Original Article

Perception of Medical Students and Faculty Regarding Integrated Curriculum in A Medical Institute

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Abstract

Objective: To assess the perception of medical students and teaching faculty regarding integrated medical curriculum and its implementation in a public sector medical institute of Lahore.

Material and Methods: This descriptive, cross-sectional study was conducted from June-December 2022 in a public sector undergraduate medical institute of Lahore, which is a public sector medical college in Punjab. A pre-tested questionnaire based on 3-point Likert scale was used to collect data from 336 medical students and 48 teachers using systematic random sampling technique. Binary logistic regression was used to calculate adjusted odds ratio (AOR) with 95% confidence intervals on preference of integrated curriculum compared to traditional curriculum. SPSS version 25 was used for data analysis.

Results: Of 336 students, 205(61%) perceived traditional curriculum to emphasize on rote learning and half of them responded that teachers were not trained to deliver integrated curriculum. Teaching faculty agreed on the notion of rote learning with traditional curriculum and only 12(25%) were satisfied with current level of curricular integration. Compared to pre-clinical students, those in clinical years were 1.48 times more likely to prefer integrated curriculum (AOR: 1.48; 95% CI: 0.79-2.77; p=0.21), but this association was statistically non-significant.

Conclusion: There is a consensus among medical students and the faculty that the traditional curriculum may not be optimal for effective learning and knowledge retention. There was divergent opinion among these stake holders regarding implementation factors for adopting integrated curriculum.

Keywords: Medical Education, Horizontal Integration, Vertical Integration, Traditional Curriculum, Integrated Curriculum, Perception

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Introduction

Medical education is an ongoing process that commences from the first day of medical school and lasts until a physician departs from active

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practice. Its purpose is to build capacity of practitioners to use up-to-date scientific evidence and to refine skills for promoting health, preventing disease and contribute longevity and quality of life¹. The traditional biomedical model based on Flexner's report and its division of training years starting from basic subjects followed by clinical training has faced criticism from medical educators as being 'too isolated' and less useful for students to assimilate basic subject's knowledge without clinical exposure. In recent years, there has been a shift towards integrating across basic subjects (horizontal integration) and pre-clinical subjects with clinical disciplines (vertical integration).²The combination of horizontal and vertical integration is represented by spiral integration, which is the most favored form of integration.³

The debate of implementing integrated against nonintegrated medical curriculum still echoing, with most medical educationists are in favor of an integrated medical curriculum.⁴ In contrast to the traditional curriculum, an integrated curriculum improves motivation, encourages self-directed learning, problem-based learning, and allows for a more objective assessment of knowledge and skills.⁵ Yet, the integration process poses several challenges for medical educationists in terms of its implementation, training of staff, logistics, its acceptance by stake holders, scheduling and for designing workflow.⁶⁻⁹

Pakistan Medical and Dental Council (PMDC) is a statutory regulatory body for medical education in Pakistan. Recently, it has revised the medical curriculum for undergraduate medical degrees (MBBS) that is in line with International guidelines emphasizing the need for horizontal and vertical integration of medical curriculum in Pakistan.^{8,10,11}

Review of relevant literature shows that there is paucity of data in Pakistan on the perception and the experience of medical faculty and students regarding this recent change of adopting integrated medical curriculum replacing traditional way of teaching and assessment. Sharif et al.¹² in their study conducted at Lahore Pakistan during 2019 reported that only 15% of students were satisfied with the traditional curriculum However, the perception of faculty in this regard was not investigated.¹² Similarly, Qurban et al. showed that 46% of students preferred an integrated medical curriculum over a traditional, yet almost half of participants in the study also perceived integrated curriculum to be more stressful.¹³

Integrated medical curriculum using horizontal and vertical integration of basic and clinical sciences was implemented on a trial basis in Allama Iqbal Medical College Lahore (a public sector medical college) since 2020 and both faculty and students have experienced its operations. The purpose of this study was to assess the perception of teaching faculty and students regarding integrated medical curricula and the extent of curriculum integration in the institute. Data generated in this study are expected to provide evidence on the opinion of students and faculty on integrated medical curriculum in comparison to the traditional system and this would help the medical educationists in Pakistan to review their educational planning.

Material and Methods

This descriptive, cross-sectional study was conducted from June-December 2022 in a public sector undergraduate medical institute of Lahore which is a public sector medical college in Punjab, with an enrolment of more than 1500 MBBS medical students and with more than 130 medical teachers (basic and clinical disciplines). Ethical approval for this study was obtained from Ethical review Board of AIMC (ref:244/26/04/2022/S1 ERB dated 26/04/2022).

Participants were the teaching faculty of AIMC (demonstrators, lecturer, assistant professors, associate professors and professors, with at least two years of teaching experience in AIMC) across basic and clinical disciplines and the MBBS students from all years of enrolment. Administrative and nonteaching clinical staff of the all departments were excluded. Students from other courses such as medical laboratory technician, physiotherapy and nursing were excluded. We constructed separate sampling frames from first year to final year MBBS students to select sample using systematic random technique (every third student in the list). Similarly, medical faculty was also stratified into lecturers/demonstrators and professorial staff and random number table was used to draw sample from each stratum using simple random technique.

Sample size was calculated using Open Epi software[®] including the population size of 1800 (1500 student and 300 faculty members), with anticipated population proportion at 50% with 5% precision around the proportion, at 95% confidence level. Estimated sample size of students was 306. We added 10% of this sample size to account for missing data and non-response, so total sample size for medical students was 336 and those of medical faculty was 48. Informed consent was obtained and a selfadministrated semi-structured, pre-tested questionnaire questionnaire was provided to participants to fill independently. Three-point Likert scale was used to assess the perception regarding traditional and integrated curriculum, extent of integration, pros and cons of both types of curricula and any resistance against recent change of curriculum.¹⁴ Questionnaire was pilot tested for validity and reliability on 32 students and 15 faculty members and found to be valid and reliable (Cronbach alpha=0.89).

The data were managed and analyzed using SPSS-25. Frequencies and percentages were used to describe qualitative variables. Normality assumptions were checked using Shapiro-Wilk test and by using normality plots for quantitative variables before running any significant testing and regression modelling. Assumptions for ordinal regression was also checked by using test of parallel lines (proportional log odds assumptions). Since assumption was violated, therefore we used binary logistic regression to calculate odds ratio with 95% confidence intervals. Assumption of multicollinearity was examined using tolerance value. Model fit was examined using Hosmer-Lame Show test of goodness of fit.

The outcome of interest in regression model was the preference for integrated curriculum compared to traditional curriculum. A composite measure representing preference of medical students and faculty for integrated curriculum was computed by taking mean value of Likert scale on 14 similar items. We used a cut-off of 3 (median of Likert scale) to categorize the composite score into binary variable (Prefer integrated curriculum ≥ 3 value, and do not prefer integrated curriculum against traditional curriculum<3 value. The medical students' model estimates adjusted for sex, area of residence and academic year of enrolment and the faculty's model estimates being adjusted for age, sex, discipline of teaching, teaching experience in years and position of teaching. We used p-value of less than 0.05 as being statistically significant.

Results

Of 351 medical students invited for the study, 342 completed the self-administered questionnaire and after exclusion of missing data of six students, data of 336 students were analyzed and results are presented here. Similarly, we gathered data from 48 faculty members. Among medical students, 196 (58.3%) respondents were females and 140(41.7%) were males, mostly from urban areas (86%). Of 48 medical teachers, most participants were aged less than 40 years (52.1%), equally distributed in basic subjects to clinical disciplines (47.9 % against 52.1%) and majority (54%) had teaching experience of 10 years or more (Table 1).

More than half of medical students (61%) and 77% of teachers perceived traditional curriculum to promote rote learning, while 50% of students and 52% of faculty mentioned the presence of unnecessary repetition using traditional curriculum. (Figure 1). While 44% of the students agreed that the integrated curriculum is time-consuming, most teachers (60%) expressed disagreement with this notion. Similarly, opinions on the difficulty of implementing the integrated curriculum were divided. Approximately 43% of the students agreed that the integrated curriculum is difficult to implement, whereas a majority of the faculty (56%) disagreed with this view. Furthermore, we found that almost half of medical students and 60% of teachers perceived that teacher are not adequately trained to implement an integrated curriculum (Figure 1). Many students (60%) expressed disagreement with the notion that departments will be able to effectively coordinate for integrated curriculum, whereas 44% of the faculty members agreed with this observation. Similarly, opinions on adjusting timetables to allow for the integration of basic and clinical sciences were divided. On resistance to adopt an integrated curriculum, 41% of the students disagreed that resistance exists, while 48% of the faculty agreed that resistance is present (Figure 2).

Regarding the horizontal integration of basic sciences, both students and faculty expressed limited agreement. Furthermore, satisfaction on current integration of basic and clinical subjects were relatively low; only 29% students and one-quarter of the teachers expressed satisfaction on current state of curriculum integration (Figure 2). When preference for integrated medical curriculum against traditional curriculum was analyzed using binary logistic regression modelling, we found no significant difference among male and female medical students for their preference of integrated curriculum after adjustment for other predictors (OR=1.00; 95% CI: 0.53-1.89), Whereas, among teachers, the odds of

favoring integration increased with per unit increase in Table 2: Multivariate analysis of various predictors of age years (OR=1.21;95% CI: 0.86-1.21). However, the preference for integrated medical curriculum as odds of preference were lower with per unit increase in *compared to traditional medical curriculum among* years of experience (OR= 0.90; 95% CI: 0.65-1.24). medical students and staff in a public sector medical Clinical faculty had slightly higher odds of preference college of Lahore (Medical students n=336 & Faculty for integrated medical curriculum as compared to basic n=48) side (OR=1.77; 95% CI: 0.09-34.51) (Table 2).

Table 1: Socio-demographic characteristics of medical students and teaching faculty at a public sector medical college of Lahore, Pakistan (Medical students n=336 & Faculty n=48)

Medical Students (n=336)					
	Numbers	Percentage			
Sex					
Males	140	41.70%			
Females	196	58.30%			
Area of residence					
Urban	290	86.30%			
Rural	46	13.70%			
Academic Year of learning (MBBS)					
First Year & Second year	136	40.50%			
Third year to final year	200	59.50%			
Medical Teaching f	aculty (n=48	3)			
Age					
≤40 years	25	52.10%			
More than 40 years	23	47.90%			
Sex					
Male	24	50%			
Female	24	50%			
Discipline of teaching					
Basic Sciences	23	47.90%			
Clinical Sciences	25	52.10%			
Position of Teaching					
Demonstrator/ Lecturer	12	25.00%			
Assistant /Associate Professor	25	52.10%			
Professor	11	22.90%			
Teaching experience					
Less than or equal to 10 years	22	45.80%			
More than 10 years	26	54.20%			
* Footnotes: Data are numbers and percentages (%) unless					

indicated otherwise

Characteristics	Unadjusted Model			Adjusted (Multivariable) Model		
Characteristics	Odds ratio (OR)	95% CI.	p	Odds ratio (OR)	95% CI	р
Medical Students						
Sex	D.C	D.C		D.C	D.C	
Males	Reference	Reference	0.9	Reference	Reference	1
Females	1.04	0.56-1.95		1	0.53-1.89	
Area of residence						
Rural	Reference	Reference	0.8	Reference	Reference	0.9
Urban	1.12	0.47-2.68	0.0	1.06	0.44-2.56	0.7
Academic Year						
(MBBS)						
First Year & Second year	Reference	Reference	0.2	Reference	Reference	0.2
Third year to final year	1.49	0.80-2.77		1.48	0.79-2.77	0.2
Teaching						
faculty						
Age (Years)	1.12	0.91-1.39	0.3	1.21	0.86-1.71	0.3
Discipline of teaching						
Basic Sciences	Reference	Reference		Reference	Reference	
Clinical Sciences	2.28	0.19-27.1	0.5	1.77	0.09-34.51	0.7
Teaching experience	1.04	0.88-1.22	0.7	0.9	0.65-1.24	0.5
Position of Teaching						
Demonstrator/ Lecturer	Reference	Reference	07	Reference	Reference	0.8
Professorial staff	1.54	0.19-18.71	0.7	0.84	0.03-28.12	0.0

* Abbreviations: CI, confidence interval; *p* stands for probability of rejecting a null hypothesis when it is true



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Figure-1: Perception of medical students and teaching faculty of a public sector medical institute regarding traditional and integrated medical curriculum.



Figure-2: Response of medical students and teachers regarding implementation of integrated curriculum in a public sector medical institute of Lahore, *Pakistan.*

Discussion

One of the fundamental requirements of efficient health care system is the development of proficient healthcare professionals through rigorous medical education. The World Federation of Medical education (WFME) encouraged restructuring of medical curriculum through innovative approaches to ensure competent health workforce.¹⁵ The developing countries including Pakistan are in evolution from traditional subject based curriculum towards integrated medical curriculum.¹⁶ The findings of this study provided evidence on the perception and preferences of the main stake holders (medical students and teachers) for integration of the medical curriculum. The results indicate a consensus among participants that the traditional curriculum, with elements of rote learning and unnecessary repetition, may not be optimal for effective learning. This aligns with previous research where majority of students and faculty members were in favor of usefulness of integrated over traditional curriculum.^{7,17}

Regarding the implementation process of integrated curriculum, one of the key observations from this study is the divergent opinions among participants. While a significant proportion of students considered the integrated curriculum to be time-consuming and challenging to implement, most faculty members disagreed with these notions. Similarly, there was disparity regarding adequate time allocation and coordination among various department for integration. A study conducted in Karachi also reported difference in perception of students and faculty.¹⁶ These differences in perspectives may stem from variations in experiences, expectations, or roles within the educational context. It is crucial to address these discrepancies and promote a mutual understanding between students and faculty to ensure the successful implementation of an integrated curriculum. Moreover, to ensure a seamless integration of different disciplines, it is crucial to foster strong collaborations and communication channels among departments, promoting a cohesive learning environment.¹⁸

An important aspect highlighted by the study was that a substantial number of participants, including both students and faculty, believed that teachers are not adequately trained to implement an integrated curriculum. This finding is consistent with previous studies that have also reported this issue^{7,17-19}. It points to the potential gaps in the preparation for faculty to implement this approach.

The findings also indicate limited agreement among both students and faculty regarding the current implementation of horizontal and vertical integration. This lack of perceived integration highlights the need for further efforts to bridge the gap between basic and clinical sciences in the curriculum.

Furthermore, the satisfaction levels with the current integration of basic and clinical subjects were relatively low among both students and faculty. This dissatisfaction suggests that the existing integration efforts may not fully meet the expectations and needs of the participants. Similar finding reported from another study where 43% of students were dissatisfied with the conduciveness of institutional environment regarding implementation of integrated curriculum.³¹ It emphasizes the importance of continuous evaluation and improvement of the integrated curriculum to ensure its effectiveness and alignment with the anticipated educational effects.

Lastly, the study did not find any significant relation between various predictors and preference for integrated curriculum among students and faculty. The results are in coherence with other studies where no statistically significant association was observed between preference for integrated curriculum and gender in addition to academic year.¹⁹⁻²¹

While this study provides useful evidence regarding the integration of the medical curriculum, it is important to acknowledge several limitations that may have influenced the results and should be considered when interpreting the findings. The study sample consisted of a specific group of medical students and faculty from a particular institution, which may have its unique curriculum, teaching methods, and institutional culture. This may limit the generalizability of the findings to other settings or populations. Secondly, the data collected in this study relied on self-reported responses through questionnaires. This introduces the possibility of response bias. While the study adjusted for certain variables in the regression models, there may be other unmeasured confounding factors that influence the perceptions and preferences of the participants. Lastly, the study relied solely on quantitative measures, such as Likert scale responses, which may not capture the depth and richness of participants' experiences and perspectives. Incorporating qualitative methods could provide a more nuanced exploration of the topic. Despite these limitations, this study provides valuable insights into the perceptions and preferences regarding the integration of the medical curriculum. Future research could address these limitations by employing larger and more diverse samples, utilizing mixed-methods approaches, and incorporating longitudinal designs to further explore the complex nature of integrating medical education.

Conclusion

There is a consensus among participants that the traditional curriculum may not be the optimal method for effective learning and knowledge retention. However, there are differing opinions and perceptions of faculty and medical students regarding various dimensions of integration process. These variations underscore the importance of addressing and reconciling these differences to ensure the successful implementation of an integrated curriculum. Efforts should be directed towards providing adequate training for faculty, promoting

interdepartmental collaboration, and improving the integration of basic and clinical sciences. This will ensure that health care professionals are better prepared to face the complex challenges of the healthcare system.

Conflict of Interest	None
Funding Source	None

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Authors Contribution

MA, SM: Conceptualization of Project

- MA, MA, MFB, MM: Data Collection
- MA, MFB, MM: Literature Search
- MA, SM, ZPB: Statistical Analysis
- MA, SM, MA, MFB, MM: Drafting, Revision MA, SM, ZPB: Writing of Manuscript