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Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in the Midwifery Programme in Botswana

Masters of Nursing Science-Education

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LIST OF ABBREVIATIONS TO BE USED IN THIS STUDY

AC-OSCA	Acute Care Objective Structured Clinical Assessment
BLSON	Bamalete Lutheran School Of Nursing
CTT	Classical Test Theory
CCS-ET	Clinical Communication Self-Efficacy Toolkit
CVI	Content Validity Index
CVR	Content Validity Ratio
COSMIN	Consensus-based Standards for the Selection of Health Measurement Instruments
C-ITC	Corrected Item-total Correlation
HRU	Health Research Unit
HOD	Head of Department
I H S-G	Institute of Health Scences- Gaborone
I H S-F	Institute of Health Scences- Francistown
IRB	Institutional Review Boards
ICC	Intra-class Correlation Coefficient
ICM	International Confederation of Midwives
I-CVI	Item Content Validity Index
K S D A C O N	Kanye Seventh Day Adventist Colledge Of Nursing
KMO	Kaiser-Meyer-Olkin
MoH	Ministry of Health
NIC	Nursing Interventions Classification
NSE-OSCA	Nursing Skill Examination:Objective Structured Clinical Assessment
OSCE	Objective Structured Clinical Examination
PCCS-ES	Patient Centred Communication Self-Efficacy Scale
PDMS	Postpartum Distress Measure Scale
SCVI/UA	Scale Content Validity Index using Universal Agreement
SCT	Script Concordance Test
SANC	South African Nursing Council
SPSS	Statistical Package for the Social Sciences
SME's	Subject Matter Experts

TPS	Total Population Sampling
USA	United States of America
QPE	Quality Practical Experience

DECLARATION

I, **Itumeleng Rasetshwane**, declare that evaluating the Psychometric Properties of The Clinical Assessment Tool used in the Midwifery Programme in Botswana, is my original work and that it has never been submitted before to any other institution. All the sources that have been cited have been acknowledged by a comprehensive referencing system. I declare that this full dissertation is submitted in partial fulfilment of the requirements of Magister Curationis (full dissertation) in the Department of Nursing Science, Faculty of Health Sciences, at the University of Pretoria.

Name of student: Itumeleng Rasetshwane   Date: 18/12/2020

Signature: I. Rasetshwane **(Signed)**

DEDICATION

This dissertation is dedicated to my family, my sons and daughter, who continuously provided me with support and encouragement throughout the study.

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ABSTRACT

Background: Clinical assesssment tools play an essential role in clinical practice and assessment. Clinical assessment tools have to be evaluated for pyschometric properties to enhance objectivity and fairness when evaluating students. Reliability and validity are considered the main psychometric properties of clinical assessment tools. However, determining the psychometric properties of clinical assessment tools still remains a major problem. Hence, some tools are designed and used without adequate assessment of their reliability and validity. There is no evidence of the psychometric properties, mainly internal consistency, reliability and content validity of the clinical assessment tool used in Midwifery Programme in Botswana.

Aim/Purpose: The aim of the study was to evaluate the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana.

Design: A methodological design was used to evaluate the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana.

Research process: Data was collected from the completed clinical assessment tools which were used to assess midwifery students registered for intrapartum care (MID 421) in semester 2 and intrapartum care practicum (MID 543) in semester 4 in 2019, from the midwifery training schools, n=114. Data collected from these clinical assessment tools was captured and analyzed using the downloaded IBM® Statistical Package for the Social Sciences (SPSS) software, version 25. Inter-item analysis and the corrected item–total correlation were calculated to determine the internal consistency reliability of the clinical assessment tool used in midifery programme. Cronbach's alpha was used to determine the reliability of the entire clinical assessment tool. The Subject Matter Expects in midwifery working in the academic field and those working in the Nursing and Midwifery Council in Botswana, were used to evaluate the content validity regarding the relevance and clarity of the competencies in the clinical assessment tool. The Content Validity Index (CVI), Item Content Validity Index (I-CVI), Content Validity Ratio (CVR), the overall scale (S-CVI/Ave) and Scale Content Validity Index using Universal Agreement (S-CVI-UA) were calculated to determine the content validity of the clinical assessment tool used in the Midwifery Programme in Botswana.

Results: The results of this study with regard to internal consistency reliability, revealed an overall Cronbach's alpha of the clinical assessment tool of 0.837. The results of this study, with regard to content validity, revealed an overall CVR of 0.95 and an overall CVI of 0.97. The I-CVI value of the

competencies for content validity ranged from 0.8 to 1. The S-CVI/Ave and the S-CVI/UA values of the competencies for content validity were 0.97 and 0.75 respectively.

Conclusion: The clinical assessment tool used in the Midwifery Programme in Botswana is reliable and valid. However, there is a need to review some of the competencies to improve its internal consistency reliability and content validity.

Keywords: Clinical Assessment, Clinical Assessment Tool, Midwifery Training Institutions, Midwifery Students, Midwifery Programme, Botswana, Reliability, Validity, Psychometric Properties.

CHAPTER ONE: OVERVIEW OF THE STUDY

1.1 Introduction and background of the study

Clinical assessment is a structured process in which the assessors collect the evidence that will be used to make conclusions about the students' performance and whether they have acquired the prescribed programme requirements, competencies or outcomes (South African Nursing Council [SANC], Act no.33, 2005). Clinical assessment is one of the core elements of Midwifery education (Navabi, Ghaffari, Shamsalinia and Faghani, 2016:102; Vuso and James, 2017:135). The clinical assessment of Midwifery students is conducted using clinical assessment tools (Franklin and Melville, 2015:26; Sweet, Bazargan, McKellar, Gray and Henderson, 2017:60). The clinical assessment tools in midwifery education are used to provide information on students' performance, which in turn assists the educators to evaluate whether the students have acquired the expected Midwifery skills and competencies (Helminen, Coco, Johnson, Turunen and Tossavainen, 2016:312). Therefore, the clinical assessment tools have to provide evidence of pyschometric properties.

Reliability and validity are considered as the main psychometric properties of clinical assessment tools (Souza, Alexandre and Guirardello, 2017:85). Bolarinwa (2015:195) discussed and emphasized on the principles of validity, as well as the different types of validity, being: content, face, construct and criterion. In addition, Zamanzadeh, Ghahramanian, Rassouli, Abbaszadeh, Alavi-Majd and Nikanfa (2015:165) explained that content validity, which is primarily done by experts, provides a preliminary evidence of the construct validity of the tool. Content validity gives the information regarding the representativeness and clarity of the items and can also assist in the improvement of the entire tool (Zamanzadeh *et al.*, 2015:165). Therefore, evaluating other forms of validity, such as construct and criterion of an instrument before determining its content validity, may threaten the quality of the instrument or tool (Almanasreh, Moles and Chen 2019:215).

In addition, Engel and Schutt (2016:125) explained that criterion related validity is not always determined in other clinical tools because it measures how well the findings of the tool come out when compared against another tool. Bolarinwa (2015:122) further argued that it might be difficult to establish such predictors that can be used to compare the results of the different tools, especially as various tools will be developed and used for different purposes. Subsequently, construct validity is not always determined because of the assumed hypothesis for comparison (Engel and Schutt, 2016:125). On the other hand, the evaluation of the face validity of an instrument assists to establish whether the tool measures the characteristics of interest (Wu, Enskär, Pua, Heng and Wang 2016:248; Zamanzadeh *et al.*, 2015:165). However, Engel and Schutt (2016:125) explained that face validity is often much unplanned, lenient and not considered as a vigorous measurement of validity by other researchers. Bolarinwa (2015:122) further emphasized on the principles and methods of testing the reliability of a

tool in social and health sciences research. These were: internal consistency, stability and equivalence. Hence, there is a need to evaluate clincal assessment tools both for validity and reliability.

The evaluation of the reliability and validity of the clinical assessment tool used in the Midwifery Programme is done to: ascertain its effectiveness in the assessment and measurement of the midwifery skills and competencies required for provision of quality and holistic midwifery care, as well as for objective assessment (Franklin and Melville, 2015:27; Helminen *et al.*, 2016:312; Löfmark and Mårtensson, 2017:82). The reliability and validity of the clinical assessment tools in midwifery are not often addressed (Morrow, Biggs, Stelfox, Phillips, Mckellar and McLachlan 2016:86; McLachman, 2016:19). This is because ensuring consistency, reliability and validity for most developed clinical assessment tools is challenging (Ossenberg, Dalton and Henderson, 2015:30; Malakooti, Bahadoran and Ehsanpoor 2017:32; Fisher, Bower, Chenery-Morris, Galloway, Jackson, Way and Fisher, 2019:151). Wu *et al.* (2016:248) reported that many nursing competency assessment tools were developed but only few of them were evaluated for reliability and validity psychometric properties. Bearing evidence to this, there is no documentation of evaluating reliability and validity psychometric properties of the clinical assessment tool that is currently used in the Midwifery Programme in Botswana.

The researcher, thererefore, deemed it necessary to conduct the study in order to evaluate the reliability and content validity of the clinical assessement tool used in the Midwifery Programme in Botswana. The intention of evaluationg these pyschomentric properties was to provide evidence of the internal consistency reliability, as well as the content validity of the clinical assessment tool used to evaluate midwifery students in Botswana.

1.2 Problem statement

The assessment of midwifery students significantly plays an important role in Midwifery education and in clinical practice (Malakooti, Bahadoran and Ehsanpoor 2017:31). The challenges in clinical assessment result from the lack of appropriate, reliable and valid assessment tools to evaluate students' performance in the clinical area (Khosravi, Pazargadi, Ashktorab and Alavi majd 2013:36). In order to address these challenges, Ossenberg, Dalton and Henderson (2015:30), Malakooti *et al.* (2017:32) and Fisher *et al.* (2019:151) elaborated on the need to use reliable and valid clinical assessment tools. However, determining the reliability and validity psychometric properties of clinical assessment tools still remains a major problem in nursing and midwifery (Morrow *et al.*, 2016:85).

Hence, some tools were designed and used without the evaluation of their reliability and validity (Souza, Alexandre and Guirardello, 2017:85).

As a result of the lack of reliable and valid clinical assessment tools, forty-one (41) percent of midwifery students at Babol University of Medical Sciences in Iran, complained and expressed challenges and frustration in the assessment and evaluation processes (Navabi *et al.*, 2016:102). The problem of lack of evaluation of the psychometric properties of the clinical assessment tools is also evident in Botswana. This is because there is no evidence or documentation of the reliability and content validity of the clinical assessment tool used in the midwifery programme. Some of the midwifery students also raised complaints about their rating during clinical assessments, which could be the result of lack of determining the reliabity and validity of the clinical assessment that is used to assess them.

The interpretations that are not validated may contribute to an element of subjectivity and inconsistency in assessment (Morrow *et al.*, 2016:86). Subsequently, the 'human factors' of 'subjectivity' of the competencies in the assessment tool have a negative impact on its reliability (Ossenberg *et al.*, 2015:2; Fisher *et al.*, 2019:157). Therefore, the reliability of the tool could be affected by the different opinions or interpretations of the clinical assessors (Fisher *et al.*, 2019:159). Consequently, lack of reliable and valid clinical assessment tools may lead to some students passing clinical assessment even if they have not demonstrated acquisition of key competencies in these clinical fields (Helminen *et al.*, 2016:316). Therefore, this study was conducted to evaluate internal consistency reliability and content validity psychometric properties of the clinical assessment tool that is used in rthe Midwifery Programme in Botswana.

1.3 Research Questions, Aim and Objectives

1.3.1. Aim

The aim of the study was to evaluate the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana.

1.3.2 Research questions
- What is the level of the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana?
- What is the level of content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana?

1.3.3 Research objectives
The research objectives were to:
- Establish the internal consistency reliability psychometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana.

- Determine the content validity psychometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana.

1.3 Definition of key terms/concepts

1.3.1 Clinical assessment tool
A clinical assessment tool is an instrument that is used in the clinical area to collect evidence that will be used to judge the quality of performance (Australian Skills Quality Authority, 2015:2). In this study, the clinical assessment tool refered to the instrument that is used by midwifery lecturers to evaluate if the midwifery students have acquired the expected midwifery clinical skills and competencies in the midwifery programme in Botswana.

1.3.2 Content validity
Content validity is the degree to which the elements of an instrument are relevant and representative of the targeted construct for a particular assessment purpose (Jusoff, 2019:49). In this study, content validity referred to the degree to which the items or competencies in the clinical assessment tool used in the Midwifery Programme in Botswana adequately represent the construct that needs to be evaluated to assess if midwifery students have acquired the required competencies during training.

1.3.3 Internal consistency reliability
Internal consistency reliability, which is also known as homogeneity, refers to the similarity of the responses between the separate items or domains on the tool in relation to the total variability of the scores (Matheson, 2019:325). In this study, the internal consistency reliability referred to the extent to which the different competencies on the clinical assessment tool used in the midwifery program in Botswana, are related to each other and assess the same unit.

1.3.4 Training institution
A training institution is a school that prepares students for a specific occupation or profession (Merriam-Webster.com Dictionary, 2021). Training institution, in this study, refers to the school or institution that is registered by the Botswana Qualifications Authority, under the Ministry of Health, to provide health related diploma courses. The courses include basic diplomas and post basic diplomas like Midwifery.

1.3.5 Midwifery students
A Midwifery student is an individual who is currently undertaking training in a Midwifery program and is not yet registered as a 'Midwife' (ICM, 2017:26). In this study, Midwifery students were those individuals who were registered and studying for a Diploma in Midwifery at Midwifery training institutions in Botswana. Additionally, Midwifery students referred to individuals who were registered for Intrapartum in semesters 2 and 4 in 2019 and were assessed using the clinical assessment tool that is evaluated in this study.

1.3.6 Programme

A programme refers to a syllabus or curriculum (Collins dictionary, 2020). In this study, a programme referred to the midwifery curriculum, that is, offering or teaching midwifery students to attain a Diploma in Midwifery, at the Midwifery training institutions in Botswana.

1.3.7 Reliability

The reliability of an instrument relates to *'how accurate or precise the tool is'* (Franklin and Melville, 2013:27; Heale and Twycross, 2015:66). Reliability is also referred to as the stability, accuracy, agreement, reproducibility and homogeneity of the instrument or tool (Echevaría-Guanilo, Gonçalves and Romanoski, 2017:4). Stability reliability which is also referred to as '*test,* re-test reliability is the agreement of measuring instruments over time', (Echevaría-Guanilo, Gonçalves and Romanoski, 2017:4). In this study, reliability referred to how accurate and precise the clinical assessement tool that is used in a Midwifery Programme is, in assessing the required Midwifery competencies. The study will only focus on the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana using Cronbach's alpha and inter-item analysis (stability). Therefore, if the tool is reliable different people must reach the same conclusion about concepts or statements in the tool.

1.3.8 Validity

Validity refers to the extent to which the instrument or tool measures the construct it implies to measure (Polit and Beck, 2017:176). In this study, validity referred to the extent of relevance and clarity of the competencies in the clinical assessment tool in the Midwifery Programme in Botswana.

1.3.9 Subject Matter Expert

Subject Matter Expert refers to an individual with specialist skills, knowledge and experience in a specific field in which they have qualified to practice (Hopkins and Unger, 2017). In this study, the SMEs referred to individuals who have with Midwifery qualifcations and are specialists in the area.

1.3.10 Pyschometric Property

Psychometric property is a quantifiable attribute, for example, validity and reliability that relate to the statistical strength or weakness of a test or measurement. In this study psychometric property is used as it is explained from the literature to measure the reliability and validity of the clinical assessment tool used in Midwifery Programme in Botswana (Polit and Beck, 2017:176).

1.4 Assumptions

The researcher evaluated the internal reliability consistency psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana by using the completed clinical assessment tools for students registered for intrapartum care in semester 2 and intrapartum care

practicum in semester 4, in academic year 2019. The researcher's assumption was that the clinical assessment tools that were used to evaluate midwifery students were all completed by the midwifery lecturers during clinical asessments to prevent missing data. In addition to this, the use of the statistician was beneficial to calculate missing data in those tools and there was no clinical assement tool that had missing data. Subject Matter Experts (SME's) in Midwifery Education were involved in this study because the researcher assumed that they are qualified midwives and have the expertise and professional knowledge in the midwifery field that would assist them to evaluate if each competency in the tool is essential, clear or not. To minimise their variations in the interpretation of what is expected of them, clear instructions were provided with the clinical assessment tool.

1.5 Delineation

The study focused on evaluating the internal consistency reliability psychometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana. The internal consistency reliability is important because it determines how the individual items in a tool relate with the rest of the items (Hajjar, 2018:31). The content validity psychometric property was evaluated because it is considered as an important piece of evidence that indicates the overall validity of the assessment tool (Jusoff, 2019:50). Furthermore, content validity can minimise the potential error with the utilization of the assessment tool or instrument (Jusoff, 2019:50). Content validity can also measure the degree to which the components or competencies of an instrument are appropriate and representative of the content (Shrotyia and Dhanda, 2019:4). Content validity includes all aspects of the component or domain to be assessed or measured in midwifery (Shrotyia and Dhanda, 2019:4). According to Almanasreh *et al.* (2019:215), evaluating other forms of validity, such as construct and criterion of an instrument before determining its content validity may threaten the quality of the instrument or tool. Thus, the other forms of validity were not the focus of this study. Furthermore, the other assessment tools used in midwifery such as the holistic clinical assessment tool and the family assessment tool were excluded in this study.

1.6 Significance

This study was conducted in 4 Midwifery training institutions in Botswana. These institutions are located in different parts of the country, namely: Francistown in the northern part, Gaborone which is the central and capital city, Ramotswa and Kanye which are located in the southern part. Evaluation of the psychometric properties may provide evidence of the internal consistency reliability of tools or instruments. The results of the internal consistency reliability will provide the information on Cronbach's alpha values which will be used to estimate if the clinical assessment tool is reliable to assess midwifery students or it requires revision. The results of the content validity which will be based on the

recommendations from SME's regarding the relevance and clarity of the content/ competencies, may provide information that the tool is valid. This may decrease the element of subjectivity among midwifery lecturers, hence standardize clinical assessment. In general, the evaluation of these two pychometric properties of this study may be used to assist midwifery lecturers and/or the programme to review or revise the content of the clinical assessment tool to improve its effectiveness in evaluating the midwifery students' competencies.

1.7 Research design and methods

The study design is the overall plan that the researcher uses to get appropriate answers to the research questions (Polit and Beck, 2017:56). A research design is also used to control factors that can interfere with the validity of the research findings (Burns and Grove, 2018:253). Thus, increasing the accuracy of the results. In this study, a methodological design was used to determine the internal consistency reliability and the content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. The research method was also followed to conduct this study. A research method is referred to as the "architectural backbone of the study" (Polit and Beck, 2017:56). The research methods that were followed to conduct this study, included the population and sampling technique, ethical considerations, data collection, data analysis and rigor. The population to determine the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme were the completed clinical assessment tools for Midwifery students registered for intrapartum care and intrapartum care practicum, in the academic year 2019. Total Sampling Technique (TPS) was used to determine the sample for reliability which resulted in $n= 145$.

Data was collected from clinical assessment tools used in the midwifery programme and analysed using the Statistical Package for the Social Sciences (SPSS) version 25 to determine the internal consistency reliability psychometric property. The population to determine the content validity of the clinical assessment tool used in the Midwifery Programme was ten SME's in Midwifery, eight from the academic field and two from the Nursing and Midwifery Council of Botswana. The research design and methods which include population, sampling methods and ethical considerations, data collection, data analysis, rigor are explained in details in Chapter Three.

1.8 Summary

This chapter focused on the introduction and background of the study, problem statement, the aim, research questions, research objectives and definition of key terms, assumptions, delineation, the significance of the study and research design and methods. The assessment of midwifery students is a vital component in Midwifery Education and in clinical practice. Lack of appropriate, reliable and valid assessment tools to evaluate students' performance in the clinical area, is still one of the challenges in nursing and midwifery. There is a need to provide evidence of the internal consistency reliability and

validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. Therefore, a methodological design was used to evaluate both the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. The clinical assessment tools for midwifery students registered for intrapartum and intrapartum care in the academic year 2019 were used to determine the internal consistency reliability psychometric property of this study. A TPS was used to determine the sample for internal consistency reliability psychometric property of this study. A panel of ten SME's were used to determine the content validity psychometric property of the clinical assessment tool. The next chapter will be Chapter Two, which provides the Literature Review.

1.9 Overview of the chapters

Chapter one   :   Overview of the study

Chapter two   :   Literature review

Chapter three   :   Research design and methods

Chapter four   :   Presentation of research findings

Chapter five   :   Discussion of findings

Chapter six   :   Conclusion, Limitations, Implications and Future recommendations

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter One discussed the overview of the study.The first part of this chapter focused on the literature review of the study. This part briefly described the background of the literarure review and the search categories and criteria for the literature review. The second part of the literature review focused on the theoretical framework and lastly, the summary of the chapter was provided.

2.2 Background of the literarure review

Literature review is an organized and written presentation of the information that is relevant to the topic to be investigated which is selected from various sources (Polit and Beck, 2017:56). A literature review serves as the foundation on which to base the new evidence (Polit and Beck, 2017:56). The literature review of this study focused mainly on the reliability and validity psychometric properties of the clinical assessment tools used in nursing and midwifery. Reliability and validity psychometric properties are considered to be the two principles of measurement for clinical assessment tools or instruments (Bolarinwa, 2015:195). They ensure that the information gathered in clinical assessment tools is acurate with minor ommisions (Nartgün and Şahin, 2015:2849). Reliability refers to the consistency to which a measurement scale or tool measures what it is supposed to (Vitoratou and Pickles, 2017:486). It is concerned about error in measurement, for example, a mistake in measurement that an assessor or rater can make as a result of being distracted during the assessment (Zamanzadeh et al., 2015:105). Therefore, reliability assesses or estimates the extent to which a score or rating is free from random error (Zamanzadeh et al., 2015:105). In addition, reliability assists in estimating the effect of several sources of differences regarding the scores (Mokkink, Prinsen, Patrick, Alonso, Bouter, de Vet and Terwee, 2019:2). Furthermore, reliability determines whether the instrument used for assessment gives the same results or scores each time it is used under the same setting or conditions and with the same type of subjects (Vitoratou and Pickles, 2017:486). According to Bolarinwa (2015:198), reliability can be assessed in three major ways, being: test-retest, alternate form/equivalence and internal consistency reliability.

The internal consistency is a widely used method for testing reliability which indicates the extent to which the different components or items of a tool or instrument measure the same thing (Bolarinwa,

2015: 109; de Souza, Alexandra and Guirardello, 2017:86). It identifies the sampling errors of items of an instrument or tool (Vitoratou and Pickles, 2017:486). Cronbach's alpha coefficient is the most commonly used method to estimate internal consistency reliability because most errors occur due to sampling of the contents of the instrument or tools (Vitoratou and Pickles, 2017:486).

The stability of an instrument or tool relates to the extent to which the same results will be obtained when the tool or instrument is repeatedly used, that is, 'the consistency in measurement repetition' (de Souza, Alexandra and Guirardello, 2017:85). It is measured using the test-retest reliability or intra class correlation coefficient (ICC). The ICC is commonly used because it takes into consideration the measurement error (Souza, Alexandra and Guirardello, 2017:86). However, the test retest requires that the instrument be re- administered after some time using the same individuals, under the same conditions (Bolarinwa, 2015:108).

According to Bolarinwa (2015:195), validity is the degree to which an instrument measures what it claims to measure and has the following forms: content, face, concurrent, construct, divergent, criterion, as well as predictive validity. Almanasreh, Moles and Chen (2019:215) explain that content validity is the measurement of items or constructs in an instrument or a tool that are sampled sufficiently from the specified domain of content. In addition, Yusoff (2019:49) defined content validity as the degree to which the elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose. This simply states that the tool or an instrument should contain the items that significantly represent the content that needs to be assessed or evaluated. Content validity is important in an instrument because it provides information on the 'representativeness' of the content and it also gives information regarding the clarity of the items (Zamanzadeh *et al.*, 2015:166).

Lack of content validity may impact on the other measurement properties (Terwee, Prinsen, Chlarotto, Westerman, Patrick, Alonso, Bouter, de Vet, and Mokkink, 2018:1160). Consequently, in the absence of content validity, it will be difficult to establish the reliability of an instrument or tool (Zamanzadeh *et al.*, 2015:166). Therefore, establishing the content validity is essential as it supports and proves the validity of tests, tools or questionnaires (Nartgün & Şahin, 2015:2853; Yusoff, 2019:50). In addition, Zamanzadeh *et al.* (2015:167) emphasized that, a valid tool has a good representation of the items that represent the knowledge and the skills intended to be measured or assessed. However, lack of valid tools which are able to evaluate the knowledge and skills of nursing and midwifery students in the clinical area, still remains a challenge (Navabi *et al.*, 2016:102).

Content validity ratio (CVR) initially proposed by Lawshe in 1975 is one of the most commonly used methods to quantify content validity (Almanasreh, Moles and Chen, 2019:216). A panel of experts are invited and requested to evaluate the items in a tool or instrument with regard to whether they are; essential, useful but not essential, or not necessary. The formula for calculating CVR is = (ne –

(N/2)/(N/2) (Almanasreh, Moles and Chen, 2019:216). The *ne* refers to the number of experts rating an item as essential, N is the number of experts and it ranges between -1 and 1, -1 representing perfect disagreement and 1, representing perfect agreement (Almanasreh, Moles and Chen, 2019:216).

Content validity Index (CVI) is an indicator of the agreement between raters - the inter-rater agreement (Shouryabi, Ghahrisarabi, Anboohi, Nasiri and Rassouli, 2017:3). It can be calculated for each item in an instrument or tool, (the item level CVI) or I-CVI in conjunction with the CVI for the entire tool/instrument (S-CVI) (Almanasreh, Moles and Chen, 2019:216). CVI guides the instrument/tool developers regarding the final content of the tool or instrument to be able to decide whether an item can be removed or maintained (Almanasreh, Moles and Chen, 2019:216).

Therefore, the need for reliable and valid pychometric properties of the clinical assessments tools has always been emphasized (Navabi *et al.*, 2016:101). However, determning the validity and reliability of clinical assessment tools in nursing and midwifery still remains a challenge (Wu *et al.*, 2016:2). Furthermore, despite the importance and emphasis on objective, reliable and valid tools, there were still some challenges with regard to the validity and reliability pychometric properties of the clinical assessment tools that were evaluated (Khosravi, Pazargadi, Ashktorab and Alavi majd, 2013: 36). This is also evident in the Midwifery Programme in Botswana as there is no evidence of the reliability and validity pychometric properties of the clinical assessment tool that is used to evaluate midwifery students. Hence, the main focus of the literature review was to search for information relating to the internal consistency reliability and the content validity pychometric properties of the clinical assessment tools used in nursing and midwifery, in particular, how these psychometric properties were evaluated.

2.2 Search categories and criteria

The review of literature was done through searching articles and journals related to the evaluation of the reliability and validity of the psychometric properties of the clinical assessment tools in nursing and midwifery on electronic databases. Unfortunately, the hard copies could not be accessed in libraries because of the lock down restrictions due to Covid-19 pandemic. Relevant information was searched on several databases, including PubMed, MEDLINE, Google Scholar, ERIC, Proquest, Research gate and Sabinet. The following search terms were used: evaluation, psychometric properties, clinical assessment tools, midwifery, validity and reliability. The search was limited to full text articles, published in English between 2015 and 2020. The inclusion criteria were: studies done in nursing and/or midwifery, evaluating the internal consistency reliability and content validity psychometric properties of the clinical assessment tools individually or simulteneosly. The other methods of validity, the construct, convergent and criterion, were excluded in the study because content validity provides a preliminary evidence of the construct validity of a tool. It can also provide information regarding the representativeness and clarity of the items and can also assist in the improvement of the entire tool based on the experts' recommendations. The initial search using the search terms yielded 1300

articles. The studies that did not include nursing and midwifery, including the duplicates, were rejected at abtsract level. See figure 1 below.
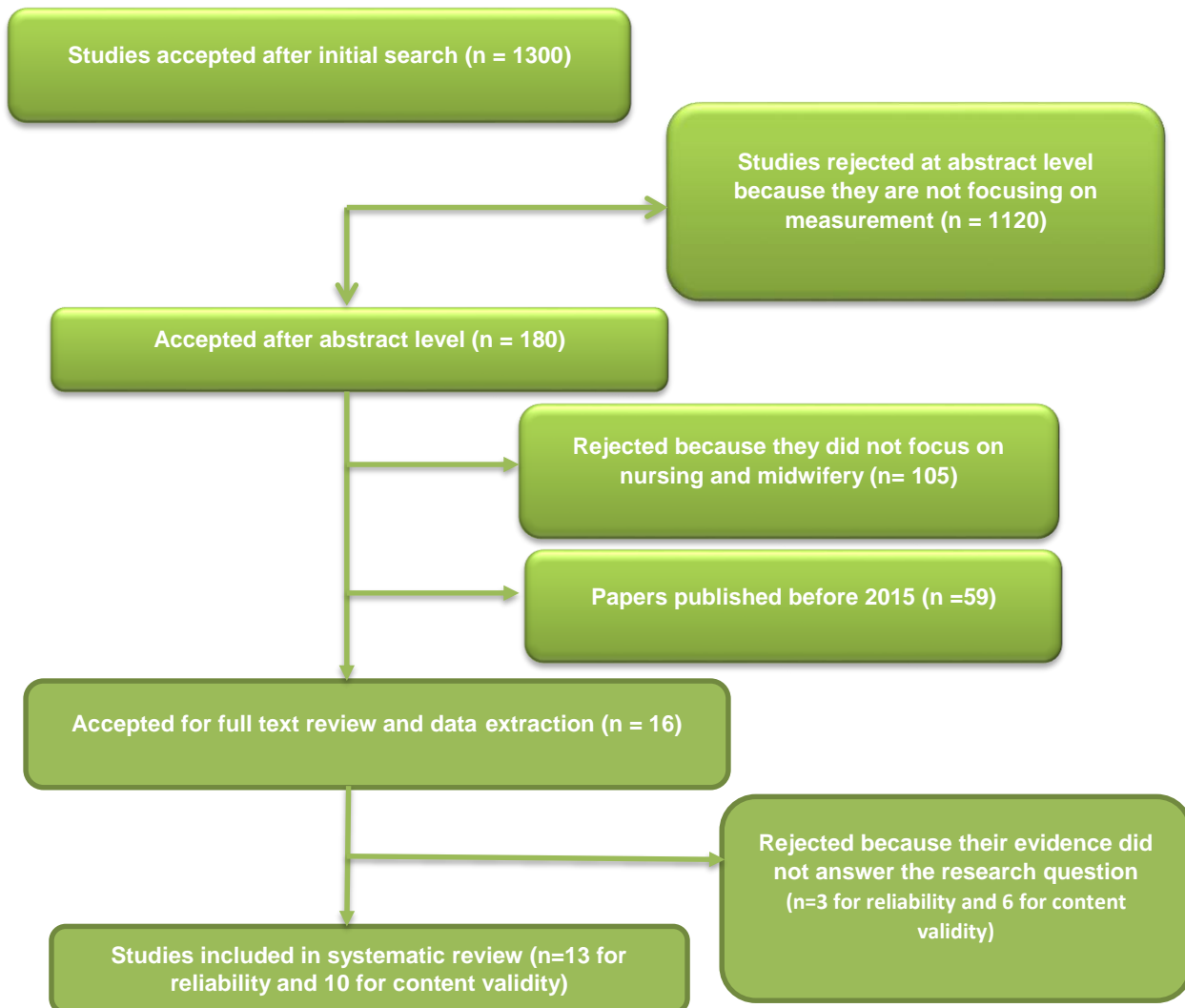
*Figure 1: **Flow chart for selection of articles***

The Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) checklist (Terwee e*t al.*, 2018:1159) was used to evaluate the methodological quality of the identified studies that met the inclusion criteria. This checklist was used because of the following reasons:

- It contains the standards that guide to evaluate the methodological quality on the measurement properties of the measurement instruments and tools.
- It makes it possible to calculate the overall scores of the methodological quality of the measurement properties and
- It aids in making conclusions regarding the quality of instruments (Mokkink *et al.*, 2016:109).

In addition, the COSMIN methodology for evaluating content validity, supplementary material, was also used to assess the quality of the tools regarding their measurement properties (Mokkink *et al.*, 2019:1).

The clinical assessment tools used in the Nursing and Midwifery Programmes identified in the literature, were not evaluating the patient related outcomes. However, the checklist was designed and recommended for the evaluation of the measurement properties of other existing tools in Nursing and Midwifery (Mokkink et al., 2019:3; Charette, McKenna, Maheu-Cadotte and Merisier, 2020:2). The quality of the reliability and content validity psychometric properties of the instruments used in the articles that met the inclusion criteria, were evaluated and discussed below. See summary of studies included in Table 2.1 and Table 2. 2.

2.2.1 Studies that evaluated the reliability pyschometric property of the clinical assessment tools in Nursing and Midwifery

The studies that have been included in the review of the reliability pyschometric property of different clinical assessment tools in nursing and midwifery are those that were conducted between 2015 and 2020 . In support of this, Najjar, Docherty and Miehl (2016:88) conducted a quantitative descriptive study in sample of 33 nursing students, to examine the reliability of the checklist rubric used to evaluate undergraduate nursing students in a simulation testing environment. The study was conducted because there was inconsistencies in clinical teaching and assessment, as well as lack of reliable standard assessment measures in clinical assessment in the United States of America (USA) (Najjar, Docherty and Miehl, 2016:88). These researchers established the inter-rater reliability by measuring the absolute percentage agreement and the intra class correlation coefficient for consistency and absolute agreement was also calculated (Najjar, Docherty and Miehl, 2016:92). The percentage agreement between the raters for the expected behaviors assessed were 85% to 100% for communication skill, 76% to 97% for patient education skill and 76% to 100% for medication administration skill (Najjar, Docherty and Miehl, 2016:94). The intra class correlation coefficient for consistency and absolute agreement indicated good to excellent scores. The intra class correlation coefficient for consistency ranged from 0.63 to 0.94 and 0.77 to 0.97 respectively (Najjar, Docherty and Miehl, 2016:94). This intra class correlation coefficient for consistecy indicated good to excellent scores.

However, the overall reliability of the Acute Care Objective Structured Clinical Assessment (AC- OSCA) was not reported in their sudies. Therefore, the researcher of this study could not document it in this present study. The inter-item results of the AC- OSCA tool were not reported to indicate the internal consistency of the tool (Bolarinwa, 2015:198; Hajjar, 2018:35). In addition, as explained in the COSMIN template, a minimum sample size should at least be 50, for the statistical analysis to be reliable (Terwee *et al.*, 2018: 1159).

Hunt, Ramjan, Daly, Lewis, O'reilly, Willis and Salamonson (2020:1) conducted a cross-sectional survey with 727 third-year undergraduate nursing students in Western Sydney, in Australia. The study was conducted because there was no reliable tool that has been developed to assess the perception of the students, as well as their satisfaction regarding the Nursing Skill Examination: Objective

Structured Clinical Assessment (SINE-OSCA) assessment method (Hunt *et al.*, 2020:1). The study aimed to develop and test the reliability of the SINE-OSCA scale which was ranked from a seven-point Likert scale questionnaire, with one (1) indicating strongly disagree and seven (7) strongly agree (Hunt *et al.*, 2020:1). The students' responses were aggregated and a higher score equated to higher levels of satisfaction. The internal consistency reliability of the scale was calculated using Cronbach's alpha. The item-total correlation for all the 10 items were above 0.30, which indicated good stability. The overall Cronbach's alpha was 0.91, which indicated excellent internal consistency reliability.

Kolivand, Esfandyari and Heydarpour (2020:1) also conducting a descriptive correlation study to determine the reliability of the Objective Structured Clinical Examination (OSCE) used for evaluation of clinical skills for midwifery undergraduate students in Iran. According to Kolivand, Esfandyari and Heydarpour (2020:1), the assessment of midwifery students in the clinical area was still a challenge because of lack of reliable clinical evaluation methods and techniques. Cronbach's alpha and item correlation coefficient of the total scores of the test and the scores of each station were obtained to evaluate the internal consistency reliability of OSCE. Kolivand, Esfandyari and Heydarpour (2020:1) reported that the observer's results for collection of medical history and communication indicated desirable agreement between the raters. The overall Cronbach's alpha was not indicated thus could not evaluate the internal consistenct reliability of OSCE. However, Kolivand Esfandyari and Heydarpour (2020:3) had a small sample of 32 students. This could have affected the quality and interpretability of the results (Terwee *et al.*, 2018:1159).

Navabi *et al.* (2016:102) conducted a methodological study to develop and assess the reliability of the clinical assessment tool used in pharmacology unit for Nursing students in Iran. The study was done to evaluate the internal consistency reliability using Cronbach's alpha coefficient correlation between the different nursing classes (Navabi *et al.*, 2016: 102). A sample of 264 nursing students in second and third semesters participated in the study. The Cronbach's alpha coefficient was 0.96 indicating high internal consistency reliability of the tool (Navabi *et al.*, 2016: 102). The intra class correlation coefficient value was 0.91 indicating good inter-rater reliability.

Subsequently, Shouryabi, Ghahrisarabi, Zohari, Anboohi, Nasiri and Rassou (2017:2) also conducted a methodological study to determine the psychometric properties of the Intensive and Critical care Nursing competence scale, version one (1), among the Iranian nurses in nine hospitals. Cronbach's alpha was used to determine the internal consistency of the tool (Shouryabi *et al.*, 2017:2). The correlation test-retest was done among the 32 nurse practitioners who worked in the Intensive Care Units in hospital at an interval of two weeks (Shouryabi *et al.*, 2017:2). The overall Cronbach's alpha coefficient was 0.98, indicatng excellent internal consistency reliability and the overall ICC was 0.86, indicating good inter rate reliability (Shouryabi *et al.*, 2017:2). However, the sample size for Shouryabi *et al.* (2017:2) was inadequate. This could affect the realiability of the results in the bigger sample.

The inter-item analysis to determine the consistency of the items and rule out the measurement errors was ommitted in this study.

Iglesias-Parra, García-Guerrero, García-Mayor, Shakira Kaknani-Uttumchandani, Álvaro León-Campos and Morales-Asencio (2015:371) conducted a psychometric evaluation of the clinical competencies of the nursing students based on the Nursing Interventions Classification (NIC) scale in Spain. Two pairs of panel of experts comprising of faculty members and clinical tutors evaluated the competencies and interventions identified (Iglesias-Parra *et al.*, 2015:371). One hundred and seven (107) second-year degree nursing students were assessed over a period of two consecutive years based on the 91 interventions and nine competencies (Iglesias-Parra *et al.*, 2015:371). The reliability and responsiveness of the NIC scale were measured. The overall Cronbach's alpha was 0.96, with a variation from 0.73 to 0.96 between the dimensions. This indicated good reliaibity of the NIC scale. The mean item score was 3.98 (SD=0.26), overall item correlation was 0.26 and the total item correlation ranged from 0.19 and 0.66. This indicated good stability of the NIC scale.

Hernández-Padilla, Cortés-Rodríguez, Granero-Molina, Fernández-Sola, Correa-Casado, Fernández-Medina and López-Rodríguez (2019:1), conducted a cross sectional, observational study among 305 nursing students, in Spain. The aim of the study was to design and evaluate the psychometric properties, that is, the reliability of the Clinical Communication Self -Efficacy Toolkit (CC-SET) (Hernández-Padilla *et al.*, 2019:1). This tool encompassed three other tools; patient clinical information exchange and interprofessional communication self-efficacy scale (PIE-SES), patient centred communication self-efficacy scale (PCC-SES) and intrapersonal communication and self -reflection self-efficacy scale (ISR-SES).

The reliability of the tool was determined using: Cronbach's alpha coefficient for each tool, corrected item-total correlation (C-ITC), Pearson's correlation coefficient (test re-test after six weeks to determine the stability of the tool) and the estimated Cronbach's alpha in case an item was removed (Hernández-Padilla *et al.*, 2019:1). Cronbach's alpha for the PCC-SES was 0.93, for the PIE-SES was 0.87 and for ISR-SES was 0.86 (Hernández-Padilla *et al.*, 2019:1). These indicated good reliability among all the three tools. The C- ITC ranged from 0.52 to 0.75 for PCC-SE, from 0.55 to 0.69 for ISR-SES and from 0.57 to 0.75 for PIE-SES, (Hernández-Padilla *et al.*, 2019:1). This indicated good internal stability.

The Script Concordance Test (SCT) was one of the tools used to assess the clinical reasoning skill of midwfery students (Delavari, Amini, Sohrabi, Koohestani, Kheirkhah, Delavari, Rezaee, R,

Mohammadi, Demeester and Charlin, 2018:1). The study aimed to determine the reliability of the SCT test during the assessment of midwifery students in their final lessons and gynecology examinations in Iran. Cronbach's alpha was used to determine the reliability of the tool and it was was 0.74, (Delavari et al., 2018:1). This indicated an acceptable level of reliability. In this study, there was an acceptable item difficulty level for all the scenarios and that ranged between 0.3 and 0.8. This indicated varied interpretations and measurement errors between the assessors. However, the scoring criteria for the scenarios used seemed difficult and complicated and thus could have contributed to varied interpretations and measurement error.

Mobaraki, Ghavami and Gol (2019:1) conducted a methodological study involving 302 midwives in Iran. The study aimed to evaluate the psychometric properties of a cultural competence assessment tool (Mobaraki, Ghavami and Gol, 2019:1). Structured interviews were used to collect data. Cronbach's alpha and the test re-test reliability at an interval of two weeks were used to determine the internal consistency of the items and the total reliability of the tool. Cronbach's alpha was 0.899 (Mobaraki, Ghavami and Gol, 2019:5). This Cronbach's alpha indicated good reliability.

Towell, Coventry, Foster,Twigg, Bharat and Boston (2020:1) conducted a methodological survey to evaluate the test re-test and the internal reliability of the Quality Practical Experience (QPE) instrument that allowed both the nurse supervisors and the students nurses the chance to evaluate the supervision models in Australia. The researchers used convenience sampling method to recruit a total of 488 nurses and 1116 nursing students. The nurses completed two QPE surveys (T1 and T2) at an interval of at least a week. The overall Cronbach's alpha of the nurse QPE was 0.91 and an ICC score of 0.82. This indicated a good reliability. The overall alpha and the intra class correlation coefficient value for the student QPE was 0.91 and 0.71 respectively. This also indicated excellent reliability.

Another psychometric explorative study to determine the psychometric properties of the Persian version of the Postpartum Distress Measure Scale (PDM Scale) was conducted by Shokuhi, Ranjbar, Hakimi, Bahri,and Ghaffarifar (2020:1) in Iran. Cronbach's alpha was also used to calculate the internal consistency of the questionnaire (Shokuhi et al., 2020:4). The overall Cronbach's alpha coefficient for the scale was 0.98 (Shokuhi et al., 2020:4). This indicated excellent reliability. The corrected item-total correlation if item deleted ranged from 0.151 to 0.714 (Shokuhi et al., 2020:4). This indicated acceptable correlation among the items.

Table 2.1: Summary of studies that evaluated the reliability of the assessment tools in Nursing and Midwifery.

Criteria	Najjar, et al., (2016)	Hunt, et al., (2020)	Kolivand et al., 2020)	Navabi et al., (2016)	Shouryabi al., (2017)	Iglesias-Parra et al., (2015)	Hernández-Padilla et al., 2019)	Delavari et al., 2018)	Mobaraki et al., 2019)	Towell et al., 2020)	Shokuhi, et al., 2020)	Carter et al., 2016)	Kassab and Hamadneh 2019)
Clear aim	+	+	+	+	+	+	+	+	+	+	+	+	+
Clear description of construct measured	+	+	+	+	+	+	+	+	+	+	+	+	+
Clear description of development process	+	+	+	+	+	+	+	+	+	+	+	+	+
Clear origin of construct/rationale	+	+	+	?	+	+	+	+	+	+	+	+	+
Clear description of structure, responses, scoring	+	+	+	+	+	+	+	?	+	+	+	+	+
Clear description on quality of tool	+	+	+	+	+	+	?	+	+	+	+	+	+
Clear description of context of use	+	+	+	+	+	+	+	+	+	+	+	+	+
Clear description of target pop, setting	+	+	+	+	+	+	+	+	+	+	+	+	+
Clear description of methods used for selection of sample	+	+	+	+	+	+	+	+	+	+	+	+	+
Description of whether sample is representative of target population	-	-	-	+	+	+	+	+	+	+	+	+	+

Analyses: Use appropriate approach to analyse data	_	+	?	+	+	+	+	+	+	+	+	+	?
Internal consistency Analyses is performed in an adequate sample, >100, ±50	-	+	_	+	+	+	+	+	+	+	+	+	+
Provides clear description of how missing data will be handled	-	-	_	_	_	_	-	-	-	-	+	+	-
Calculates Cronbach's alpha, reliability coefficient	_	+	?	+	+	+	+	+	+	+	+	+	+
Results **Reliability:**	ICC-	a= 0.91 ITC>. 0.30	?	0.96 ICC=> 0.4	α =0.98	α =0.96 IIC=0.26 TIC=.19-.66	α =0.79 C-ITC>0.5	α =0.74	α =0.899	α - 0.87, 0.87, 0.73 MIIC=0 .48,0.4 6, 0.36	α =0.98 CITC	CITC= 0.674. 0.815α	**α = 0.851**

Key: *+ sufficient. – Insufficient, ± inconsistent, ? Indeterminate*

2.2.2 Studies that evaluated the content validity pyschometric property of the clinical assessment tools in Nursing and Midwifery

There were a few studies that were conducted to evaluate the content validity of different clinical assessment tools in nursing and midwifery. In support of this, Carter, Creedy and Sidebotham (2016:141) conducted a descriptive cohort study among the midwives working in maternity settings in Australia. Carter, Creedy and Sidebotham (2016:141) indicated that the study was conducted because there were a number of tools that were developed to assess critical thinking for nursing students, but there was no tool designed specifically for assessing critical thinking for midwifery students (Carter, Creedy and Sidebotham, 2016:143). Therefore, Carter, Creedy and Sidebotham (2016:141) developed a tool that was used to assess the midwifery students' critical thinking in Australia. The experts from midwifery clinical and academic fields as well as the understanding of the development of the critical thinking in midwifery to review the tool, were used to evaluate the content validity of the newly developed tool (Carter, Creedy and Sidebotham, 2016:141). The mapping of the selected items and testing for coherence were done. The construct validity using Kaiser-Meyer-Olkin (KMO) and r-value was 0.930. However, the results for content validity were not reported hence the researcher of this study could not conclude whether the content of the tool was valid or not.

Navabi *et al.* (2016: 102) conducted a methodological study to develop and assess the content, face and construct validity of the tool used in pharmacology unit for Nursing students in Iran. The content validity ratio using the Lawshe model of 1975 was 0.62 and the content validity index was 0.72 (Navabi *et al.*, 2016: 102). These indicated good content validity of the tool.

In addition, Shouryabi *et al.* (2017:2), also reported that several measuring instruments and tools in nursing were rarely tested for validity. The researchers conducted a methodological study to determine the psychometric properties of the Intensive and Critical care nursing competence scale version one (1) among the Iranian nurses in nine hospitals. The content and face validity were determined using members of the faculty of the school of nursing and midwifery as experts and ten nurse practitioners from different intensive care units in the hospitals. The experts evaluated the items on the scale for relevance, simplicity and clarity (Shouryabi *et al.*, 2017:5). The simultaneous evaluation of all the statements of the scale by 10 members of faculty/ experts and 10 nurse practitioners indicated that all the items (except two items) were simple, relevant and clear. In both studies, Navabi *et al.* (2016: 102) and Shouryabi *et al.* (2017:5) explicitly described the content validity of the tools. However, Shouryabi *et al.* (2017:5) could have also included the CVI, I-CVI and S-CVI to determine content validity their tool. This would further provide more information about relevance of each item and whether to maintain, modify or completely delete the items, especially the items that were not simple, relevant and clear.

Kolivand, Esfandyari and Heydarpour (2020:23) also conducted a descriptive correlation study in Iran. According to Kolivand, Esfandyari and Heydarpour (2020:24) there were challenges in clinical assessment as a result of lack of valid clinical evaluation methods and techniques that were usedThe purpose of conducting the study was to determine the validity of OSCE for evaluation of clinical skills for midwifery undergraduate students in Iran (Kolivand, Esfandyari and Heydarpour, 2020:1).

The clinical instructors evaluated and confirmed the face validity of the checklist while the content validity was approved by four midwifery faculty members. The correlation of OSCE scores with the mean score of clinical course for normal pregnancy was 0.319 (p=0.075), for normal delivery was 0.399 (p=0.024) and abnormal delivery and gynecology was 0.419 (p=0.017) respectively (Kolivand, Esfandyari and Heydarpour, 2020:4). There was no significant correlation between OSCE scores and the theoretical course. The Pearson's correlation indicated a significant correlation between the OSCE score (total score) and the scores of five stations with a (p>0.005) indicating good internal consistency (Kolivand, Esfandyari and Heydarpour, 2020:4).

Kolivand, Esfandyari and Heydarpour (2020:1) adopted the use of checklists and to determine the correlation between the total OSCE examination scores and scores of the individual stations. There was a clear description of the content validity that could have contributed to clear criteria for the checklist. However, content validity could have been indicated or reflected by the correlation of the scores between the assessors, the CVR as well as the item content validity index (I-CVI) which were not reported. As explained in the COSMIN template, there was also a small sample which could limit the generalizability of the results (Terwee *et al.*, 2018:1159).

Shokuhi *et al.* (2020:1) carried out another psychometric explorative study to determine the psychometric properties of the Persian version of the Postpartum Distress Measure Scale (PDM Scale) in Iran. The validation of content, face and construct validity of the questionnaire was done by 10 experts among 150 women who received the same care during postpartum period were involved in the study. The results of the study revealed a CVI, of 0.94 and CVR of 0.73, indicating good content validity (Shokuhi *et al.*, 2020:1). However, the item level of I-CVI and the overall CVI were not reported to further provide adequate information regarding the content validity of the scale.

Hernández-Padilla *et al.* (2019:1) conducted a cross sectional, observational study among 365 nursing students at a university in Spain. The aim of the study was to design and evaluate content, construct and criterion validity psychometric properties of the clinical communication self-efficacy toolkit (CC-SET). This tool encompassed three other tools. Those tools were the PIE-SES, PCC-SES and ISR-SES. A panel of 17 experts in health care communication who came from 13 different institutions

independently evaluated the three sub-scales for item relevance and clarity of wording using a four-point Likert scale (Hernández-Padilla *et al.*, 2019:3). The I-CVI ranged from 0.88 to 1 and the tool's S-CVI was 0.97, for PCC-SES was 0.98 and for PIE-SES was 0.95 (Hernández-Padilla *et al.*, 2019:3). These results indicated good content validity.

Najjar, Docherty and Miehl (2016:88) reported that there were challenges in clinical assessment such as inconsistencies in clinical teaching, assessment and lack of valid and reliable standardized assessment measures in the USA. The aim of the descriptive study was to examine the psychometric properties of a rubric to evaluate undergraduate nursing students in a simulation testing environment (Najjar, Docherty and Miehl, 2016:88). In this study, 33 nursing students participated and were assessed using checklists by two trained faculty members. Content validation for the rubric and the implementation plan was done by seven faculty members from different campuses who were experts in teaching acute care. The experts were asked to evaluate whether the contents of the scenarios and the skills being assessed for were relevant (Najjar, Docherty and Miehl, 2016:88). They were also asked to evaluate whether the rubric appropriately assessed students' performance and competency with regard to the specified constructs: communication, safety and performance of a skill. The mean (M) and standard deviations (SD) were calculated to determine the content validity. Experts panelists reached a consensus that the scenarios (M=3.43, SD=0.53), the constructs (M=3.57, SD=0.53) and the skill being tested (M=3.71,SD=0.49) were valid and aligning well with the outcomes (Najjar, Docherty and Miehl, 2016:88).

Charette, McKenna, Maheu-Cadotte, Marie-France and Merisier (2020:1) also conducted a psychometric review to analyze, evaluate and synthesize the measurement properties of scales used to assess new graduate nurses' clinical competence in clinical setting. This study was a two-phased systematic review. The researchers used the COSMIN methodological framework to assess each scale. The results of the review indicated that the quality of content validity of the scales of the studies reviewed were inadequate or doubtful (Charette *et al.*, 2020:1).

Moskoei, Mohtashami, Ghalenoeei, Nasiri and Zaghari (2017:4155), conducted a methodological study in 2015, in Tehran, Iran, to develop and evaluate the validity of the clinical competency evaluation rating scale in mental health. The main items were developed after literature review and the validity and reliability of the tool were identified. The CVR and CVI were calculated. The CVI was 0.97 and CVR was 0.88 (Moskoei *et al.*, 2017:4155). The results indicated acceptable content validity of the scale. Table 2.2 below shows a summary of the studies that evaluated the validity of the assessment tools in nursing and midwifery.

Table 2.2: Summary of studies evaluating the validity of assessment tools in nursing and midwifery

Criteria	Najjar, et al. (2016)	Kolivand et al. 2020)	Navabi , et al. (2016)	Shourya bi al. (2017)	Moskoei et al. (2015)	Hernández -Padilla et al. (2019)	Delavari et al. (2018)	Mobaraki et al., (2019)	Shokuhi et al. (2020)	Carter et al. (2016)
Clear aim	+	+	+	+	+	+	+	+	+	+
Clear description of construct measured	+	+	+	+	+	+	+	+	+	+
Clear description of development process	+	+	+	+	+	+	+	+	+	+
Clear origin of construct/rationale	+	+	+	+	+	+	+	+	+	+
Clear description of structure, responses, scoring	+	+	+	+	+	+	+	+	+	+
Clear description on quality of tool	+	+	+	+	+	+	+	+	+	+
Clear description of context of use	+	+	+	+	+	+	+	+	+	+
Clear description of target pop, setting	+	+	+	+	+	+	+	+	+	+
Clear description of methods used for selection of sample	+	+	+	+	+	+	+	+	+	+

Description of whether sample is representative of target population	_	-	+	+	+	+	+	+	+	+
Content relevance Are all included items relevant?	+	+	+	+	+	+	?	+	+	+
Are items relevant to target population?	+	+	+	+	+	+	+	+	+	+
Are items relevant for context of use	+	+	+	+	+	+	+	+	+	+
Are the response options appropriate?	+	+	+	+	+	+	?	+	+	+
Are all the key concepts included?	+	+	+	+	+	+	+	+	+	+
Analyses Use appropriate approach to analyze data	_	_ no content	+	_	+ CVR, CVI	+	_ ? content	+	+	+
Results validity	CVI, 0.712 and CVR, 0.94,	Only construct	CVI= 0.72	Construct only	CVR=0.88, CVI-0.97	I-CVI=.88-1 CVI/Ave .97,0.98, 0.95	-			

Key: *+ sufficient. – Insufficient, ± inconsistent, ? Indeterminate*

2.3 Theory and the model

The second part of the literature was the review of the theory that was adopted to determine the internal consistency reliability of the pychometric property in the study. The Classical Test Theory (CTT) was used in this study. The CTT, also referred to as the true score model, is a statistical approach that is used to evaluate the quality of measurement tools (Kean and Reilly, 2014:2). The goal of CTT is to improve the reliability and validity of tests and assessments (Eleje, Onah and Abanobi, 2018:59). According to this theory, reliability relates to the degree of inconsistency that is attributable to true differences and error (Matheson, 2019:4). This is based on the fact that, the CTT is the foundation of reliability and uses the (Cα) whereby "α" is defined as the per-comparison error rate and "C" as the number of comparisons in statistics to measure the internal reliability (Lane, 2018:241; Trakman, 2017:3). The CTT also aims to investigate the relationship between the items and the total score of the tool (Palmgren, Brodin, Nilsson,Watson and Stenfors, 2018:2). Furthermore, CTT focuses on the whole tool and assumes that all the items in the tool assess the expected construct, determines the relationships or correlation between the items and assumes that all the components of a tool should be related (Trakman, 2017:3). The researcher chose to follow CTT as the foundation model because it guided in the use of the statistical approach such as Cronbach's alpha to determine the level of the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana.

The other second part of this review also consisted of the model that was also adapted to guide the study with regard to establishing the content validity of the clinical assessment tool used in the Midwifery Programme in Botswana. The model was initially proposed by Lawshe in 1975 and it was used to establish and quantify content validity (Ayre and Scally, 2014:2). In this study, Lawshe's model of 1975 was adapted to evaluate the content validity of the clinical assessment tool used in the Midwifery Programme in Botswana. Lawshe's model of 1975 was chosen because it has been widely used to determine the content validity of instruments in many fields including health care (Ayre and Scally, 2014:2). It proposes that a panel of SME's should be used to determine content validity. This method measures the level of agreement among the SME's regarding how essential an item in an instrument or test is (Baghestani, Ahmadi, Tanha and Meshkat, 2017:3). Lawshe's model of 1975 was chosen because it can also be readily seen whether the level of agreement amongst the experts is greater than 50%, which gives some assurance of content validity (Ayre and Scally, 2014:3).

The method further proposes that; each of the SME's will grade or categorize each item measured on the instrument / tool based on whether the item is essential / relevant or not. The CVR determined whether each item on the instrument adequately measures the domain that it is supposed to (Anuar

and Sadek, 2018:70). According to Anuar and Sadek (2018:70), Lawshe's model of 1975 is used to calucate the CVR as follows:

$$CVR = \frac{n - \frac{N}{2}}{\frac{N}{2}}$$

In this formula, *n* is regarded as the number of experts who rate an item as essential/relevant and N is regarded as the total number of experts (Shrotryia and Dhanda, 2019:6). The researcher chose to use Lawshe's model of 1975 to determine the content validatity pyschometric property of the clinical assement tool used in the Midwifery Programme. The SME's were used to provide their opinion on the relevance and clarity of the competencies of the clinical assessment tool that is used in the Midwfery Programme in Botswana. The researcher also chose to follow Lawshe's model of 1975 because it allowed the rsearcher to determine the level ofagreement among SME's when determing both the clarity and the relevance of the constructs/competencies evaluated in the clinical assessment tool that is used in the Midwifery Programme in Botswana.

2.4 Summary

The literature review documented studies that have evaluated the reliability and validity psychometric properties of the clinical assessment tools used in Nursing and Midwifery. Almost all the studies used Cronbach's alpha to determine the internal consistency reliability psychometric property of the clinical assessment tools used in Nursing and Midwifery. However, internal consistency reliability using inter-item analysis, corrected item-total correlation and Cronbach's alpha if an item was removed, were minimally reported in most of the studies. In addition, most of the studies also evaluated construct validity psychometric property with little emphasis on content validity of the clinical assessment tools used in Nursing and Midwifery. Few of the studies also reported or evaluated the item level validity which also further evaluates the content validity.

Another observation is that, the literature used both internationally and regionally, was that the evaluation of psychometric properties of tools in the past five years were done in nursing. However, only few studies have evaluated the psychometric properties, the reliability and validity of the clinical assseement tools in Midwifery. Furthermore, there is no study that evaluated the psychometric properties of the clinical assessment tool in Midwifery in Botswana. Hence, the researcher deemed it necessary to conduct this study, to evaluate the reliability and validity psychometric properties of the clinical assessment tool that was adopted and used to evaluate students in the Midwifery Programme, since 2011. The next chapter, which is Chapter Three, will be describing the study design and methods.

CHAPTER THREE: RESEARCH DESIGN AND METHODS

3.1 Introduction
The previous chapter focused on the review of literature. This chapter discusses the research design, research process and methods, sampling and sampling techniques, methods of data collection and data analysis.

3.2 Study design
A methodological design was used to conduct this study. A methodological design is a process that is followed to evaluate the reliability and validity of instruments or tools to measure the constructs used as variables in research (Sileyew, 2019:112). This design was appropriate for this study because the process enabled the researcher to determine both the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana simultaneously.

3.3 Research methods
The researcher discussed the research processes that were followed to determine the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the midwifery programme separately, starting with the reliability. Then followed by the description of the research process used to determine content validity.

3.3.1 Research methods for reliability

The research processes that were followed to evaluate the internal consistency reliability psychometric property of the clinical assessment used in the midwifery programme were: the study setting, study population, sampling method, sampling size, data collection, data analysis, pilot study and rigor.

3.3.1.1 Study setting
This study was conducted in four (4) midwifery training institutions in Botswana. These institutions are located in different parts of the country, namely: Francistown in the northern part, Gaborone which is the central and capital city, Ramotswa and Kanye which are located in the southern part. The Midwifery curriculum in Botswana has 4 semesters and runs over a period of 24 months. Each semester comprises of 20 weeks and has both theoretical and clinical components, except in semester 4, which is clinical practice and integration of clinical skills only. There is an operational task force consisting of the HOD's and senior lecturers from the 4 Midwifery training institutions. The task force oversees the implementation of the midwifery curriculum and have agreed on the implementation logistics including common theoretical assessments. The Midwifery students are placed and rotate in different Midwifery

related clinical areas. They are allocated lecturers who supervise, teach and assess them during these clinical rotations. All the students are assessed on a continuous basis and graded in each clinical area before they rotate to another clinical area. The clinical assessment tool that is used to assess the Midwifery students' skills and competencies during the clinical period. Table 3.1 below indicates the number of students and number of Midwifery lecturers in different Midwifery training institutions in Botswana.

Table 3.1: Midwifery student enrolment and lecturers in Midwifery training institutions in Botswana in 2019

Midwifery Institution In Botswana	Number of students (2019)	Number of lecturers including HOD's
Institute of Health Scinces- Gaborone	42	12
Bamalete School of Nursing	39	7
Instute of Health Sciences- Francistown	34	6
Kanye Seventh Day Adventist Colledge of Nursing	30	6
TOTAL	145	32

3.3.1.2 Population

The population to determine the internal consistency reliability were the clinical assessment tools. These were the clinical assessment tools for the midwifery students who were assessed for Intrapartum care in semester 2 and intrapartum care practicum in semester 4 in 2019, from all the Midwifery training institutions in Botswana. The two semesters were selected mainly for sampling purposes. However, the population was dependent on the number of students that were assessed in each midwifery training institution as shown in Table 3.2 below.

Table 3.2: Study Population

Institution/school	Number of students	Total number of tools
BLSON	39	39
I.H.S.G	42	42
I.H.S.F	35	35
K.S.D.A.C.O.N	30	30

Total	145	145

3.3.1.3 Sampling method

Sampling is the process of selecting a portion of the population that is used to represent the entire population (Kellar and Kelvin, 2013:13; Polit and Beck, 2018:162). The TPS was used to determine internal consistency reliability psychometric property of the clinical assessment used in the Midwifery Programme. The TPS is a purposive sampling technique, in which the researcher studies the total population of interest (Etikan, Abubakar and Alkassim, 2016:2; Stephanie, 2018:1). Therefore, all the clinical assessment tools for the midwifery students who were registered for intrapartum care, in semester 2 and intrapartum care practicum, in semester 4 in 2019 academic year, in the 4 Midwifery training institutions, were used for data collection, n=145 as reflected in Table 3.1 above.

3.3.1.4 Sample size

The sample size for the study was all the 145 clinical assessment tools for the students in semester 2 and 4, who were assessed by midwifery lecturers, from the 4 Midwifery training institutions. Only 114 tools were available for data collection. This was so because some of the clinical assessment tools from I.H.S.F could not be accessed as a result of lockdown and restricted movement between the zones due to the Covid-19 pandemic.

3.3.1.5 Data collection

The researcher wrote letters to the respective institutions requesting permission to use the clinical assessment tools which were used to assess midwifery students in semester 2 and 4. Thereafter, administrators gave the researcher the tools for 2019. The researcher sorted the clinical assessment tools for students who were registered and assessed for intrapartum care and intra partum care practicum in 2019 academic year at each midwifery training institutions. The clinical assessment tool used in the Midwifery Programme has 12 competencies, which are: adequate relevant history, preparation for procedure, manual dexterity, prioritizes and takes appropriate action, interpretation of findings, provides relevant education, time management, relates theory to practice, critical thinking, conducts self in a professional, caring empathetic approach and reporting. These competencies are graded using a Likert scale from 0 to 5, with 0 being the lowest grade and 5 being the highest grade when assessing midwifery students in the clinical area.

The researcher captured the independent items or competencies from the clinical assessment tools in a word sheet which was sent to the statistician to enter into excel to determine the level of internal consistency reliability. The data collection process lasted for five weeks from 1 September 2020 to 9 October 2020. The data collection did not involve human participants, the researcher made an appointment with the HOD's in each midwifery institution to collect the clinical assessment tools that were used to evaluate Midwifery students in Botswana. The researcher and the HOD's observed

Covid-19 regulations such as sanitizing their hands, wearing masks and kept physical distancing when the researcher was collecting the clinical assessment tools for the 2019 academic year.

3.3.1.6 Data analysis

Data was analysed using the downloaded IBM® SPSS, version 25. The descriptive analysis using Cronbach's alpha was computed to determine the internal consistency reliability or homogeneity of the clinical assessment tool used in the Midwifery Programme (Polit and Beck, 2017:250). The researcher used Cronbach's internal consistency values in Table 3.3 below, to explain whether the Internal consistency value of the tool is reliable or not.

Inter- item reliability, the corrected item -total correlation were also calculated to determine the extent of stability between the competencies of the clinical assessment tool. A higher Cronbach's alpha would indicate more reliability (Hajjar, 2018:33). An inter-item correlation value between 0.10 and 0.29 indicated a weak correlation, a value between 0.30 to 0.49 indicated a medium correlation and a value between 0.50 and 1 indicated a strong correlation (Hajjar, 2018:33).

Table 3.3: Cronbach's internal consistency values

Cronbach's alpha	Internal consistency
α ≥ 0.9	Excellent
0.9 > α ≥0.8	Good
0.8 > α ≥0.7	Acceptable
0.7 > α ≥0.6	Questionable
0.6 > α ≥0.5	Poor
0.5 > α	Unacceptable

3.3.1.7 Pilot study

A pilot study is a small research study to demonstrate the effectiveness and reliability of the measuring instrument (Polit and Beck, 2018:246). In this study, the researcher did not conduct a pilot study to test the feasibility of the study. The purpose of not conducting pilot is that, this study aimed to evaluate the psychometric property of the clinical assessment tool used in the Midwifery Programme. Whenever the researcher evaluate the psychometric properties is focusing on reliability and validity of the tool. However, bias was prevented because the researcher used TPS although only 114 clinical assessment tools were available for data collection. The other tools were not accessible because of the Covid-19

restrictions in movement between districts /zones, therefore, the researcher could not travel to collect the tools from the midwifery training institution in the northern district/zone.

3.3.1.8 Rigor

Rigor is defined as the methodological commitment to experimental procedure, to the need of controlling all parameters that can affect the results of the tests that should be conducted (Polit and Beck, 2018:156). The researcher followed all the methodological processes to internal consistency reliability of the psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The researcher also followed all the methodological processes to control all parameters that could affect the results of testing the reliability of this study. For example, the researcher collected data from all the available clinical assessment tools, as advised by the statistician to avoid selection bias.

3.3.2 Research method for content validity

The research methods for determining the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme was different from the one that was used to determine the internal consistency reliability of the tool. For content validity, the researcher followed the six steps of the content validation process. The content validation process included preparing content validation form/tool, selecting the review panel of experts, conducting content validation, reviewing domains and items, providing score on each item and calculating CVR and CVI (Yusoff, 2019:51). In line with the University of Pretoria proposal guidelines, preparing content validation form and conducting content validation are discussed under data collection, while selection of the review panel of experts is discussed under population and sampling technique. The calculation of CVR and CVI are discussed under data analysis. The study setting to determine the internal consistency reliability and validity psychometric properties of the clinical assessment used in Midwifery Programme is the same. Therefore, the information of the setting is not repeated when discussing the evaluation of content validity of this study.

3.3.2.1 Population

The SME's from the University of Botswana, Midwifery training institutions and those working in the Nursing and Midwifery Council of Botswana were used to evaluate the content validity of the clinical assessment tool used in the Midwifery Programme in Botswana.

3.3.2.2 Sampling technique and inclusion criteria

Purposive sampling technique was used to select the SME's to determine the content validity psychometric property, that is, the relevance and clarity of the competencies in the clinical assessment tool used in the Midwifery Programme in Botswana. Although there is no consensus on the number of experts to be used for instrument review, often up to 10 experts are used (Almanasreh, Moles and

Chen 2019:216). Almanasreh, Moles and Chen (2019:216) further stated that a high number of experts may decrease the probability of agreement by chance. On the other hand, Shrotryia and Dhanda (2019:4) warned that an increase in the number of experts decreases the chance of agreement. The SME's identified were recruited based on their specific training, expertise and professional experience in Midwifery (Yusoff, 2019:51; Shrotryia and Dhanda, 2019:3). The SME's were selected from different academic environments. Four (4) Midwifery lecturers who showed interest were from the University of Botswana, 4 from the different Midwifery training institutions in Botswana and the 2 midwives were from the Nursing and Midwifery Council of Botswana. Therefore, ten (10) midwifery experts were purposively recruited for this study.

3.3.2.3 Data collection
Online data collection tool was used to collect data from the 10 SME's. The online data collection was advantageous in this Covid-19 pandemic. The researcher began with calling the SME's in midwifery to inform them about the study and request for their participation. The researcher explained to them the aim, objectives, expectations and the ethical and legal considerations. Following a telephonic conversation, those who willingly agreed to participate provided their e-mail addresses and an e-mail was sent to them individually. Attached to the e-mail were: the participant information letter (see Annexure 10.5), the consent form (see Annexure 10.9), the confidentiality agreement form (see Annexure 10.5) and the data collection tools for relevance and clarity (see Annexures 10.6 and 10.7 respectively).

The SME's were requested to evaluate the relevance of each competency assessed by indicating if it is; 1[not relevant, 2[somewhat relevant, 3[quite relevant] and 4[highly relevant] in the checklist (Bolarinwa, 2015:197; Zamanzadeh *et al.*, 2015:168) (see Annexure 10.6). The SME's were also requested to evaluate the wording of the competencies included in the clinical assessment tool if they clearly indicate what it measures or not on a three-point rating scale with; 1[not clear], 2[item needs revision] and 3[very clear] (see annexure 10.7). The wording was evaluated for clarity in each competency that is used to evaluate midwifery students. All the recruited SME's responses and their responses were sent to the statistician for analysis using an Excel sheet. Data collection for reliability and validity were done concurrently. The only difference was on the method of data collection that was used to collect data for reliability and for validity.

3.3.2.4 Data analysis
Captured data to determine internal consistency reliability and content validity psychometric properties of the clinical assessment used in the Midwifery Programme in Botswana was sent to the statistician for analysis using SPSS and an Excel sheet. For relevance, the items with a score of 3 and 4 in Annexure 10.6, were combined to make one score (1), representing relevance while items that scored 1 and two 2 were also combined to produce one score (0), representing irrelevant. The SME's judgments were quantified by calculating the CVR according to Lawshe's model of 1975. The Lawshe's

model of 1975 is summarized in Table 3.6. The formula for calculating CVR was; CVR=(ne-N/2)/(N/2) in which *ne* represented the number of experts who rated the competency as relevant and N being the total number of experts (Mobaraki-Asl, Ghavami and Gol, 2019:3).

A high score of CVR resulted if all the experts agreed that an item was essential and a positive CVR is between 0 and 0.99 (Anuar and Sadek, 2018:200). A negative CVR results when fewer than half of the experts scored an item as essential (Anuar and Sadek, 2018:200). CVR was regarded as zero (0) if none of the experts scored an item as essential (Anuar and Sadek, 2018:200). However, Ayre and Scally (2014:2); Shrotryia and Dhanda (2019:6) warned that caution has to be exercised when determining CVR for the items to guard against the level of agreement that may result by chance thus, giving wrong values.

Table 3.4. Lawshe's model of 1975 CVR values

Number of Experts	Minimum Value
6	.99
8	.78
10	.62
15	.49
20	.42
25	.37
30	.33

The CVI for both relevance and clarity were calculated to determine the overall content validity of the clinical assessment tool used in the Midwifery Programme in Botswana. The I-CVI of the competencies in the clinical assessment tool were calculated to evaluate the content validity, that is, the relevance and clarity of the clinical assessment tool. The I-CVI values that ranged between zero (0) and one (1), if using six or more experts indicated that the competencies were relevant and clear (Shrotryia and Dhanda, 2015:4). The I-CVI values between 0.70 and 0.79 will indicate that the competencies are clear and relevant (Heale and Twycross, 2015:66; Zamanzadeh *et al.*, 2015: 169). The I-CVI values below 0.70 will indicate that the competency is not clear and relevant, therefore it requires the revision (Heale and Twycross, 2015:66; Zamanzadeh *et al.*, 2015: 169).

The scale level CVI (S-CVI) using the universal agreement (UA) among the SME's [S-CVI/UA], was calculated to determine the overall content validity of the clinical assessment tool used in the Midwifery Programme. The calculation to determine S-CVI using UA is based on the number of SME's ratings of each competency (Shrotryia and Dhanda, 2015:4). This was done by adding all the competencies of the tool that were graded three (3) which represent quite relevant and four (4) which represents highly relevant. In addition, Dobbins *et al.* (2018:4) stated that the calculations of S-CVI for rating the clinical assessment three (3) or four (4) for clarity should be divided by the total number of SME's.

The S-CVI/UA value of 0.8 and higher than 0.90 indicate that the content validity is excellent (Bolarinwa, 2015:197). Kappa statistic coefficient, which is a consensus agreement that adjusts for agreement by chance, was also calculated (Zamanzadeh *et al.*, 2015:169). Kappa statistics coefficient values between 0.60 and 0.74 with the significance value of 0.05, are regarded as good and excellent (Zamanzadeh *et al.*, 2015:169). The Kappa statistics coefficient between 0.40 and 0.59, with the significance value of 0.05, is regarded as fair (Zamanzadeh *et al.*, 2015:169).

3.3.2.5 Rigor
Quality control measures are required in the study to protect the internal validity of the entire study. The internal validity is required to strengthen the quality of evidence yielded from the study (Polit and Beck, 2018:154). The internal validity of the entire study was done through giving SME's clear instructions in the data collection sheet to prevent varied interpretations. Additionally, SME's working in different academic institutions were invited to participate in the study to prevent biasness of the participants. This was done regardless of the fact that according to the methodology maximum of 10 SME's are required to determine content validity of the tool (Almanasreh, Moles and Chen 2019:216). The first 10 SME's from different academic environment were, therefore, used to evaluate the content validity of the psychometric property of the clinical assessment that is used to evaluate students in the Midwifery Programme.

3.4 Ethical considerations
The research proposal was submitted to the University of Pretoria ethics committee for ethical approval, ethics number 282/2020, see Annexure 10.8. Following the ethical approval from University of Pretoria, the proposal was also submitted to the Health Research Unit (HRU), Ministry of Health (MoH) in Botswana to request permission to conduct the study, see Annexure 10.10. In addition, permission was also sought from the Institutional Review Boards (IRB's) of the midwifery training institutions, see Annexure 10.11. Letters were written to the heads of departments in midwifery training schools to request for permission to access clinical assessment tools records that were used by Midwifery lecturers during the clinical assessments for midwifery students in semesters II and IV in the

2019 academic year, see Annexure 10.4. An informed consent was sought from the SME's before they were given the questionnaires, see annexure 10.9. The research also upheld the following principles:

Respect for human dignity: The researcher explained the purpose of the study to the SME's and informed them that their participation in the study is solely voluntary, there were no incentives such as money or rewards directly entitled to them. In addition, if they wished to participate, they will do so out of their own will and were requested to give written consent to give permission.

The researcher also ensured privacy and respected human dignity by not disclosing the names of the SME's and names of the student Midwives appearing in the clinical assessment tools that were used for data collection in this study. The clinical assessment tools that were used for data collection in this study were kept safely in a locked cupboard during the process of data collection and the entry of data was done in SPSS, downloaded in a computer with a locked password, to ensure confidentiality.

Beneficence: This principle emphasizes on doing good and doing no harm (Burns *et al.*, 2011:105). The information such as the names of the SME's and the Midwifery students appearing on the clinical assessment tools were not disclosed to people not directly involved in the study. The tools were used solely for the evaluation of internal consistency reliability and content validity psychometric properties of the clinical assessment tool used to assess students in the Midwifery Programme. The researcher emphasized that information provided will be used solely for the purpose of the research and for the benefit of the midwifery program in general.

Justice*:* The principle of justice emphasizes on the respondents' right to be treated fairly with regard to benefits and the risks of the study and the right to privacy (Polit and Beck, 2017:139). In this study, all the clinical tools for the students who were in 2020 academic year were not eligible for this study, thus avoiding biasness. All the available tools for the students registered for 2019 academic year in intrapartum care were included in the study. Although, only a maximum of 10 SME's are needed to determine content validity of the study, all the SME's working in different academic institutions were invited to participate in the study to prevent biasness when selecting the participants.

3.5 Summary

This chapter focused on the research design and the methods. A methodological design was used to determine the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Boswana. Only one hundred and fourteen (114) clinical assessment tools for midwifery students registered for 2019 academic year, from the Midwifery training istitutions, were available. The clinical assessment tools were used to collect data to determine the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. Ten (10) SME's were used to evaluate the content validity of the clinical assessment tool

used in the Midwifery Programme in Botswana. Rigorous methods were followed to ensure reliability and validity throughout the entire study and to avoid bias. The next chapter, Chapter four (4), will focus on presentation of research findings of this study.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 Introduction

The previous chapter discussed the research design and methods. This chapter provides the presentation of findings. The findings of the study were drawn from the objectives of the study which were to determine the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana.

4.2 Demographic data for establishing the reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana

The demographic data of this section only focused on the findings that established the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The data was collected from 114 clinical assessment tools that were completed by Midwifery lectures during the clinical assessments for midwifery students who were registered for 2019 academic year in all midwifery training institutions in Botswana. The clinical assessment tool used to assess midwifery students in midwifery institutions in Botswana has 12 competencies rated in a five-point Likert scale, starting with 0, indicating poor performance and 5 indicating excellent performance. The midwifery students are assessed by different midwifery lecturers, using this clinical assessment tool as they rotate in different clinical areas throughout their two-year training period.

4.3 Actual findings for internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana

The first objective of this study was to establish the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. Therefore, the presentation and analysis of the results in this section will only focus in establishing the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. Data was analysed through calculating Cronbach's alpha and the inter item analysis was done to establish the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The data was collected from 114 clinical assessment tools that were used to assess midwifery students during intrapartum in semesters 2 and 4 in 2019 academic year.

Cronbach's alpha was calculated to estimate the overall internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. The overall Cronbach's alpha was estimated from the data that was collected from 114 clinical assessment tools that were used to assess Midwifery students in intrapartum in 2019. The overall Cronbach's alpha was 0.837. This indicated that

the overall internal consistency reliability psychometric property of the clinical assessment used in the Midwifery Programme is good.

The second part of the analysis used to determine the internal consistency reliability psychometric property of the clinical assessment tool was using the inter item analysis. The inter -item analysis was done by calculating the corrected item total correlation and Cronbach's alpha if item deleted, to determine the extent of stability between the competencies of the clinical assessment tool used in Midwifery Programme in Botswana. In this study, an inter- item correlation value between 0.10 and 0.29 indicated a weak correlation. An inter-item correlation value between 0.30 and 0.49 in the results of this study will indicate a medium correlation and an inter item correlation value between 0.50 and 1 in this study will indicate a strong correlation, thus good internal consistency reliability.

In the relevant history and significance competence the results of this study revealed that if this competence was deleted, the scale mean of the clinical assessment tool would be 39.6 and the scale variance would be 8.619 and the corrected item-total correlation would be .880. The overall Cronbach's alpha if adequate relevant history and significance was deleted would be .790. This indicates a significant reduction in the overall internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana would be from .837 to .790. Therefore, this implies that this item should be maintained in the clinical assessment tool that is used in the Midwifery Programme in Botswana because it has indicated strong correlation coefficient.

The results of this study also revealed that, if the competency preparation for the procedure was removed from the clinical assessment tool used in the Midwifery Programme in Botswana, the scale mean would be 39.57, scale variance would be 9.286 and the item -total correlation would be .643. This item/competency would significantly drop the Cronbach's alpha would be from .837 to .812. Hence, this indicates that the competency should be maintained in the clinical assessment tool used in the Midwifery Programme in Botswana because it has indicated strong correlation coefficient.

The results of the study further indicated that for the competency manual dexterity, the scale mean if item deleted, would be 39.71, the scale variance if item deleted would be 9.905 and the corrected item-total correlation would be .496. The Cronbach's alpha if item deleted would significantly decrease from .837 to .825. This indicated that the item /competency should be maintained in the clinical assessment tool used in the Midwifery Programme in Botswana because it has indicated strong correlation coefficient.

If the competency prioritizes and takes appropriate action with emerging needs was deleted, the scale mean of the clinical assessment tool would be 39.43, the scale variance would be 8.619 and the corrected item total correlation would be .880. The overall Cronbach's alpha, if item deleted, would be .790. This indicated a significant reduction in the overall internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana from .837 to .790. Therefore, this implies that the competency should be maintained in the clinical assessment tool that is used in the Midwifery Programme in Botswana because it has indicated strong correlation coefficient

The results of this study indicated that if knowledge of drugs competency was removed from the clinical assessment tool that is used in the Midwifery Programme in Botswana, the scale variance would be 11. 571, the corrected item-total correlation for the competence would be -.043 respectively. The Cronbach's alpha if knowledge of drugs was deleted, would significantly increase from .837 to .865. This indicated that this competency has poor correlation and is not measuring the same thing as the other competencies. Therefore, it should be removed from the clinical assessment tool that is used in the Midwifery Programme in Botswana.

The results of this study indicated that for adequate relevant history and significance competency, if the item was deleted, the scale mean of the clinical assessment tool would be 39.6, the scale variance would be 8.619 and the corrected item-total correlation would be .880. The overall Cronbach's alpha, if adequate, relevant history and significance was deleted, would be .790. Therefore, this indicated a significant reduction in the overall internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana from .837 to .790. Therefore, this implies that the item should be maintained in the clinical assessment tool that is used in the Midwifery Programme in Botswana because it has indicated strong correlation.

The results indicated that for the competency provides relevant education and counselling, the scale mean of the clinical assessment tool would be 39.29 and the scale variance would be 9.238 and the corrected item-total correlation would be .404. The overall Cronbach's alpha, if adequate relevant history and significance was deleted, would be .845. Therefore, this indicated a significant increase in the overall internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana from .837 to .845. Thus, this implies that the item should be maintained in the clinical assessment tool that is used in the Midwifery Programme in Botswana because it has indicated strong correlation. See Table 4.1

Table 4.1: Total item analysis for stability of internal reliability consistency psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana

Competencies of Clinical assessment tool	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Adequate relevant history and significance	39.57	8.619	.880	.790
2. Preparation for procedure:-client, equipment, environment	39.57	9.286	.643	.812
3. Manual dexterity	39.71	9.905	.496	.825
4. Prioritizes and takes appropriate action with emerging needs	39.43	8.619	.880	.790
5. Knowledge of drugs used	39.71	11.571	-.043	.865
6. Interpretation of findings	39.57	8.619	.880	.790
7. Provides relevant education and counselling (IEC)	39.29	9.238	.404	.845
8. Time management	39.00	11.667	.000	.844
9. Relates theory to practice	39.71	9.905	.496	.825
10. Critical thinking in client's care	39.43	8.619	.880	.790
11. Conducts self in a professional, caring empathetic approach	39.00	11.667	.000	.844
12. Reporting and recording	39.00	11.667	.000	.844

4.4 Actual findings to determine the content validity psychometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana

The second objective of this study was to determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The data was collected from SME's and their demographic information is described in this section. This section also presented findings of the content validity.

4.4.1 Demographic information of SME's

A total of 10 SME's participated in the study. The SME's were recruited from the academic field and the Nursing and Midwifery Council of Botswana. Four (40%) of the experts were midwifery lecturers from the University of Botswana, two (20%) were Midwives from the Botswana Nursing and Midwifery Council and four (40%) were midwifery lecturers and administrators coming from the different nursing

and midwifery training institutions in Botswana. Only ten percent (n=1) of the experts was a male and 90 percent (n=9) were females. The mean age distribution for the SME'S was 52.4 years, while the mean years of experience were 24.5 years. The SME's demographic information is shown in Table 4.2.

Table 4.2: SME'S Demographic information

SME'	Gender	Age (yrs.)	Facility/Institution	Designation	Years of experience	Highest qualification
1	M	54	University of Botswana	Lecturer	9	Masters of Nursing Sciences, PHD Lit. and Philosophy
2	F	50	University of Botswana	Lecturer- Midwifery	16	Masters in Midwifery
3	F	52	Bamalete of School of Nursing	Principal- Midwife	29	Masters in Midwifery
4	F	56	Institute of Health Sciences-Gaborone	Head of Department-Midwifery	31	PHD in Counselling
5	F	50	Nursing & Midwifery Council-Botswana	Registrar/Midwife	34	Masters in Midwifery
6	F	56	Molepolole Institute of Health Sciences	Deputy Principal/Midwife	35	Masters in Midwifery
7	F	52	University of Botswana	Lecturer	29	Masters in Nursing
8	F	51	University of Botswana	Lecturer	20	Masters in Midwifery
9	F	52	Bamalete of School of Nursing	Head of Department-Midwifery	12	Masters in Midwifery
10	F	51	Nursing & Midwifery Council-Botswana	Deputy Registrar-Midwife	30	Masters in Nursing-Women's Health

4.2.2 Content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana

The SME's were requested to evaluate both the relevance and clarity of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana. The CVR was calculated to determine the relevance of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana. As indicated in Table 4.3, the results of this study indicated that the overall CVR was 0.95. According to Lawshe's model of 1975, the CVR in this study illustrated good content validity. All the competencies except manual dexterity and reporting and recording achieved the highest scores, that

is, a CVR of 1. The competency manual dexterity had a CVR value of 0.6 and reporting and recording had a CVR of 0.8. These CVR values also indicated good content validity.

Table 4.3: Overall CVR for relevance of the competencies of the clinical assessment tool used in the Midwifery Programme, in Botswana.

Competencies of Clinical assessment tool used in the Midwifery Programme	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	CVR
1.Adequate relevant history	1	1	1	1	1	1	1	1	1	1	1
2. Preparation for procedure	1	1	1	1	1	1	1	1	1	1	1
3. Manual dexterity	-	1	1	-	1	1	1	1	1	1	0.6
4.Prioritizes and takes appropriate action	1	1	1	1	1	1	1	1	1	1	1
5.Knowledge of drugs	1	1	1	1	1	1	1	1	1	1	1
6.Inteprtation of findings	1	1	1	1	1	1	1	1	1	1	1
7.Provides relevant education and counselling	1	1	1	1	1	1	1	1	1	1	1
8.Time management	1	1	1	1	1	1	1	1	1	1	1
9. Relates theory to practice	1	11	1	1	1	1	1	1	1	1	1
10.Critical thinking in client's care	1	1	1	1	1	1	1	1	1	1	1
11.Conducts self in a professional caring empathetic approach	1	1	1	1	1	1	1	1	1	1	1
12. Reporting and recording	-	1	1	1	1	1	1	1	1	1	0.8

CVR (Critical for a panel of size (N=10) is 1									Overall CVR	0.95

The overall CVI was calculated to further determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The CVI calculations were based on the SME's ratings regarding the relevance and clarity of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana. The results of the study indicated that the overall CVI of the clinical assessment tool used in the Midwifery Programme in Botswana, was 0.97. See Table 4.5. This demonstrated that the tool has an excellent content validity.

For relevance, the results of the study revealed that the I-CVI values for all the competencies of the clinical assessment tool ranged from 0.8 to 1, which indicated excellent content validity. All the competencies except manual dexterity, knowledge of drugs, and reporting and recording indicated an I-CVI value of 1. The I-CVI value of 1 indicated that the competencies of the clinical assessment tool used in the Midwifery Programme, in Botswana were relevant. The clinical competencies; manual dexterity, knowledge of the drugs and reporting and recording had I-CVI values of 0.8, 0.9 and 0. 9 respectively. The I-CVI values also indicated that the competencies are relevant, hence good content validity of the clinical assessment tool. See Table 4.4

For clarity, the results of this study revealed that the I-CVI values for the competencies of the clinical assessment tool ranged from 0.3 to 0.9. The competencies; preparation for procedure, prioritizes and takes appropriate action when need arises, interpretations of findings, provides relevant education and counselling, relates theory to practice and critical thinking had I-CVI values ranging from 0.8 to 0.9. The values indicated that the competencies were clear, hence good to excellent content validity of the clinical assessment tool. However, the other competencies; adequate relevant history, knowledge of drugs used, conducts self in a professional, caring empathetic approach and recording and reporting had I-CVI values of 0.7. This also indicated that the competencies were clear. The competency, manual dexterity had an I-CVI value of 0.3, indicating that the competence is not clear, hence, may require some revision. See Table 4.4.

Table 4.4 Comparison of relevance and clarity by SME's

Competencies of Clinical assessment tools	Relevance		Clarity	
	I-CVI	Experts agreeing score	I-CVI	Experts Agreeing score
1.Adequate relevant history with significance	1	10/10	0.7	7/10
2.Preparetion for procedure: Client-Equipment-Environment	1	10/10	0.9	9/10
3. Manual dexterity	0.8	8/10	0.3	3/10
4. Prioritizes and takes appropriate action with emerging needs	1	10/10	0.8	8/10
5. Knowledge of drugs used	0.9	9/10	0.7	7/10
6. Interpretation of findings	1	10/10	0.8	8/10
7. Provides relevant education and counselling (IEC)	1	10/10	0.9	9/10
8.Time management	1	10/10	0.8	8/10
9. Relates theory to practice	1	10/10	0.9	9/10
10. Critical thinking in client's care	1	10/10	0.8	8/10
11. Conducts self in a professional, caring empathetic approach	1	10/10	0.7	7/10
12. Reporting and recording	0.9	9/10	0.7	7/10

The average of the I-CVI scores for all the competencies on the scale (S-CVI/Ave) and the scale level CVI based on the universal agreement (S-CVI/UA) were also calculated to further determine the relevance and clarity content validity psychometric properties of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana. The results of this study showed that the S-CVI/Ave and the S-CVI/UA scores were 0.97 and 0.75 respectively. This further indicated good CVI of the entire clinical assessment tool used in the Midwifery Programme in Botswana. See Table 4.5

The calculation of Kappa statistic coefficient is a consensus agreement that adjusts for the experts' agreement by chance to determine S-CVI/UA. The calculation of Kappa is based on the number of SME's ratings of each competency. As reflected in Table 4.3, the results of this study demonstrate

Kappa values for each item that ranged from 0.757 to 1 indicating excellent consensus among the SME's. The universal agreement for competencies; manual dexterity, knowledge of drugs and reporting and recording were 0, with Kappa values of 0.757, 0.899 and 0.899 respectively. The Kappa value for manual dexterity, 0.757, indicates that the item may require some revision.

Table 4.5: I-CVI, *CVI/Average, SCVI/UA and* **Kappa** *according to SME's ratings of the relevance of the competencies of the clinical assessment used in the Midwifery Programme in Botswana.*

Competencies of Clinical assessment tool	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert agreement	I-CVI	UA
1.Adequate relevant history	1	1	1	1	1	1	1	1	1	1	10		
2. Preparation for procedure	1	1	1	1	1	1	1	1	1	1	10		
3. Manual dexterity	0	1	1	0	1	1	1	1	1	1	8		
4.Prioritizes and takes appropriate action	1	1	1	1	1	1	1	1	1	1	10		
5.Knowledge of drugs	0	1	1	1	1	1	1	1	1	1	9		
6.Inteprtation of findings	1	1	1	1	1	1	1	1	1	1	10		
7.Provides relevant education and counselling	1	1	1	1	1	1	1	1	1	1	10		
8.Time management	1	1	1	1	1	1	1	1	1	1	10		
9. Relates theory to practice	1	11	1	1	1	1	1	1	1	1	10		
10.Critical thinking in client's care	1	1	1	1	1	1	1	1	1	1	10		
11.Conducts self in a professional caring empathetic approach	1	1	1	1	1	1	1	1	1	1	10		
12. Reporting and recording	0	1	1	1	1	1	1	1	1	1	9		
											S-CVI/Average	0.97	

Proportion	0.75	1	1	0.92	1	1	1	1	1	1	SCVI-UA		0.75
Average proposition of competencies of clinical assessment tool used in the Midwifery Programme, judged across ten experts.												0.97	

4.3 Summary

This chapter focused on the presentation of the findings regarding the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. The findings focused on two objectives: to establish the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme and to determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The results of the study indicated that the clinical assessment tool used in the Midwifery Programme has acceptable levels of internal consistency reliability and content validity. However, there were some competencies in the tool which required revision and modification. The competencies which need to be revised are knowledge of drugs and manual dexterity.

However, according to the Kappa value, the knowledge of drugs is acceptable, meaning that it does not need revision. Therefore, this competency may be revised and tested for item analysis to establish the internal consistency for reliability for stability and retested for Kappa value to determine its clarity and relevance content validity. The competency that requires revision according to the I-CVI results is manual dexterity and this was also the case according to the results of the Kappa value. However, manual dexterity was acceptable in the results drawn from the internal consistency reliability psychometric property. The retest after revising manual dexterity and knowledge of drugs will be used to draw the conclusion whether these competencies must remain or be removed from the clinical assessment tool used in the Midwifery Programme in Botswana.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

The aim of this study was to determine the internal consistency reliability and the content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. Lack of appropriate, reliable and valid assessment tools to evaluate students' performance in the clinical area remained a challenge in Nursing and Midwifery. The study was conducted because there was no evidence or documentation of the internal consistency reliability and content validity of the psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. This chapter includes the discussions of the findings of the internal consistency reliability and content validity psychometric properties of the clinical assessment tools and the brief summary of the chapter. The discussions are focused on the objectives of the study. The first objective of the study was to establish the internal consistency reliability of the psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The second objective was to determine the content validity of the psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana.

5.2 Objective 1: To establish the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme.

Data was collected from 114 completed clinical assessment tools used to evaluate midwifery students in semesters 2 and 4 in the 2019 academic year. This data was collected to establish the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. The internal consistency is a widely used method for testing reliability because it indicates the extent to which the different components or items of a tool or instrument measure the same thing (Bolarinwa, 2015). In this study, the overall Cronbach's alpha of the clinical assessment tool used in the Midwifery Programme in Botswana, was 0.837. This indicated good internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana. Other studies also used Cronbach's alpha to estimate the internal consistency reliability psychometric property of the clinical assessment tools used in nursing and midwifery.

In support of these findings, Iglesias-Parra *et al*. (2015:371) determined the internal consistency reliability of the clinical competency evaluation system tool for the nursing students' practicum and Cronbach alpha of their study was 0.96. These results also indicated excellent internal consistency reliability of the psychometric property of the clinical competency evaluation tool for the nursing students' practicum. Hernández-Padilla *et al*. (2019:1) also used Cronbach's alpha coefficient, and the corrected item-total correlation to determine the internal consistency reliability of the three tools for Clinical Communication Self- Efficacy Tool kit (CC-SET). Cronbach's alpha for the three tools

encompassed in CC-SET was 0.93, 087 and 0.86 respectively and the corrected item- total correlation (C-ITC), ranged from 0.52 to 0.75. This indicated good internal consistency reliability of CC-SET tools that was used to evaluate the nursing practical skills. Furthermore, Cronbach alpha if item deleted did not increase if any of the items or competencies of the CC-SET tool if removed (Hernández-Padilla *et al.*, 2019:1). This has continually illustrated good internal consistency reliability of the competencies of CC-SET tool that was used to evaluate the clinical communication self- efficacy tool.

Similarly, the results of the evaluation of the Persian version of Postpartum Distress Measure Scale indicated Cronbach's alpha of 0.94 (Shokuhi *et al.*, 2020). This has also indicated high internal consistency reliability. Delavari *et al.*, (2018:1) assessed the clinical reasoning skills for Midwifery students and the results of this study illustrated a Cronbach alpha of 0.74, (Delavari *et al.*, 2018:1). This is a bit lower, however, in their study, Delavari *et al.* (2018:1) indicated that this is an acceptable level of internal consistency reliability. Kassab, and Hamadneh (2019:9549) also used Cronbach's alpha to estimate the reliability of a questionnaire that measured the basic new-born resuscitation skills among the midwives. The results of the study indicated a Cronbach's alpha of 0.851 (Kassab and Hamadneh, 2019: 9554). These results correlate well with the results for the current study, indicating good internal consistency reliability. Therefore, the findings of this study indicate that the clinical assessment tool used in the Midwifery Programme in Botswana measures what it is supposed to measure. In addition, the findings of this study are congruent with the CTT model which was used to guide the statistical approach, using Cronbach's alpha to determine the level of the internal consistency pyschometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana.

Cronbach's alpha is an important approach that can be used to estimate the internal consistency of clinical assessment tools because it indicates the covariance level between the items of a scale or tool (de Souza *et al.*, 2017:13; Vitoratou and Pickles, 2017:66). Additionally, Cronbach's alpha is used to determine if the clinical assessment tool used in the Midwifery programme has good internal reliability to measure what it is supposed to measure (de Souza *et al.*, 2017:17; Hajjar, 2018: 18; Najjar, 2016:3). In this study, the internal consistency reliability of the clinical assessment tool used in the Midwifery Programme in Botswana for stability was determined by calculating the inter-item analysis. The inter-item analysis was done through calculating the corrected item-total correlation and the Cronbach's alpha if the item was deleted. Determining the internal consistency reliability using: the corrected item-total correlation and the Cronbach's alpha if the item was deleted for stability, were also done in other studies (de Souza *et al.*, 2017). The values of Cronbach's alpha if the item was deleted are important because if the items measure different things or construct, the correlation among the items, that is, the corrected item-total correlation (C-ITC), will be low and the alpha value also decreases (Hajjar, 2018:35). The results of this study showed that the corrected item-total correlation ranged between -.043 and .880. The results of the study done by Iglesias-Parra *et al.* (2015:) also indicated that the

total-item correlation ranged from 0.19 and 0.66. The competencies with low item-total correlation values below .50, imply that the items are not measuring what they are supposed to measure, thus require to be reviewed (Hajjar, 2018:36). This is because if these items increase Cronbach's alpha if the item is deleted, there is a statistical reason to drop it or should not be used for computing an overall alpha score (Hajjar, 2018:35).

From the results of this study, the knowledge of drugs competency had low C-ITC below 0.50 which significantly increased the Cronbach's alpha, thus, affecting the internal consistency reliability of the entire clinical assessment tool (Hajjar, 2018:34). Although the number of items in a scale or tool affects the Cronbach's alpha values, the proportionality and the degree of measurement stability of the competencies with each other indicated the internal consistency reliability of the entire tool (Shokuhi *et al.*, 2020). Lack of correlation may lead to measurement errors which in turn would affect the internal consistency reliability of the clinical assessment tool. Therefore, the results of the internal consistency reliability of this study suggested that the knowledge of drugs among the twelve competencies of the clinical assessment tool in the Midwifery Programme in Botswana, must be reviewed to avoid element of subjectivity and errors when evaluating Midwifery students. Consequently, it affected the overall Cronbach alpha, the corrected item-total correlation and the Cronbach alpha if item deleted of the clinical assessment tool used in the Midwifery Programme in Botswana. However, all the other eleven competencies of the clinical assessment tool used in the Midwifery Programme in Botswana were reliable because they had good item correlation and did not affect Cronbach alpha if item deleted. Those eleven competencies are adequate relevant history, preparation for procedure, manual dexterity, prioritizes and takes appropriate action, interpretation of findings, provides relevant education and counselling, time management, relates theory to practice, critical thinking in client's care. Concurrently, the findings of this study accepted the CTT model which was used to guide the statistical approach of using correlation coeffienct and Cronbach's alpha if items deleted test to make sure that that all the components of the tool measured what they are supposed to measure.

5.3 Objective 2: To determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana

Ten (10) SME's from the academic field and the Nursing and Midwifery Council of Botswana were used to determine both the relevance and clarity of the competencies in the clinical assessment tool used in the Midwifery Programme in Botswana. The SME's ratings of the competencies of the clinical assessment tool used in the Midwifery Programme were calculated to determine the CVR and CVI. The results of this study indicated that the clinical assessment tool that is used in the Midwifery Programme has an overall CVR of 0.95, which indicated good content validity according to the Lawshe's model of 1975 (Almanasreh *et al.*, 2019:217). The results of this study were almost similar to a methodological study done by Moskoei *et al.*, (2017:4150). The overall CVR and CVI of the rating

scale were 0.88 and 0.97 respectively (Almanasreh *et al.*, 2019). The results from this study indicated acceptable content validity of the clinical assessment tools.

The CVR for relevance and clarity of the competencies of the clinical assessment tool in this study were independently tested statistically. The results of this study showed that these eleven competencies of the clinical assessment tool used in midwifery, had CVR values that ranged from 0.8 to 1. The CVR values of the eleven competencies of the clinical assessment tool that is used in the Midwifery Programme indicated that the tool has good content validity. The eleven competencies were; adequate relevant history, preparation for procedure, knowledge of drugs, prioritizes and takes appropriate action, interpretation of findings, provides relevant education and counselling, time management, relates theory to practice, critical thinking in client's care. The findings of this study were also in line with the findings of the cross sectional, observational study conducted by Hernández-Padilla *et al.*, (2019), which evaluated the content validity of the clinical communication self -efficacy toolkit (CC-SET). The results indicated the CVR of 0.92, 0.82, 0.81 respectively, for all the scales, which reflected good content validity of the entire clinical communication self -efficacy tool kit (Heale and Twycross, 2015:66; Zamanzadeh *et al.*, 2015).

However, the manual dexterity competency of the clinical assessment tool used in the Midwifery Programme had a CVR of 0.6. This CVR value for manual dexterity competency is below the minimum value of 0.62. Therefore, according to Lawshe's model of 1975, it is not relevant and requires some revision (Heale and Twycross, 2015:55; Zamanzadeh *et al.*, 2015:78). Fisher *et al.* (2019:22) explained that when of the competency of the clinical assessment is irrelevant, it brings the element of subjectivity and varied interpretations, which affects the content validity of the clinical assessment tool. Navabi *et al.* (2016:102) also used 10 SME's from the field of tool development, to evaluate the relevance and necessity of the items of the tool of the nursing students' clinical pharmacology unit. The results of the study indicated a CVR of 0.62 which led to removal of two options because of the low numerical values according to Lawshe's table (Navabi *et al.*, 2016:102).

The results of this study regarding the clarity of the competencies of the clinical assessment tool used in the Midwifery Programme, indicated an I-CVI range between 0.3 and 0.9. The competencies that had the maximum agreement from the SME's were seven. These competencies were; preparation for procedure, prioritizes and takes appropriate action with emerging needs, interpretation of findings, critical thinking in client care, provides relevant education and counselling, time management and relates theory to practice. According to Zamanzadeh *et al.* (2015:167), the competencies of the clinical assessment that had I- CVI values higher than 79% were appropriate. Therefore, it implies that they should remain in the clinical assessment.

The results of the study also reflected that some of the competencies; collects adequate relevant history, knowledge of drugs used, conducts self in a professional, empathetic approach and reporting and recording had approximately 70% agreement by the SME's. The competency manual dexterity, had the minimum of 30% agreement by the SME's and this means that it should be eliminated in the clinical assessment tool. This is so because an item with an I- CVI value below 70%, requires to be eliminated (Zamanzadeh *et al.*, 2015: 168). Similarly, other results that evaluated the need to keep, revise and eliminate other competencies in the clinical assessment tool for clarity were also conducted previously. In support of this, Shouryabi *et al.* (2017:5788) used 10 experts from Faculty of Nursing and Midwifery to simultaneously evaluate the statements of the scale for relevance, simplicity and clarity. The results of the study indicated that the content validity of the scale was acceptable although there were two items which were not simple and clear for both experts thus, were modified (Shouryabi, Ghahrisarabi, Zohari *et al.*, 2017: 5789).

The results of this study illustrated that the clinical assessment tool that is used in the Midwifery Programme in Botswana has an overall CVI of 0.97. The I-CVI of the competencies of the clinical assessment tool used in Midwifery program in Botswana were also evaluated for clarity. The competencies indicated the I-CVI range between 0.8 and 1. The I-CVI values are above 0.78 which indicated an acceptable level of agreement among the SME's. Therefore, this means that the competencies of the clinical assessment tool are relevant and have good content validity. This is mainly based on the fact that the findings of this study accepted the findings of other studies and Lawshe's model of 1975 which was used to guide content validity of this study (Almanasreh *et al.*, 2019:66;Zamanzadeh *et al.*, 2015:22).

Furthermore, this study evakuated the overall scale (S-CVI/Ave) and Kappa value of the competencies of the clinical assessment tool that is used in the Midwifery Programme. The results of this study illustrated that competencies of the clinical assessment tool have an S-CVI/Ave of 0.97. This overall S-CVI/Ave of 0.97 in this study indicated an excellent content validity (Almanasreh *et al.*, 2019:66; Zamanzadeh *et al.*, 2015:23).

5.4 Summary
This chapter focused on discussion of the major findings regarding the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. The discussion focused on two objectives, to establish the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme and to determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana. The results of the study indicated that the clinical

assessment tool used in the Midwifery Programme has an acceptable level of internal consistency reliability psychometric property and content validity psychometric property. However, there were some competencies in the tool which required revision and modification or even to be excluded from the tool. The results from this study with regard to reliability and validity were also congruent with the results from other studies.

CHAPTER 6: CONCLUSIONS, LIMITATIONS, IMPLICATIONS, AND FUTURE RECOMMENDATIONS

6 Introduction

Establishing the internal consistency reliability and content validity of the psychometric properties of the clinical assessment tools used in the Midwifery Programme is essential. Evaluation of relevance and clarity content validity and internal consistency reliability for stability of clinical assessment tools provides information on whether there is need for revision of the content or not. Based on the key findings that were generated from the methodological process and quantitative analysis, it can be concluded that the clinical assessment tool used in the Midwifery Programme in Botswana is reliable and valid. However, there is need to review the other competencies of the clinical assessment tool to improve its internal consistency reliability as well as its content validity. This chapter also discusses the limitations identified, the implications as well as the recommendations for future research, Midwifery training institutions, the Nursing and Midwifery council, as the main stakeholder in Nursing and Midwifery education and practice, as well as decisions for policy makers.

6.1 Aim, questions, and objectives of the study

The aim of this study was to evaluate the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana.

The questions and objectives, were as follows:

1.   What is the level of the internal consistency reliability psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana?

2.   What is the level of content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana?

The objectives were to:

- establish the internal consistency reliability psychometric property of the clinical assessment tool that is used in the Midwifery Programme in Botswana
- determine the content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana.

6.2 Key findings of the Study

The main findings of this study presented the evaluation of the internal consistency reliability and the content validity of the psychometric properties of the clinical assessment tool that is used in the Midwifery Programme in Botswana. The findings were answering two main questions which related to

the internal consistency reliability and the content validity of the clinical assessment tool. The results proved that the clinical assessment tool used in the Midwifery Programme in Botswana has an acceptable level of internal consistency reliability and also demonstrated that the clinical assessment tool is valid. However, some of the competencies, being; manual dexterity and knowledge of drugs were not clear, thus, require to be reviewed. The other competencies of the clinical assessment tool used in the Midwifery Programme in Botswana other than these were rated as relevant.

6.2.1 The internal consistency reliability psychometric property of the clinical assessment tool
The clinical assessment tool used in the Midwifery Programme in Botswana has an acceptable level of internal consistency reliability psychometric property. However, some of the competencies, being, knowledge of drugs, indicated that they are not measuring the same construct as the others. Therefore, this illustrated that this competency has to be reviewed to prevent varied interpretations and element of subjectivity in Midwifery clinical assessment.

6.2.2 The content validity psychometric property of the clinical assessment tool used in the Midwifery Programme in Botswana
The clarity and relevance of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana had CVR values that ranged from 0.6 to 1. The overall CVR for relevance and clarity of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana was 0.95. These values indicate that the clinical assessment tool has good content validity. The overall CVI for relevance and clarity of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana was 0.97. The relevance for competencies of the clinical assessment tool used in the Midwifery Programme in Botswana had I-CVI values that ranged from 0.8 to 1. All the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana indicated good to excellent I-CVI which means these competencies are relevant to evaluate Midwifery students.

The clarity of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana have I-CVI values that ranged from 0.3 to 0.9. This means that the competencies that are above 0.5 can be used to evaluate the Midwifery students because they are clear. On the other hand, the competency, manual dexterity scored less than 0.5 and cannot be used to evaluate Midwifery students because it is not clear. Furthermore, the findings from the study indicated that the S-CVI/Ave as well as the S-CVI/UA for kappa values ranged between 0.75 and 0.97, which both indicated good to excellent content validity. The evaluation of the content validity of the clinical assessment tool used in the Midwifery Programme indicated that the clinical assessment tool is valid. However, manual dexterity was not clearly worded, thus, needs to be reviewed to indicate specific assessment criteria. Thus, the prevention of varied interpretations and subjectivity in Midwifery clinical assessment.

6.3 Limitations

The limitations of this study are as follows:

- The study focused only on evaluating the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in Midwifery Programme in Botswana.

- The second limitation was with regard to the literature review in which most of the studies published were done in nursing with a few studies conducted in Midwifery, especially locally and regionally.

- The sample was also affected as some of the clinical assessment tools could not be accessed and this may affect the interpretability and generalizability of the findings.

6.4 Implications

The study has a significant contribution to the body of knowledge in Midwifery education and training in general, for the Midwifery training institutions as well as for policy development. This study has provided the basic information regarding the reliability and the validity of the clinical assessment tool used in the Midwifery Programme in Botswana. The results have also provided information regarding the clarity of the competencies, thus providing evidence on the need for evaluation of some of the Midwifery competencies. These findings further provide information that may assist the midwifery task force, in Midwifery training institutions, on areas of focus during the review of the Midwifery curriculum, especially with regard to clinical assessment tools and the clinical assessment in Botswana.

Therefore, this study served as the first study to provide the internal consistency reliability and content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in one African Country which is Botswana. Reliable and valid clinical assessment tools in the Midwifery Programme and training will effectively enable the Midwifery lecturers to evaluate if students have acquired the relevant Midwifery skills and competencies that will enhance provision of quality Midwifery services in clinical practice.

6.5 Recommendations

The recommendations are based on the limitations, as well as the implications of this study in general. The recommendations of this study address future research, midwifery training institutions, the Nursing and Midwifery council, as the main stakeholder in Nursing and Midwifery education and practice, as well as decisions for policy makers.

Based on the conclusions drawn from this study, there is a need for review and modification of some of the competencies of the clinical assessment tool used in the Midwifery Programme in Botswana, to improve both its internal consistency reliability, for stability as well as the content validity, especially

their clarity. A rubric can be developed for all the competencies to be used in conjunction with the clinical assessment tool to ensure common interpretation of the clinical competencies in the tool. This will specifically indicate the students' activities, hence clear assessment criteria that will reduce varied interpretations by the Midwifery assessors. Further research should be conducted to evaluate other aspects of reliability, such as the inter-rater reliability, in order to evaluate the reliability of the clinical assessment tool further. Other forms of validity may also be reviewed, such as the criterion validity to evaluate how it performs when compared with other clinical assessment tools. There is also a need to evaluate the reliability and validity of other tools used in midwifery, such as the holistic assessment and family study tools.

Secondly, it is recommended that the task force in the Midwifery training institutions considers to review the assessment procedures, in particular the clinical assessment tools that are used in the Midwifery Programme, to align them with the competencies required in the Midwifery Programme. There is a need for institutions to encourage research projects, both as individuals or collaboratively, so as to generate information that serve as evidence for practice, in Nursing and Midwifery. The research projects may focus on the use of criteria in the tool (which are clear statements describing actions and activities, as opposed to generic competencies as used in the tools now).

Thirdly, it is recommended that policy makers should incorporate the clinical assessment criteria, especially at curriculum development. There is need for continued review of the curriculum with regard to clinical assessment tools.

7 Final conclusion

This study was conducted to evaluate the internal consistency reliability and the content validity psychometric properties of the clinical assessment tool used in the Midwifery Programme in Botswana. A methodological quantitative descriptive design and methods were used. Retrospective data was collected from the clinical assessment tools for Midwifery students registered for intrapartum in semesters 2 and 4. The results indicated that the clinical assessment tool has an acceptable level of internal consistency reliability. However, the competency of knowledge of drugs must be reviewed and retested for internal consistency reliability, stability, using item analysis. Furthermore, the SME's in Midwifery from the academic field and Nursing and Midwifery council of Botswana were used to evaluate the relevance and clarity of the Midwifery competencies in the clinical assessment tool. The results from SME's in Midwifery indicated that the clinical assessment tool is valid. However, the manual dexterity competency must be reviewed and retested for clarity using I-CVI and Kappa values.

8 Dissemination of results

Dissemination of results will be done after the researcher has compiled a report. The results will be reported through presentations to relevant various stakeholders in their meetings, workshops, research conferences and publications will be done afterwards.

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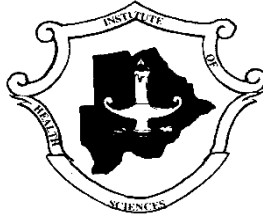
10 ANNEXURES

Annexure 10.1 : Clinical assessment tool used in the Midwifery Programme in Botswana

TELEPHONE: 3953033   INSTITUTE OF HEALTH SCIENCES

P.O. BOX 985 TELEGRAMS: SABAOKI   GABORONE

 FAX NO: 3900935   BOTSWANA
GABORONE BOTSWANA

AFFILIATED HEALTH TRAINING INSTITUTIONS (AHTI)

MIDWIFERY PROGRAMME

CLINICAL EVALUATION TOOL

NAME :   AREA: DATE:

Attribute	5	4	3	2	1	0	Score	Comments
1.Adequate relevant history with significance	Always gives adequate relevant history and significance	Adequate relevant history with significance given most of the time	Sometimes gives adequate history with significance	Inadequate history with inappropriate significance given	Rarely gives adequate history, inappropriate significance given	No relevant adequate history, significance not known		
2.Preparetion for procedure: **- Client** **- Equipment** **- Environment**	Always adequately prepares the client, environment and equipment required	Adequately prepares the client, environment and equipment required	Sometimes adequately prepares the client, environment and equipment required	Inadequate preparations in all areas with some omissions	Poor preparation in all areas with major omissions	No preparations in all areas		

3. *Manual dexterity*	Always has mastery of skills, performs activities confidently and efficiently	Mostly has mastery of skills and performs activities confidently and efficiently	Sometimes performs skills adequately, efficiently and with confidence	Inadequately demonstrates expected skills with limitation and less confidence	Rarely performs skills efficiently and lacks confidence	Unable to perform required skills efficiently and lacks confidence		
4. **Prioritizes and takes appropriate action with emerging needs**	Always prioritizes correctly and takes appropriate actions	Prioritizes activities and takes appropriate actions most of the time	Sometimes prioritizes correctly and takes appropriate actions	Inadequately prioritizes activities and takes inadequate actions	Rarely prioritizes correctly and takes inappropriate actions most of the time	No prioritization and always takes inappropriate actions		
5. *Knowledge of drugs used*	Always demonstrates comprehensive knowledge of drugs used	Demonstrates comprehensive knowledge of drugs most of the time	Sometimes demonstrates comprehensive knowledge of drugs	Inadequately demonstrates comprehensive knowledge of drugs used	Rarely demonstrates comprehensive knowledge of drugs used	Lacks comprehensive knowledge of drugs used		
6. **Interpretation of findings**	Always interprets findings accurately	Interprets findings accurately most of the time	Sometimes interprets findings accurately with minor omissions	Inadequately interprets findings accurately with some omissions	Rarely interprets findings accurately	Unable to interpret findings correctly		

7. Provides relevant education and counseling (IEC)	Always provides relevant IEC according to needs	Mostly provides relevant IEC according to needs	Sometimes provides relevant IEC according to needs	Inadequately provides relevant IEC according to needs	Provides irrelevant IEC	No IEC provided	
8. Time management	Always uses time effectively and efficiently	Mostly uses time effectively and efficiently	Sometimes uses time effectively and efficiently	Often fails to use time effectively and efficiently	Rarely uses time effectively and efficiently	Never uses time effectively and efficiently	
9. Relates theory to practice	Always relates theory to practice	relates theory to practice most of the time	Sometimes relates theory to practice	Inadequately relates theory to practice	Rarely relates theory to practice most of the time	Inappropriate application of theory to practice	
10. Critical thinking in client's care	Always demonstrates critical thinking in client's care	Demonstrates critical thinking in client's care most of the time	Sometimes demonstrates critical thinking in client's care	Inadequately demonstrates critical thinking in client's care	Rarely demonstrates critical thinking in client's care	No demonstration of critical thinking in client's care	
11. Conducts self in a professional, caring empathetic approach	Always conducts self in a professional caring and empathetic approach	Mostly conducts self in a professional caring and empathetic approach	Sometimes conducts self in a professional caring and empathetic approach	Minimally conducts self in a professional caring and empathetic approach	Rarely conducts self in a professional caring and empathetic approach	No empathy, fails to give appropriate care, unprofessional conduct	

12. Reporting and recording	Always provides a comprehensive detailed report	Mostly provides a comprehensive detailed report	Sometimes provides a comprehensive detailed report	Inadequately reports the data needed with some omissions	Inadequate reporting with major omissions	Fails to report and record activities		

TOTAL SCORE: _____/60

60

Assessor's comments:

_____
_____
_____
_____
_____

Name:_____ Signature:_____ Date_____

Student's comments:

_____
_____
_____
_____Name: _____ Signature: _____ Date: _____

4

Annexure 10.2: Declaration of plagiarism

DECLARATION OF ORIGINALITY UNIVERSITY OF PRETORIA

The Department of HEALTH SCIENCES places great emphasis upon integrity and ethical conduct in the preparation of all written work submitted for academic evaluation.

While academic staff teach you about referencing techniques and how to avoid plagiarism, you too have a responsibility in this regard. If you are at any stage uncertain as to what is required, you should speak to your lecturer before any written work is submitted.

You are guilty of plagiarism if you copy something from another author's work (eg a book, an article or a website) without acknowledging the source and pass it off as your own. In effect you are stealing something that belongs to someone else. This is not only the case when you copy work word-for-word (verbatim), but also when you submit someone else's work in a slightly altered form (paraphrase) or use a line of argument without acknowledging it. You are not allowed to use work previously produced by another student. You are also not allowed to let anybody copy your work with the intention of passingif off as his/her work.

Students who commit plagiarism will not be given any credit for plagiarised work. The matter may also be referred to the Disciplinary Committee (Students) for a ruling. Plagiarism is regarded as a serious contravention of the University's rules and can lead to expulsion from the University.

The declaration which follows must accompany all written work submitted while you are a student of the Department of .....HEALTH SCIENCES....No written work will be accepted unless the declaration has been completed and attached.

Full names of student: ITUMELENG RASETSHWANE

Student number: 17180831

Topic of work: Evaluating the Psychometric Properties of the Clinical Assessment Tool Used In the Midwifery Programme In Botswana,

Declaration 1. I understand what plagiarism is and am aware of the University's policy in this regard.

2. I declare that this PROJECT is my own original work. Where other people's work has been used (either from a printed source, Internet or any other source), this has been properly acknowledged and referenced in accordance with departmental requirements.

3. I have not used work previously produced by another student or any other person to hand in as my own.

4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

SIGNATURE : ITUMELENG RASETSHWANE

Annexure 10.3: Clearance and confidentiality agreement of statistician

Clearance and Confidentiality agreement of statistician

This letter is to confirm that the student, with the name(s) **Itumeleng Rasetshwane**
Studying at the University of Pretoria discussed the Project with the title, **Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in Midwifery Programme in Botswana** with me.

I, **Liezel Korf**, the statistician hereby confirm that I am aware of the project and also undertake to assist with the Statistical Analysis of the data generated from the project. This letter is to confirm that I have assessed the research instrument for this study, and in my opinion, the research instrument, statistical methods and techniques are appropriate for the research.

The analytical tool that will be used will be *Descriptive statistics using Cronbach's alpha and correlation coefficient statistics,* in SPSS version 25 to achieve the objective(s) of the study. The significant value of 0.05 will be set in SPSS.

I understand that any information (written, verbal or any other form) obtained during the performance of my duties must remain confidential and in line with the **University of Pretoria** Policy on Research Ethics. This includes all information about participants, their employees/their employers/their organisation, as well as any other information.

I understand that any unauthorised release or carelessness in the handling of this confidential information is considered a breach of the duty to maintain confidentiality. I further understand that any breach of the duty to maintain confidentiality could be grounds for immediate dismissal or possible liability in any legal action arising from such breach.
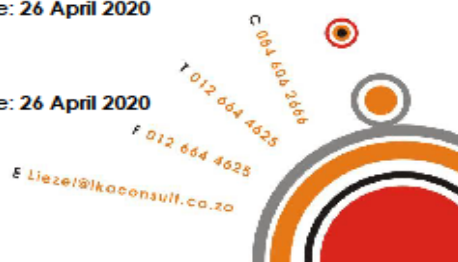
Full Name of Statistician: **Dr Liezel Korf**

Signature of Statistician: Date: **26 April 2020**

Signature of Primary Researcher: Date: **26 April 2020**

Owner *Liezel Korf*
PhD, Research Psychologist & Independent Practice (Psychometry)

Annexure 10.4: Letter of approval: Permission to access records/files/databases in midmifery training Institutions in Botswana

<div align="right">

From: Itumeleng Rasetshwane

P.O.Box 863 AAD

Gaborone

19 August 2020

</div>

To: The Principals

Institute of Health Sciences

P O BOX 267

Francistown

ATT: Institutional Review Board

RE: REQUEST FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I, Itumeleng Rasetshwane, am a research student at the University of Pretoria under the supervision of Dr. N. V. Sepeng and Prof. Mogale. I am a lecturer in Midwifery Program at the Institute of Health Sciences – Gaborone, Botswana.

The title of my study is: **Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in the Midwifery Programme in Botswana.**

The aim of the study is to evaluate the psychometric properties, the reliability and validity of the clinical assessment tool used in the Midwifery Programme in Botswana. Permission has been granted from the Health Research and Development Committee in the Ministry of Health and Wellnes.

I am requesting for permission to conduct the study in your institution, in Midwifery Programme. Permission is requested to access information from the institution's records, that is, the clinical assessment tools for all the students who were registerd for acdemic year 2019. These will be the clinical assessment tools that were used reflecting the students' scores from intrapartum, intrapartum care practicum and postpartum care.

Thank you.

Yours faithfully

___I.Rasetshwane____

Itumeleng Rasetshwane (Ms)

Contacts: +267 71737363,72868059

Email: raseitum@yahoo.com

Annexure 10.5: Confidentiality agreement form for SME's

RE: Confidentiality agreement during review

I, -------------------------------- agree to maintain confidentiality and promise that whatever is discussed during the review will be regarded as confidential.

SME's ……………………… Date……… Signature…………

Annexure 10.6: Data collection tool for SME's/Midwifery Experts to evaluate content validity:Relevance

Code Number: ---------------------- Facility/Institution--------------------Designation/Rank: ------------

Age---------------- Gender------------------ Work experience---------------------years

 Dear Subject Midwifery Experts

This data collection instrument has 12 domains or competencies that are used to evaluate Midwifery Students for in the clinical area. I request your expert judgement on the degree of relevance of each item to the measured domains/competencies in midwifery.

Instructions: Kindly evaluate the competency/attributes (from 1-12) and tick in the appropriate box of the response that indicate your expert opinion on whether the competency attributes is (1) not relevant, (2) somewhat relevant (3) quite relevant or (4) highly relevant. Provide any comments regarding your opinion and any suggestions in the spaces provided.

Attribute	1. Not relevant	2.somewhat relevant	3.quite relevant	4.higly relevant	Comments/ Reasons
1.Adequate relevant history with significance					
2.Preparetion for procedure: - Client - Equipment - Environment					
3. Manual dexterity					
4. Prioritizes and takes appropriate action with emerging needs					
5. Knowledge of drugs used					

6. Interpretation of findings					
7. Provides relevant education and counseling (IEC)					
8. Time management					
9. Relates theory to practice					
10. Critical thinking in client's care					
11. Conducts self in a professional, caring empathetic approach					
12. Reporting and recording					

Annexure 10.7: Data collection tool for SME's/Midwifery Experts for content validity:Clarity

Code Number: ----------- Facility/Institution----------------------Designation/Rank: -----------

Age------------- Gender------------------------- Work experience-------------- years……..Highest qualification

Instructions: Kindly tick the appropriate response which indicates your expert opinion on whether the wording of the competencies/attributes included in the tool clearly indicates what it measures or not. You are requested to be as honest as possible. Provide any comments regarding your opinion or the competencies in the spaces provided.

Attribute	1.Not clear	2.item needs revision	3.very clear	Comments/suggestions
1.Adequate relevant history with significance				
2.Preparetion for procedure: - Client - Equipment -Environment				
3. Manual dexterity				
4. Prioritizes and takes appropriate action with emerging needs				
5. Knowledge of drugs used				
6. Interpretation of findings				
7. Provides relevant education and				

counseling (IEC)			
8. Time management			
9. Relates theory to practice			
10. Critical thinking in client's care			
11. Conducts self in a professional, caring empathetic approach			
12. Reporting and recording			

Annexure 10.8: Ethics clearance letter- University of Pretoria

25 June 2020

Approval Certificate
New Application

Ethics Reference No.: 285/2020
Title: Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in Midwifery Programme in Botswana

Dear Ms I Rasetshwane

The **New Application** as supported by documents received between 2020-04-30 and 2020-06-24 for your research, was approved
by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 2020-06-24.

Please note the following about your ethics approval:
- Ethics Approval is valid for 1 year and needs to be renewed annually by 2021-06-25.
- Please remember to use your protocol number (285/2020) on any documents or correspondence with the Research
  Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further
  modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted
  to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other
  aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers
MBChB MMed (Int) MPharmMed PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of
Federal Regulations Title 46 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African
Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2016 (Department of Health)

ICD 2A - PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT FOR A PARTICIPANT ADMINISTERED QUESTIONNAIRE

STUDY TITLE: ……EVALUATING THE PSYCHOMETRIC PROPERTIES OF THE CLINICAL ASSESSMENT TOOL USED IN THE MIDWIFERY PROGRAMME IN BOTSWANA

Principal Investigator: …ITUMELENG RASETSHWANE

Supervisor: …………DR VN SEPENG.

Institution: …INSTITUTE OF HEALTH SCIENCES GABORONE

Daytime telephone number: …71737363

DATE AND TIME OF INFORMED CONSENT DISCUSSION:

				:
Dd	**Month**	**year**		**Time**

Dear Research Participant

1) INTRODUCTION

You are invited to volunteer for a research study. I am doing this research for **Master's Nursing Education** degree purposes at the University of Pretoria. The information in this document is provided to help you to decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy with the kind of questions that will be asked.

2) THE NATURE AND PURPOSE OF THIS STUDY

This study aims to: **Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in the Midwifery Programme in Botswana**

By doing so, we wish to   determine content validity and reliability of the clinical assessment tool used in the Midwifery Programme in Botswana**.**

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

This study involves answering some questions regarding   Content validation of the clinical assessment tool used in the Midwifery Programme in Botswana

We would like you to complete a questionnaire. It will take approximately **20** to **30** minutes/hour/s and email back to the researcher. We will be available to help you with the questionnaire in case you need clarity. The researcher will keep the completed questionnaires in a safe place to make sure that only people working on the study will have access to it. Please do not write your name on the questionnaire. This will ensure that your answers are kept confidential (so nobody will know what you have answered).

The questionnaire consists of two parts:

Part 1: **Content Validation of the questionnaire** which have 12 domains or competencies that are used to evaluate Midwifery Students for their clinical Module. I request your expert judgement on the degree of each item to the measured domains/competencies

Part 2: **Content Validation of the questionnaire** which involves answering some questions which will require you to kindly tick the appropriate response which indicate your opinion on whether the wording of the competencies included in the tool is clear or not. You are requested to be as honest as possible. Provide any comments regarding your opinion or the competencies in the spaces provided.

4) RISK AND DISCOMFORT INVOLVED

There is no foreseeable physical discomfort or risk involved. If there are questions that are too sensitive for you to answer, you do not need to answer them.

5) POSSIBLE BENEFITS OF THIS STUDY

This study may help **The results of the study may be used to assist midwifery lecturers and or programme to review or revise the content of the clinical assessment tool to improve its effectiveness in evaluating the midwifery students' competencies. The results of content validty, the clarity of the content/ competencies may be used to decrease the element of subjectivity among midwifery lecturers.This will lead to fair assessment that will benefit all the students**.

.

6) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59, Telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving humans. A copy of the Declaration may be obtained from the investigator should you wish to review it.

8) INFORMATION

 If you have any questions concerning this study, you may contact: **Dr Sepeng and Prof Mogale**

9) CONFIDENTIALITY

All records from this study will be regarded as confidential. All results will be published or presented in such a way that it is not possible to identify the participants.

10) COMPENSATION

You will not be paid to take part in the study. There are no costs involved for you to be part of the study.

11) CONSENT TO PARTICIPATE IN THIS STUDY

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above-written information about the study.
- I have had adequate time to ask questions, and I have no objections participating in this study.
- I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.
- I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.
- I am participating willingly.
- I have received a signed copy of this informed consent agreement.

_____   _____

Participant's name (Please print)   Date

_____   _____

Participant's signature   Date

_____   _____

Researcher's name (Please print).   Date

_____   _____

Researcher's signature   Date

Annexure 10.10: Permission letter from HRU- Ministry of Health, Botswana

PRIVATE BAG 0038
GABORONE
BOTSWANA
REFERENCE:

TEL: (+267) 363 2500
FAX: (+267) 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

REPUBLIC OF BOTSWANA

MINISTRY OF HEALTH AND WELLNESS

REFERENCE NO: HPDME 13/18/1   14th August 2020

Health Research & Development Division

Notification of IRB Review: **New application**

Itumeleng Rasetshwane
P. O. Box 863 AAD
Gaborone, Botswana

Dear Itumeleng Rasetshwane

Protocol Title:	**EVALUATING THE PSYCHOMETRIC PROPERTIES OF THE CLINICAL ASSESSMENT TOOL USED IN MIDWIFERY PROGRAMME IN BOTSWANA**

Review Type:	Expedited Review
Approval Date:	14 August 2020
Expiration Date:	13 August 2021
Review Determination:	Approved
Risk Determination:	Minimal risk

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health and Wellness within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

Continuing Review

Vision: *A Healthy Nation by 2036.*
Values: *Botho, Equity, Timelliness, Customer Focus, Teamwork, Acountability*

BOTSWANA

Annexure 10.11 Permission letter from IRB's

From: Itumeleng Rasetshwane

      P.O.Box 863 AAD

      Gaborone

19 August 2020

To: The Principal

Institute of Health Sciences-Gaborone

P O BOX 985

Gaborone

ATT: Institutional Review Board

RE: REQUEST FOR PERMISSION TO CONDUCT A STUDY IN YOUR INSTITUTION

I, Itumeleng Rasetshwane, am a research student at the University of Pretoria under the supervision of Dr. N. V. Sepeng and Prof. S, Mogale. I am a lecturer in Midwifery Program at the Institute of Health Sciences – Gaborone, Botswana.

The title of my study is: **Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in the Midwifery Programme in Botswana.**

The aim of the study is to evaluate the psychometric properties, the reliability and validity of the clinical assessment tool used in the Midwifery Programme in Botswana. Permission has been granted from the Health Research and Development Committee in the Ministry of Health and Wellness.

I am requesting for permission to conduct the study in your institution, in Midwifery Program. Permission is requested to access information from the institution's records, that is, the clinical assessment tools for all the students who were registered for academic year 2019. These will be the clinical assessment tools that were used reflecting the students' scores from intrapartum, intrapartum care practicum and postpartum care.

Thank you.

Yours faithfully

_____I.R_____

Itumeleng Rasetshwane (Ms)

Contacts: +267 71737363,72868059

BAMALETE LUTHERAN SCHOOL OF NURSING

P.O. BOX V202
RAMOTSWA
BOTSWANA
TELEPHONE: +267 5391330
FAX: +267 5391668
E-Mail: enquiries@bamson.co.bw

REF: BLSON 2/44b IV (41)   03 September 2020

Ms Itumeleng Rasetshwane
P O Box 863 ADD
Gaborone

Dear Ms Rasetshwane

RE: Evaluating the Psychometric Properties of the Clinical Assessment Tool used in Midwifery Programme in Botswana

Reference is made to your request to conduct a study in our institution dated 19 August 2020, concerning the above mentioned subject matter.

Bamalete Lutheran School of Nursing has acceded your request to conduct a research study as requested.

Yours sincerely

Ms J. Seumako
For/Principal

Annexure 10.13: Language editor certificate

To whom it may concern

With this letter, I, Simonete Munro, BIS Publishing Honours Degree graduate and member of the Professional Editors' Guild (membership number: MUN002), confirm that the research paper titled *"Evaluating the Psychometric Properties of the Clinical Assessment Tool Used in the Midwifery Programme in Botswana"* by Itumeleng Rasetshwane, was edited by myself in a professional capacity in December 2020.

Attention was given to sentence structure, spelling, grammar, and other minor language matters in the document.

For further information, please contact me at simonete@wol.co.za.

Kind regards,

Simonete

Professional
EDITORS
Guild

Simonete Munro
Associate Member

Membership number: MUN002
Membership year: March 2020 to February 2021

072 609 6572
simonete@wol.co.za

www.editors.org.za