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Evaluation of Student Feedback on Integrated vs. Traditional Curriculum in Dental Education: A Comparative Study

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ABSTRACT

Dental education benefits a lot from a well-designed curriculum. Integrated curricula now replace traditional teaching models by adding early practical learning, connecting different subjects in training, and making students a priority. The research investigates dental students' opinions on integrated and traditional ways of presenting the curriculum in Pakistan. **Objectives:** To compare dental students' perceptions of the learning environment and curriculum structure in integrated versus traditional curricula at a dental college in Mardan, Pakistan. **Methods:** This cross-sectional study was carried out at Bacha Khan College for the duration of 3 months. There were 182 undergraduate students in the study who were selected using stratified sampling. The study measured how students perceived the environment and curriculum with a questionnaire based on a Likert scale of 5 points. Data were analyzed in SPSS version 21.0, and p-values smaller than 0.05 were regarded as statistically significant. **Results:** Students in the integrated curriculum reported significantly higher satisfaction across all domains, including support for diversity (mean = 4.35 ± 0.65), academic discussions (4.50 ± 0.55), self-directed learning (4.45 ± 0.50), and preparedness for clinical practice (4.50 ± 0.45). Similarly, curriculum structure and delivery were better rated in the integrated group, with clearer objectives, earlier clinical exposure, and stronger subject integration ($p<0.05$). **Conclusions:** Students favored the integrated curriculum due to its inclusive environment, alignment of teaching with learning outcomes, and focus on critical competencies. These findings support curricular reform toward integrated models in dental education to enhance learning outcomes and professional readiness.

INTRODUCTION

Developing a curriculum document is a process that involves thorough preparation, careful implementation and uninterrupted checking of results. It aids medical and dental educators in building courses that continue to address both academic and professional changes. Furthermore, the structure and approach to a curriculum have a considerable impact on how learners perceive, process, and remember knowledge [1]. The scheme of dental education curriculum has now become necessary in preparing competent oral healthcare professionals. Traditionally, dental education is organized so that basic sciences are taught in the first part of the course and clinical subjects are taught in the last year. Because of this approach, students may find it hard to translate their knowledge into practical practice of real-world scenarios [2]. The transition from traditional to integrated curricula in the dental system represents an important change in teaching approaches, aimed at bridging the gap between basic sciences and practicing dentistry [3]. Integrated curriculum focuses on horizontal and vertical integration,

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hands-on experience in the initial years, and the development of problem-solving and critical thinking skills in students. The methodology is consistent with modern educational approaches, which lay emphasis on student-centered learning and the development of abilities required for modern dental practice [4]. In Pakistan, it is recognized by the Pakistan Medical and Dental Council (PMDC) that dental education requires reform in its curriculum. The PMDC supports integrated curricula in dental schools so that graduates are set to respond to the constantly changing needs in dental practice. This initiative reflects a commitment to aligning dental education in Pakistan with international standards and best practices [2]. The modular-based curriculum has gained prominence in medical education globally, offering a dynamic and integrative approach that fosters advanced cognitive skills such as critical thinking, analytical reasoning, synthesis, evaluation, and practical application. This format enables students to actively participate in their study, developing a greater grasp of both basic and clinical sciences through collaborative and interdisciplinary approaches. This integration not only improves the educational experience but also fills the gap between academic knowledge and practical experience. [5]. Based on the fundamental value of the conventional curriculum, including early clinical experience and biological sciences into dentistry education has shown considerable results. A quasi-experimental study indicated that students in an integrated curriculum obtained clinical competency around 608 hours earlier than those in standard programs, with more confidence in applying biological knowledge to treating patients [6]. Furthermore, the integration of case-based learning (CBL) across dental curricula has been associated with positive outcomes, including improved critical thinking and problem-solving skills. CBL encourages students to apply theoretical knowledge to real-world scenarios, fostering a deeper understanding and retention of information. Such pedagogical strategies align with contemporary educational goals, preparing students for the complexities of modern dental practice [7]. Despite the many advantages of the modular method, conventional curricula are still valued because of their meticulous and well-organized foundation in the fundamental sciences [8]. Because it fosters the development of critical abilities like clinical reasoning and well-informed decision-making, this strong foundation is crucial for clinical practice. Furthermore, the ability to successfully apply information in clinical contexts depends on the long-term recall of fundamental scientific principles, confirming the enduring value of traditional educational paradigms [9].

Therefore, the purpose of this study is to assess and contrast the opinions of students on the traditional and integrated dentistry education curricula. Although integrated and modular curricula are widely discussed globally, there is a clear lack of empirical data from Pakistan that directly compares student perceptions of traditional and integrated dental education within the same institutional context. Most existing studies have focused on medical education or have not examined the combined impact on perceived learning environment and curriculum structure in dentistry. Addressing this gap will help generate context-specific evidence to inform curriculum development and policy decisions in Pakistani dental colleges. This study aimed to investigate how students perceive the learning environment, curriculum structure, and delivery to identify the benefits and drawbacks of each model.

METHODS

This descriptive cross-sectional study was conducted at Bacha Khan College of Dentistry, a tertiary-care dental teaching institution, to assess dental students' perceptions of the transition from a traditional to an integrated curriculum at the institutional level. The study was carried out over a period of three months from August 2024 to October 2024. Approval was obtained from the Institutional Review Board of Bacha Khan College of Dentistry (Ref. No. 533/BKMC), and informed consent was secured from all participants. The target population included all undergraduate students enrolled in the Bachelor of Dental Surgery (BDS) program during the study period (N=192). As the population size was relatively small and accessible, a census approach was adopted, and all eligible students were invited to participate. To ensure proportional representation from each academic year, stratification was applied at the stage of analysis. A total of 182 students completed the questionnaire, resulting in a high response rate of 94.8%. This high participation rate minimized selection bias, strengthened internal validity, and ensured adequate power for statistical comparisons. At the time of the study, the institute was undergoing a curriculum transition in accordance with PMDC guidelines. Consequently, the older batches (third- and final-year BDS students) continued with the traditional curriculum, while newly inducted students (first- and second-year BDS) were enrolled under the integrated curriculum. This parallel implementation created a natural basis for comparison of perceptions. Inclusion criteria were all currently enrolled BDS students from first to final year, willing to participate voluntarily, and able to complete the questionnaire independently. Students on academic leave or absent during data collection were excluded. For analysis, students were grouped as: Group A (first- and second-year BDS, integrated curriculum) and Group B (third- and final-

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year BDS, traditional curriculum). Data were collected using a structured, self-administered questionnaire developed specifically for this study, with items adapted from validated instruments such as the Dundee Ready Education Environment Measure (DREEM) and relevant literature [10]. The tool was reviewed by three subject experts for face and content validity and pilot-tested with 15 students to assess clarity and comprehension. Necessary refinements were made, and the final version demonstrated good reliability (Cronbach's alpha=0.87). The questionnaire had three sections. The first section gathered demographic data (5 items: age, gender, year of study, and related background details). The second section evaluated perceptions of the learning environment (10 items) covering inclusivity, peer support, teamwork, self-directed learning, academic discussion, facilities, sense of community, professional support, and preparedness for clinical practice. The third section assessed students' perceptions of curriculum structure and delivery (6 items), including clarity of objectives, alignment of teaching with outcomes, subject integration, early clinical exposure, faculty effectiveness, and logical progression of content [11]. Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). To reduce response bias, two items in each of the learning environment and curriculum sections were negatively worded and reverse-coded during analysis, ensuring that higher scores consistently reflected more positive perceptions. Domain scores were calculated by summing the relevant items, and a combined score was computed for overall perceptions. Possible ranges were 6–30 for curriculum, 10–50 for learning environment, and 16–80 overall, with higher scores indicating more favorable perceptions. Confidentiality and anonymity were strictly maintained. Data analysis was performed using SPSS version 21.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized the data. The Independent Samples t-test was applied to compare mean scores between students in the integrated and traditional curricula across the two main domains (curriculum and learning environment). A p-value of <0.05 was considered statistically significant.

RESULTS

The institution recently implemented a curriculum reform, moving from a traditional, subject-based teaching approach to an integrated curriculum. The integrated model incorporates horizontal and vertical integration of content, early clinical exposure, student-centered learning (including PBL and case-based discussions), and emphasizes professional development and ethical reasoning. The transition aimed to align dental education with international best practices and outcome-based education standards. Out of the 192 students approached, 182 responded to the survey, yielding a high response rate of 94.8%. The mean age of respondents was 19.6 ± 1.2 years (Table 1).

Table 1: Demographic Characteristics of the Respondents (N = 182)

Variables	Value
Total Students Approached	192
Total Respondents	182 (94.8%)
Mean Age (years)	19.6 ± 1.2

Among the 182 participants, 82 (45.1%) were male and 100 (54.9%) were female (Figure 1).

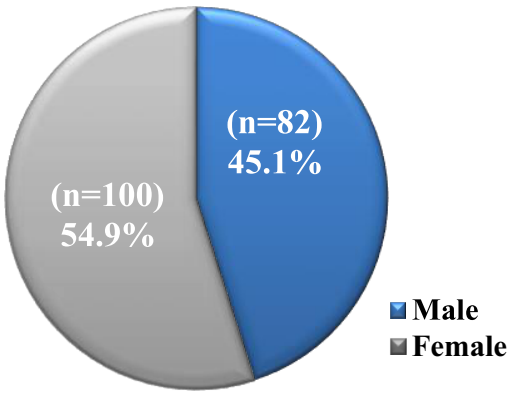

Figure 1: Gender Distribution of the Participants

Students following the integrated curriculum (Group A: first year and second year students) consistently reported significantly more positive perceptions across all domains compared to those in the traditional curriculum (Group B: third year and fourth year students). The integrated group rated their curriculum higher for supporting a diverse and inclusive learning environment (4.35 ± 0.65 vs. 3.40 ± 0.90, p=0.003), promoting academic discussions and problem-solving (4.50 ± 0.55 vs. 3.25 ± 0.85, p = 0.001), and encouraging teamwork and interprofessional collaboration (4.30 ± 0.60 vs. 3.60 ± 0.75, p=0.007). Similarly, self-directed learning was more effectively promoted in the integrated group (4.45 ± 0.50 vs. 3.10 ± 0.95, p=0.000). Other significantly higher scores in Group A included sense of community and peer support, adequacy of facilities and resources, overall academic environment, lifelong learning habits, professional support, and preparedness for clinical practice (all p<0.05) (Table 2).

Table 2: Student Perception of Learning Environment in Integrated vs. Traditional Curriculum

S. No.	Statements (Perception Item)	Group A (Integrated Curriculum) Mean ± SD	Group B (Traditional Curriculum) Mean ± SD	p-Value
1	The curriculum supports a diverse and inclusive learning environment.	4.35 ± 0.65	3.40 ± 0.90	0.003

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2	Students are actively engaged in academic discussions and problem-solving.	4.50 ± 0.55	3.25 ± 0.85	0.001
3	Teamwork and interprofessional collaboration are encouraged.	4.30 ± 0.60	3.60 ± 0.75	0.007
4	Self-directed learning is effectively promoted.	4.45 ± 0.50	3.10 ± 0.95	0.000
5	I feel a strong sense of community and peer support in the learning environment.	4.20 ± 0.70	3.50 ± 0.80	0.012
6	Facilities and resources adequately support educational needs.	4.10 ± 0.60	3.35 ± 0.90	0.009
7	The overall environment is conducive to academic excellence.	4.40 ± 0.50	3.30 ± 0.85	0.001
8	Lifelong learning habits are instilled through the curriculum.	4.25 ± 0.60	3.20 ± 0.80	0.004
9	I feel safe, respected, and professionally supported during learning.	4.15 ± 0.65	3.40 ± 0.85	0.018
10	The learning environment prepares me for real-world clinical practice.	4.50 ± 0.45	3.50 ± 0.70	0.000

The integrated curriculum was perceived as having a clearer structure with well-defined objectives (p=0.001), and its teaching was better aligned with learning outcomes and assessments (p=0.002). Students also reported that the integrated curriculum effectively encouraged subject integration (p=0.000) and incorporated sufficient clinical exposure early in the program (p=0.004). Additionally, faculty in the integrated curriculum were viewed as well-prepared and effective in delivering content (p=0.009), while the curriculum itself was perceived to promote continuity and logical progression (p=0.006) (Table 3).

Table 3: Evaluation of Curriculum Structure and Delivery in Integrated vs. Traditional Curriculum

S. No.	Statements (Curriculum Structure and Delivery Item)	Group A (Integrated Curriculum) Mean ± SD	Group B (Traditional Curriculum) Mean ± SD	p-Value
1	The curriculum has a clear structure with well-defined objectives.	4.45 ± 0.50	3.40 ± 0.85	0.001
2	Teaching is aligned with learning outcomes and assessments.	4.40 ± 0.55	3.35 ± 0.80	0.002
3	Curriculum delivery encourages integration across subjects.	4.50 ± 0.45	3.20 ± 0.75	0.000
4	Sufficient clinical exposure is incorporated early in the curriculum.	4.35 ± 0.60	3.25 ± 0.85	0.004
5	Faculty are well-prepared and deliver content effectively.	4.30 ± 0.65	3.50 ± 0.90	0.009
6	The curriculum promotes continuity and logical progression of content.	4.25 ± 0.60	3.30 ± 0.80	0.006

DISCUSSION

Curriculum design is essential in shaping the quality of education and student learning experiences, particularly in fields like dental education, where both theoretical knowledge and practical skills are needed [12]. In current study, the integrated curriculum rated their learning environment significantly higher across several dimensions compared to their counterparts in the traditional curriculum. The integrated curriculum was viewed as promoting a more inclusive and diverse educational atmosphere, receiving higher ratings for its support of a varied learning environment. These findings are consistent with earlier studies highlighting the significance of inclusive and supportive academic settings in improving student engagement and learning outcomes [13]. The students in the integrated curriculum, as mentioned, exhibited significantly higher engagement in academic discussions, problem-solving, and self-directed learning (SDL) compared to those in the traditional curriculum. This supports recent research on the benefits of integrated education in dental training. For example, Ali *et al.* found that problem-based learning (PBL) improves self-regulation and intrinsic motivation among dental students [14]. Furthermore, Çelik *et al.* demonstrated that scenario-based peer learning programs effectively increased readiness for inter-professional collaboration, emphasizing the importance of communication and teamwork in dental education [15]. The supportive learning environment ensures safety and respect, promoting innovation and creativity among students. Studies have shown that integrated learning environments are better at encouraging innovation, supporting creative and critical thinking, and providing a good supporting environment for teaching and learning [16, 17]. Among the participants, those enrolled in the integrated curriculum reported a greater sense of preparedness for clinical practice compared to those in the traditional curriculum. These findings are consistent with previous studies demonstrating that early exposure to clinical environments and the integration of theoretical knowledge with practical experience enhance students' readiness for professional practice [18]. Integrated curricula enhance students' clinical competence, confidence, and ability to apply knowledge in real patient scenarios [19]. Additionally, the use of case-based and problem-based learning further improves clinical reasoning skills [20], and also the acquisition of clinical skills and long-term knowledge retention are enhanced by eliminating the divide between basic and clinical sciences [21]. The comparative evaluation of curriculum structure and delivery between integrated and traditional curricula reveals significant advantages associated with the integrated approach. Those students learning under an integrated program reported higher levels of satisfaction regarding the curriculum, the alignment between teaching and learning outcomes, integrated subjects, early exposure to clinical

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practice, and the smooth flow of information from one semester to the next. These findings align with recent literature emphasizing the benefits of integrated curricula in medical education. For instance, a study by Miller *et al.* highlighted the successful implementation of a course integrating basic, clinical, and health systems sciences, which received positive reception from students and enhanced their clinical reasoning skills [22]. Similarly, a qualitative study at Shiraz University of Medical Sciences reported that the integration of basic and clinical sciences facilitated better understanding and application of knowledge among medical students [23]. Students participating in the present research were considerably more likely to agree that the curriculum develops the material in an organized way relative to those using the traditional curriculum. This observation shares similarities with what Wijnen-Meijer *et al.* discovered, that linking basic and clinical sciences consistently throughout the curriculum helps students better tie their foundational knowledge to practical applications and engages them in learning step by step. [24]. In order to satisfy the increasing needs of multidisciplinary clinical practice and patient-centered care, dental education is changing. An intentional attempt to improve clinical competency and student involvement is shown in the transition from traditional to integrated courses [25]. This single-institution study during a transitional phase may limit generalizability.

CONCLUSIONS

In conclusion, students generally had a more positive opinion of the integrated curriculum in terms of its organization, the way that classes relate to learning objectives, clinical skills, the necessity of independent study, and the overall learning environment. Students who used the approach had more defined goals, improved grades in their classes, and more clinical work experience, which inspired many to become more committed and self-assured. However, some said that the traditional curriculum was less cohesive and did not encourage pupils to actively collaborate. In order to assist students in adjusting to the demands of today's clinical environments and collaborating more effectively with other healthcare teams, there is justification for adding more integrated curriculum components to dental schools.

Authors Contribution

Conceptualization: WUN
Methodology: SMA
Formal analysis: SA, IAK, MR
Writing review and editing: MR, RZ

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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