Health profession education course teaching to undergraduate medical and dental students for making consensus: A mix research method among medical educationist of Peshawar by using Delphi technique

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Abstract

**Introduction:** The future medical education demands newer strategies to enforce positive teaching change. The Pakistan Medical & Dental Council (PM&DC) has added outcomes such as leadership and management, professionalism, communication skills, and personal professional development. However, the level of difficulty and the importance of the contents need to be identified for the undergraduate medical and dental students.

**Methodology:** This study was conducted at four institutions of Peshawar, Khyber College of Dentistry, Khyber Medical College, Khyber Girls Medical College and Khyber Teaching Hospital, the study was completed from April to December 2018, mix method study design of modified Delphi survey was used through a self-administered questionnaire. The study comprised of two iterative rounds of opinion seeking. The questionnaire included baseline data about the participants including instructions, consent form and name, teaching experience, professional degree, and institute. The first and second round of the questionnaire had 09 statements and 01 Likert scales ranging from strongly agree to strongly disagree. The data were analyzed by using SPSS version 21.

**Results:** The analysis showed that out of 11 items, 07 items in the key contents of teaching medical education could not achieve consensus, while 04 items achieved consensus. The 40(67%) of respondents agreed to include medical education at the undergraduate level. Majority 32(53%) of the respondents agreed that medical education contents should be taught in the third year of MBBS and second-year BDS 43(72%).

**Conclusion:** Key content areas of medical education to the undergraduate medical and dental students should be
taught in the form of small group discussions. However, the consensus could not be developed on the assessment procedures for assessing medical education topics to the undergraduate medical and dental students.

**Keywords:** Medical Education; Syllabus; Consensus; Delphi Technique; Undergraduate; Curriculum.

**Introduction**

New teaching techniques and technology demands for more practical approaches that necessitate curricular change (Ludmerer, 2010). Future medical education demands newer education strategies to enforce positive change in teaching attitudes. It is a fact beyond denial that Flexner's report brought revolution in North America in the context of medical education (Chodorow, 1996). The curriculum is a dynamic process which changes according to the dire need of the hour. Many efforts have been taken by Pakistan Medical and Dental Council (PM&DC) regarding Bachelor of Medicine and Bachelor of Surgery (MBBS) and Bachelor of Dental surgery (BDS)’s curriculum (Sachdeva, 1996).

It is perceived that we cannot bring the undergraduate students to the level of masters, but we can sensitize them about the subject of medical education. Though there is an attempt by the PM&DC to include medical education in its curricula yet we don’t know when it is going to be implemented. (Najmi, 1999) On the analogy of the above facts, it is the need of the hour to justify the level of difficulty for undergraduate students. Moreover, the content also needs to be identified so as to appropriately adjust it according to the undergraduate medical and dental curriculum. Furthermore, the identification of content will enable us to develop an undergraduate elective (student selected component), to develop their skills in peer-assisted teaching and learning.

At present we don’t teach medical education to medical & dental graduates in undergraduate programs. There is no denying the fact that medical education improves the students learning ability. Hence it is imperative to bring consensus on key contents to be taught in the said programs. In this study, consensus means to develop agreement on the topics of medical education that should be taught to the undergraduate medical and dental students. The Pakistan Medical & Dental Council (PM&DC) has added outcomes such as leadership and management, professionalism, communication skills, and personal professional development. All these outcomes are covered in the postgraduate medical education program and the same can be applied at the undergraduate level. However, the level of difficulty and the importance of the content needs to be identified for the undergraduate students (Najmi, 1999).

The aim of this study was to develop consensus on contents, contact hours, assessment procedures and teaching strategies of Medical Education topics to be taught in the undergraduate medical & dental curriculum.

**Methods**

This study was conducted at Khyber College of Dentistry, Khyber Medical College, Khyber Girls Medical College and Khyber Teaching Hospital. This study was completed from April to December 2018. The study comprised of two iterative rounds of opinion seeking modified Delphi survey through a self-administered questionnaire.

It was a mixed method study design based on a modified Delphi technique. The study comprised of two iterative rounds of opinion seeking survey through self-administered questionnaire expert. The target population for this study included 68 Medical and dental faculty members having Masters in Health Professions Education/Certificate in Health Professions Education background. In our study, there were 05 Professors while 11 were Associate professors and 19 were Assistant professors, 25 were Registrars.

The faculty, teaching in these colleges primarily consists of male and female doctors. They all follow guidelines,
regulations and syllabus prescribed by PM&DC in the curriculum and with similar educational and social background. They included all faculty members who were willing to participate in the study and meeting inclusion criteria. The investigator had the contact details available for all willing participants and they could be contacted easily to give their opinion. Sixty-eight faculty members (68) with a medical and dental education background who responded in the first round were included. They all were having a minimum of 03 years of teaching experience of undergraduate as per PM&DC criteria for qualification and faculty position. Literature search and critical appraisal of the most relevant studies were done to keep away from, poor wording, and insufficient response options.

The questions were developed and presented to the subject specialists of medical education at the Institute of health professions education and research at Khyber Medical University, to finalize the questionnaire. The following components of the questionnaire were developed: key content areas, contact hours, assessment procedures and teaching strategies. These aspects of the questionnaire were covered in meetings with the experts. However, the positions of items were thoroughly evaluated. Free text spaces were used for input and later on used for the final construct of the questionnaire. The questionnaire was pilot tested on three participants having more than five years of teaching undergraduate Masters of Health Profession education and certificate in health profession education for validation. It went through minor modifications related to language, and finalized, based on the feedback from the pilot study. The pilot study participants were not included in the main study. The questionnaire was developed in the English language as all study participants were proficient in this language. The first section included baseline data about the participants, including instructions, consent form, name, teaching experience, professional degree, and institute. The second section had 09 statements and 01 Likert scales, ranging from strongly agrees to strongly disagree. The questionnaire required approximately 05 to 10 minutes of the participant's time to complete. The purpose of the study was explained to the participants. Both verbal and written consent was taken before data collection. Technical approval of the study was granted by Khyber Medical University Research and Ethics Board.

Data were edited and entered by the investigator in SPSS version 21, which was then used for analysis. For qualitative variables like Key Contents of Medical Education and Demographic of the Participant were elaborated in the form of frequency and percentages while mean and standard deviation were calculated for a continuous variable like contact hours for Health Professions Education(HPE) contents. Results were presented in the form of tables and charts.

**Results/Analysis**

In our study, there were 05 Professors while 11 were Associate professors and 19 were Assistant professors while 25 were Registrars as well. Among the respondents, 01 Associate Professors, 02 Assistant professors and 05 Registrars did not participate in the study.

The demographics of study participants shown in Table 1

| Table 1: Demographics of the Participants |
|------------------------------------------|
| **Name of Institution**                  |
| Khyber College of Dentistry(KCD)        |
| Khyber Medical College(KMC)             |
| Khyber girls medical College(KGMC)      |
| Khyber Teaching Hospitals(KTH)          |
| **Total**                               |
| **Designation**                         |
| Professor                               |
| Associate Professor                     |
| Assistant Professor                     |
| Registrar                               |
| **Professional Degree**                 |
| Bachelor of Medicine and Bachelor of Surgery(MBB) |
| Bachelor of Dental surgery(BDS)         |
| **Experience**                          |
| Designation                             |
| Professor                               |
| ≥ 25 Years                              |
| Associate Professor                     |
| ≥ 15 Years                              |


The response rate to the questionnaire was 91%. The consensus was developed on five key contents of Medical education that should be taught at undergraduate level i.e. an overview of HPE in Medical education, learning theories in Medical education, making effective power point presentation in medical education and large group small group format in medical education. Tables 2 & 3 give details of key contents of medical education and contact hours of the participants.

**Table 2: Key Contents of Medical Education**

| Variable                                                                 | Level | Frequency | % Age |
|--------------------------------------------------------------------------|-------|-----------|-------|
| Overview of Health Profession education (HPE) in Medical education       | Yes   | 47        | 76    |
|                                                                          | No    | 15        | 24    |
| learning theories in Medical education                                    | Yes   | 44        | 71    |
|                                                                          | No    | 18        | 29    |
| Making effective power point presentation in Medical education           | Yes   | 48        | 78    |
|                                                                          | No    | 14        | 22    |
| Different assessment tools in Medical education                           | Yes   | 47        | 76    |
|                                                                          | No    | 15        | 27    |
| Large group small group format in medical education                      | Yes   | 44        | 71    |
|                                                                          | No    | 18        | 29    |
| How to develop an integrated module in Medical education                 | Yes   | 20        | 32    |
|                                                                          | No    | 42        | 68    |
| Teaching strategies regarding Modes of information transfer (MIT)        | Yes   | 36        | 59    |
|                                                                          | No    | 26        | 41    |
| How to construct Multiple choice Questions (MCQs), Short Essay Questions (SEQs), Objective Structured Clinical Examination (OSCE), Objective structured practical examination (OSPE)? | Yes   | 32        | 52    |
|                                                                          | No    | 30        | 48    |
| Standard setting techniques in Medical education                         | Yes   | 18        | 29    |
|                                                                          | No    | 44        | 71    |
| Item analysis in Medical education                                       | Yes   | 14        | 22    |
|                                                                          | No    | 48        | 78    |
| Workplace-based assessment in Medical education                          | Yes   | 14        | 22    |
|                                                                          | No    | 48        | 78    |

**Table 3: Contact hours for HPE contents**

| Variable Name                                                                 | Mean (Hours) | SD | Minimum | Maximum |
|-----------------------------------------------------------------------------|--------------|----|---------|---------|
| Contact hours for HPE                                                      | 3            | 2.1| 1       | 10      |
| Contact hours for learning theories                                        | 2.2          | 1.1| 1       | 5       |
| Contact hours for large group/Small group format                           | 2.9          | 1.2| 2       | 5       |
| Contact hours for making effective Power point presentation?               | 2.9          | 2.2| 1       | 10      |
| Contact hours for developing integrated module                             | 4            | 2.6| 2       | 8       |
| Contact hours for teaching strategies of information technology in Medical Education | 2.5          | 1.2| 1       | 5       |
| Contact hours for diff. Assessment tools                                    | 2.9          | 1.5| 1       | 5       |
Contact hours for how to construct Multiple choice Questions (MCQs), Short Essay Questions (SEQs), Objective Structured Clinical Examination (OSCE), Objective structured practical examination (OSPE)

| Variable                                                                 | Level | N  | %  |
|--------------------------------------------------------------------------|-------|----|----|
| Overview of Health Profession Education in Medical education              | Yes   | 45 | 75 |
|                                                                          | No    | 15 | 25 |
| Learning theories in Medical education                                   | Yes   | 32 | 25 |
|                                                                          | No    | 18 | 25 |
| Making effective power point presentation in Medical education           | Yes   | 46 | 72 |
|                                                                          | No    | 18 | 25 |
| Different assessment tools in Medical education                          | Yes   | 38 | 63 |
|                                                                          | No    | 14 | 37 |
| Making effective power point presentation in Medical education           | Yes   | 35 | 60 |
|                                                                          | No    | 24 | 40 |
| Large group small group format in medical education                      | Yes   | 43 | 72 |
|                                                                          | No    | 17 | 28 |
| How to develop an integrated module in Medical education                 | Yes   | 20 | 33 |
|                                                                          | No    | 40 | 67 |
| Teaching strategies Modes of information transfer (MIT)                  | Yes   | 36 | 60 |
|                                                                          | No    | 24 | 40 |
| How to construct Multiple choice Questions (MCQs), Short Essay Questions (SEQs), Objective Structured Clinical Examination (OSCE), Objective structured practical examination (OSPE) | Yes   | 32 | 53 |
|                                                                          | No    | 18 | 47 |
| Standard setting techniques in Medical education                         | Yes   | 18 | 30 |
|                                                                          | No    | 42 | 70 |
| Item analysis in Medical education                                       | Yes   | 14 | 23 |
|                                                                          | No    | 46 | 77 |
| Workplace-based assessment in Medical education                          | Yes   | 14 | 23 |
|                                                                          | No    | 46 | 77 |

A consensus on mean number of contact hours for agreed upon key content areas was as: for overview of Health Profession education (HPE) an average of three contact hours, for learning theories an average of 2.2 contact hours, for making effective PowerPoint presentations an average of 2.9 contact hours, for different types of assessment tools an average of 2.9 contact hours. **See Table 5.**
Table 5: Descriptive Statistics of Continuous Variable (Total N=60)

| Variable Name | Mean (Hours) | Std. Deviation | Min | Max |
|---------------|--------------|----------------|-----|-----|
| Contact hours for HPE | 3 | 2.1 | 1 | 10 |
| Contact hours for learning theories | 2.2 | 1.1 | 1 | 5 |
| Contact hours for large group/Small group Format | 2.9 | 1.2 | 2 | 5 |
| Contact hours for making effective Power Point Presentation | 2.9 | 2.2 | 1 | 10 |
| Contact hours for developing integrated module | 4 | 2.6 | 2 | 8 |
| Contact hours for teaching strategies MIT in Medical education | 2.5 | 1.2 | 1 | 5 |
| Contact hours for diff. Assessment tools | 2.9 | 1.5 | 1 | 5 |
| Contact hours for how to Multiple choice Questions(MCQS), Short Essay Questions (SEQs), Objective Structured Clinical Examination(OSCE),Objective structured practical examination (OSPE) | 3.1 | 1.3 | 1 | 5 |
| Contact hours for standard setting tech. In medical education | 3.9 | 2.1 | 0.5 | 6 |
| Contact hours for Item analysis in Medical education | 4.1 | 2.1 | 1 | 6 |
| Contact hours for workplace-based assessment in medical education | 2.3 | 1.9 | 0.5 | 7 |
| Contact hours for any other suggestion | 3.6 | 1.5 | 2 | 5 |

Assessments Procedures

The consensus on the method of assessment for medical education was not reached, (43.3%) of the respondents choose the method of assessment to appear in the transcript as pass/fail i.e. summative evaluation, in contrast to 36.7% of the respondents who opted for general assessment at the end of the year i.e. formative evaluation.

Teaching Strategies

The 72% respondents agreed on Small group discussion(SGD) as the preferred method of information transfer/teaching strategy to the undergraduate students for medical education.

Discussion

The objective of this study was to develop consensus based on mix method study design of modified Delphi technique on contents, contact hours, assessment procedures and teaching strategies of Medical Education topics to be taught in the undergraduate medical & dental curriculum.

In this study consensus was reached on four key contents which were to be taught to the undergraduate medical and dental students that include an overview of medical education, learning theories, making effective PowerPoint presentations, and teaching various assessment tools.

In our study, two-thirds of the respondents agreed that medical education should be taught at the undergraduate level in the third year of Bachelor of medicine and Bachelor of Surgery(MBBS) and second year of Bachelor of Dental surgery(BDS). This may be attributed to the alignment of medical education at the start of clinical orientation classes for better understanding and comprehensions. This finding is similar to the findings of World Health Organization(WHO) recommended incorporating elements of medical education in the undergraduate curriculum.
but did not mention the year it should be taught (Neo, 2003; Cohen, 2006). This will be the first step forward for improving the old system of medical and dental curriculum. The students will learn to understand the subject and will help them to become self-learners and research-oriented individuals. This step will be just like Flexner’s recommendation to bring a revolution in the field of medical education (Ludmerer, 2010). However, their recommendations were based on the needs of undergraduate medical students.

The key content addressed in this study indicate that overview of medical education, learning theories, making effective PowerPoint presentations, and teaching various assessment tools should be incorporated in undergraduate curriculum to improve the performance of the medical graduates, as these are the very basic topics of medical education which will enhance the learning capabilities of the undergraduate students. These findings are similar to findings mentioned in the study done by Robert B Barr & John Tagg (Barr and Tagg, 1995).

The mean number of contact hours for key contents of medical education at undergraduate level on which the respondents agreed was three hours per week, for the contents on which the consensus was developed. It was also agreed that these identified key content areas should be taught by medical educationists exclusively. The respondents agreed that these key content areas should be taught in Small Group Discussion format, and is also mentioned by MT O Connell, JM Pascoe (Pawlina et al., 2006).

Majority of the respondents indicated that the topics of medical education taught at the undergraduate level should be evaluated in summative form pass/fail at the end of the year. The students will be better able to judge their strengths and weaknesses through self-directed learning (Beck, 2004) and getting sensitized about the importance of medical education. Pakistan Medical & Dental Council (PMDC) has attempted to include medical education in its curriculum but there is no policy to date regarding this proposal. This study strengthens the evidence for PMDC (Kazim, 2007) and sets a stepping stone for the inclusion of the contents of medical education at the undergraduate level. Teaching Medical education at the undergraduate level will not only enhance student capabilities to learn, but it will guide them to obtain proper professional attitudes (Dennick and Exley, 1997).

The preparation of power point presentation was also emphasized as the medical and dental students have to either present their clinical studies or knowledge sharing as they are considered, prospectively, to be the teachers of tomorrow. So it is essential to include a powerpoint presentation to deliver their thoughts and presentations in an efficient manner (Khalid, L. 2013; Franzoni et al.,1997; Khadjooi et al., 2011; Belfield, 2010).

However, in round one consensus was developed on teaching medical education to a large and small group format, but in round two, it did not make consensus because the response rate in round two was less comparative to round one. Though this apparently weak consensus in round one (71%) and in round two (63%) respectively, may be due to the drop of two respondents where the numerical value is sometimes exaggeratedly expressed in percent value than the actual frequency number. As the mean of contact hours has no extensive effect on the sample size in a study that is why no significant change was observed from the response frequency of the participants. Moreover, almost all of the participants were of the view that, instead of teaching the students all the eleven key contents of medical education, we should focus on teaching the undergraduate students the four medical education key contents which made consensus among the participants, to improve upon the skills and knowledge of the undergraduate students and also to promote deep learning.

The limitation of this study was that only the medical education graduates of Khyber Medical University Graduates were included in this study. The sample size was less and was not calculated accurately. All the medical and dental institutions were not included.

The strength of the study: It is the only study in my knowledge to study both the quantitative and qualitative aspects of contents, contact hours, assessment procedures and teaching strategies of Medical Education in the local setting.
Conclusion

It concludes that to teach key content areas of medical education to the undergraduate medical and dental students in the form of Small Group Discussions. However, the consensus could not be developed on the assessment procedures for assessing medical and dental undergraduate students on agreed upon medical education topics. However, less then half of the respondents preferred Multiple Choice Questions (MCQs), Short Essay Questions (SEQs), Objective Structured Clinical Examination (OSCE), Objective structured practical examination (OSPE) as a method of assessment.

Take Home Messages

1. Teaching Medical education at the undergraduate level will not only enhance student capabilities to learn, but it will guide them to obtain proper professional attitudes.

2. The key content addressed in this study indicate that overview of medical education, learning theories, making effective PowerPoint presentations, and teaching various assessment tools.

3. Medical education should be taught at the undergraduate level in the third year of MBBS and second year of BDS.

4. It was a mixed method study design based on a modified Delphi technique. The study comprised of two iterative rounds of opinion seeking survey through self-administered questionnaire expert.

5. It is imperative to bring consensus on key contents to be taught in the said programs. In this study, consensus means to develop agreement on the topics of medical education that should be taught to the undergraduate medical and dental students.

Notes On Contributors

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Appendices
None.

Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

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