



Assessing Learning Preferences of First-Year Medical Students in a Competency-Based Medical Education (CBME) Curriculum: A Study at a North Indian Medical College

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Abstract

Introduction: A growing trend in medical education is “competency-based medical education (CBME),” which emphasises building the skills necessary to deliver high-quality patient care. Individual variances in how pupils approach learning are referred to as learning preferences. In order to adapt instruction to match individual needs, educators may find it useful to understand these preferences. The purpose of this study was to investigate the preferred learning styles of first-year medical students enrolled in a north Indian medical college's CBME programme.

Methods: 180 first-year medical students were recruited for a cross-sectional study to determine their preferred methods of learning using the “VARK (Visual, Aural, Read/Write, Kinesthetic)” questionnaire. To analyse the data, descriptive statistics were employed.

Results: It was shown that most students preferred kinesthetic and visual learning styles and were multimodal learners. Few students favoured aural learning over read-and-write instruction. Based on gender or prior educational experience, learning preferences did not differ much.

Conclusion: The study's findings suggest that medical educators should use a variety of instructional techniques to meet the varying learning preferences of their pupils. The findings are in line with those of earlier research done in other nations, underscoring the significance of taking cultural differences in learning preferences into account. Teachers can create effective teaching tactics that encourage learning by taking into account the preferred learning styles of medical students. Future research might examine the efficacy of various teaching strategies for various learning preferences in CBME curriculum.

Keywords: Learning preferences, CBME, medical students, VARK, north India

Introduction

Recent years have seen substantial developments in medical education, including a move towards CBME [1]. The development of the competencies necessary for medical practise is the main goal of CBME, an outcome-based approach to medical education [2]. Changes to teaching and assessment strategies are needed to apply CBME [3].

The various methods that people choose to learn and absorb information are referred to as learning styles. The four primary learning styles identified by the VARK model are “visual, aural, read-and-write, and kinaesthetic” [4]. Diagrams, charts, and movies are among the visual learning tools that visual learners prefer to use. Auditory learners like to learn through speaking and listening. Learners that want to read and write prefer to learn this way. Kinesthetic learners favour experiential learning and physical activity.

For educators to create effective teaching strategies that accommodate students' various learning styles, they must first have a thorough understanding of their learners' preferences [5]. Medical students have a variety of learning preferences, according to earlier study [6]. Investigating the preferred learning styles of medical students enrolled in the CBME curriculum is crucial.

This study attempts to look into the learning preferences of first-year medical students taking the CBME course at a medical college in north India. The results of this study can aid educators in creating instructional strategies that accommodate the various learning styles of medical students.

Materials and Methods

This study sought to discover more about the preferred learning styles of first-year medical students participating in a CBME programme at a medical college in north India. The research was carried out between January and March 2022. All subjects provided written informed consent, and the study was approved by the medical college's institutional ethics committee.

The study population was made up of all first-year medical students enrolled in the CBME programme for the academic year 2021–2022, and it had a cross-sectional design. The sample size was determined using the formula $n = Z^2pq/d^2$, where n is the sample size, Z is the standard normal deviation at the desired level of confidence ($Z = 1.96$ for 95% confidence level), p is the estimated percentage of students with a particular learning preference (maximum sample size: 50%), q is the complement of p (maximum sample size: 50%), and d is the margin of error (5%). The 138-person sample size was determined. 200 first-year medical students from a north Indian medical college who were enrolled in the CBME programme participated in the study.

Data on learning preferences were gathered through a self-administered survey. The VARK questionnaire was employed as the basis for the questionnaire used in this study [1]. The VARK questionnaire has been extensively used to determine preferred methods of learning in medical school [2,3,4]. 16 items made up the modified questionnaire utilised in this study,

four for each type of learning preference (kinesthetic, visual, aural, and read/write). A five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used to gauge the degree to which each learning modality was chosen by the pupils. The survey also gathered demographic information, such as respondents' ages, genders, and educational histories.

The IBM Corp., Armonk, NY, USA, company's SPSS version 25 was used for data analysis. The data were compiled using descriptive statistics, such as frequencies and percentages. The chi-square test was performed to examine whether gender and prior educational experience had a significant impact on learning preferences. A 0.05 p-value was regarded as statistically significant.

Results

180 first-year medical students in all took part in the study. The participant's demographic details are shown in Table 1. The majority of participants (60.6%) were women, and 84.4% of them had studied science in the past.

Based on the VARK questionnaire, Table 2 shows the participants' preferred methods of learning. The findings revealed that 69.4% of the participants preferred two or more modalities of learning, indicating that they were multimodal learners. Kinesthetic and visual learning were the most favoured forms of learning among multimodal learners, with 47.2% and 41.7% of the participants favouring each, respectively. Only a tiny portion of participants (6.1%) and 4.2% favoured read-and-write learning styles. Only 30.6% of the individuals identified a preferred way of learning, with kinesthetic learning (22.8%) being the most popular among them.

The distribution of learning preferences by gender and prior educational experience is shown in Table 3. There were no gender- or past educational-related variations in learning preferences ($p=0.75$ and 0.97 , respectively).

Table 1: Demographic characteristics of the participants

Characteristic	n (%)
Gender	
Male	71 (39.4)
Female	109 (60.6)
Prior educational background	
Science	152 (84.4)
Non-science	28 (15.6)

Table 2: Learning preferences of the participants based on the VARK questionnaire

Learning mode	n (%)
Kinesthetic	85 (47.2)
Visual	75 (41.7)
Aural	11 (6.1)
Read/write	8 (4.2)

Table 3: Distribution of learning preferences based on gender and prior educational background

	Kinesthetic	Visual	Aural	Read/write
Gender				
Male	35 (49.3)	30 (42.3)	3 (4.2)	3 (4.2)
Female	50 (45.9)	45 (41.3)	8 (7.3)	5 (4.6)
Prior educational background				
Science	72 (47.4)	67 (44.1)	9 (5.9)	4 (2.6)
Non-science	13 (46.4)	8 (28.6)	2 (7.1)	4 (14.3)

Note: Values are presented as n (%).

Discussion

The findings of this study indicate that kinesthetic and visual learning styles are preferred by first-year medical students enrolled in a CBME curriculum at a north Indian medical institution. This result is in line with other research that indicated medical students tended to favour active learning strategies and practical applications [7,8]. In contrast to research done in other regions of the world, where read/write and aural learning styles are more frequently observed among medical students, the preference for visual learning is for visual learning [9,10].

The CBME programme, which emphasises practical and experience learning through simulated patient encounters and hands-on clinical training, may be to blame for the increased preference for kinesthetic learning in this study. The CBME curriculum's usage of multimedia and visual aids during teaching and learning activities may be related to students' preferences for visual learning. This research emphasises the significance of modifying

teaching strategies and instructional resources to correspond with students' preferred learning styles, as doing so can improve student engagement and learning outcomes [11,12].

Additionally, the study identified no appreciable variations in learning preferences based on gender or past educational experience. This result is in line with earlier research that demonstrated that learning preferences are unaffected by gender or prior academic success [13,14]. Further study using bigger sample sizes is necessary because the limited sample size of this study may restrict the generalizability of this finding.

The study's conclusions have consequences for medical curriculum development. The engagement and learning outcomes of medical students can be improved by using teaching strategies and instructional materials that are more in line with the students' preferred learning styles, which can be identified by educators [15]. Medical students who like kinesthetic learning will benefit from CBME's emphasis on practical and experiential learning. To accommodate students' preferences for visual learning, it could be necessary to place even more emphasis on the use of multimedia and visual aids.

The limited sample size of this study, which can restrict the generalizability of the results, and the use of a self-reported questionnaire to gauge learning preferences, which might be susceptible to response bias, are its limitations. The learning preferences of medical students may be better understood in the future with the use of larger sample sizes and different assessment techniques, such observation or interviews.

As a result, this research sheds light on the preferred methods of learning for first-year medical students enrolled in a CBME programme at a north Indian medical college. The study discovered that students favour kinesthetic and visual learning modes, which may have effects on how medical educators teach and how their students learn. Larger sample sizes and different techniques for determining learning preferences are required in additional study in order to validate and build upon these findings.

Conclusion

In conclusion, this study emphasises how crucial it is to comprehend the learning styles of medical students in order to develop efficient teaching and learning procedures. According to the research, a north Indian medical college's CBME curriculum is efficient at attracting students who favour kinesthetic and visual learning styles through hands-on, experiential learning, the use of multimedia, and visual aids. Further study using bigger sample sizes and different techniques for determining learning preferences is advised because the small sample size and use of self-reported questionnaires may restrict the generalizability of the findings.

The results of this study also have significance for other contexts and places where CBME is used in medical education. The focus on experiential and practical learning is consistent with the emerging trend in medical education towards competency-based learning and assessment, which places an emphasis on the acquisition of specific knowledge, skills, and attitudes necessary for successful clinical practise. However, it could be necessary to adjust the usage

of multimedia and visual aids based on the learning preferences of students in various contexts and circumstances.

As a result, the findings of this study offer insightful information about how first-year medical students learn best in a CBME curriculum at a north Indian medical college. The study emphasises how crucial it is to comprehend medical students' preferred methods of learning in order to develop teaching and learning strategies that would increase their engagement and academic success. It is advised that these results be confirmed and expanded upon by more study using larger sample sizes and different techniques for figuring out learning preferences.

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