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Competence-based frameworks in nursing – a concept analysis

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Abstract

Nursing is a competence-based profession, and clinical competence has been widely discussed within the nursing literature over the past three decades due to growing public demand for professional accountability. However, the concept remains nebulous and defined differently by healthcare researchers. This paper presents a concept analysis which reviews the different competence-based frameworks and its application within the nursing literature. The analysis reveals flaws in the existing assessment methods used by current nursing regulatory bodies for their licensure system and proposes a modified Miller's model for utilisation in nursing education.

1. Introduction

Nursing is a competence-based profession, and clinical competence has been widely discussed within both clinical and nursing literature over the past three decades due to public demand for professional bodies to ensure safe and high-quality care (Cant et al., 2013). As a result, professional regulatory bodies have implemented competencebased frameworks and mechanisms, such as licensure and credentialing, to evaluate the clinical competence of graduating nursing students to ensure that they have demonstrated the necessary work and professional attributes before being granted the licence to work as registered nurses in the country (Cant et al., 2013). Despite the proliferation of literature on clinical competence, the concept remains somewhat nebulous and contradictory within the nursing literature, presenting a significant challenge for one to achieve a universal consensus on its definition and operationalisation (Fida et al., 2016).

2. Methodology

This concept paper seeks to present a review of the different competence-based frameworks and its application within the nursing literature. We adapted Walker and Avant's (2011) concept analysis approach as follows: (1) identify the antecedents, attributes, and consequences of nursing competence; and (2) present a typology of cases illustrating the competence-based frameworks used for professional licensure by nursing regulatory bodies. Walker and Avant's approach was chosen because it offers a pragmatic and logical method to explore the current development, understanding and operationalising of the concept of which a variety of theories and models exist. At the end of the concept analysis, we synthesised the relevant competencebased theories and models to propose a model of utilisation for nursing education.

3. Results

A total of five electronic databases (CINAHL, PubMed, Scopus, Medline, and PsycINFO) were searched for relevant papers, and this search was conducted using a combination of exact keywords on the title and abstract. The search terms employed in this review were: 'competenc*', 'nurs*', and 'medic*'. In addition, a hand search of the reference lists and bibliographies of included papers were conducted to search for additional studies not located through electronic databases, such as the websites for nursing regulatory bodies. A total of 39 papers was retrieved for the purpose of this study. The decision-making process and the search results at each step of the course are depicted in the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) diagram (see Figure 1).



Figure 1. PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) diagram depicting literature search strategies and articles retrieval.

3.1 Antecedents, Attributes, and Consequences of Clinical Competence

3.1.1 Antecedents – the Establishment of a Competencebased Framework for Nursing Licensure

Walker and Avant (2011) define antecedents as events that precede the occurrence of the concept. Within the literature on nursing competence, an individual must first identify the issues which warrant the establishment of the competencebased frameworks for nursing licensure. Two global trends were pivotal to the growing demand for competence-based frameworks within the nursing field.

The first trend lies in nursing education when the nursing profession witnessed a transfer of nursing education from traditional hospital-based nursing schools to universities and tertiary colleges, also known collectively as higher education institutions (HEIs) during the late twentieth century (Hickerson et al., 2016). With the establishment of nursing education at the HEIs, it is assumed that these HEIs could afford greater resources, a wider knowledge repository and a greater element of self-regulated learning, thereby hastening the professional development of the nursing profession (Hickerson et al., 2016). However, this same shift in nursing education has created a gap between nursing practice and nursing education, whereby nursing students nowadays have fewer clinical attachment opportunities and exposure to acquire the necessary competence before graduation (Chen et al., 2014). As a result, Candela and Bowles (2008) reported that many nurse graduates in the U.S. felt unprepared for real clinical practice upon entering the workforce, while Hickerson et al. (2016) reported employers' concerns on the nurse graduates' calibre these days. These employers complained that the graduates were

"unfit for practice" despite having successfully completed the nursing programmes (Hickerson et al., 2016). Similarly, in the United Kingdom (UK), nurse graduates have complained that they had encountered difficulties during their transition to actual clinical workplace, resulting in many of them being disillusioned with their practice (Monaghan, 2015). Several researchers have cautioned that incompetent nurses could pose greater risks to patient safety and other colleagues' work, as well as incur higher medical errors and healthcare costs for the organisations (Chen et al. 2014; Hickerson et al., 2016).

The second trend pivotal to the proliferation of competencebased frameworks lies with the nursing regulatory bodies and healthcare institutions. Due to concerns on the widening theory-to-practice gap, government bodies and healthcare organisations have instituted licensure systems on many professions, such as medicine, law, and nursing (Dent & Harden, 2013; Institute of Medicine, 2011). In this regard, competence-based frameworks are being used by professional regulatory bodies to guide curriculum, define standards in practice, and establish licensing and certification mechanisms, which are used to judge whether an individual has achieved the necessary ability to practice (Oermann & Gaberson, 2014). Individuals wanting to work in government-regulated occupations, such as medicine and nursing, must first demonstrate that they have mastered the necessary skills and knowledge associated with the job scope and then apply for professional registration with the relevant regulatory bodies before they could practice locally (Dent & Harden, 2013).

3.1.2 Attributes of Competence

McClelland, an American organisational psychologist, popularised the term competence during the 1970s by criticising traditional assessments, which focused heavily on intellectual attainment, rather than work-related competence (Cowan et al., 2007). Since then, there has been considerable interest in the conceptual definition of competence and the operationalisation of its measurement. Unlike clinical biodata which are highly quantifiable, clinical competence is an abstract construct which comprises different attributes, making it difficult to operationalise and measure. Based on the contributions by several researchers (Cowan et al., 2007; Fida et al., 2016; Fukada, 2018; Garside & Nhemachena, 2012; Pijl-Zieber et al., 2014; Potgieter & Van der Merwe, 2002; Smith, 2012; Valloze, 2009), we have outlined the three main approaches in the conceptualisation of competence within the nursing literature (Table 1).

a) Behaviourist Approach

The first approach is a behaviourist approach, which focuses on discrete skills associated with individual task completion (Fukada, 2018; Potgieter & Van der Merwe, 2002; Smith, 2012). The behaviourist approach defines competence as competency, which comprises three domains, knowledge, skills and attitudes (KSA; Smith, 2012). A popular competency model, which embraces the behaviourist approach, is the Iceberg Model by Spencer and Spencer (2008). The Iceberg Model defines five main competencies or underlying characteristics as the basic features for performance at work. These five competencies are skills, knowledge, traits, self-concept, and motives, which are classified into either visible or hidden competencies. They use the iceberg analogy to depict their model, stating that the bulk of individual performance is hidden under the waterline and only a small portion, the tip, is visible and readily observed and measured. The Iceberg Model reflects a behaviourist approach and postulates that visible competencies, such as knowledge and skills, can be easily operationalised and assessed by existing assessment methods, such as checklist and theory tests. However, the 'submerged' attributes are innate characteristics, which are not easily observed. Hence, researchers would need to develop new assessment methods to measure these constructs effectively.

b) Holistic Approach

The second approach is a holistic/generic approach, which regards competence as a broad and interrelated set of one's overall abilities and competency, which enables a practitioner to fulfil one's work. The holistic approach seeks to cluster the individual competence attributes into several broad competence statements which are regarded as essential for effective work performance and could be applicable across diverse workplace settings (Garside & Nhemachena, 2012). This approach was popular within the clinical literature because it does not simply view competence as a mere construct of a KSA domain alone, but includes broader attributes of an individual, such as motives, personal factors and experiences (Pijl-Zieber et al., 2014). Lenburg's (1999) Competency Outcomes and Performance Assessment (COPA) model is an example of a holistic approach to the conceptualisation of competence. The COPA model outlines eight core domains which identify the types of attributes nurses should be demonstrating within the actual workplace setting – assessment and intervention skills, communication skills, critical thinking skills, human caring and relationship skills, management skills, leadership skills, teaching skills, and knowledge integration skills. However, Potgieter and Van der Merwe (2002) stated that the holistic approach disregards the contextual variations in different workplace settings and simply assumes that these domains are applicable across all workplace situations.

c) Normative Approach

The third approach is a normative approach. It shares similar views with the second, generic approach by viewing competence as attributes and ability of an individual worker to combine all work competencies to perform one's role effectively. However, it also focuses on how these general attributes are contextualised to specific work environments or circumstances (Garside & Nhemachena, 2012). The normative approach views *competence* as a competence-performance continuum which changes over time in one's course of work. These competencies are divided into different levels to differentiate superior from average performance (Potgieter & Van der Merwe, 2002). An illustration of a theory which adopts the normative approach is Benner et al.'s (2009) 'novice-to-expert' theory which is a five-stage proficiency development process that a nurse would undergo to achieve competence/expertise – novice, advanced beginner, competent, proficient, and expert. Benner's theory has advanced the field of nursing education, and many nurse researchers have built on her theory to develop competence-based assessment instruments such as the Nurse Competence Scale and Self-Evaluated Core Competencies Scale (Yanhua & Watson, 2011).

Approach Category	Conceptualisation of competence	Methods / Instruments	Advantages	Disadvantages
Behaviourist	Competence defined as knowledge, skills, and attitudes (KSA) domains Used interchangeably with the term "competency"	Checklists	Focus on demonstration of skills or tasks Easy to operationalise and measure construct	 Reductionist Disregard other important components of competence (e.g. communications, motivation, and critical thinking)
Holistic	Broad clusters of general attributes essential for work performance	Performance- based tools (e.g. Multisource 360° feedback)	Focus on individual attributes which are highly relevant to effective work performance Encompass a wide repertoire of attributes Applicable across diverse settings	Hard to measure construct Measurement instruments highly subjective and qualitative in nature Need for assessor to observe over extended period to obtain accurate and fair evaluation
Normative	Applications of general attributes to the specific workplace setting Differentiation of different levels of performance along a continuum	Global rating scales	Encompass a wide repertoire of attributes Views competence as a developing concept Relevant to workplace outcomes	Hard to measure compared to behaviourist approach Newly-developed instruments require validation and might be limited in terms of generalisation

Table 1: Three main approaches to competence conceptualisation (sources: Cowan et al., 2007; Fida et al., 2016; Fukada, 2018; Garside & Nhemachena, 2012; Pijl-Zieber et al., 2014; Potgieter & Van der Merwe, 2002; Smith, 2012; Valloze, 2009).

3.1.3 Consequences

Consequences are events that occur as a result of a concept and can often stimulate new ideas or avenues for research pertaining to certain concepts (Walker & Avant, 2011). In our case, considerable interest has been generated in developing different methods to assess clinical competence. The purposes of assessment are many and varied, e.g. for academic progression, licensure with a professional body, professional certifications or career and professional development (Oermann & Gaberson, 2014). Based on the clinical education works by several authors (Boursicot et al., 2011; Dent & Harden, 2013; Norcini et al., 2011; Oermann & Gaberson, 2014; Reinert, 2013; Schuwirth & Van Der Vleuten, 2019; Yanhua & Watson, 2011), we have synthesised and presented a list of assessment methods currently used in clinical education (Table 2).

3.2 Typology of Cases Illustrating the Different Types of Competence-Based Frameworks Used for Nursing Education and Licensure.

Using Walker and Avant's (2011) case typology, this section illustrates the three types of competence-based frameworks which are adopted by the nursing regulatory bodies around the world to evaluate nurse graduates' clinical

S/No.	Assessment methods	Domains	Nature of standard					
Traditional assessment methods								
1.	 Written examination Multiple-choice questions (MCQs) Short-answer questions (SAQs) / Essay questions Written assignments 	Knowledge (includes critical thinking)	Objective					
2.	Oral examination / Viva voce Presentation Projects	Knowledge (includes critical thinking)	Subjective					
3.	Practical skills examination Usually involves checklist 	Skills	Objective / Subjective					
Contemporary competence-based assessment methods								
4.	Simulation	Knowledge, skills & attitudes	Subjective					
5.	Portfolio	Knowledge, skills & attitudes	Subjective					
6.	Clinical observations Mini-CEX (mini-clinical evaluation exercise) Directly observed procedures Performance review report (self- assessment or tutor) Student logbook	Knowledge, skills & attitudes	Subjective / Objective					
7.	Objective structured clinical examination	Knowledge, skills & attitudes	Objective					

Table 2: Assessment methods used in Clinical Education (sources: Boursicot et al., 2011; Dent & Harden, 2013; Norcini et al., 2011; Oermann & Gaberson, 2014; Reinert, 2013; Schuwirth & Van Der Vleuten, 2019; Yanhua & Watson, 2011).

competence for professional licensure. Walker and Avant's (2011) case typology illustrates the different categories of actual phenomena, that by their existence or presence, demonstrate the occurrence of the concept itself – *contrary, borderline,* and *model* cases.

3.2.1 A Contrary Case

A contrary case is one in which none of the defining attributes are met or a case that is "not the concept" (Walker & Avant, 2011). The first nursing regulatory framework illustrates a contrary case, which involves merely a verification of educational qualifications as proof of successful completion of an approved nursing programme. This system of verification of a nurse graduate's competence is common in the UK and Singapore, where there is no national licensure examination. The professional regulatory bodies from these two countries adopt the assumption that a graduate is competent once he or she has successfully completed an approved nursing programme (Nursing & Midwifery Council, 2015; Singapore Nursing Board, 2016). Bradshaw and Merriman (2008) have criticised this laisse-faire approach, which delegates the responsibilities of evaluating graduating students' clinical competence to the nursing schools. They observed the wide variations in assessment standards among the nursing schools and cautioned that this system has produced many "knowledgeable" nurses, that were, however, found to be "unfit for practice" or had difficulties adjusting to the real workplace setting (Bradshaw & Merriman, 2008).

3.2.2 A Borderline Case

A borderline case is an example of a case in which some, but not all, defining attributes of the concept are demonstrated (Walker & Avant, 2011). Borderline cases are inconsistent in some way with one or more of the defining attributes of the concept. One example of a borderline case is the U.S. nursing regulatory framework, which involves implementing a national licensure examination to verify clinical competence for nurse graduates (National Council of State Boards of Nursing, 2016). A graduate from a nationally-approved nursing school is required to pass the National Council Licensure Examination-Registered Nurse (NCLEX-RN), a theory-based examination, before he or she can register with the state nursing boards (National Council of State Boards of Nursing, 2016) (Figure 1). New Zealand and Malaysia have also chosen to implement a national licensure theory examination to assess their nursing graduates' clinical competence (Nursing Council of New Zealand, 2012; Nursing Division Malaysia, 2015).

Another example of a borderline case is the Australian nursing regulatory framework, which requires a submission of a professional work portfolio as proof of the attainment of clinical competence (Australian Nursing and Midwifery Accreditation Council (ANMAC), 2012). The ANMAC has mandated that all Australian nursing schools implement a competence-based assessment system, requiring every nursing student to document and compile one's attainment of nursing competencies in accordance with the ANMAC nursing competency standards in a professional portfolio (Australian Nursing and Midwifery Accreditation Council, 2012). In order to qualify as registered nurses in Australia, applicants must submit a professional portfolio as proof of acquisition of clinical competence prior to registration with the body (Nursing and Midwifery Board of Australia, 2010) (Figure 2).

The borderline cases illustrate several flaws in the existing assessment methods used by current nursing regulatory bodies for their licensure. Critics viewed the use of theorybased examination as reductionist because it mainly assesses the cognitive domain of competence, while a portfolio is subjected to inconsistency in presentation structure and examiners' grading, making it difficult for assessment standardisation and objectivity (Bradshaw & Merriman, 2008; Miller & Archer, 2010).



Figure 2. Three Main Approaches to Competence-Based Frameworks for Nursing Licensure.

3.2.3 A Model Case

A model case provides an example of the concept that

demonstrates all defining attributes of the concept, or a pure exemplar (Walker & Avant, 2011). Unfortunately, the previous two cases illustrate the inadequacies in the existing competence-based frameworks used by the nursing regulatory bodies to measure clinical competence in a holistic, consistent, and objective manner. Clinical competence requires not only a foundation of medical knowledge, but also the application of clinical skills and professional attributes to the actual workplace setting (Van der Vleuten & Schuwirth, 2005). The model cases can be inferred from the licensure frameworks used by the medical regulatory bodies, such as the U.S. Medical Licensing Examination (USMLE) and Canadian Medical Licensing Examination. These bodies have incorporated the objective structured clinical examination (OSCE), one of the contemporary assessment methods, to evaluate clinical skills for their medical graduates for licensure purposes (Miller & Archer, 2010). The original 16-station OSCE design was developed by Dr. Ronald Harden in Scotland in 1975 as an objective and standardised method to evaluate different components of clinical competence required of medical graduates (Dent & Harden, 2013). Since its introduction in 1975, the OSCE has gained widespread popularity, and it has been utilised extensively by medical and nursing education in over 50 countries (Patrício et al., 2013; Goh et al., 2019). In recent years, the OSCE has also been extended to postgraduate schools to evaluate candidates enrolled in medical specialisation programmes, such as paediatrics, psychiatry, and obstetrics and gynaecology (Goh et al., 2019; Patrício et al., 2013).

4. Discussion

This paper sought to explore the concept of competence within the nursing field. A literature review revealed a lack of consensus on the conceptualisation of competence among nursing scholars (Garside & Nhemachena, 2012). Smith (2012) argued that any attempt to unify the 'competence' term could be futile and potentially add to the confusion due to the heterogeneity in nursing workplace settings and practices. Instead, he suggested that any attempt to conceptualise the term should be substantiated by the underpinning theoretical approach used. This paper has contributed to the literature by classifying the different approaches into three main categories based on their commonalities in the theoretical lenses and assumptions. We found that most nursing scholars and regulators have chosen either one of the three approaches as the basis for their competence-based frameworks (Fahy et al., 2011).

Our concept analysis has also explored the different types of competence-based frameworks used by nursing regulatory bodies for professional licensure. Based on the case examples, we highlighted the inadequacies in the theory examination or portfolio currently used by nursing regulatory bodies to evaluate clinical competence (Bradshaw & Merriman, 2008; Miller & Archer, 2010). It is well-documented that traditional forms of assessment, such as written tests, assignments, or oral questioning alone, have failed to adequately capture clinical competence (Dent & Harden, 2013). A critical review of the literature reveals an urgent need for the nursing regulatory bodies worldwide to reconsider the issue of robustness in their licensure examinations and implement an appropriate competence-based assessment method to evaluate their nurse graduates' fitness for practice.

4.1 Miller's Pyramid of Clinical Competence

Competence-based models and theories, therefore, provide a theoretical framework or basis for researchers and practitioners to build and establish sector-specific competence and assessment framework for the different professions and occupations (Modi et al., 2015). In nursing, several models which are commonly used within the literature, include Lenburg's Competency Outcome Performance Assessment (COPA) Model (Lenburg et al., 2011), Miller's (1990) pyramid of competence, Spencer and Spencer's (2008) Iceberg Model, and Patricia Benner's 'novice-to-expert' theory (Benner et al., 2009). Among the different competence has made important contributions to the literature on competence-based assessment and was used extensively by researchers.

In 1990, Miller published a journal article in medical education to propose a four-level pyramid framework to guide competence-based assessment for medical education (Miller, 1990). Miller designated the four levels as 'knows', 'knows how', 'shows how', and 'does'. The lowest level of measurement - 'knows', which measures knowledge, is usually assessed using two common formats of cognitive testing, such as multiple-choice questions (MCQs) and short answer questions (SAQs). The second level - 'knows how', which measures the application of knowledge, is assessed using skills tests, case presentations, and written essays (Dent & Harden, 2013). The third level - 'shows how', which measures the clinical competence, is assessed using direct observation of the performance of clinical tasks within a simulated work environment. The fourth level - 'does', measures work performance, whether the individual can function independently within the real clinical workplace (Dent & Harden, 2013). This level is assessed using multiple assessment methods, such as mini-clinical evaluation exercise (mini-CEX) and 360-degree feedback, within the actual workplace context over an extended period.

4.2 Proposed Modified Miller's Model for Utilisation in Nursing Education

As Miller has not revised his model since 1990 to account for the influences of covert attributes and workplace circumstances on competence and work performance, this paper proposed a modified Miller's model for utilisation in nursing education based on our concept analysis (Figure 3). First, the model has inverted the Miller's pyramid to illustrate the complexity and need in measuring an increasing number of attributes, which form the composite of higher competence levels as one moves towards evaluating workplace performance. Additionally, the model has presented the individual attributes which form the different competence levels within the pyramid. Several researchers have advocated the perspectives of *workplace performance* and *competence* as composite constructs, which comprise of multiple attributes and are unique to each profession and workplace setting (Boursicot et al., 2011; Norcini et al., 2011; Reinert, 2013; Schuwirth & Van der Vleuten, 2019). Based on Figure 3, competence is a composite construct of three competency domains: knowledge, skills, and professional attributes while work performance is a highly complex construct, which is influenced not only by competence alone, but also workplace settings (environment, mentor, workplace standards and outcomes etc.), and individual factors (work motivations and personal values). For example, OSCE should be utilised if an institution wanted to evaluate if a final-year graduating nursing student is clinically ready to graduate from the nursing programme. It is hoped that this modified model will allow the continuation of the use of the available assessment tools with added clarity about the context or environment in which the competence and performance are being assessed.

Second, the proposed model adopts a normative approach by regarding competence as part of a learning or development continuum, rather than an end-point construct. Recent evidences have suggested work performance and competence as evolving and dynamic concepts, which could make their measurement highly complex and difficult for evaluation (Boursicot et al., 2011; Khan & Ramachandran, 2012). Additionally, existing assessment methods were reported to be limited in capturing the entire construct of competence over extended periods (Norcini et al., 2011). Therefore, Schuwirth and Van der Vleuten (2019) advocate the use of a programmatic approach involving multiple assessment methods, assessors and prolonged evaluation duration to determine if performance standards are met or not. For example, MCQ grades could be triangulated with an OSCE performance to draw meaningful conclusions on the examinee's progress in a domain of performance. It is hoped that the flexibility in the modified model will allow future researchers to combine existing assessment methods or develop a new tool to adequately capture all composite attributes for the intended competence level.



Figure 3: Proposed Model for Competence-based Assessment Framework for Nursing Education in Singapore (sources: Miller's (1990) Pyramid of Clinical Competence; Spencer and Spencer's (2008) Iceberg Model). Note: OSCE = Objective structured clinical examination; Mini-CEX = mini clinical evaluation exam; KSA = knowledge, skills, attitudes; MCQs = multiple-choice questions.

5. Conclusion

In conclusion, this paper explored the antecedents, attributes, and consequences of competence. Although the concept remains nebulous, the approaches to its conceptualisation can be categorised into three main approaches - behaviourist, holistic and normative. The concept analysis highlights the need for nursing regulatory bodies to reconsider the issue of robustness in their licensure examinations and we propose a modified Miller's model as an appropriate framework for nursing education in Singapore. In this model, clinical competence is viewed as a composite construct which should integrate the individual's KSA with other factors, such as one's traits (values and motivation) and workplace circumstances. As the concept varies according to specific workplace settings, this concept remains dynamic and would require the validation and operationalisation using an appropriate approach.

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