INSTITUTIONAL ASSESSMENT ENVIRONMENT EVALUATION THROUGH ASSESSMENT IMPLEMENTATION MEASURE (AIM) TOOL

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ABSTRACT

Objective: *To evaluate the awareness of undergraduate dental students about the assessment environment at their institution.*

Materials and Methods: *A cross-sectional study was conducted in year 2023 at Institute of Dentistry, CMH Lahore and consisted of first, second and third year undergraduate dental students. Data was collected through census sampling using a pretested, reliable and valid questionnaire. Three domains of "The Assessment Implementation Measure" (AIM tool) on a 4 point Likert scale was utilized. The data collected was analyzed by using statistical software SPSS -20.*

Results: *Majority (72.57%, 70.06%, and 70.74%) students agreed with the Institutional assessment policies, methods used for assessment and purpose of assessment of IOD, CMH LMC, Lahore. Highest score was given to the item, 'The criteria of student progression to next class are clearly documented' (79.7%) with mean score of 2.32±0.81 from Assessment Policies subscale. The lowest rated item was from Assessment Methods subscale i.e. 'An appropriate weightage was given to knowledge, skills and attitude domains in assessments' (64.4%) with mean score of 2.05±0.81. The median score about assessment awareness of undergraduate dental students came to be 45.95 (71.21%)*

Conclusion: *It is concluded that majority of students expressed their satisfaction with the institutional assessment environment at IOD, CMH LMC, Lahore.*

Keywords: *Educational assessment, Feedback learning, Student perception, Dental students*

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INTRODUCTION

Educational environment in a health professional institute is an essential factor in generating an affirmative conclusion of the curriculum relative to students' learning and accomplishments.[1] It is an important part of a high quality health care education.[2] It facilitates the institutional policy makers to enhance the academics and intellectual development of students required to become accomplished professionals. Improvement of health education environment and modification in current curriculum can aid in implementation of an effective teaching and learning.[3]

Assessment drives learning. Teaching and administrative faculty should play a crucial role in implementing an assessment environment in an institute.[4] Assessment reflects the objectives to learn, and mediation of learning approaches. It is a motivational tool to prompt students in their engagement with specific tasks. It collects and combines the necessary information to provide a reliable and valid feedback to ensure the quality treatment

provided to the patients. Examinees need to be familiar with the objective of assessment scoring criteria, prevalent processes and the significance of feedback to encourage their professional growth.[5]

Assessments' alignment with the learning outcomes can enhance the educational standards. Educational specialists approve the use of several formative assessments (FA) along with summative assessments (SA).[6] Program evaluation in the form of formal or informal feedback can be instrumental in enhancing their annual performance. This approach sections the comprehensive curriculum in manageable portions that lead to its better understanding. The term formative implies regular revision with the intent of formation of a better assertive curriculum for the students. Feedback can provide directions to all stakeholders in an educational system with clear indications for improvement in curriculum.

Various assessments tools[7-11] exist for assessment of educational environment. Assessment tools used in higher education plays a key role in evaluation of institutional learning outcomes and the satisfaction levels of the students. The objectives of each tool vary as per quality assessment of diverse aspects of educational environment. Assessment, Development, Assurance Pharmacist's Tool (ADAPT)[11] is utilized for pre planning of health campaign for patients. In ADAPT a 36-item based questionnaire divided into 3 significant portions i.e. policy development, assurance and assessment. However, in Analysis of Determinants of Policy Impact (ADEPT model)[10] goal is to regulate the policy development and its impact on implementation of goals, means, opportunities and accountability. Dundee Ready Educational Environment Measure (DREEM)[7,9] can be used to assess learning environment. It is used for a range of assessment-related objectives, i.e. inter and intra group comparisons for establishing students' accomplishments and quality assurance of the curriculum. Johns Hopkins Learning Environment Scale (JHLES)[12] assesses the medical school learning environment awareness towards the students.

The Assessment Implementation Measure (AIM) is a convenient, descriptive tool without the comparative analysis of questionnaires, as required in DREEM and R-SOQ-2F. Literature search reported limited data utilizing Assessment Implementation Measure (AIM) tool within Pakistan.

This research aimed to analyze the awareness of assessment environment among undergraduate dental students.

METHODOLOGY

A cross-sectional descriptive study was carried out on first, second and third year undergraduate dental students of Institute of Dentistry, CMH Lahore, Pakistan from March-May 2023. Data was collected through census sampling using a questionnaire "The Assessment Implementation Measure" (AIM) tool. All study participants exposed to modular assessment system throughout the academic years were included. Final year dental students were excluded owing to their non-exposure to modular assessment systems. Ethics approval was obtained from institutional ethical review board. Verbal consent was taken from study participants for their participation, integrity of the research and confidentiality of the study. The "Assessment Implementation Measure" tool comprised of four subscales:

- Assessment Policies
- Assessment Methods
- Purpose of Assessment
- Assessment Quality Measures

First three out of these four subscales of AIM tool were used to calculate individual awareness scores. Fourth domain of AIM tool i.e. assessment quality measures was excluded after face validity carried out by five professionals, owing to the complexity of its contents for the targeted population.

A 4-point Likert scale system was utilized to assess students' response. With '4' being "Strongly agree" (SA), and '1' being "Strongly disagree" (SD). Higher scoring on Likert's scale represented higher degree of understanding of institutional assessment programs. The maximum possible score of AIM Tool was 84 and minimum possible score was 21. After the Delphi process, the eventual AIM tool had 21 questions consisting of three domains. Content validity of the overall scale (S-CVI) was 0.98 with the S-CVI/Avg method and 0.86 by S-CVI/UA method. This reflects improved validity of AIM tool questionnaire. All questions were analyzed for appropriate interpretation by the students using cognitive pre-testing. Cronbach's alpha estimated for complete AIM tool questionnaire was 0.80, and its value for three subscales of the questionnaire ranged from 0.52 to 0.70. The information collected was analyzed by using statistical software SPSS -20. Mean and SD were calculated for each domain of AIM tool.

RESULTS

From the study sample of 225 students, 222 students participated in this research with a feedback response of 98.66%. 75 students (33.3%) were from 1st year, 74 students (32.8%) were from 2nd year and 73 students (32.4%) were from 3rd year BDS. The scores for the 21 items of the questionnaire are shown in (Table 1).

The "Assessment Policies" in the institute were given the highest score with percentile of 72.57% followed by

"Purpose of Assessment" and "Assessment Methods" with percentile of 70.74% and 70.06% respectively. 29.95% study participants disagreed with the "Assessment Methods", followed by 29.3% not abiding to the "Purpose of Assessment" and 27.43% to the "Assessment policies". To simplify the statistics of the data collected, we pool the results of strongly agree (SA) and agree (A) of Likert scale in a single cluster and of strongly disagree (SD) and disagree (D) in another cluster (Table 1). Although (Table 1) represents all four categories separately. The median score of assessment awareness was 45.95 (71.21%) (Table 2).

Participants gave highest score to their awareness about the documentations required for student promotion to next class (79.7%) with mean score of 2.32±0.81 from Assessment Policies subscale. The lowest rated item was from Assessment Methods subscale reflecting appropriate weightage to knowledge, skills and attitude domains in assessments' (64.4%) with mean score of 2.05±0.81.

DISCUSSION

Assessment plays a critical role in health professional education.[13] Educators, policymakers, and institutional administrators adopt assessment methods for educational reforms.[14] The information obtained from assessments provides a level of understanding to the students through a continuous approach.[15] Present study indicated positive perception of dental students towards assessment environment at CMH LMC & IOD, by gaining 71.21% score in the questionnaire. This is persistent with a research based study carried out for dental students in University of Lahore, with mean score of more than 2 and less than 3 in all questions of the KAP study.[16] Assessment is deeply embedded in the curriculum of progressing and competitive health education system. Non standardized assessment methods reduces its effectiveness in delivering knowledge and curriculum modulation.[17]

Institutional accreditation bodies like Pakistan Medical

TABLE 1: MEAN SCORES AND PERCENTAGES OF 21 ITEMS OF AIM TOOL SUBSCALE

Sr.no	AIM subscales	SA+A	SD+D	Mean score
Assessment Policies		**72.57%**	**27.4%**	**2.21±0.76**
1.1	Standard setting is used to decide Pass/fail criteria before each individual summative assessment.	74.8%	25.2%	2.21±0.72
1.2	Assessments are open to scrutiny by external experts.	71.2%	28.9%	2.17±0.75
1.3	A system of appeal against assessment results is in place	68.9%	31.1%	2.16±0.71
1.4	The number of allowed exam retakes are clearly documented	66.6%	33.3%	2.10±0.78
1.5	The criteria of student progression to next class are clearly documented	79.7%	20.3%	2.32±0.81
1.6	The procedures used for assessment of students are clearly laid down in assessment policy	73%	26.7%	2.20±0.71
1.7	I have been oriented about the assessment policy in my col-lege.	69.4%	30.7%	2.23±0.76
1.8	The medical school has a clearly defined assessment policy.	77%	23%	2.21±0.79
Assessment Methods		**70.06%**	**29.95%**	**2.19±0.76**
2.1	The assessment methods used to assess knowledge component of course are appropriate for assessing the cognitive domain.	75.7%	24.3%	2.25±0.81
2.2	The assessment methods used to assess skill component of course are appropriate for assessing the psychomotor domain.	72.1%	27.9%	2.21±0.70
2.3	The assessment methods used to assess behavior component of course are appropriate for assessing attitude domain.	68%	32%	2.22±0.72
2.4	An appropriate weightage is given to knowledge, skills and attitude domains in assessments.	64.4%	35.6%	2.05±0.80

2.5	The assessment methods used are feasible.	72.5%	27.5%	2.19±0.70
2.6	Use of new assessment methods is encouraged, where appro-priate.	68.5%	31.5%	2.21±0.80
2.7	Clear blueprints (table of specifications) are provided for each assessment.	67.6%	32.4%	2.25±0.80
2.8	Checklists or rubrics for performance assessments are clearly documented	71.1%	28.4%	2.19±0.78
Purpose of Assessment		**70.74%**	**29.3%**	**2.20±0.74**
3.1	Feedback is given to students promptly after an as-sessment.	66.3%	33.8%	2.12±0.82
3.2	The assessments encourage integrated learning by the students.	68.5%	31.5%	2.16±0.78
3.3	There is an appropriate mix of formative and summa-tive as-sessments.	71.6%	28.4%	2.21±0.70
3.4	Formative assessments are done at appropriate points during the curriculum to guide student learning.	74.3%	25.7%	2.23±0.71
3.5	The assessment system promotes student learning.	73%	27.1%	2.22±0.71

TABLE 2: MEDIAN SCORE SHOWING THE AWARENESS OF UNDERGRADUATE DENTAL STU-DENTS ABOUT THE ASSESSMENT

	Percentiles		
	25	**Median**	**75**
Assessment policies	15	17	19
Assessment methods	16	17	19
Purpose of assess-ment	10	10	12
Overall score of AIM	40	45	50

and Dental Council has set standards and guidelines for medical and dental colleges to adapt an assessment environment to prepare up to the standard medical professionals. Assessment allow institutes to evaluate their learning environment as well as assessment policies and its implementation. Learning environment can be assessed through multiple tools for assessment including Assessment Implementation Measure (AIM). AIM is a self-administered, reliable, pre-tested and pre-validated tool, developed through an assorted methodology.[18]

In the present study, AIM tool was utilized to understand the purpose of assessments conducted within CMH LMC & IOD. Majority students agreed with the assessment policies, methods used for assessment and the purpose of assessments given in the institute. This reflects the pertinent utility of assessments for improved learning and gives a perception that students are involved in a continuous learning process. The highest percentage subscale was Assessment Policies (72.57%) with all its questions scoring mean value of more than 2.16 except for question no. 1.4 (Table 1) with 32% students disagreeing with the permitted number of exam

retakes. This highlighted the relevant issue that needs to be corrected in the future by communicating the examination related policies in time with the students.

In the present study, students express some dissatisfaction with the assessment environment. Accessibility of curriculum to students in the form of study guides on college website prior to learning sessions improved their comprehension of the curriculum learning outcomes. The lowest scoring subscale is the "Assessment Methods" (70.06%) with its lowest scoring item 2.4 with agreeing percentile of 64.4% (Table 1). It shows that about 36% students disagreed with the weightage and importance given to skills and knowledge section in current assessments given in the institute. This observation of difference of perception of learning environment by the participants was also found in other studies(8, 16) depicting it to be a predictable outcome. Such aspects can be managed through regular program evaluations and feedbacks which can be valuable in periodically revised curricula.

The lowest scoring item from the subscale, "Purpose of Assessment" was the item 3.1 (Table 1) with agreeing percentile of 66.3%. Similar results were found in the

study conducted at University of Lahore (16) depicting the need of timely assessment feedbacks. Institutional administration can emphasize upon the significance of feedback to the faculty and develop an effective process for monitoring the feedbacks.

Although DREEM appears to be the most-commonly used assessment tool for evaluation of undergraduate learning environment[19] the inclusion of professional jargon, lack of uniformity and clarity in data report and analysis as well as cultural bias limits its convenient application.[20] Furthermore, DREEM lacks theoretical foundation[21,22] as well as sufficient evidence of its validity.[23] Therefore, more recently developed tools i.e. HELES[8]; or AIM[18] are feasible to use to assess the educational environment.[21] Modern era demands training of health professionals as innovative problem-solvers. This requires our curriculum to assess the students' competence, imagination and distinctiveness, instead of relying totally on quantitative scores.[24] The education system has repercussions on the didactic principles of teaching and learning due to the kickback effect on the current examination processes. A vast disparity in between the responses of students need to be taken in consideration for future assessment related policies.

Other tools i.e. ADEPT and ADAPT are developed for planning health promotional activities as well as influence policy development and implementation respectively. ADEPT lacks its application on assessment evaluation which drives learning but mainly used to analyze policy implementation. We also recognized some complications pertaining to the empirical testing and practical application.[11] In ADAPT instrument, every statement may not apply to every health promotion program because of differences in different state laws, scope of practice regulations, differences in college or school policies (legal issues or liability insurance), and/or the recommendation may simply be outside the scope of the program. Other limitations of the ADAPT instrument may include potential resistance from the program planners to alter parts of established programs that the ADAPT finds to be inadequate.[10]

Due to these deficiencies, it is recommended to align the table of specifications (TOS) of each subject with their assessment evaluation criteria and appropriate weightage must be given to it during assessments. The whole process can be ensured by mandatory presence of subject specialist and medical educationist during curriculum modification as well as assessment planning. Future research is needed to identify and explore other correlated factors to foster the educational experience for our students.[25]

Limitations: Dental students from a single institute were included in the present study, making these results less likely to be generalizable. Variable administrative and educational policies of diverse institutes within Pakistan can preclude the outcomes. As a questionnaire was used to gather the responses of the participants, the Social Desirability Bias may have a possibility of an impact on these responses. Moreover, students' awareness and judgement to the conventional aspects of health professional education may also be limited.

CONCLUSION

Majority of students expressed their satisfaction about the institutional assessment environment. Dissatisfaction was found among students about the feedback mechanisms and weightage given to skills, knowledge and attitude domains in assessments. Improvement of different aspects of assessment environment within the institute can be analyzed through AIM tool. This tool can be applicable for periodic evaluation of learning environment to improve institutional educational quality standards.

REFERENCES

1   Jackson N, Jamieson A, Khan A. Assessment in medical education and training: a practical guide: CRC Press; 2023.

2   Constantinou C, Wijnen-Meijer M. Student evaluations of teaching and the development of a comprehensive measure of teaching effectiveness for medical schools. BMC Medical Education. 2022 Feb 19;22(1):113.

3   Brierley C, Ellis L, Reid ER. Peer‐assisted learning in medical education: A systematic review and meta‐analysis. Medical education. 2022 Apr;56(4):365-73.

4   Vakili A, HajiAghajani S, Rashidy-Pour A. An investigation of factors influencing student evaluation of teacher performance: A comprehensive study in Semnan University of Medical Sciences. Koomesh. 2024;12(2):93-103.

5   Yadav D. Criteria for good qualitative research: A comprehensive review. The Asia-Pacific Education Researcher. 2022 Dec;31(6):679-89.

6   Svensäter G, Rohlin M. Assessment model blending formative and summative assessments using the SOLO taxonomy. European Journal of Dental Education. 2023 Feb;27(1):149-57.

7   Riveros-Perez E, Jimenez E, Cheriyan T, Varela N, Rodriguez J, Rocuts A. Approach to learning and educational environment: time to rethink measurement tools in postgraduate medical training?. International Journal of Medical Education. 2019;10:62.

8   Rusticus SA, Wilson D, Casiro O, Lovato C. Evaluating the quality of health professions learning environments: development and validation of the health education learning environment survey (HELES). Evaluation & the health professions. 2020 Sep;43(3):162-8.

9   Khan RA, Spruijt A, Mahboob U, Eraky MA, van Merrienboer JJ. Curriculum viability indicators: A Delphi study to determine standards and inhibitors of a curriculum. Evaluation & the health professions. 2021 Sep;44(3):210-9.

10   Rütten A, Gelius P, Abu-Omar K. Policy development and implementation in health promotion—from theory to practice: the ADEPT model. Health promotion international. 2011 Sep 1;26(3):322-9.

11   Truong HA, Taylor CR, DiPietro NA. The Assessment, Development, Assurance Pharmacist's Tool (ADAPT) for ensuring quality implementation of health promotion programs. American Journal of Pharmaceutical Education. 2012 Feb 10;76(1):12.

12 Shochet RB, Colbert-Getz JM, Wright SM. The Johns Hopkins learning environment scale: measuring medical students' perceptions of the processes supporting professional formation. Academic Medicine. 2015 Jun 1;90(6):810-8.

13 Fischer J, Bearman M, Boud D, Tai J. How does assessment drive learning? A focus on students' development of evaluative judgement. Assessment & Evaluation in Higher Education. 2024 Feb 17;49(2):233-45.

14 Srivastava TK, Waghmare LS, Vagha SJ, Mishra VP. Effective feedback practices in formative assessment: recognizing the relevance. J Educ Pract. 2013;4(11):47-55.

15 Kumari D, Philip BA, Chandran T. Dental undergraduate student perceptions on formative and summative assessment–A cross sectional study. J Evol Med Dent Sci. 2020 Aug 17;9:2367-71.

16 Aslam K, Bari A, Ayub A. Students' perception about assessment environment of University of Lahore-Dental School: A cross-sectional survey. JPMA. The Journal of the Pakistan Medical Association. 2019 Dec 1;69(12):1834-7.

17 Norcini J, Anderson B, Bollela V, Burch V, Costa MJ, Duvivier R, Galbraith R, Hays R, Kent A, Perrott V, Roberts T. Criteria for good assessment: consensus statement and recommendations from the Ottawa 2010 Conference. Medical teacher. 2011 Mar 1;33(3):206-14.

18 Sajjad M, Khan RA, Yasmeen R. Measuring assessment standards in undergraduate medical programs: Development and validation of AIM tool. Pakistan journal of medical sciences. 2018 Jan;34(1):164.

19 Mukhalalati B, Yakti O, Elshami S. A scoping review of the questionnaires used for the assessment of the perception of undergraduate students of the learning environment in healthcare professions education programs. Advances in Health Sciences Education. 2024 Apr 29:1-38.

20 Miles S, Swift L, Leinster SJ. The Dundee Ready Education Environment Measure (DREEM): a review of its adoption and use. Medical teacher. 2012 Sep 1;34(9):e620-34.

21 Rusticus SA, Wilson D, Jarus T, O'Flynn-Magee K, Albon S. Exploring student perceptions of the learning environment in four health professions education programs. Learning Environments Research. 2022 Apr 1:1-5.

22 Schönrock-Adema J, Bouwkamp-Timmer T, van Hell EA, Cohen-Schotanus J. Key elements in assessing the educational environment: where is the theory?. Advances in Health Sciences Education. 2012 Dec;17:727-42.

23 Colbert-Getz JM, Kim S, Goode VH, Shochet RB, Wright SM. Assessing medical students' and residents' perceptions of the learning environment: exploring validity evidence for the interpretation of scores from existing tools. Academic Medicine. 2014 Dec 1;89(12):1687-93.

24 Preston R, Gratani M, Owens K, Roche P, Zimanyi M, Malau-Aduli B. Exploring the impact of assessment on medical students' learning. Assessment & Evaluation in Higher Education. 2020 Jan 2;45(1):109-24.

25 Oh SL, Kim YJ, Cho E, Han JY. Practical approaches for enhancing student performance in summative assessment. J Med Educ Train. 2020;4(1):46.

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