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August 2015

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Content Validity of a Tool Measuring Medication Errors

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ABSTRACT

The objective of this study was to determine content and face validity of a tool measuring medication errors among nursing students in baccalaureate nursing education. Data was collected from the Aga Khan University School of Nursing and Midwifery (AKUSoNaM), Karachi, from March to August 2014. The tool was developed utilizing literature and the expertise of the team members, expert in different areas. The developed tool was then sent to five experts from all over Karachi for ensuring the content validity of the tool, which was measured on relevance and clarity of the questions. The Scale Content Validity Index (S-CVI) for clarity and relevance of the questions was found to be 0.94 and 0.98, respectively. The tool measuring medication errors has an excellent content validity. This tool should be used for future studies on medication errors, with different study populations such as medical students, doctors, and nurses.

Key Words: Content validity index. Medication errors. Nursing students.

Medication preparation and administration are nurses' primary responsibilities in any clinical setting. During the course of nurses' baccalaureate preparation, one of the roles of student nurses is to administer medications, under the supervision of faculty or staff nurses. Therefore, student nurses need to be careful while preparing and administering medications so as to avoid errors.[1]

This paper describes the development and content validity testing of 'medication error measurement tool' for a larger study entitled 'reported medication errors committed by undergraduate Nursing (BScN) students at the Aga Khan University School of Nursing and Midwifery (AKU-SoNaM), Karachi, Pakistan'. This study involved retrospective record review of baccalaureate nursing students' advisory files from 2010 - 2013, so as to identify the trends of medication errors among them. As part of this study, a Data Extraction Form (DEF) was developed to collect data of medication errors from the students' advisory files. The form was developed based on literature review and professional expertise of the researchers.

Ten nurse educators teaching Pharmacology and Mathematics at baccalaureate nursing schools in Pakistan, were contacted. Out of ten, five faculty members responded affirmatively to the request. All of these educators had between 5 - 20 years of teaching experience in medication administration at their respective institutions.

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The DEF consisted of 12 questions. Out of these, 11 were multiple choice questions; whereas one question was open ended. Question number one was about type(s) of medication errors reported. Question number two was based on the number of times the student has committed medication error, during the four year BScN program. The next question was about the names of medications in which error occurred. The fourth question discussed the different routes of administration whereby the error occurred. The fifth question was in relation to whether the error occurred in supervised or unsupervised clinical setting. The other questions number 6 - 10 referred to the clinical shift in which error was reported, the nursing units where the error occurred, the mode of error reporting, the extent of harm to the patient after the medication error occurred, and the action taken for the student in terms of re-medication, file note, or expulsion from the program. Question number eleven explored the personal factors due to which medication error occurred. Question number twelve was based on the environmental factors due to which medication error had taken place.

Permission to collect the data was taken from the Dean of the School of Nursing. The larger study was approved by the Ethical Review Committee (ERC) at the study setting.

Content validity tool was used in which two parameters were used i.e. clarity and relevance of the questions. The tool was validated by sending it to the five identified faculty at different baccalaureate nursing schools in Pakistan. The faculty rated the questions on a Likert scale of 1 - 4 for clarity and relevance of the questions. In addition, in the Content Validity Index (CVI) forms, space was provided for additional comments. These CVI forms were sent back to the researchers. The questions and their associated comments were reviewed critically by the researchers. Since there were only few minor changes in the questionnaire, therefore the process of

Table I: Calculation of CVI for clarity and relevance.

Question No.	CVI calculation for clarity	CVI calculation for relevance
1	3/4 = 0.75	4/4 = 1
2	4/4 = 1	4/4 = 1
3	4/4 = 1	4/4 = 1
4	4/4 = 1	4/4 = 1
5	4/4 = 1	3/4 = 0.75
6	4/4 = 1	4/4 = 1
7	4/4 = 1	4/4 = 1
8	4/4 = 1	4/4 = 1
9	2/4 = 0.5	4/4 = 1
10	4/4 = 1	4/4 = 1
11	4/4 = 1	4/4 = 1
12	4/4 = 1	4/4 = 1
	S-CVI for clarity=0.94	S-CVI for relevance=0.98

content validity ended at this stage after incorporating these minor changes.

CVI was calculated manually as per the procedure described by Polit and Beck.[2] Five raters were included in the CVI calculation. Initially, Item Content Validity Indexes (I-CVIs) were calculated for each question by dividing the number of experts who had given a rating of either 3 or 4 (over a Likert scale of 4) by the total number of expert raters i.e. five. This was followed by averaging all the I-CVIs to calculate the Scale Content Validity Index (S-CVI).

I-CVIs were in the range of 0.5 - 1.0 for clarity, and 0.75 - 1.0 for relevance. S-CVI for both clarity and relevance was calculated after experts' satisfactory rating and with minor changes; CVI for clarity came out to be 0.94 and for relevance, it was 0.98 (Table I).

When the researchers planned the larger study, no validated tool was found that could be used to study medication errors among nursing students. Hence, a new tool was developed, and it was deemed important to validate the tool so that the study findings do not get biased.

Among the five experts, two were from the parent institutions; whereas the other three were from other private and public sector schools of Nursing in Karachi. This variety of background helped in bringing their diverse experience into play so as to validate the tool.

Many authors have indicated that an S-CVI of 0.80 or higher is acceptable.[3-5] I-CVIs should not be lower than 0.78.[6] Since S-CVIs for clarity and relevance were 0.94 and 0.98, respectively; therefore, these results can be deemed as an excellent validity index.

The tool for measuring medication errors developed and validated in this study. This paper describes the development of a tool for medication error using content validity. Therefore, this tool can be used in future studies around medication errors with different study populations such as nursing and medical students, doctors, and staff nurses.

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