke gotlhole.	1	2	3	4	5	6	7

10	A go gotlhola ga gago go go tlhoba boroko?	1	2	3	4	5	6	7
11	O itemogetse tlhaselo ya go gotlhola ga kae ka letsatsi?	1	2	3	4	5	6	7
12	Go gotlhola ga me go dirile gore ke ikutlwe ke tsielegile/ tshwenyegile?	1	2	3	4	5	6	7
13	Go gotlhola ga me go mphetsa pelo.	1	2	3	4	5	6	7
14	A o kile wa sha lentswe ka ntlha ya go gotlhola ga gago?	1	2	3	4	5	6	7
15	Mo dibekeng tse pedi tse di fetileng, a o ntse o ikutlwa o nale maatla?	1	2	3	4	5	6	7
16	O ne wa tshwenngwa ke gore go gotlhola ga gago go ka kaya bolwetsi jo bo tseneletseng?	1	2	3	4	5	6	7
17	A o ne wa tshwenngwa ke gore batho ba akanya gore go na le sengwe se se phoso ka wena ka ntlha ya go gotlhola ga gago?	1	2	3	4	5	6	7
18	Go gotlhola ga me go kgoreleditse dipuisano tsa me le tsa megala?	1	2	3	4	5	6	7
19	Ke ikutlwa ekete go gotlhola ga me go tenne molekane wa me, balelapa le ditsala.	1	2	3	4	5	6	7

Appendix I: TurnitIn similarity index

CM Kotze_1088214_MSc Physiotherapy

ORIGINALITY REPORT

10%	8%	7%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.science.gov Internet Source	1%
2	vtechworks.lib.vt.edu Internet Source	<1%
3	Submitted to Royal Veterinary College Student Paper	<1%
4	Endang, Ariesta Milanti. "eHealth Literacy and COVID-19 Preventive Behaviours of the Migrant Domestic Workers in Hong Kong: A Mixed Methods Study.", The Chinese University of Hong Kong (Hong Kong) Publication	<1%
5	escholarship.umassmed.edu Internet Source	<1%
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