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DOI: 10.46903/gjms/20.04.1048

ORIGINAL ARTICLE

DIFFERENT AND DOMINANT PREFERENCES OF LEARNING STYLES AMONG UNDERGRADUATE MEDICAL STUDENTS FROM ISLAMABAD AND GUJRANWALA CITIES, PAKISTAN

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ABSTRACT

Background: Across institutions, cultures, and pedagogical settings, researchers and psychologists have shown that students' preferred learning styles are distinct. Therefore, it is crucial to understand the dominant learning style among students. The objective of this study was to determine the different and dominant preferences of learning styles among undergraduate medical students from Islamabad and Gujranwala cities in Pakistan.

Materials & Methods: This cross-sectional study was conducted in Department of Medical Education, Shifa Hospital, Islamabad, Pakistan from February 2020 to January 2021. A total of 363 students were selected from Shifa College of Medicine, Islamabad, and Gujranwala Medical College, Gujranwala, Pakistan. The Honey and Mumford 80-item LSQ tool was used, based on learning style inventory of Kolb. It has four major learning styles; Activist, Reflector, Theorist, and Pragmatist. It is considered an effective tool for identifying students learning styles. Participants were explained the questionnaire. The data was analyzed as counts and percentages with 95% CI.

Results: A total of 363 students participated in this study. The dominant/ preferred learning style was Reflectors in 206 (56.75%, 95% CI: 51.65-61.85) students, followed by Theorists in 176 (48.48%, 95%CI: 43.34-53.63), Activists in 156 (42.97%, 95%CI: 37.88-48.07) and Pragmatists in 140 (38.57%, 95%CI: 33.56-43.57) students.

Conclusion: In our study, most of the medical students showed Reflector as dominant learning style, followed by Theorists, Activists and Pragmatists. It is important for faculty to understand the varied learning styles of students in a class for effective learning.

KEYWORDS: Curriculum; Learning style; Medical students; Questionnaire.

Cite as: Fatima SH, Hussain A, Naseem S, Fatima SR. Different and dominant preferences of learning styles among undergraduate medical students from Islamabad and Gujranwala cities, Pakistan. Gomal J Med Sci 2022 Oct-Dec; 20(4):172-7. https://doi.org/1046903/gjms/20.04.1048

1. INTRODUCTION

1.1 Background: A learner's favored way of learning and attaining information is described as a learning style.[1] Learning style promotes the learner to achieve and master his goals effectively.[1] The idea that learners study and learn differently has become a prominent learning issue in the last three decades. Learning styles and their models, given by educationists and researchers, have offered a wide range of styles ranging from fixed student natural personality to adaptable preferences for learning and studying.[2] Knowing the learner's preferred way of learning style can clearly benefit both the learner as well as the educator.[3] It is believed that the use of a single learning strategy for all learners in the class can favor some but undermines the process of learning for others.[4]

A learning style is "a description of attitudes and actions that influence our preferred approach of learning," as described by Honey and Mumford.[1]

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Date Submitted: 08-01-2022
Date Revised: 05-08-2022
Date Accepted: 11-10-2022

Kolb's learning style assessment was the basis for the 80-item **L**earning **S**tyle **Q**uestionnaire (LSQ) developed by Honey and Mumford. Four distinct learning styles; Activist, Reflector, Theorist, and Pragmatist, are distinguished by the LSQ.[1] It is considered an effective tool to identify students learning styles. Kappe et al. documented that identifying the learning styles of students through LSQ can create data that can be employed to match the instructional strategy with the learning style of the cohort.[5]

Table 1 shows different learning styles with descriptions as mentioned by Honey & Mumford.[5]

Table 1: Description of learning styles (Honey and Mumford, 1992)

Learning styles	Description
Activists	They enjoy new experiences. They take decisions intuitively and are considered active in their daily lives. One of the drawbacks of these people is that they dislike structured procedures
Theorists	They are concerned with concepts, reasoning, and systematic preparation. For them, intuition and emotional investment are not to be trusted
Pragmatists	They value efficiency and effectiveness. They are realistic in their outlooks, and they thrive in collaborations with others where they may argue and take calculated risks. These individuals lack the capacity for introspection and profound comprehension
Reflectors	Forward-thinking predictors are called "reflectors" since they like looking back at processes to characterize them and looking forward to seeing what could happen. They think things over and grasp the underlying significance of things

We have both public and private medical colleges in Pakistan. Students with a wide range of academic backgrounds from all over the country join these medical colleges. There are also foreign seats reserved in every medical college.[6] Environment in terms of teaching and learning strategy and learning opportunities may vary among these two sectors.[7] But curriculum and syllabus, along with guidelines for curriculum, are same and standardized under the directives of the accrediting body i.e. Pakistan Medical Commission.

1.2 Research Question: What are the different and dominant preferences of learning styles among undergraduate medical students from Islamabad and Gujranwala cities, Pakistan?

1.3 Research Objective: To determine the different and dominant preferences of learning styles among undergraduate medical students from Islamabad and Gujranwala cities, Pakistan.

2. MATERIALS AND METHODS

2.1 Design, setting & duration: This cross-sectional study was conducted in the Department of Medical Education, Shifa Hospital, Islamabad, Pakistan, from February 2020 to January 2021. Ethical approval was granted by Institutional Ethics Committee.

2.2 Sampling procedure: A sample of 363 students (academic years 1, 3, and 5) was selected from one private medical college; Shifa College of Medicine, Islamabad, and a public sector medical college; Gujranwala Medical College, Gujranwala, Pakistan through convenient sampling.

2.3 Data collection tool (questionnaire): Honey and Mumford's questionnaire was used, which consists of 80 items; 20 for each of the four learning styles; Activist, Theorist, Pragmatist, and Reflector. Students marked each statement as "✔" if they agreed to the statement and "✘" if they did not agree. For the dominant/ preferred learning style, each statement marked as "tick" was matched with the specific learning style question in the key.[8] The student's response was then evaluated according to his or her preference (very strong preference, strong preference, moderate preference, low preference, and very low preference) using the general norms established by Honey & Mumford in 1992.[9]

2.4 Data collection plan: Students of a private (Shifa) medical college were approached by a group of three researchers and students of a public (Gujranwala) medical college by one researcher of the team. The selected students were given the questionnaires to fill these in 40 minutes. They were explained how to complete the questionnaire. They

Table 2: General norms for 3,500 people in the UK (Honey and Mumford, 1992)

Learning style	Very strong preference	Strong preference	Moderate preference	Low preference	Very low preference
Activist	13-20	11-12	7-10	4-6	0-3
Reflector	18-20	15-17	12-14	9-11	0-8
Theorist	16-20	14-15	11-13	8-10	0-7
Pragmatist	17-20	15-16	12-14	9-11	0-8

were given a choice to skip the demographic portion. Researchers explained the study rationale along with Honey & Mumford LSQ. All the queries of students were addressed, and clarifications were made. The responses were collected on the spot.

2.5 Data analysis plan: Descriptive statistics were calculated as count and percentage for the sample. The results were inferred to the population as a 95% confidence interval using the statistical calculator "Statistics Kingdome"(https://www.statskingdom.com/proportion-confidence-interval-calculator.html). Table 2 shows general norms for 3,500 people in the UK, which provides the basis for the identification of preferred learning styles.

As we are also interested in the dominant learning style, the data for very strong preference and strong preference are added to give us dominant learning style[10,11] according to general "norms" as shown in Table 3. Then data is expressed as count and percentage with 95% CI.

3. RESULTS

A sample of 363 students was selected. Table 3 shows the frequency of students from two medical colleges and three academic years.

Table 4 shows the count and percentages of 363

Table 3: Frequency of undergraduate medical students from Islamabad and Gujranwala cities, Pakistan (n=363)

Year of study	Both Medical Colleges		Private Medical College		Public Medical College	
	Count	Percentage	Count	Percentage	Count	Percentage
Year 1	161	44.35	71	36.04	90	54.22
Year 3	93	25.62	69	35.03	24	14.46
Year 5	109	30.03	57	28.93	52	31.32
Total	363	100%	197	100%	166	100%

Table 4: Different preferences of learning styles among undergraduate medical students from Islamabad and Gujranwala cities, Pakistan (n=363)

Preference	Learning styles	Sample statistics		95% confidence interval	
		Count	Percentage	Lower	Upper
Very strong preference	Reflectors	76	20.94	16.75	25.12
	Pragmatists	59	16.25	12.46	20.05
	Theorists	85	23.42	19.06	27.77
	Activists	98	27.00	22.43	31.56
Strong preference	Reflectors	130	35.81	30.88	40.74
	Pragmatists	81	22.31	18.03	26.60
	Theorists	91	25.07	20.61	29.53
	Activists	58	15.98	12.21	19.75
Moderate preference	Reflectors	104	28.65	24.00	33.30
	Pragmatists	120	33.06	28.22	37.90
	Theorists	60	35.54	12.71	20.35
	Activists	122	33.61	28.75	38.47
Low preference	Reflectors	43	11.85	8.52	15.17
	Pragmatists	80	22.04	17.77	26.30
	Theorists	45	11.85	9.01	15.79
	Activists	44	12.12	8.76	15.48
Very low preference	Reflectors	10	2.75	1.07	4.44
	Pragmatists	23	6.34	3.83	8.84
	Theorists	15	4.13	2.08	6.18
	Activists	41	11.29	8.04	14.55

Table 5: Dominant learning styles among undergraduate medical students from Islamabad and Gujranwala cities, Pakistan (n=363)

Learning Style	Score for dominant learning style	Sample statistics		95% confidence interval	
		Count	Percentage	Lower	Upper
Reflectors	15-20	206	56.75	51.65	61.85
Theorists	14-20	176	48.48	43.34	53.63
Pragmatists	15-20	140	38.57	33.56	43.57
Activists	11-20	156	42.97	37.88	48.07

students for four different learning styles with five different preferences. Estimated parameters are shown as confidence intervals (CI) at 95% confidenece level (CL) for population proportion. It means that we are confident that 95% of times the true proportion of reflectors, pragmatists, theorists, and activists among all medical students from Islamabad and Gujranwala cities will lie between the lower and upper limits of CI.

It is important to note that an individual can have strong to very strong preferences for more than one learning style. The majority of students in our study i.e. 206 (56.75%) have a dominant learning style as "Reflectors" (Table 5).

DISCUSSION

Each learner uses a unique combination of learning strategies that suits him and is developed through time. When engaged in learning or other tasks, a person tends to rely on one of these types more naturally, as reported by Honey and Mumford (1995).[12] Educators find it most beneficial to investigate the learning processes of medical students because of the breadth and depth of information they must acquire in a short span of time. Different elements might affect how a student handles their studies. Experiential learning theory was the foundation for Honey and Mumford's definition of learning preferences.[12]

In our study, the majority of students with 56.75% ratio (95% CI: 51.65-61.85) showed Reflectors" as the dominant learning style. Similar findings were seen in a study conducted by Guraya et al., which showed reflector as the dominant learning style in 96% of undergraduate medical students.[13] Similarly, study by Nizami et al. showed that 42.5% of MBBS and DPT students had a dominant learning style of Reflectors.[14] Another study conducted on undergraduate medical students showed a dominant learning style of Reflector with 46.75% ratio.[15] Medical practitioners have a dominant learning style of reflectors.[16] Our findings contrast with the study of Shukr et al., where 21% undergraduate students showed reflectors as dominant learning style and 45% showed activists as dominant style.[17] According to Educational researchers, most common learning styles in professional students are found to be pragmatists and reflectors.[12,16,18]

The above finding is consistent with most of the studies as most of the literature has debated and documented that the dominant learning style of undergraduate medical students is "Reflector".[14,15,17]

Reflectors generally acquire roles of observers while working as part of health care teams. They are considered solution generators and are good at reviewing and analyzing one's actions. They enjoy tasks of medical history taking and clinical decision-making. Settings of endoscopic units, operating rooms, and intensive care units catch their interest because of the different and novel practice of treating patients in these units. They are generally bogged down by the stress of emergencies, monotonous tasks, and daily ward routines.[17]

The reason for dominant preference for Reflectors in undergraduate students in this study is uncertain. Though, multiple factors can be involved through which the preferred learning style has surfaced. One of the major factors can be the academic environments of the said colleges. The academic environment includes all the factors present in an academic institute that are related to academics with the intention of preparing students for professional life.[19] There can be multiple factors that impact the academic environment, including teaching strategies adopted by teachers, work/study load, class size, free time, the attitude of the faculty towards students, self-directed learning opportunities, assessments, reflective exercises, etc.[19] These can affect the learning styles of students. It needs further investigation in future studies. Another domain that can have an impact on the learning styles of students is the Emotional Quotient (EQ). Though, there is a lack of literature determining the positive relation between the two,[20] authors of the study think that emotional intelligence has a significant effect on learning styles as EQ benefits in improving the physical as well

as mental health of the students that improve their self-satisfaction and diminishes the effect of stressors in the academic environment.[21] Numerous educators debate that EQ should be inculcated in the medical curriculum to help students effectively cope with their studies.[21]

The curriculum is standardized in all medical and dental colleges in Pakistan, but teaching and learning strategies may vary. Implementing an integrated curriculum is being practiced in medical colleges, and the adoption of student-centered activities is a trend in teaching and learning strategies. Preferred learning style of Reflectors may be there because of progressively developing integrated curriculum and instructional strategies for a very long time in the said colleges. Now the students may not have much to experiment with in sessions with set patterns of teaching and learning strategies. Another explanation of this can be the impact of social and cultural factors and the distinctiveness of educational systems. The training and exposure of students before coming to medical colleges may also have significance in molding their learning styles.

5. CONCLUSION

In our study, most of the medical students showed Reflector as dominant learning style, followed by Theorists, Activists and Pragmatists. It is important for faculty to understand the varied learning styles of students in a class for effective learning. Learning methods and methodologies vary among medical students. This study provides a stepping stone for the faculty to identify the preferred learning styles of their students and modify teaching methods and learning strategies accordingly to make medical studies more effective for the students. Curriculum can be designed in such a manner to include learning opportunities for students with various learning style preference.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	SHF, AH
Acquisition, Analysis or Interpretation of Data:	SHF, AH, SN, SRF
Manuscript Writing & Approval:	SHF, AH, SN, SRF

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.