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Original Article

Instrument Development for Perceptions of Medical Teachers about Integrated Curriculum

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ABSTRACT

Background; Instrument is any device the researcher uses to collect information, such as a rating scale or a questionnaire. Their use is an important method of data collection and they have been used extensively in studies. The design and validation of instruments is neglected in many studies and it often leads to an inability to compare data among various studies. Weather a questionnaire or an interview guide is used to collect data its reliability and validity has to be maintained through a series of steps starting from defining constructs then generating items followed by piloting and lastly finalizing the scale.

Objective: This study aims to develop data collection instrument using the steps mentioned to obtain perceptions of medical teachers about integrated curriculum.

Methods: A thorough literature search and critical appraisal of selected articles was done and items were identified. Four essential steps were followed and a panel of experts validated the instrument.

Results: Content and construct of the instrument was defined. Items were generated incorporating the content. In the questionnaire closed ended items were formulated for quantitative analysis. In the interview guide to be used for qualitative analysis semi structured open ended items were developed. Known groups method was used to support construct validity of instruments. Scale was finalized after validation by panel of experts.

Conclusion: For getting perceptions of medical teachers about integrated curriculum a standard instrument should be used. We have developed instruments which are valid and reliable and their use in future research will improve comparability among different studies.

Key words: Integration, perceptions, curriculum development, thematic analysis, mix-methods research.

Introduction

An instrument is any device the researcher uses to collect information, such as a rating scale or a questionnaire.[1] Generally in educational research there are three ways a researcher can receive information. Firstly a researcher can gather information by himself without any help of others like using tally sheets. Second way is Researcher getting information directly from the subjects of study by doing interview or administering a questionnaire and third way is getting information from others who are knowledgeable about the subject. Questionnaire or interview guides are instruments used for data collection. Their use is an important method of data collection and they have been used extensively in studies.[2]

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The design and validation of instruments is neglected in many studies and this often leads to an inability to compare data among various studies.[3] Hence there is a need for designing of a valid instrument which will overcome this issue.

Data collection instrument must be valid and reliable. Reliability refers to consistency or repeatability of a measurement.[4] Validity is the degree to which instrument actually measures what it is intended to measure.[5] Validity includes face validity, content validity which are qualitative measures secured through panel of experts. [6]Criterion validity is the correlation of instrument to another instrument identified as gold standard. Construct validity is the degree to which an instrument correlates to the under investigated theoretical concept; the unidimensionality of construct in an instrument.[7]

Weather a questionnaire or an interview guide is used to collect data its reliability and validity has to be maintained through a series of steps[8]starting from defining constructs then generating items followed by

piloting and lastly finalizing the scale. This process is mandatory to get credible data and reliable results.

Integrated curriculum is followed in many colleges. AJK Medical College is also following integrated modular curriculum. Analysis of the Perceptions of medical teachers about the integrated curriculum is very important to get an insight on the issues and challenges in implementation of this reform. It will lead us towards areas of improvement in the curriculum. It becomes all the more important that a standardized data collection instrument should be designed and made available for use in future studies of similar nature. Hence data among various studies can also be compared.

Methods

Study Design: Descriptive study utilizing Delphi technique.

Two rounds of Delphi technique were carried out to develop consensus on the qualitative questions and the quantitative questionnaire. Delphi is a structured communication technique which relies on panel of experts.[8, 9, 10] Experts are given a problem or an issue, to which they give an answer in two or more rounds. After each round a facilitator provides an anonymous summary [11]of the experts from previous round and the experts are encouraged to revise their previous answers in light of the views of other members of the panel. The process continues till a consensus is reached.

Study settings: Azad Jammu and Kashmir Medical College Muzaffarabad

Study Duration: Three months

Sample: Five experts were included in the process.

Instrument development begins with thorough exploration of available literature.[12] During the literature search following Haig and Dozier approach[13]and critical appraisal of selected articles we found questions about different aspects of curriculum. The different aspects of curriculum under question were teachers knowledge about universal practices of curriculum, their own university's curriculum, students awareness about recommended books, weather their curriculum stimulates research among students and early exposure of students to patients is beneficial. [14]

We also found issues like weather problem solving abilities of students are better in integrated curriculum or otherwise during the critical appraisal of selected articles.[15] Finally weather integrated curriculum is needed in our institution (willingness of the faculty) and role of faculty training in integrated curriculum.[16]

Steps for Instrument Development:

For the development of valid and reliable instruments four essential steps were followed and a panel of experts validated the instrument. [12]Four essential steps were:

1. Defining constructs and content domain
2. Generating and judging measurement items
3. Conducting studies to develop a scale
4. Finalizing the scale

Steps used for Delphi technique

One person who was familiar with the research and data collection was chosen as facilitator. A five member panel of experts was developed; they were qualified and experienced in medical education. The problem of developing instrument to study perceptions of medical teachers about integrated curriculum was given to them. Broad understanding about the construct and content of the instrument was achieved and items were created according to the gaps found in literature search. Then in second round based on the comments on the questions developed in the first round all the irrelevant material was removed and consensus was built among the experts on the questions.

Our panel of experts included five medical educationists as shown in the table 1.

Table 1: Panel of experts for development and approval of data collection instrument

S. No	Expert	Designation
1.	First expert MBBS, PhD in Medical Education (UK).	Certified Professional in Healthcare Quality, and a qualified medical educationist
2.	Second expert MD, FRCS, MHPE	Professor of surgery and qualified medical educationist
3.	Third Expert MBBS, Mphil, DCPS- HPE	Professor of Anatomy and qualified medical educationist
4.	Fourth expert MBBS, FCPS, MHPE	Surgeon and medical educationist
5.	Fifth expert MBBS, MCPS, MSPH	Public health specialist and medical educationist

Results

Step 1: Defining constructs and content domain

After thorough exploration of literature and critically appraised articles, we defined the content and construct of the instruments.[14, 15, 16] curricular change, Global trends and changing role of teachers were underlying constructs. Contents defined were awareness about latest under grade medical education curricula, universal practices in medical education, early clinical exposure of medical students, recommended books, learning resources, students problem solving skills, student's behavior and the difficulties faced by the teachers and students. Opinion of panel of experts comprising of medical educationists was sought. After incorporation of their expert advice received through mail, content and construct were finalized

Step 2: Generating and judging measurement items

Items were generated incorporating the content and keeping in mind the process of analysis. In the questionnaire closed ended items were formulated for quantitative analysis. In the interview guide to be used for qualitative analysis semi structured open ended items were developed. After completion the new instruments were sent for review by the panel of experts for its clarity and readability.

Step 3: Conducting studies to develop a scale

Known groups method was used to support construct validity of instruments. This method is based on the fact that if a test is valid one criterion could be that test scores should discriminate among groups theoretically having different traits. [17] We assumed that teachers having experience of working in integrated curriculum will have different views than teachers who had no experience of working in integrated curriculum.

The instrument was then pilot tested. Participant medical teachers were from Azad Jammu and Kashmir medical college and inducted on the same inclusion criteria that is Medical teachers having at least one year experience of teaching in institutions following conventional curriculum and in institutions following integrated curriculum as for the study. However, the participants in the pilot study were excluded from the actual sample size. During piloting there were a few clerical errors found in the questionnaire, they were corrected. As far as language of the questionnaire no difficulty was found.

Step 4: Finalizing the scale

The instrument was then finalized with incorporation of all the suggestions which we came across in the whole process of two rounds of Delphi with approval of the panel of experts thereby validating the instrument also by using known groups method.

The finalized interview guide developed after consensus is shown in figure 1. It is available to be used in qualitative data collection in research on perceptions of medical teachers about integrated curriculum. The questionnaire finalized after consensus is shown in figure 2. It can be administered for quantitative data collection in studies about perceptions of medical teachers about integrated curriculum.

Figure 1: Interview guide developed after consensus for qualitative analysis

1	Name (optional)					
2	Age		3	Gender	1. Male	2. Female
4	Educational level	1. MBBS	2. MBBS+ Minor postgraduate qualification		3. MBBS+ Major postgraduate qualification	
5	Experience in years in conventional curriculum					
6	Experience in years in integrated curriculum					
7	What is your opinion a medical teacher should be aware of contents of latest Under Grade medical education curriculum of his university/Institution?					
8	What is your opinion a medical teacher should be aware of Global/universal practices & challenges in medical education?					
9	What is your opinion about awareness level of our students about recommended books and resource material?					
10	What is your opinion about awareness level of our faculty about recommended books and resource material?					

11	In your opinion, is it beneficial for the students to be exposed to the patients from the first year (as in integrated curriculum) or from the third year (as in traditional curriculum).
12	Do you think Integrated curriculum stimulates research among students?
13	What is your opinion about the problem solving skills of students in integrated curriculum as compared to conventional curriculum?
14	How would you compare the behavior/ attitude of students in integrated curriculum as compared to conventional subject based curriculum?
15	What is your opinion about planning and resources in integrated curriculum as compared to conventional curriculum?
16	What is your opinion about difficulties teacher faces in integrated curriculum as compared to conventional curriculum?
17	What is your opinion about difficulties students faces in integrated curriculum as compared to conventional curriculum?
18	Why integrated curriculum is needed in your institution?
19	Any other views

Figure 2: Survey Questionnaire developed after consensus for quantitative Analysis

1	Name					
2	Age		3	Gender	Male	Female
4	Educational level	1. MBBS	2. MBBS+ Minor post graduate qualification		3. MBBS+ Major post graduate qualification	
5	Teaching Experience in years in conventional curriculum					
6	Teaching Experience in years in integrated curriculum					
7	Do you consider essential; a medical teacher should be aware of contents of latest Under Grade medical education curriculum of his university? 1. Yes ☐ 2. No ☐					
8	Do you consider a medical teacher should be aware of universal practices in medical education? 1. Yes ☐ 2. No ☐					
9	Should integrated curriculum continue in your institution? 1. Yes ☐ 2. No ☐					
10	Do you think our students have sufficient level of awareness about recommended books and learning resources? 1. Yes ☐ 2. No ☐					
11	Do you think our teachers have sufficient level of awareness about recommended books and learning resources? 1. Yes ☐ 2. No ☐					
12	In your opinion, is it beneficial for the students to be exposed to the patients from the first year (as in integrated curriculum) or from the third year (as in traditional curriculum). 1. Yes ☐ 2. No ☐					
13	Do you think Integrated curriculum stimulates research among students? 1. Yes ☐ 2. No ☐					
14	In effective learning process: Which of the following curriculum is more effective: 1. Integrated curriculum ☐ 2 Conventional subject based curriculum? ☐					
15	In developing correct attitude (professionalism/ the behavior of students): Which of the curriculum is more effective: 1 Integrated curriculum ☐ 2 Conventional subject based curriculum? ☐					
16	In terms of planning and implementation Which of the curriculum requires more resources 1. Integrated curriculum ☐ 2. Conventional subject based curriculum? ☐					
17	In planning curriculum in terms of resources which of the curriculum is more convenient for students: 1 Integrated curriculum ☐ 2 Conventional subject based curriculum? ☐					

18	In your opinion students face more difficulties in which curriculum : 1 Integrated curriculum ☐ 2 Conventional subject based curriculum? ☐
19	In planning curriculum in terms of resources which of the curriculum is more convenient for Teachers: 1 Integrated curriculum ☐ 2 Conventional subject based curriculum? ☐
20	In your opinion teachers face more difficulties in which curriculum : 1 Integrated curriculum 2 Conventional subject based curriculum
21	Do you think teachers training is must before starting integrated system 1. Yes ☐ 2. No ☐

Discussion

Data collection instrument must be valid and reliable. Reliability refers to consistency or repeatability of a measurement. [18] Validity is the degree to which instrument actually measures what it is intended to measure. [19] Validity includes face validity, content validity which is qualitative measures secured through panel of experts. [20] Criterion validity is the correlation of instrument to another instrument identified as gold standard. Construct validity is the degree to which an instrument correlates to the under investigated theoretical concept; the uni-dimensionality of construct in an instrument. [21] Face and content validity was achieved through approval by the panel of experts and construct validity was achieved by using knowns group method.

A valid instrument is required for every research. When we are getting data on a sensitive issue such as medical teacher's perceptions about integrated curriculum instrument needs to be valid because analysis of these perceptions may lead towards a change in curriculum.

Successful curricular reforms are based on evaluation of students and teachers perceptions and sharing them with teachers and students.[22] Curricular reforms is a dynamic process. Continuous evaluation of teachers and students' perception will lead us to the deficiencies in the system and the areas for improvement. Knowing the fact that teachers face challenges in dealing with curriculum changes it is important to understand their perceptions for successful implementation of reforms. [23]

Our panel agreed that efforts of faculty in integrated curriculum are much more as compared to conventional curriculum. This finding compliments the findings of a research done in India.[14] In that research teachers were agreed with implementation of curricular reforms. Basic science and clinical teachers alike identify the need for greater integration in the curriculum.[14]

Our panel agreed that teachers should be asked whether they want integrated curriculum in their institution and this finding is being complimented by another study from Pakistan[16] in which similar question was asked from the participants and they were not willing for the change.

There was consensus among the panelists that views must be taken on faculty development as it is the fundamental issue for the planning and implementation of integrated curriculum. Training of teachers as they are inducted and later on refresher courses will greatly enhance their output. This fact is well supported by other studies that development of faculty provides teachers the capacity to implement and support the efforts of curricular reforms.[16]

Limitations of this research are that the sample size for expert opinion was small.

Conclusion

Data collection instrument is an essential tool for gathering information in majority of studies. For getting perceptions of medical teachers about integrated curriculum a standard instrument should be used. We have developed instruments which are valid and their use in future research will improve comparability among different studies. We conclude that instruments should be made available free on-line for access to the researchers. Our instrument will be freely available for use in future studies.

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