

LEARNING STYLE PREFERENCE AMONG UNDERGRADUATE PHYSIOTHERAPY STUDENTS, PAKISTAN: CROSS-SECTIONAL STUDY

Original Research

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ABSTRACT

Background: Each student possesses unique learning style preferences that vary based on their characteristics, cognitive levels, physical conditions, and readiness to acquire, process, and retain knowledge. Identifying and adapting to these preferences can enhance the selection of teaching methods and improve academic performance.

Objective: This study aims to assess the learning style preferences among undergraduate physiotherapy students in Rawalpindi, Pakistan.

Methods: A cross-sectional study was conducted from February 2023 to July 2023 involving undergraduate students aged 18 to 28 years from both genders. Data were collected using the VARK Questionnaire (Version 8.01) developed by Fleming and analyzed using SPSS version 21. Descriptive statistics and Chi-square tests were utilized to analyze the data and examine the association of VARK learning styles between male and female students.

Results: Among the 476 participants, with a mean age of 23.71 ± 0.36 years, 258 (54.2%) were female and 218 (45.8%) were male. A total of 298 (62.60%) students preferred a multimodal learning style, while 178 (37.40%) opted for unimodal learning styles. Bimodal learning was preferred by 155 (32.6%) students. The most preferred unimodal learning style was kinesthetic, chosen by 15.3% of students. A significant majority of female students (76.3%) showed a preference for multimodal learning styles compared to 56.45% of male students.

Conclusion: Multimodal learning styles are predominantly preferred by undergraduate physiotherapy students in Rawalpindi, with a notable preference among females for a combination of visual, auditory, reading, and kinesthetic modes.

Keywords: Academic performance, learning, Pakistan, students, undergraduate.

INTRODUCTION

The concept of learning styles was first introduced in 1954 by Herbert Thelen and has since been recognized as the individual's innate and preferred way of acquiring, processing, interpreting, organizing, and recalling information (1). These preferences are influenced by various factors, including personality traits, which in turn directly affect a student's learning process. The ability to identify the learning styles prevalent among students is pivotal for educators, as it not only impacts academic performance but also enhances overall learning effectiveness and shapes learning outcomes (2). Over recent years, medical education has witnessed a paradigm shift from a passive, teacher-centered approach to an active, student-centered methodology. This transition necessitates that educators be cognizant of the diverse learning styles to tailor their teaching methods accordingly, thus ensuring a productive learning environment. This is particularly vital in fields like medical education, where students are required to assimilate, recall, and apply extensive information throughout their courses (3).

Various models, such as those developed by Kolb, Reid, and Fleming's VARK model, as well as Gregorc's and Honey and Mumford's learning styles, have been formulated to assess and explain these preferences. Each model is based on distinct theories and concepts that illustrate how learning preferences are influenced by cultural backgrounds—not only internationally but also across different professions (4, 5). Within the allied health professions, which include physiotherapy, speech therapy, podiatry, occupational therapy, and nutrition, it is crucial to adopt learning styles that foster an effective teaching and learning environment (6). A recent study advocated for a blended learning approach, combining various teaching methods and learning approaches to meet educational needs effectively, thereby facilitating professionals in integrating theoretical knowledge with practical applications (7).

The VARK model, which categorizes learners into visual, auditory, reading/writing, and kinesthetic, highlights that each individual perceives information best through specific sensory modalities. Visual learners, for instance, excel when information is presented through graphs, diagrams, and images, whereas auditory learners prefer listening to lectures and discussions. Those who favor reading/writing learn optimally from printed texts and note-taking, while kinesthetic learners benefit from hands-on activities like dissection and examination (8). Recognizing that no single learning style is superior and that each has its own strengths and weaknesses is essential for educators to tailor their teaching strategies effectively (9).

Despite the significance of understanding learning styles, there is a dearth of research focusing on this aspect among physiotherapy students in Pakistan. Thus, this study aims to identify the learning style preferences of undergraduate physiotherapy students in Rawalpindi, Pakistan. This objective is grounded in the rationale that a deeper understanding of student learning preferences can significantly enhance the educational strategies deployed, thereby improving academic performance and optimizing learning outcomes (10).

METHODS

This cross-sectional study was conducted over a six-month period from February to July 2023, encompassing various universities in Rawalpindi and Islamabad. Ethical clearance was secured from the Institutional Review Board & Research Ethical Committee of the university (IRB-IIUI-FAHS/DPT/1022-1203). Prior to their participation, all study participants provided written informed consent. The sample size was determined using the RaoSoft online calculator, which estimated the necessary sample to achieve a confidence interval of 95% and a margin of error of 5%. Employing a nonprobability purposive sampling method, the study initially targeted 569 undergraduate students aged between 18 to 28 years, encompassing both genders; however, foreign students were excluded. Of these, 476 completed the study questionnaire, resulting in a response rate of 83.6%.

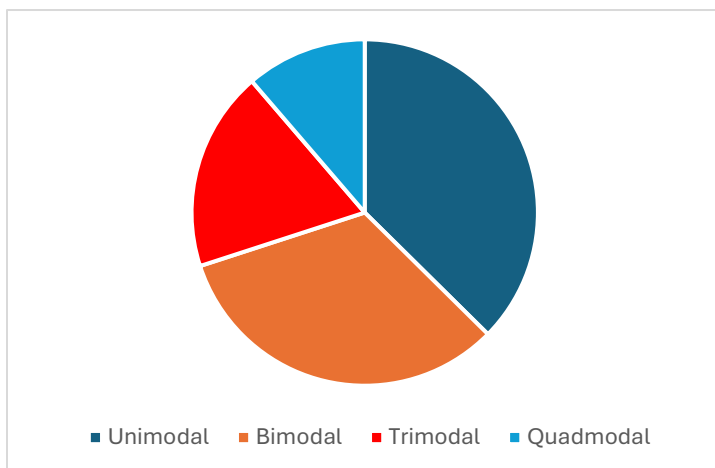
Data collection was facilitated through a semi-structured questionnaire, which was divided into two sections. The first section gathered general information about the participants, including name, gender, age, and semester. The second section consisted of the VARK Questionnaire (Version 8.01) developed by Fleming, aimed at identifying the students' preferred learning styles. This questionnaire included 16 multiple-choice questions, each offering four options where students could select multiple responses that best described their preferred learning modality. These modalities—Visual (V), Auditory (A), Reading/Writing (R), and Kinesthetic (K)—correspond

to different sensory channels through which information is most effectively received. The responses were then categorized into unimodal, bimodal, trimodal, and quadmodal learning styles, as described on the VARK website (<https://vark-learn.com/>).

Statistical analysis was conducted using descriptive statistics to calculate frequencies, percentages, and mean values with standard deviation. The association between male and female learning styles was examined using the Chi-square test, with a significance level set at a p-value of less than 0.05. The methodology adheres to standard research protocols, ensuring a robust framework for accurately assessing the learning style preferences among the targeted student population in Pakistan.

RESULTS

The study assessed the learning preferences of 476 undergraduate students, aged between 18 and 28 years, with an average age of 23.71 ± 0.36 years. The cohort consisted of 258 female students (54.2%) and 218 male students (45.8%). Analysis of learning styles revealed that 178 students (37.40%) favored a unimodal learning approach, while a significant majority, 298 students (62.60%), preferred a multimodal learning style. Within the multimodal category, bimodal preferences were most common (32.6%), followed by trimodal (18.7%) and quadmodal styles (11.3%).



The distribution of specific unimodal preferences indicated that kinesthetic learning was the most favored method, preferred by 15.3% of participants. Visual, auditory, and reading preferences followed, with 10.02%, 7.96%, and 4.1% of students preferring each mode, respectively. Among the bimodal combinations, the VK (visual and kinesthetic) combination was preferred by 14% of the students, while the most prevalent trimodal style was VAK (visual, auditory, and kinesthetic), preferred by 9.01% of students.

Figure 1 Overall learning preference among study participants

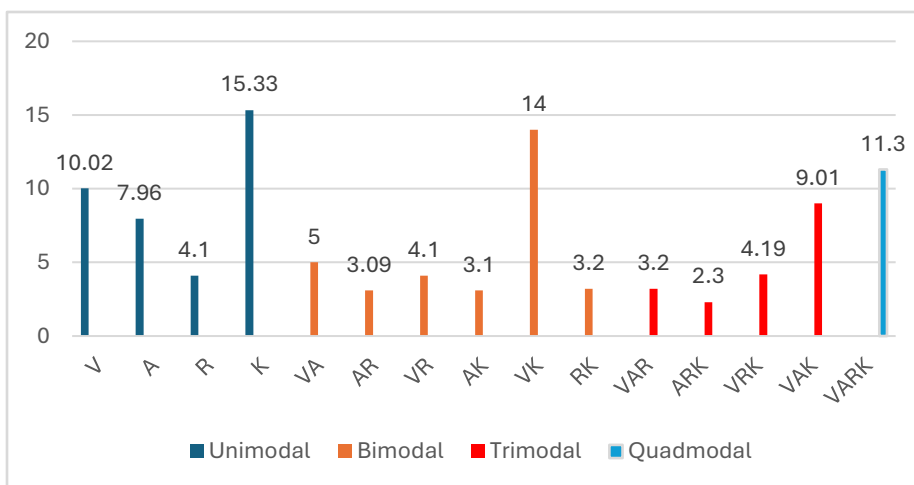


Figure 2 Distribution of learning style in students

A notable difference was observed in learning style preferences between genders. A significant proportion of male students (43.6%) preferred unimodal learning styles, in contrast to 23.7% of female students. Conversely, multimodal learning styles were more favored among females, with 76.3% indicating a preference, compared to 56.45% of males. This gender difference in learning style preference was statistically significant ($p = 0.03$).

Table 1 Association between gender and mode of learning

Learning style	Male	Female	Total	P value
Unimodal	95 (43.6%)	61 (23.70%)	178	0.03*
Multimodal	123 (56.45)	197 (76.30%)	298	

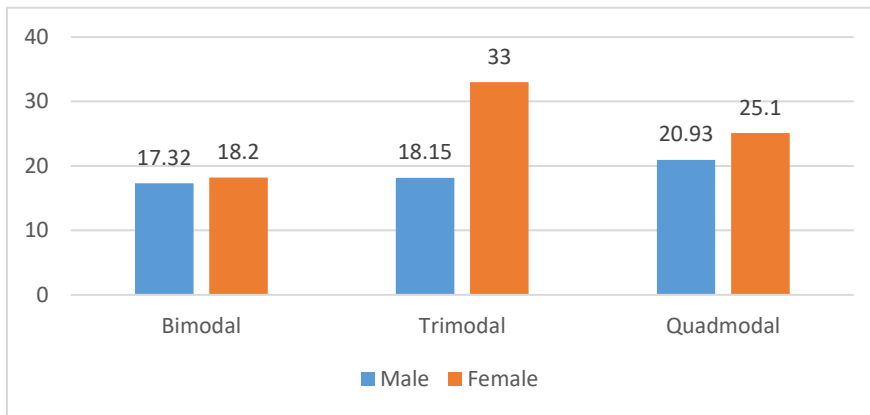


Figure 3 Multimodal learning style preference among male and female students

Among males who preferred multimodal learning, 20.93% opted for quadmodal styles, whereas among females, 33% showed a preference for trimodal learning styles. This suggests a diverse range of learning style preferences within the study population, highlighting the importance of tailoring educational strategies to meet varied learning needs effectively.

DISCUSSION

This cross-sectional study aimed to identify the predominant learning styles among physiotherapy students in Rawalpindi, revealing a significant inclination towards multimodal learning, with 62.60% of participants preferring this method. Specifically, the bimodal category emerged as the most popular, a trend also reflected in various comparative studies, such as those conducted by Aldosari et al., who found similar preferences for multimodal learning styles among their subjects (11). The preference for kinesthetic learning among unimodal learners aligns with broader educational studies in different disciplines, including those by Gaythri et al. and Chandrika et al., further highlighting a general preference for hands-on learning experiences across student populations (14, 15).

Contrasts in findings, such as those reported by Hamid Reza et al., who noted a higher preference for unimodal learning among dental students, suggest that disciplinary differences might influence learning style preferences (12). This could be attributed to the varying demands of academic content and teaching methodologies across different fields. Moreover, our study underscores a significant gender difference in learning preferences, with female students predominantly favoring multimodal strategies, contrasting with the unimodal preference among male students. This observation is supported by findings from Enjy Abouzeid et al. and Amjad Mahmood et al., who noted similar gender-based distinctions in learning style preferences (17, 18). Such differences may reflect broader cognitive and psychological variations between genders in processing and engaging with educational content.

However, this study is not without its limitations. The sample size, though adequate for initial analysis, is relatively small and concentrated within a specific geographic and academic context, thus limiting the generalizability of the findings. Additionally, while the VARK questionnaire effectively identifies preferred learning styles, it does not assess the efficacy of these styles in enhancing student performance or their applicability in different academic or professional settings. Despite these limitations, the study provides valuable insights into the learning preferences of physiotherapy students, which can inform the development of more effective educational strategies tailored to diverse learner needs. The clear preference for multimodal learning approaches suggests that integrating various teaching methods could enhance educational outcomes, catering to a broader range of learning preferences and potentially increasing academic engagement and retention rates.

CONCLUSION

The distinct learning style preferences exhibited by each student underscore the importance of recognizing and adapting to these individual differences. This study highlights the critical role that understanding learning preferences plays in fostering a motivational and efficient educational environment. By aligning teaching methods with the diverse learning styles of students, educators can significantly enhance academic engagement and performance, thereby achieving the educational objectives set forth in diverse academic settings. This tailored approach not only benefits the students by catering to their specific learning needs but also empowers teachers to deploy more effective and responsive educational strategies.

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