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Evaluation of a Tool for Assessing Clinical Competence of Msc Nurse Students

*Margaret Chege[1] Peter Mwaniki [2] Timothy Abuya [3]
1. PhD student, Mount Kenya University
2. Jomo Kenyatta University of Agriculture &Technology
3. Population Council
* E-mail of the corresponding author: ngathas@gmail.com

Abstract
This paper reports the first of a four phase study whose aim is to develop and validate an instrument for assessing the clinical competence of Master of Science (Msc) - medical-surgical nurse students.
The objective of the first phase of the study was to evaluate the existing instrument, currently being used for assessing clinical competence of MSc nurse students pursuing medical/surgical specialty. It also explores ideas and content for the development of a new tool.
The target population was nurse educators and nurse clinicians with a minimum of MSc-Medical/surgical nursing. Twenty seven (27) participants who participated in this study were drawn from eight (8) of Kenya's recognized universities offering nursing training. The participants had been involved in the training of undergraduate and post-graduate nurse students for a minimum of two (2) years. The aim was to capture participants with current knowledge in nursing practice and those who are familiar with emerging issues in nursing education and practice. Qualitative and quantitative research approaches were used. Data were analyzed using SPSS version 17. The study findings showed that the tool has a low average congruency percentage at 60%. Only seven (20.6%) out of 34 items/competencies demonstrated the minimum content validity index (CVI) of 0.78 (Lynn, 1986). This calls for urgent revision of the tool specifically in terms of adding some performance competencies and probably deleting others.
Keywords: Instrument evaluation, Clinical competence, Clinical competence assessment instrument, Content evidence, Average Congruency Percentage

1. Background information

Internationally, nursing education has evolved rapidly since introduction of baccalaureate nursing training in universities. In common with other settings, a lot of changes in nursing education have been witnessed in Kenya during the last fifteen years or so. Apart from introduction of nursing curricula at undergraduate level in several Kenyan universities during this period, the first ever post-graduate medical-surgical nursing training was launched at the University of Nairobi in 2004. At the same time, the nursing profession in Kenya was struggling to shift from the traditional method of nurse training to innovative methods to ensure high level of competence in practice and education **(**Rakuom, 2010). These changes have served both as a response to advocacy and a means of ensuring better patient care (Bruden & Gibbs, 2002). To determine adequacy of training programmes such as the MSc – medical surgical nursing course in addressing gaps in patient care, formal assessments of clinical competence are critical and constitute part of the educational challenges in establishing new clinical programmes.

In light of the recent innovations in nursing training in Kenya, such as e-learning and skill lab methodology, assessing clinical competence among nurses trained in the newly introduced specialties is of major importance. According to EdCAN (2008) assessment of clinical competence is faced by many challenges such as inadequate preparation of the individual being assessed and of the assessor.
In more recent nursing studies, the issue of competence has been explored in different ways. It is generally accepted that nursing competence is based on clinical reasoning which includes clinical decision making, critical thinking, global grasp of the situation (Heller et al., 2011) and dynamic practice that incorporates application of high level knowledge and skills among others. Measuring competence through performance is therefore necessary for determining ability, readiness and quality of workers produced by a training programme and can be a prediction of the quality of health services to be offered.
In 2004 the University of Nairobi's School of Nursing Sciences (SONS) was the only institution offering postgraduate medical-surgical nursing course in Kenya and understandably the institution unilaterally developed an assessment tool for clinical competence in this area. This is the tool under evaluation and consists of six (6) domains stated as "Conducts assessment of patient and gives report", "Draws a comprehensive plan of action", "Execution of management using the drawn plan of intervention" "Candidates characteristics as applied to

client/patient" "Candidates characteristics as applied to interaction with other members of staff" and lastly "Oral examination". The tool has a pool of 34 competency items.

According to van Der Vleuten & Schurwith (2005) assessment in medical education addresses complex competencies and as such requires quantitative and qualitative information from different sources as well as professional judgment. The scholars further explain that adequate sampling across judges and tool contents can ensure the validity and reliability of a tool.. Such procedures ensure an assessment tool measures the construct it is designed to measure and does so accurately. Such a tool forms the basis for facilitating the quality of student learning in the clinical area and protection of the clients from harm. Separately, public safety is forcing professions to confront issues of competence critically and more so for those in highly specialized disciplines (Byrne & Waters, 2007). The MSc – medical-surgical nurse graduates are deployed in such areas. They are expected to respond competently to complex health care needs of the clients. They are also expected to expand nursing faculty and redesign nursing education in Kenya. The MSc-medical-nurse graduates are trained to undertake complex procedures, such as endotracheal intubation, prescription, wound closure, manual vacuum aspiration, insertion of Norplant, prescribing and administering oxytocin**,** which have been the preserve of doctors (Rakuom, 2010). To ensure that medical-surgical specialists are equipped to handle the current demands of their jobs, a valid, reliable tool for assessment of clinical competence at exit from training is vital. Without clear standards for the demonstration of this important aspect, a patient's safety could be at risk.

Lofmark &Thorell – Ekstrand (2004) imply that after an assessment tool has been in use for some years, it should be revised. This is because many changes in theory and practice occur over time. These changes influence clinical competence (Chege et al., 2009). Despite the existence of MSc – medical - surgical nursing programme for nearly 10 years in Kenya, no research has been conducted to establish the validity and reliability of the clinical competence assessment tool. There are rapid changes in nursing education and practice such as rapid evolving technology, changes in nursing roles and consumer awareness. Such changes demand development of assessments within context of curricula change. When standards of acceptable performance are clearly defined by regulatory bodies such as the Nursing Council of Kenya, then the society holds trainers and practitioners fully accountable when performance is unacceptable. If educators fail to ensure that the assessment tools measure what they are designed to measure, thus identifying the competent and incompetent practitioners, then improper decisions about the student may be made. The patient may be hurt (Epstein, 2007) and the future of caregiver put in jeopardy.

1.1 Methodology

The goal of this phase of the study was to evaluate and to explore issues including ideas for developing and validating a tool that would be the new standard for assessing clinical competence of MSc – Medical-surgical student nurses. Twenty seven (27) experts drawn from eight universities across Kenya were surveyed to collect content evidence. Among these 5(18.5%) were specialists in Medical-surgical nursing, 12(44.4%) in Critical Care nursing, 8(29.6%) in Paediatric nursing and 2(7.4%) in Mental health and Psychiatric nursing. The Letters of request to participate in the study were sent to the experts. The principles outlined in the Helsinki Declaration were followed. Ethical approval for research was obtained from the joint Kenyatta National Hospital and University of Nairobi Ethics and Research Committee and Ministry of Higher Education, Science and Technology. The Director of School of Nursing Sciences, University of Nairobi also provided institutional approval for the study. The subjects were not coerced to participate in the study. Traceable personal identifiers were removed from the data to ensure anonymity and data were treated with confidentiality.

The initial version of the assessment tool consisted of thirty four items (34) across six (6) domains. Experts started by deciding whether the current tool was adequate in content and if not, what domains and competencies were lacking. During this first round of the Delphi study the experts were asked to examine the items on the tool under study and determine if the domains and items present were representative of the construct being measured. The questionnaire asked participants two questions addressing each domain and item:

a) Do you agree that the following domains and items/competencies should be included in the tool for the assessment of clinical competence of MSc-medical-surgical nurse students?
b) Do you feel more domains or items need to be added? Write down the domains and items which need to be added in the space provided, giving reasons for your suggestion (s). These questions were however restructured after pre-testing to read:

1. To what extent do you agree or disagree that the following domains and competencies should be included in the tool for the assessment of clinical competence of MSc -medical- surgical nurse students at exit from the course?

2. Do you suggest addition of more domains or items? [Yes] [No]. If "yes" which ones? Please indicate in the pace provided, giving reasons for your response(s).

The participants were to indicate their agreement on the acceptance of an item/competency on a 4-point scale: 1 = strongly disagree, 2 = disagree, 3 = agree and 4 = strongly agree. This 4-point scale was chosen to ensure a focused decision rather than a neutral response. The questionnaire also asked the participants to freely add to the content of the tool, any domains and/or items which they thought were missing. Hence, after every set of domain and its items/competencies, there was a space for comments. For example domain 1 "Conduct assessment of patient and give report" had four items stated as: "empathy, response to patient's needs, respects patient and confidentiality".

1.1.2 Data Analysis

Data analysis was conducted using SPSS version 17. Basic sample characteristics were summarized and presented using descriptive statistics including means, standard deviation (SD) and frequency tabulations. Two indices namely individual content validity index (I-CVI) and content validity index for scale (S-CVI) were calculated to determine item relevance. An I-CVI was computed for each of the thirty four items in the assessment tool while an average S-CVI was calculated for each of the six domains. I-CVI, a measure of content validity was calculated by collapsing the experts' four-point ordinal responses into two levels – agree and disagree and computing the proportion of experts who rated an item as relevant. The S-CVI was calculated as the proportion of items within each domain given a rating of **relevance** by all experts. Finally, Cronbach alpha was calculated to determine the internal consistency of the assessment tool.

1.2 Results and Discussion

1.2.1 Characteristics of participants

A total of twenty seven participants were recruited during this first round. The average age of the panelist was 42. ± 6.3 and ranged 35 to 57 years.

Table 1: Demographic Characteristics of the participants

	Number	Percent %
Gender		
Male	12	44.4
Female	15	55.6
Institutional affiliation		
Public University	24	89
Private University	3	11.1
Academic qualification		
Master's degree	25	92.6
PhD degree	2	7.4
Area of specialization		
Medical surgical	5	18.5
Critical care nursing	12	44.4
Paediatric nursing	8	29.6
Mental Health & Psychiatry	2	7.4
Primary responsibilities		
Nurse educator	20	74.1
Nurse clinician	7	25.9

Designation		
Assistant lecturer	7	25.9
Lecturer	12	44.4
Senior lecturer	1	3.7
Senior nursing officer	7	25.9

Table 1 above shows that fifteen (55.6%) of the panelists were female and 24 (89%) were based in public universities and were mostly (92.3%) holders of master's degree qualification. Approximately three quarters (74.1%) of participants were nurse educators drawn from various specialties including paediatrics, critical care nursing, medical- surgical and mental health and psychiatric nursing. Their experience in the training of BSc nursing ranged from 2 to 21 years.

1.2.2 Rating of the current MSC clinical assessment tool by domain and items

The analysis of nurse experts rating of the items contained in the MSc- clinical assessment tool is presented according to tool's domains.

Table 2: Cronbach alpha by tool domains

No.	Domains	Cronbach alpha
1	Assessment of patient	0.84
2	Comprehensive plan of action	0.86
3	Execution of management using the drawn plan for intervention	0.94
4	Candidates' characteristics as applied to client/patient	0.76
5	Candidates' characteristics as applied to interaction with other members of staff	0.83
6	Oral examination	0.63

Table 2 above shows the Cronbach alpha of each of the tool 's domains. The Average Congruency Percentage (ACP) for all the 34 items contained in the tool was 60%. Content Validity Index (CVI) for the six individual domains ranged from 0.43 to 0.72 with domain- specific Cronbach alpha values being between 0.63 and 0.94.

1.2.3 Domain 1: Conducts assessment of patient and give report

Twenty-one (77.9%) of panelists felt that the domain's name did not match the four items within it and suggested that it should be renamed "health assessment of the patient" and contain two sub domains namely, history taking and physical examination. Further 18 (66.7%) participants suggested that the part of the domain "give report" should instead be an item/competency under a new domain "documentation" which was lacking in the tool. Sixteen (59.3%) participants suggested that the student should be assessed on application of Gordon's Functional Health Pattern in patient assessment.

Table 3: The I-CVI of Items in domain 1: Conduct assessment of patient and give report

	Items/competencies	Agree, n (%)	Disagree, n (%)	I-CVI	S-CVI/ Ave
1	Empathy	7(25.9)	20(74.1)	0.26	0.43
2	Response to patient needs	13(50.0)	13(50.0)	0.50	
3	Respect for patients	14(51.8)	13(48.2)	0.52	
4	Confidentiality	11(42.3)	15(57.7)	0.42	

From table 3 above, majority 21 (74.1%) of experts felt that the first item "empathy" was difficult to assess and that it should be incorporated in a domain "professional conduct". Agreement on the relevance of this item was a correspondingly low among the panelists (I-CVI = 0.26). Similarly panelists felt that confidentiality was difficult to assess. At least 14 (51.9%) of the participants indicated that response to patient needs though an important competency, was not relevant in the domain.

1.2.4 Domain 2: Comprehensive plan of action

Table 4: Participant's perception of relevance of items in domain 2: - Drawing comprehensive plan of action)

	Items/competencies	Agree, n (%)	Disagree, n (%)	I-CVI	S-CVI/ Ave
1	Nursing care plan	18(66.7)	9(33.3)	0.67	
2	Nursing diagnoses	17(63)	10(37.0)	0.63.	
3	Intervention	24(89)	3(11.1)	0.89	0.72
4	Scientific rationale	15(55.6)	12(44.4)	0.56	
5	Evaluation	22(84.6)	4(15.4)	0.85	

Table 4 above shows that, there was strong agreement among panelists regarding the relevance of two aspects of nursing care planning namely, intervention and evaluation, as content of the assessment tool. The two had I-CVI values 0.89 and 0.85 respectively. Many 14(51.9%) of the participants felt that the student should be assessed on the ability to draw a Concept Map as a pre-requisite for nursing care plan and that it should be included as a domain in the **tool.**

1.2.5 Domain 3: Execution of management using the drawn plan for intervention

The panelists 24 (89%) indicated that the domain was poorly structured and that it should be named "execution of a specified procedure".

Table 5: Participants' perception of relevance of items in Domain 3:- Execution of management using the drawn plan for intervention.

	Items/competencies	Agree, n (%)	Disagree, n (%)	I-CVI	S-CVI/ Ave
1	**Preparation of:**				
	a) Environment	11(40.7)	16(59.3)	0.41	
	b) Self	19(70.4)	8(29. 6)	0.70	
	c) Assistant	8(29.6)	19(70.4)	0.30	0.63
	d) Patient	17(63)	10(37)	0.63	
	e) Equipment	19(70.4)	8(29.6)	0.70	
2	**Procedure: -**				
	a) Procedure steps	13(48.2)	14(52)	0.48	
	b) Response to patients' needs	19(76.0)	6(24.0)	0.76	
	c) Patient's safety	20(80.0)	5(20.0)	0.80	
3	**Post Procedure Care:-**				
	a) Patient comfort	18(66.7)	9(33.3)	0.67	
	b) Communication with patient	18(72.0)	7(28.0)	0.72	
	c) Patient support	18(72.0)	7(28.0)	0.72	
4	**Recording/Documentation**	24(89)	3(11.1)	0.89	
5	**Clearance/Disposal**	11(44.0)	14(56.0)	0.44	

From table 5 above, majority (70.4%) expressed that the items in "execution of management using the drawn plan for intervention" domain were misplaced and that the whole domain needed to be reorganized. An example of a misplaced item was "responds to patient's needs" of which 16 (59.3%) of the participants recommended should be in a domain "professional conduct". The item "ensuring patient's safety" in the domain was an important consideration for participants as indicated by the I-CVI of 0.80, while "preparation of the assistant had the lowest I-CVI of 0.30.

1.2.6 Domain 4: Candidate's characteristics as applied to client/patient

Among the four candidate characteristics contained in the domain, only "respect towards the patient" had acceptable content validity index (I-CVI = 0.89). On commenting about the domain and the items, all (100%)

stated that the items:- "empathy" (I-CVI=0.67), "responds to patient's needs" (I-CVI = 0. 63) and "showing respect towards the patient", should be under a new domain "professional conduct".

1.2.7 Domain 5: Candidate's characteristics as applied to interaction with other members of Staff

This domain had five items. "Ability to Communicate with colleagues" (I-CVI = 0.80) "prompt in decision making" (I-CVI = 0.80) and "appreciation of teamwork" (I-CVI=0.80) were reported as important characteristics to be considered in the assessment of clinical competence. Being spontaneous was considered as not important by 18 (69.2%) of the respondents.

1.2.8 Domain 6: Oral Examination

The participants indicated that, during oral examination it is vital for a candidate to justify the use of the nursing theory/model she/he applied in the care of the identified patient (I-CVI = 0.85). More than one-half of participants 14(52%) considered it relevant to identify teams involved in the management of the patient while majority 19(70.4%) indicated that explanation of patient-referral systems was not relevant (I-CVI = 0.30).
Lastly, panelists suggested several domains and items as potential additions to the oral domain:- medical/surgical nurse scope of practice (17 = 63%), explaining rationale for the patient therapeutic interventions (20 = 74.1%), interpretation of laboratory and radiologic tests (19 = 70.4%) and determination of health educational needs of patient/family (22 = 81.5%). Fifteen (55.6%) suggested inclusion of a domain "critical thinking" and 17(63%) suggested a new domain, "self-assessment".

1. 3 Discussion

At least 80% agreement was achieved among four domains, patient assessment, comprehensive plan of action, execution of plan for intervention and candidate's characteristics. This is however lower than the recommended 90% (Waltz et al., 2005). All (100%) of the participants, suggested reorganization of these domains to ensure clarity; other new domains were suggested meaning the content of the tool was viewed as inadequate and supporting the low Average Congruency Percentage (ACP) of 60%.
Although the difference between "agree and strongly agree" may seem subtle, it must have had a dynamic impact. This is because although all 34 items in the initial version of the tool were theoretically relevant and equally important for the overall purpose of the assessment of clinical competence, many of them did not perform well under psychometric testing. Others, though important in the overall clinical competence of the MSc – medical-surgical nurse student, they were placed in the wrong domain and so rated very low. In total 17(50%) items were rated low and among them "empathy" was rejected by 20(74.1%) of the participants while confidentiality and referral were rejected by 19(70.4%) participants each. Spontaneity was rated low by 18(66.70%) of the participants. No competency item demonstrated a 100% level of agreement. Those which had the highest level of agreement were intervention and recording 89% each. Evaluation of intervention and application of a nursing model were acceptable to 85% of the respondents. This supports the urgent need for an objective evaluation tool. These results alone could profoundly impact on the way MSc – medical-surgical student nurses are prepared and assessed bearing in mind the many changes suggested by the experts. For example the suggestion of inclusion of Concept Mapping by half of the participants, if incorporated in the tool will ensure that the student's clinical reasoning is assessed. Other domains suggested for inclusion in the tool are communication and critical thinking. These two are major curriculum and instruction core outcome indicators that must be defined and described in terms of observable behaviour and characteristics of students. However critical thinking being a complex construct which includes skills and disposition as well as metacognition would present challenges to the assessors (Bensel & Murtagh, undated). Effective communication is necessary in creating an environment in which mutual learning occurs among healthcare stakeholders. The nurse also needs these skills to teach, advise and counsel her/his clients about health, illness, risk factors and health living. The next phase of the study will involve "development and validation of an instrument" for the assessment of clinical competence of MSc – medical-surgical nurse student.

1.4. Conclusion

This study concluded that:-

1. The current instrument has a low Congruency Agreement Percentage and that, 79% of competency items have low Item Content Validity (ICV).

2. Many of the competencies though relevant to the clinical competence of the MSc - medical–surgical nurse student at completion of the course are not placed in the relevant competency domain(s).

3. Documentation, concept mapping, critical thinking are some of the essential competency domains which should be assessed in MSc nurse student pursuing medical-surgical specialty.

4. Confidentiality and empathy are difficult to assess objectively.

5. There is urgent need to develop and validate a tool for assessing MSc medical-surgical nurse students at completion of the course

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