DESIGNING THEORETICAL ASSESSMENTS AT NURSING HIGHER EDUCATION INSTITUTIONS: A SCOPING REVIEW

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ABSTRACT

Assessment in higher education remains one of the most reliable forms of assessing the effectiveness of the learning and teaching (L&T) process. Excellence in theory assessment design is, therefore, a pivotal element of the success of many Higher Education Institutions (HEIs) around the world. This scoping review aimed to establish current assessment best practices in nursing at HEIs. The five steps of Arksey and O'Malley's framework guided this scoping review. Following a systematic search of various databases, including Academic Search Complete, CINAHL, ERIC, MEDLINE, PubMed, Sage Online Journals, SCOPUS, and Wiley Online Library for the period from 2010 to 2020, a rigorous screening process was undertaken by three independent reviewers. The search terms included assessment best practice and nursing education institution. Of the 652 articles screened, 12 studies met the inclusion criteria. Four quantitative, four qualitative, one mixed-method, and three studies that did not specify their design were included. The findings revealed that various factors influence how educators design assessments. Theoretical assessment design is a vital activity and requires collaboration between policymakers and HEIs to enhance the quality designing of assessments by educators through professional development.
Keywords: assessment design, assessment practices, nurse educator, theoretical assessment

INTRODUCTION

Nursing education focuses on clinically-based nursing programmes and, therefore, has both theoretical and clinical components. To be promoted to the next level of study, students must be assessed for competence in both these components (Chinembiri 2017; Elahi, Adineh, and Rasooli 2016; Pijl-Zieber et al. 2014). Assessment, therefore, plays an important role in making a judgement about a student's level of competence. Assessments must be designed in a manner that appropriately assess competence and which ultimately reflect good assessment practices (Norton, Norton, and Shannon 2013).

Background/Literature Review

One of the responsibilities of nurse educators in HEIs is to design assessments (Elahi et al. 2016; Killingsworth, Kimble, and Sudia 2015). Besides teaching in class, assessment is also a means by which students learn (Wiliam 2013). The educator needs to assess whether the learning outcomes of a course or module were achieved and that learning took place (Chinembiri 2017). This requires good assessment practices, where assessment criteria are associated with the learning outcomes.

Changes in higher education during the 21st century have presented some challenges for nurse educators (Salminen et al. 2010). The need for a skilled nursing workforce, together with the gradual increase of admissions to higher education, has resulted in large class sizes. Consequently, higher education has adapted to the digital age by integrating 21st century competencies and best practices into the curriculum and assessment. Educators, therefore, need to become innovative in learning and teaching as well as assessment practices (Voogt et al. 2013). Nurse educators, as in many other fields, have gradually incorporated technology into learning and teaching and, ultimately, assessment to facilitate the large classes (Oermann, De Gagne, and Phillips 2017). These changes have affected the design of theoretical assessments (Ashford-Rowe, Herrington, and Brown 2014; Oermann et al. 2017). Fayilane (2017) and Garekwe (2010) conducted studies regarding the design of the final assessment questions at Nursing Schools in South Africa (SA). Their studies included first-year to fourth-year year levels of the undergraduate programme and found that the questions designed for the examination focused more on lower cognitive taxonomy levels. While transformation has an impact on assessments, the alignment of assessments and the design thereof still need to be ensured at higher education.

The concept, design, means to devise, construct, or create (Fogliano et al. 2019). According to Uys and Klopper (2013), designing exams refers to the assessment that the educator creates for the theoretical component of a baccalaureate nursing programme. Literature also refers to it as to draft, develop, formulate, and compile (Chinembiri 2017; Elahi et al. 2016; Nayer, Takahashi, and Hrynchak 2018; Norton et al. 2013; Villarroel et al. 2018). In this review, it refers to the design of assessments. Assessment is often referred to as an examination or test (Chinembiri 2017; Flores et al. 2015). It is a structured process for gathering evidence and making judgments about a student's performance against a set of learning outcomes, unit standards, a programme or part thereof, or a qualification (South African Qualifications Authority (SAQA) 2005; Chinembiri 2017; Elahi et al. 2016). In this review, assessment refers to the final assessment of the theoretical component of a nursing programme. Nurse educators at HEI's must design assessments that assess whether learning has taken place

and that the learning outcomes were achieved (Chinembiri 2017; Elahi et al. 2016).

There have been a number of reviews on assessment practices which mostly focussed on learning skills in nursing (Talman et al. 2020; Vierula et al. 2020). Recognising the unique characteristics and challenges associated with assessment design, this review focussed on answering the research question as presented in 3.1. It explored nursing theoretical assessment practices and how educators at HEIs, especially nurse educators, design theoretical assessments.

AIM

This scoping review aimed to establish current assessment design best practices in nursing at HEIs.

METHODOLOGY

This scoping review followed Arksey and O'Malley (2005) five-step framework: (i) identifying the initial research question, (ii) identifying relevant studies, (iii) study selection, (iv) charting the data, and (v) collating, summarizing and reporting the results. This method allowed the reviewers to include evidence-based research which was synthesized and reported on (Peters et al. 2017). It adopted a rigorous process of transparency, enabling replication of the search strategy to increase the reliability of the study findings. The review was also guided by two frameworks, namely i) Biggs (2003) constructive alignment, and ii) Bloom's Taxonomy of 1965, which align with the discussion. Biggs' constructive alignment has interlinking concepts, namely "assessment", "learning outcomes", and "learning and teaching activities", which are evident in this review. Bloom's Taxonomy highlights three domains of learning, namely cognitive, affective, and psychomotor. This review focussed on the cognitive domain.

Scoping review key question

The key question that guided this scoping review was: What are the current assessment design best practices in nursing at HEIs?

Search strategy

The aim of the search strategy was to discover published studies while maintaining the focus of the review. An initial quick search of the words found in the title was done on the Education Resource Information Center (ERIC) and Cumulative Index of Nursing and Allied Health Literature (CINAHL). This was followed by a second quick search using the identified keywords and alternative keywords. A third quick search confirmed the suitable keywords and

alternative keywords. The reviewers used university library services between October and December 2020 to access databases including Ebsco Host, Academic Search Complete, CINAHL, ERIC, MEDLINE, PubMed, Scopus, and Wiley Online. A secondary search was done by identifying any other primary sources within grey literature.

Search terms

The PICO framework was used to identify keywords from the research question. With reference to the PICO framework, "Nursing education institution" was identified as the key phrase for the population (P) of the review, while "assessment best practices" represented the outcome (O). The Intervention (I) and Comparison (C) of the PICO framework were not applicable. Following extraction of the key phrases, alternative keywords were generated to broaden the search. Truncation and the Boolean operators "OR" and "AND" were used to develop a search strategy.

Inclusion criteria

All types of studies that involved assessment practices in nursing education were considered. Published qualitative and quantitative studies and reviews that were full-text and published in the English language were included. Studies published between 2010 and 2020 were selected. The rationale for this timeframe was based on the changes during the last decade, including the integration of information and communication technologies (ICTs) into higher education curricula globally through the implementation of blended learning approaches and consequent changes in assessment (O'Flaherty and Phillips 2015). Nursing research in SA before this time was unlikely to reflect these changes in higher education since the framework for the new Bachelor of Nursing programme in SA was only finalized by the South African Nursing Council in 2013 (Blaauw, Ditlopo, and Rispel 2014a). The primary outcome was best practice on guidelines for assessment design. Secondary outcomes included assessment alignment to assessment criteria, National Qualifications Framework (NQF), cognitive taxonomy levels, and level descriptors.

Study selection process, data extraction and synthesis

A total of 1 015 articles were found using the search strategy to search the identified databases. Limiters such as English language and full-text articles narrowed the focus of the search, which left a total of 727 articles. All the duplicated articles were removed and a total of 652 articles remained. The reviewers used three spreadsheets, *Title Reading and Extraction Tool (TRET), Abstract Reading and Extraction Tool (ARET),* and *Data Extraction Tool (DET)* to chart the

information. The first spreadsheet, *TRET,* included information about the title and source, database, and location where the article is stored. A total of 640 article titles were shortlisted as irrelevant, while 12 article titles were screened as relevant. After the title screening, the abstract screening was done using the *ARET*. The second spreadsheet extracted information about the abstract, type of study, the study population, the instrument used, the outcomes, and the results of the study. Abstracts were screened for relevance based on the scoping review key question. A full-text screening established that three articles were deemed relevant. Thereafter, a manual search of the reference lists of identified articles was done and Google Scholar was used to identify any other primary sources within grey literature. An additional 16 articles were identified. Following title and abstract screening, 28 article abstracts were screened rigorously (full-text screening) and 12 articles were deemed relevant. All the included studies went through a process of study selection, data extraction, and synthesis. This process was summarised in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Moher et al. 2009) (Figure 1). To safeguard rigor, this process was repeated independently by the other two reviewers. The third spreadsheet, *DET,* was used to draw up summaries in a table format (Table 1) of each article related to the topic and answering the scoping review question. The findings were synthesized by mapping the identified literature, identifying the commonalities, differences, and potential gaps. These 12 articles enabled the reviewers to present the synthesised information to illuminate the broader view about assessment design in nursing and to answer the research question. The charting of information helped to ensure accuracy.

FINDINGS AND DISCUSSION

This scoping review aimed to establish current assessment best practices in nursing at HEIs. Twelve articles met the inclusion criteria. An iterative process was followed. All the included studies were conducted at HEIs; one study was for a PhD Dissertation, one was a case study, and 10 studies were empirical research articles. The studies were published between 2010 and 2018 and originated from 11 countries: Australia (n=1), Canada (n=1), Chile (n=1), Iran (n=1), the KSA (n=1), New Zealand (n=1), Norway (n=1), Spain (n=1), Sudan (n=1), the United Kingdom (n=1) and the United States of America (n=2). The studies discussed assessment practices. A total of three themes and six overlapping subthemes emerged from the review. The findings show that various factors impact educators' assessment design practice. It provided an understanding of the challenges that educators face in designing assessment, and specifically with maintaining the criteria and standard for quality assessments. It also highlights the responsibility of the nurse educator towards learning and teaching activities in higher education.
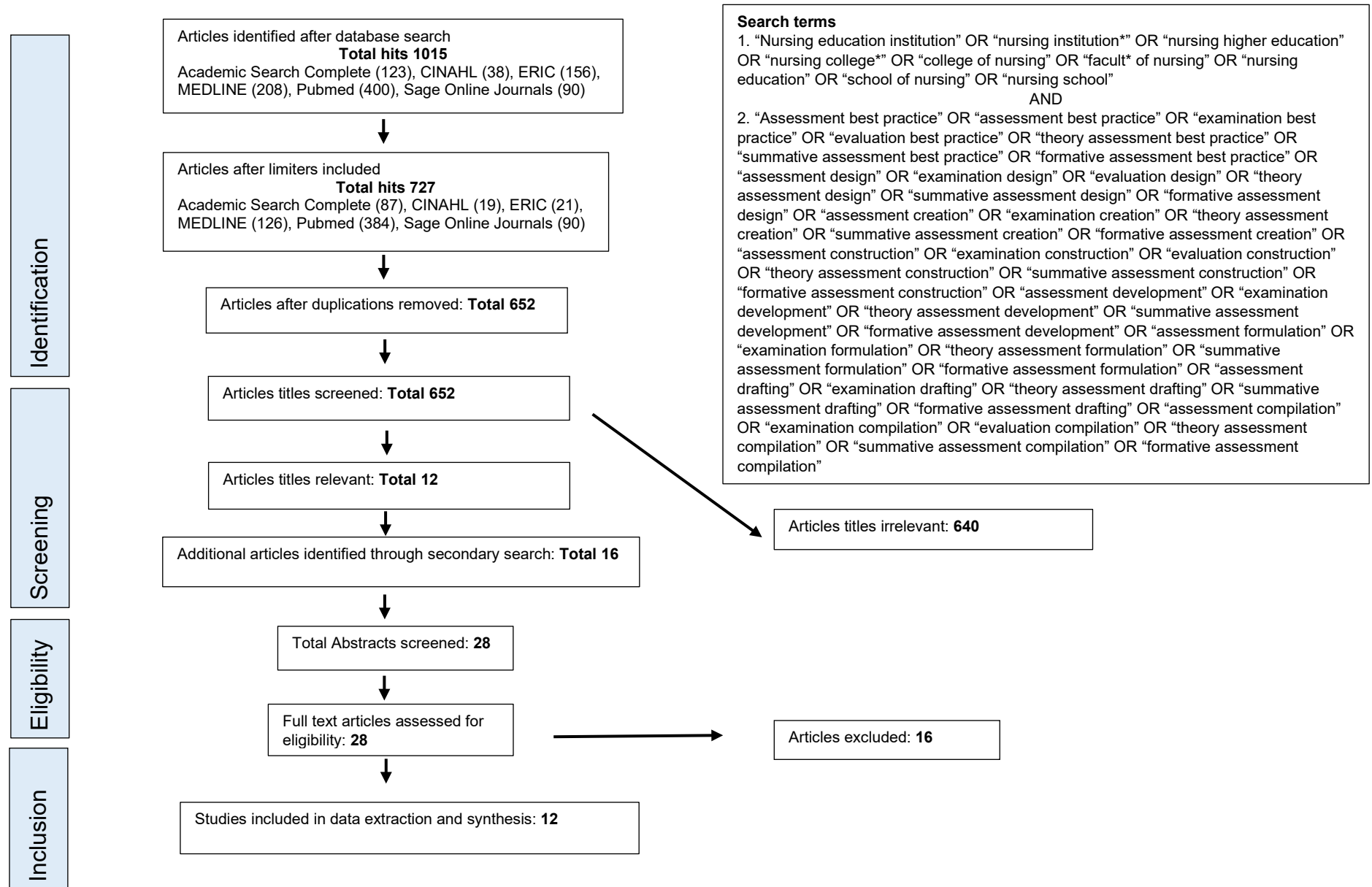
Articles identified after database search
Total hits 1015
Academic Search Complete (123), CINAHL (38), ERIC (156), MEDLINE (208), Pubmed (400), Sage Online Journals (90)

Articles after limiters included
Total hits 727
Academic Search Complete (87), CINAHL (19), ERIC (21), MEDLINE (126), Pubmed (384), Sage Online Journals (90)

Articles after duplications removed: **Total 652**

Articles titles screened: **Total 652**

Articles titles relevant: **Total 12**

Additional articles identified through secondary search: **Total 16**

Total Abstracts screened: **28**

Full text articles assessed for eligibility: **28**

Studies included in data extraction and synthesis: **12**

Articles titles irrelevant: **640**

Articles excluded: **16**

Search terms
1. "Nursing education institution" OR "nursing institution*" OR "nursing higher education" OR "nursing college*" OR "college of nursing" OR "facult* of nursing" OR "nursing education" OR "school of nursing" OR "nursing school"
AND
2. "Assessment best practice" OR "assessment best practice" OR "examination best practice" OR "evaluation best practice" OR "theory assessment best practice" OR "summative assessment best practice" OR "formative assessment best practice" OR "assessment design" OR "examination design" OR "evaluation design" OR "theory assessment design" OR "summative assessment design" OR "formative assessment design" OR "assessment creation" OR "examination creation" OR "theory assessment creation" OR "summative assessment creation" OR "formative assessment creation" OR "assessment construction" OR "examination construction" OR "evaluation construction" OR "theory assessment construction" OR "summative assessment construction" OR "formative assessment construction" OR "assessment development" OR "examination development" OR "theory assessment development" OR "summative assessment development" OR "formative assessment development" OR "assessment formulation" OR "examination formulation" OR "theory assessment formulation" OR "summative assessment formulation" OR "formative assessment formulation" OR "assessment drafting" OR "examination drafting" OR "theory assessment drafting" OR "summative assessment drafting" OR "formative assessment drafting" OR "assessment compilation" OR "examination compilation" OR "evaluation compilation" OR "theory assessment compilation" OR "summative assessment compilation" OR "formative assessment compilation"

Identification

Screening

Eligibility

Inclusion

Figure 1: Flow diagram for the data searched (Moher et al. 2009).

Table 1: Summary of data from included studies

Authors, year, country	Aim (A), design (D)	Population (P), sample size (SS)	Findings	Strengths (S) limitations (L)	Link to study
Abdalla, 2013, KSA	A: To revisit the MCQ, elaborate on factors that will affect its validity, having a fair test for students. D: Communication article.	P: Not mentioned SS: Not mentioned	"To help improve the validity of MCQs, the following must be adopted: • Faculty development programmes that concentrate on assessment validity. • Adoption of blueprint process for exam planning. • Development or adoption of guidelines for item construction. The use of guidelines will lead to improvement in the validity of the test, thus improving standards of assessment practices."	S: This study highlights the importance of a blueprint or guidelines for assessment design. L: No clarity given on the population and sample size.	• MCQ's can test any higher level of the cognitive domain provided that it is well constructed. • The majority of teachers do not have formal training in item construction.
Ahmed, 2012, Sudan	A: To examine the quality of MCQs of the final exam of the years 2007 to 2010, to improve poorly-written MCQs. D: Quantitative design using descriptive, retrospective, randomized, cross-sectional study.	P: MCQ's SS: 8 semesters of MCQ final exams.	"The experience of staff designing assessments were Master and PhD holders. • The performance of teaching staff about the item stated clearly in the stem showed that (83.3%) of them never stated the item correctly while (16.7%) do not do it. • The performance of the teaching staff about the items put on relevance to the stem or the problem showed that only (4.2%) of the staff do it correctly. • The performance of teaching staff about the positive condition of the stem showed that (63.3%) of teaching staff practice it correctly, while (36.6%) do not do it correctly. • 58.3% of the MCQs were written clearly and concisely. • Questions contain (the all of the above and none of the above) phrases: The question formulation with (the all of the above and none of the above) phrases were avoided in 95.5% of questions. • Regarding feasible functional distracters stated in the item, (85%) of the questions tested were done correctly while (18%) were not done correctly. • The performance of teaching staff regarding constructing item containing only one correct answer, (95%) of them perform it correctly. • Regarding the item laid out in a clear and consistent manner: The majority (72.5%) were incorrectly done. • The performance of teaching staff regarding punctuation, spelling and grammar of the item, (80.8%) did not practice it correctly. • The questions reviewed in this test showed that about 75.8% of these questions included unnecessary vocabulary. • The performance of teaching staff about the content of the exam and covering of important objectives of the subject matter, only (40.8%) do it correctly.	S: The method was made clear and a good description was given of the item-writing flaws that were assessed. L: Limited to the construction of MCQ's only.	• Nurse educators are not familiar with how to write MCQs that match the NQF level of learning. • They lack sufficient proficiency in the design of effective test items. • The criteria and standards for setting assessments were not met.

Authors, year, country	Aim (A), design (D)	Population (P), sample size (SS)	Findings	Strengths (S) limitations (L)	Link to study
			Recommendations: Further training in item-writing for all staff responsible for developing tests".		
Bearman, Dawson, Bennett, Hall, Molloy, Boud & Joughin, 2017, Australian	A: To explore how educators design and implement assessment. D: Qualitative design using Semi-structured interviews.	P: Educators SS: 33 university educators	• "The themes are highlighted in bold. The thematic analysis indicated that the assessment design process begins as a response to some kind of an **impetus for change**, which is subject to two types of influences: **environmental influences**, which are the circumstances surrounding the assessment design, and **professional influences**, which are those factors that the educators themselves bring to the process. Educators explicitly and implicitly described a range of activities or tasks, which were required to implement the assessment design. These activities were **essential** to all assessment design; those more **selective** activities, which educators chose to optimize the assessment process in particular ways, and **meta-design** processes that educators used to dynamically respond to environmental influences."	S: The study shows the unique experiences of educators, insightful thematic analysis of interview transcripts reporting broad categories of impetus, influences, and activities. L: Limited to Australian context setting	• Assessment is a complex process. While assessment design is often the key to promoting student learning, it is challenging for many educators. • Many factors affect how educators design and implement assessment.
Chinembiri, 2017, United States	A: The evaluation criteria and methods used for the assessment of health education programs. D: Not mentioned	P: Not mentioned SS: Not mentioned	• "It is important to improve the quality of graduates produced. • One of the improvements should be on the way the tests are carried out. • The application and taxonomy to enhance the evaluation criteria for nursing students and nursing institutions. • There are various evaluation and assessment criteria for the providers of nursing education to ensure that the trainers of nurses produce qualified nurses who can provide the services needed at the required standards."	S: Highlights the importance of evaluation criteria in assessments in nursing education. L: No clarity given on the population and sample size.	• Criteria and standards contribute to quality assessments. • Guidelines and taxonomy are important.
Elahi, Adineh & Rasooli, 2016, Iran	A: To investigate teacher nurses' experience with student evaluations in clinical settings and classrooms (theory). D: Qualitative design with in-depth semi-structured interviews.	P: Nursing educators SS: 28 registered educators	• "The evaluation process is a critical and essential component of the nursing education system. • Proper evaluation improves the quality of teaching and learning."	S: The findings revealed how critical and essential evaluation is in nursing education. L: Mostly focused on evaluations in a clinical setting and less in classrooms.	• Nurse educators do not understand the evaluation processes well. This is a challenge that leads to sub-standard assessment design and affects learning and teaching activities. • MCQs are designed in the domain of knowledge.
Johannesen & Habib, 2010, Norway	A: To explore the role played by professional identity	P: Academic staff SS: Nine academics (two at	"The culture in a faculty influences how academics use the type of assessment.	S: Three Faculties are included in the study, which	• The nursing respondents do not

Authors, year, country	Aim (A), design (D)	Population (P), sample size (SS)	Findings	Strengths (S) limitations (L)	Link to study
	in the use or non-use of multiple-choice question (MCQ) within the realm of the didactic practices of lecturers. To describe the attitudes towards technology and the possible changes in their didactic practice. D: Qualitative design using face-to-face interviews.	the Faculty of Nursing, four at the Faculty of Education, and three at the Faculty of Engineering)	• A strong epistemic culture within a faculty may bring about a 'take it or leave it' attitude towards the MCQ. • At the Faculty of Nursing a stronger element of participation and reification with regard to assessment. Nursing used the tool formatively. • The attitude of the teaching staff towards online MCQ tools and their actual practice varies greatly from one academic milieu to another."	provides a comparative view on didactic practices. L: Based on only nine interviewees and three faculties within the same institution.	express any pedagogical beliefs about MCQ tools. • The attitude of academic determines the choice of assessment used.
Killingsworth, Kimble, & Sudia, 2015, United States	A: To explore the decision-making process of BSN faculty when determining which best practices to use for test construction. D: Quantitative design using a web-based survey.	P: Nurse faculty members SS:127 educators	• "The majority had doctoral degrees, professional experience in test development, were not certified nurse educators. Teaching experience ranged from between 2 to 40 years. This indicated their experience in designing assessments. • Classroom tests were primarily administered via paper and pencil. • Best practices were reported by faculty as being frequently used. • For test construction, respondents reported using objectives most frequently, whereas a peer review of test items and the test plan were used the least. • The difficulty level of test item was least frequently used. • The participants rated their skill in the use of best practices in test construction, item analysis, and perceived themselves as moderately to very skilled in all areas, but somewhat less so in test construction. • Staff belief that rules were important. Evaluation was a significant predictor of greater use of best practices in all areas. • A large number of contextual factors used in decision-making predicted greater use of best practices in test construction."	S: This study included 31 states in the US, thus having a broader view on best practices for test construction. L: Participants may have reported the use of best practices they thought they should be doing rather than the use of best practices they used during test development.	• The experiences, development, support and responsibility of the faculty member plays a significant part in designing assessments.
Meyer et al. 2010, New Zealand	A: To investigate whether and how attitudes towards, experiences with, and expectations for assessment held by academic staff and their students are represented in	P: Academic staff, student. SS: Undergraduate students (n = 1,238), and academic staff (n = 879).	"The finding revealed that assessment is the Achilles heel of quality in today's institutions of higher education. • Over 2/3 of students indicated they had never experienced virtually half of the assessment types on the list. • Staff were more positive for the different conceptions of assessment than students. • Academic staff who reported more professional development on assessment agree that assessment improves teaching.	S: The study includes a broad sample size of students and staff. L: Data from students and staff viewpoint only.	• The study focuses on policy and practice for the assessment of learning outcomes. • Policy and practice in this area appear to be conflicted,

Authors, year, country	Aim (A), design (D)	Population (P), sample size (SS)	Findings	Strengths (S) limitations (L)	Link to study
	official institutional assessment policy and policy guidelines. D: Mixed-method using large-scale survey, with a follow-up analysis of staff comments, systematic review of institutional policy documents and individual interviews with senior academic managers.		Participation in assessment training was also related to greater use of formative assessment. The alignment of institutional assessment policy with reported staff and student attitudes about and experiences with assessment: A major theme emerged: A dichotomy: assessment of versus assessment for learning. **Recommendations** for the design of quality policy and practice guidelines to ensure that tertiary assessment is manageable, valid, and has the integrity required by stakeholders in HEIs."		confusing and challenging. • Experiences of academics and challenges to design assessments.
Nayer, Takahashi & Hrynchak 2018, Canada	A: To provide guidance to faculty who wish to develop key-feature questions (KFQs) for their tests. D: Not mentioned.	P: Not mentioned SS: Not mentioned	"Twelve tips on how to develop any examination by creating an examination blueprint using learning objectives and the instructional content for course or program, and aligning it. Tip 1: Define the key competencies related to decision making that are to be assessed and create a blueprint. Tip 2: Choose a clinical presentation or situation. Tip 3: Select the "key feature" level of difficulty that is appropriate for the learners. Tip 4: Focus on the key feature. Tip 5: Develop the scenario. Tip 6: Develop the item: stem, question (lead-in), and options (correct answer and distractors). Tip 7: Focus on the question. Tip 8: Develop the options, both correct answer and distractors. Tip 9: Develop instructions for answering. Tip 10: Develop the scoring guideline for each item. Tip 11: Make sure item-writing guidelines are followed. Tip 12: Consider the words/language used in the items."	S: Development of key-feature questions (KFQ) for effective assessment. L: The examples of questions are limited to True & False, Matching, Fill-in-the-blank.	• The tips allude to the appropriate level of difficulty for the NQF level of the learner, taxonomy, and alignment. • For any examination development, a guide is important. This indicates a standard and criteria. • The tips are best practice strategies for assessment design.
Norton, Norton, & Shannon, 2013, UK	A: To explore new lecturers' views on assessment design. D: Quantitative using survey (using a questionnaire called the Assessment Design Inventory).	P: Lecturers SS: 586	"Contextual framing items: • 75% of participants agreed, 16% disagreed and 9% were uncertain that the postgraduate certificate had changed their views on assessment practice. • 69% agreed, 17% disagreed and 14% were uncertain if they thought that new assessment methods were needed to improve current assessment practice. • 31% agreed, 57% were uncertain and 12% disagreed that there was a separation between their teaching philosophy and their	S: The study gives a contextual understanding of assessment. L: The study was limited to lecturers' perceptions and beliefs.	• Inexperienced lecturers are faced with fitting into a sector where assessment is not always seen in a positive light. • They need support to design quality

Authors, year, country	Aim (A), design (D)	Population (P), sample size (SS)	Findings	Strengths (S) limitations (L)	Link to study
			assessment practice. Results of the factor analysis: • The desirable practice factor: 86 to 65% agree they were engaging in desirable assessment practice. • The constraints factor: 61% of our participants felt that there was little incentive for lecturers to innovate in their assessment practice. • Qualification status scored higher on the desirable practice score than those currently completing their PgCerts. • Lecturers having 8 or more years' experience scoring significantly higher than both the other groups.		assessments.
Quesada-Serra, Rodrı´guez-Go´mez & Ibarra-Sa´iz. 2014, Spain	A: To look at lecturers' perceptions of their assessment practices. D: Quantitative using a survey research method questionnaire.	P: Lecturers SS: 427 respondents	• 58.3% of lecturers reported that they felt completely confident in their abilities to design and implement a final evaluation, while 1.9% stated that they did not feel sufficiently skilled to perform these tasks. • 68% of lecturers reported that they often used a final evaluation as a means of assessing students. • Implementing initial assessment – only 24.6% of lecturers felt sufficiently prepared to do an initial assessment. Most of the lecturers felt confident in their abilities to design and implement a final assessment. Competence is perceived differently depending on years of teaching experience. **Recommendations:** Spanish lecturers need training on assessment design."	S: Receive data from 18 Spanish universities which gave a good understanding of their assessment practice needs. L: Limited to lecturers' perceptions.	• Lecturers need training on assessments. • The study explores the assessment practices of the lecturers in higher education and their perception of designing assessments.
Villarroel, Bloxham, Bruna, Bruna & Herrera-Seda, 2018, Chile	A: To understand authentic assessment and propose a step-based model for designing authentic assessment in higher education subjects. D: Qualitative design using systematic review.	P: Articles SS: 112 articles	"Thirteen characteristics of authentic assessment found in the literature: 1. authentic performance 2. practical use 3. higher-order thinking 4. ability to solve problems 5. decision-making 6. have worth beyond the classroom 7. similar tasks to those faced in real life or work 8. problems contextualized to everyday life 9. formative role 10. relevant skills for successful job performance 11. collaborative 12. assessment criteria should be known in advance 13. feedback. Proposal: a model to build authentic assessments in the university Step 1: considering the workplace context Step 2: designing authentic assessment Step 3: learning and applying standards for judgement Step 4: giving feedback."	S: Good understanding is given about the characteristics of authentic assessment and the benefits of it. L: The lack of clear guidance for devising authentic assessment and operation.	• Educators are reluctant to change assessments, such as examinations because changing these practices makes great demands on time, energy and intellectual resources. • These are the challenges they experience preventing the design of authentic assessments which can ensure the quality of the programme.

The responsibility of the nurse educator in higher education

The learning and teaching responsibilities of nurse educators in higher education are continually evolving. Over the years, nursing education has moved from hospital schools to nursing colleges and universities (Billings, Faan, and Halstead 2019; Blaauw, Ditlopo, and Rispel 2014b). The role of the nursing education institution and, specifically, the nurse educator, has developed and become more complex as higher education and the science of nursing developed (Blaauw et al. 2014a). Globally, there is a pressing need for skilled nursing professionals (Mulaudzi et al. 2012; World Health Organization (WHO) 2016; Vierula et al. 2020; Chinembiri 2017). In this regard, the nurse educator is an important role player in shaping the quality of the programme to ensure the preparation of competent professionals (Billings et al. 2019; WHO 2016). The findings regarding the responsibilities of nurse educators are grouped into two subthemes below.

Bridging the theory-practice gap through assessment

The findings of this review revealed that the ultimate goal of nursing education is to produce competent graduates who can render excellent patient care (Chinembiri 2017). These graduates will become qualified professional nurses and provide nursing services of the highest standard (Chinembiri 2017). Elahi et al. (2016) confirmed that graduates need to be skilful, capable, and safe practitioners. In this regard, Chinembiri (2017) stated that nurse educators need to ensure that the country, and in fact the whole world, has proficient nurses who are in high demand and needed in society. Therefore, university educators need to design and implement innovative best practice assessments that consider both teaching activities and learning outcomes (Bearman et al. 2017).

Nurse educators have a huge responsibility in the education of nurses such as bridging the theory-practice gap and preparing students for an effortless transition into clinical practice from being a student to a professional nurse (Billings et al. 2019; Chinembiri 2017; Mulaudzi et al. 2012). To achieve this, nurse educators need to utilize scaffold teaching and learning in a meaningful way from the new student nurse at level one to the final year student, and must ensure that each year level's learning outcomes are assessed and met (Oerman and Gaberson 2016; De Gagne and Phillips 2017; Uys and Klopper 2013) . In this regard, assessments are a means of learning and nurse educators need to design assessments to ensure that learning takes place and can be applied in practice when the graduate enters the workplace.

Insight into the responsibility of the nurse educator in higher education such as their teaching responsibilities to assist and prepare students to become professional nurses, gives more understanding of nurse educators who design theoretical assessments. An assessment is

not designed in isolation; nurse educators need to ensure that they align the assessment with the learning outcome and teaching activities. They, therefore, also have a role in designing, implementing, and judging assessment outcomes (Bearman et al. 2016).

Designing assessments

A plethora of findings points to the responsibility of the nurse educator in higher education to design assessments (Bearman et al. 2016; Chinembiri 2017; Killingsworth et al. 2015; Nayer et al. 2018). Abdalla (2013) refers to assessment as a major part of the curriculum and, as such, it is an important component of learning and teaching. An assessment validates a student's development through the programme and becomes a motivating factor for a student to learn (Elahi et al. 2016). Meanwhile, Villarroel et al. (2018) promote designing authentic assessments, especially with the paradigm change from traditional assessment methods to assessments fitting the 21st Century. Conversely, Killingsworth et al. (2015); Meyer et al. (2010); and Norton et al. (2013) acknowledge that it is not easy to design assessments due to a lack of clear guidance for assessment design. Bearman et al. (2016) agree and state that assessment design is complex.

Designing theory assessments appears to be vitally important yet complex to design, hence it is imperative that nurse educators are clearly guided on these to ensure a high standard of assessment.

The findings of the review further revealed that assessment policies and guidelines, sometimes known as a blueprint, assist educators with designing quality assessments (Chinembiri 2017). Meyer et al. (2010) found that only one out of every four tertiary institutions in New Zealand had a comprehensive assessment manual that included assessment best practices guidelines. It is expected that educators adhere to best practice assessment policies when designing assessments, however, this might not be the case (Killingsworth et al. 2015). Educators, however, have reported implementing best practices, yet the potential for bias exists due to expectations of what they believe they ought to be doing rather than using best practices in designing assessments (Bearman et al. 2016; Killingsworth et al. 2015).

There is contradicting evidence in literature regarding nurse eductators' assessment design skills. Killingsworth et al. (2015) reported that participants in their study evaluated their ability to design exam questions as moderate to very skilled in all areas, while Abdalla (2013) examined the quality of the final exam questions and found that nurse educators are, in general, not acquainted with how to design exam questions that match the NQF level. In this regard, Abdalla (2013) reported that the designing of assessments was of substandard quality.

Interestingly, the findings indicated that educators prefer assessments that are simpler to

design, implement, and grade, rather than based on educational and pedagogical merit (Elahi et al. 2016; Meyer et al. 2010). To prevent this, a few studies reported that the use of a guideline will ensure that assessments are designed with a fair representation of learning outcomes (Abdalla 2013; Nayer et al. 2018). However, it seems that educators do not make use of guidelines, as indicated by Killingsworth et al. (2015). The findings further displayed that many substandard assessments are designed if questions are not presented at the suitable NQF level (Nayer et al. 2018). An example is the Multiple-Choice Questions (MCQs) as an assessment type that is widely used (Abdalla 2013; Johannesen and Habib 2010). MCQs have all the benefits and simplify the grading process, especially when done online (Johannesen and Habib 2010). However, assessments not structured at the correct level of complexity fail to meet the criteria and standards of assessments. Literature has identified the lack of using specific guidelines to design theoretical assessments as a failure in the design of a suitable assessment.

The findings also showed that educators with a desire to be contemporary and innovative in assessment design use a measure of academic freedom found within a higher education environment (Bearman et al. 2016; Bennett et al. 2017). Assessments are, therefore, found to be diverse by design and do not always meet the criteria for effective assessments, which are fair and reliable. In this regard, the quality of assessment questions is compromised and, in some cases, substandard (Bearman et al. 2016; Bennett et al. 2017; Fives and Barnes 2017; Johannesen and Habib 2010).

Using policy and guidelines to design assessments sets boundaries to ensure that the principles of assessment are adhered to. This could provide a solution to some of the challenges that educators experience.

Challenges for the nurse educator in higher education

Nurse educators face many challenges in education practice. Challenges with transformation in learning, teaching and assessment design continue to exist, fuelled by, for example, the increased use of technology and the need to keep abreast of rapid technological advancement, the increased demand for skilled professionals in the workplace, and the increased demand for widening access to higher education (Johannesen and Habib 2010). Consequently, all the challenges and advances in education can affect the designing of assessments. The findings regarding some of the challenges that nurse educators in higher education face that influence how they design theoretical assessments are presented in the subtheme below.

Need for support

The findings revealed that educators' efficacy is correlated with years of teaching experience

and being regarded as competent (Norton et al. 2013; Ahmed 2012; Killingsworth et al. 2015). Novice educators highlighted the importance of having experienced colleagues as part of a support system (Bearman et al. 2016). The support system should include workshops with experienced colleagues. Elahi et al. (2016) affirm that there is little or no guidance available to educators on how to assess students. Norton et al. (2013) state that only after years of experience do educators become comfortable with assessment practices.

The apparent lack of support and mentoring for the new nurse educator in academia could be due to many experienced nurse educators being at retirement age, which leaves universities with novice nurse educators having to find their own way in assessment practice (Mulaudzi et al. 2012). Several authors concur that more workshops are needed for educators to increase competence and abilities, and would serve as a support structure (Meyer et al. 2010; Quesada-Serra, Rodríguez-Gómez, and Ibarra-Sáiz 2016).

Criteria and standards of assessment practices

The findings revealed that assessment design involves following criteria and maintaining standards. Standards are derived from assessment policies or guidelines that each institution has (Chinembiri 2017). Guidelines emphasize criteria applicable for designing assessments (Nayer et al. 2018). They can also provide excellent frameworks for best practice when designing assessments (Killingsworth et al. 2015). Designing assessments intended for written tests or examinations gives valuable feedback on how much students have learnt (Chinembiri 2017; Flores et al. 2015). Therefore, an assessment needs to be pitched at an appropriate NQF level and maintain a certain criterion and standard. The findings regarding the criteria and standards of assessment practices are presented in the three subthemes below.

The use of taxonomy in assessment design

The review identified that assessments at higher education should stimulate critical, reflective, and analytical thinking, which are required in nursing practice (Villarroel et al. 2018). To enhance critical thinking, clinical judgement, and reflective practice among nursing students, assessments need to be inclusive and should accommodate various levels of difficulty (Abdalla 2013; Duque and Weeks 2010; Vierula et al. 2020). Designing assessments must be set at a certain standard and follow specific criterion (Chinembiri 2017). This would necessitate the nurse educator to incorporate taxonomy levels. Abdalla (2013) and Killingsworth et al. (2015) confirmed that assessments should be designed using the level of difficulty known as taxonomy. A taxonomy aims to ensure alignment of the curriculum with instructional delivery and assessment (Oermann and Gaberson 2016). It has three domains, which include the cognitive

domain, and is an important aspect of assessment in higher education (Abdalla 2013).

The use of a taxonomy requires that the standard of questions need to be based on students' education level as per the NQF and to ensure scaffolding of learning. There are various taxonomies to aid in this practice including Bloom's Taxonomy, which classifies the six levels of cognitive ability for theoretical assessments and learning behaviour on the classification system (Duque and Weeks 2010; Vierula et al. 2020). The basic level for the classification system is the "remembering" level. The difficulty grows at every level. The criteria and standards of assessment design will, therefore, be met if the levels of difficulty and specificity are incorporated and aligned to the learning outcomes.

Using the novel methodology to design assessments incorporating guidelines, taxonomy, and alignment could ensure that a quality assessment is designed.

Alignment of assessments

The findings of this review suggested that the design of assessments should be constructively aligned to further ensure that the criteria and standards of assessments are upheld (Killingsworth et al. 2015). Likewise, Chinembiri (2017) stated that it is imperative that assessments are designed in a way that is constructively aligned to the programme learning outcomes and the associated assessment criteria. Ahmed (2012) stated that when assessments are designed and constitute pre-determined learning outcomes, they allow for a high degree of test validity. However, some authors expressed concern about aligning teaching and assessment practices and identified numerous challenges such as educators' lack of information about aligning assessments (Bearman et al. 2016; Meyer et al. 2010).

Constructive alignment is the alignment of learning and teaching practices as well as assessment tasks that directly address the intended learning outcomes that students need to achieve (Biggs 1996; Kinash, Knight, and Kordyban 2013). The constructive alignment between the programme, NQF level, and the alignment between learning outcomes and the actual assessments is key to ensuring that students meet the programme outcomes as approved by the university, Council on Higher Education and SAQA. Furthermore, the teaching methodology and learning activities should be relevant and aligned with the learning outcomes and assessment design (Ashford-Rowe et al. 2014). There should be no disparity between the message in teaching and the assessment, otherwise the assessment will not have a positive impact on student learning (Davids and Waghid 2018). Existing disparities could be due to task constraints or educators lacking the knowledge about how to align assessments. This possibly relates to the support system that nurse educators seek. Alignment potentially ensures that students who complete the programme are competent to practice.

Functional factors

The findings revealed that administrative, activity, and task constraints have an impact on educators when designing assessments causing adverse implications on the criteria and standards of assessments (Bearman et al. 2016; Meyer et al. 2010). According to Meyer et al. (2010) and Quesada-Serra et al. (2016), educators have limited time to design quality assessments due to a full academic calendar. Another challenge is the ratio of nurse educator to students (Meyer et al. 2010). While the average ratio is 1:16, class sizes have increased due to the global shortage of professional nurses. As a result, educators choose easier assessment tasks that do not necessitate a great demand of time, energy, and intellectual resources (Villarroel et al. 2018; Quesada-Serra et al. 2016). These factors hamper sound pedagogy in the designing of assessments (Meyer et al. 2010). The increase in educator to student ratios adds to the administrative workload and, as a result, educators choose the easiest assessments to design. This could be one of the reasons why assessments were found to be designed at lower taxonomy levels (Fayilane 2017; Garekwe 2010). Investigation into the functional factors gave insight into the barriers to design assessments that integrates criteria and standards in nursing best practices at HEIs. Giving precedence to activities and tasks can help to overcome these impediments. In this regard, prioritizing functions, activities, and tasks of the nurse educator can have an operational advantage in assessment design best practices in nursing at HEIs.

LIMITATIONS OF THE STUDY

The reviewers acknowledge that this scoping review is based on only 12 articles. Ongoing observation of educators' assessment practices, particularly the design of assessments needs to be persued. The search limiters such as articles published in English during the period 2010–2020 may have excluded some relevant studies. This was due to limited resources for translation services that resulted in only English language studies being included.

CONCLUSION

Although this scoping review focused on nursing assessment best practices in higher education, the review may benefit other disciplines in higher education due to the general nature of assessment design in higher education.

Recommendations for nursing education institutions

The review can be used in higher education for institutional assessment policy development, educational practice, and educational research. It has the potential to contribute to the

development of specific guidelines for designing quality assessments as well as a support framework for higher education educators. HEIs rely on assessment for student throughput and promotion purposes. To ensure quality student output and meet the global demand for quality professional nurses, educators must use well-designed assessments. The review's findings suggest that HEIs can benefit from a quality assessment design by ensuring constructive assessment alignment and improving assessment design.

Research implication for learning and teaching in nursing education in SA

The review concludes that learning and teaching must be in a constant state of reflection and change if higher education is to remain relevant to the benefit of the public. The global demand for quality professional nurses, as well as the responsibility of nurse educators to design quality assessments, make learning and teaching an essential component of a pedagogical journey. As a result, assessment best practices should be reassessed on a continuous basis in light of changes in higher education in the 21st century that may occur from societal developments.

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