Dimension of learning styles among undergraduate dental students: A cross sectional study

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ABSTRACT:
Objective: To document frequency of different learning styles among dental students.
Methodology: This cross-sectional study was conducted at Liaquat University of Medical and Health Sciences (LUMHS), Muhammad Medical college (MMC) and Bhitai Dental college (BDC) Mirpurkhas from May 2021 to August 2021. 2nd year BDS students (n=198) were enrolled for the study. In addition to demographic, study participants were requested to complete VARK inventory (visual, aural, read/write, and kinesthetic) online to gather preferences of learning style.
Results: During period of study, among selected 198 participants, 172 questionnaires were completed filled with response rate of 86.86. Results showed that 64.2% participants used multimodal learning style while 35.8 % dental undergraduate students liked to learn through unimodal learning style
Conclusion: As expected, the learning preferences showed wide variation and therefore educators should try to adapt their teaching methods to the learning styles of their students, especially those with unimodal learning styles. At the same time students who prefer unimodal learning styles should encourage to adopt multimodal learning methods particularly if their previous academic performance was poor in order to enhance their educational experience.

Key words: Learning style, Dentistry students, VARK Model ,Academic Achievement

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Introduction:

Learning style, among others is one significant factor influencing academic achievement.[1] According to the VARK model, academic achievement is one of the most important variables used to predict pupils' future academic standing.[1,2] Information is often viewed and handled differently by different people. A person's learning style is the method by which they take in and remember information to gain knowledge or skills. Teachers can accommodate a variety of student requests by having a thorough understanding of their learning preferences. [3] The concept of learning styles has several implications for both educators and learners. Students can develop individualized study strategies, gain a deeper understanding of their learning preferences, and succeed academically. Each learner has a unique learning style. University students enrolled in health professional programs, including nursing, BDS, and MBBS, are exposed to a variety of teaching and learning approaches. As they progress toward professional degrees, they begin to take courses that require more independent study, reading, writing, critical thinking, and practical experience. Teaching students to become the kind of professionals who will enhance patient care is the aim of medical college teachers. Additionally, educators want their students to be lifelong learners.[4] Stewart and Felicetti define learning styles as instructional situations that boost a student's chances of learning. Mismatches between teaching approaches and students' learning styles might impede teachers' ability to successfully convey knowledge to pupils. To improve the quality of the learning experience and meet students' preferences, dental educators must first understand how students learn and then use appropriate teaching strategies. Neil Fleming developed the VARK questionnaire, which is one of the most commonly used learning style tools. He discussed the four senses: kinesthetic (K), visual (V), auditory (A), and reading/writing (R) (VARK). Seeing visuals, graphs, movies, and graphics can assist visual learners learn. Auditory learners acquire knowledge through lectures, conversations, and speaking. Kinesthetic learners learn by touching and engaging in activities that emphasize doing, bodily involvement, and object manipulation, whereas reading/writing learners learn by reading the material and taking their own notes.[5] According to research conducted at the Islamic Azad University of Roodehen Branch, learning styles and academic success are strongly associated.[6] A recent study of engineering students found that 41.17% favored kinesthetic learning.[7] Adopting the chosen learning strategy has resulted in significant academic achievements in various studies. In one study, undergraduate physical therapy students who were forced to learn in their least favorite manner demonstrated higher levels of anxiety and a more negative attitude toward the instructions[8] than a similar group that learned in their preferred techniques. Studies on the academic achievement of sec-

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ond-year medical students in Pakistan found that the impact of a moderate teaching-learning mismatch differs by learner.[9] Critical thinking has a positive educational impact because learning and thinking are the primary aims of educational institutions.[10] A person's learning style is determined by their individual learning preferences, which include the strategies they use to interact with material.[11] Numerous studies have been undertaken on the learning styles and tactics of medical students in Pakistan and around the world.[12-16] However, no research involving dental students has been undertaken at LUMHS University.Although there are several methods for assessing learning styles, researchers most commonly use the VARK questionnaire.[17-20] A great deal of study has gone into developing a variety of methods to assess a person's preferred way of learning. The VARK questionnaire, one of the most extensively used instruments, has acceptable validity and reliability.[21] Based on these findings, we should be cognizant of dental students' learning styles and how they influence their future academic success. Additionally, the medical teacher's content was tailored to the dentistry students' learning patterns.

Objectives:

To document frequency of different learning styles among dental students of 2nd year.

Methodology:

A descriptive cross-sectional study was conducted with the participation of second-year BDS students from Bhitai Medical and Dental College of Mirpurkhas and Liquate University of Medical and Health Sciences (LUMHS) Jamshoro. Study participants were asked to fill out the online VARK questionnaire in order to determine their preferred learning methods. The study's methodology was reviewed and approved by the LUMHS Ethical Review Committee. A second-year BDS representative received an email requesting that they forward a survey link to their peers. Each question allowed for the identification of a VARK learning preference and had four alternative answers.

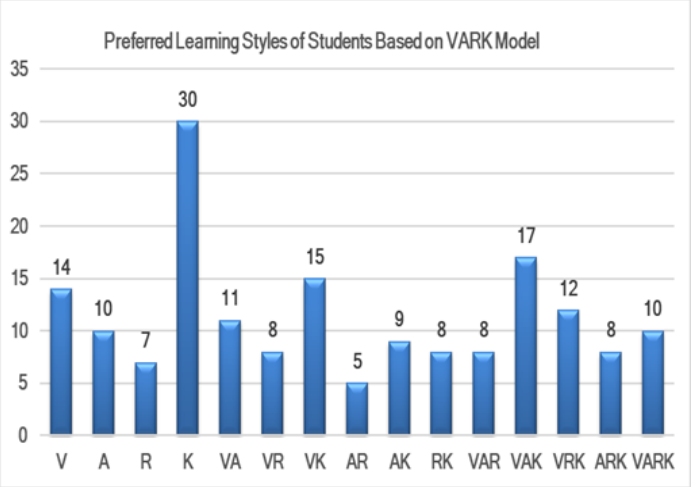
Students can choose from a range of options to ascertain their preferences for various learning approaches. The VARK preference distributions were calculated in accordance with the guidelines on the VARK website. To determine the proportion of students for each VARK modality (V, A, R, and K) and for all possible combinations of modalities (e.g., VA, VRK, etc.), the number of students who preferred each learning style modality was divided by the total number of students.

Data collected presented as mean, SD, average and frequency. SPSS used for statistical analysis.

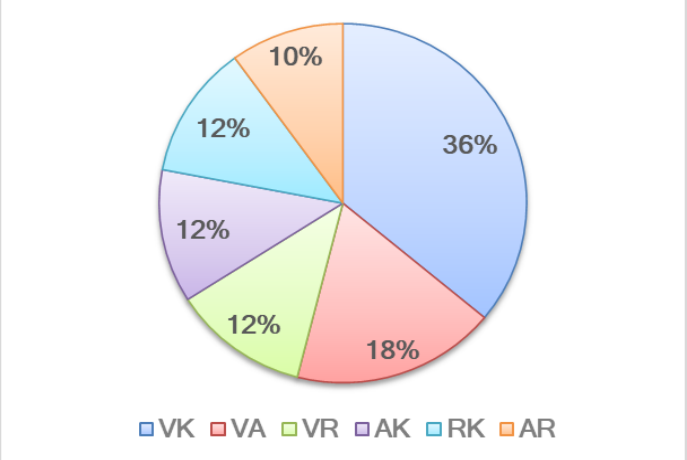
Results:

Ammong 198 dentistry students, complete response in all respect was from 172 students a reponse rate of 86.86%. Results showed that kinesthetics was the most prefrrred learning style (30%) among dentistry students, followed next in frequency by visual (14%) auditory (10%) and read write among 7% of the students . Kinesthetic (30%) was the most common learning mode among LUMHS and BDC dentistry students, followed by visual (14%), auditory (10%), and read/write (7%) as shown in graph 1. Students' preferences for multimodal and unimodal learning styles were 64.2% and 35.8%, respectively. Further analysis showed that students who favored a multimodal learning method bimodal (36.1%), trimodal39.5%, and quadmodal (24.4%) models of leaning was favored respectively. This indicates that among multimodal students, trimodal was the most popular learning mode. The unimodal students tends to be tactile and visual learners. Additional investigation revealed that the bimodal students' primary learning choices were VK (36%) followed by VA (18%), AK, VR, RK (12% each), and AR (10%) as shown in fig2. VARK model for students who prefers trimodal learning (49%) approach is shown in graph 3. Among these 25% were VRK, and 13% each were VAR and ARK.

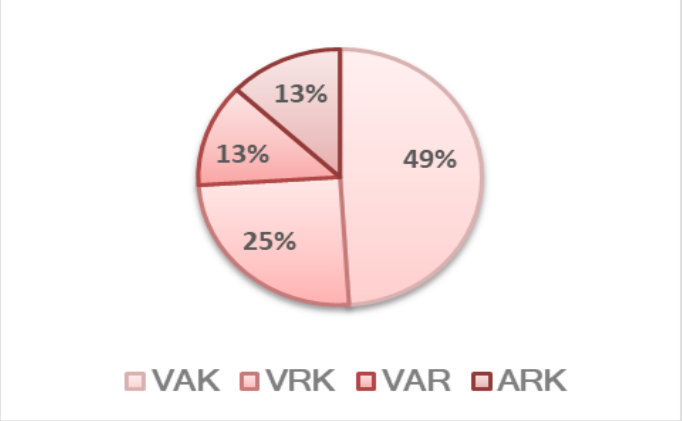
Graph No 1: Learning style of Dentitry students based upon VARK model



Graph No 2: VARK model for students with primary bimodal learning preferences.



Graph No 3: VARK model for students with trimodal learning approach preferences.



Discussion:

The goal of the current study was to determine how common the selected learning style was among dental students at LUMHS and BDS of Sindh seeking bachelor's degrees in dentistry. It found that numerous studies have examined the learning preferences of undergraduate medical and dental students, but this is the first to be conducted at Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro within the framework of a highly technologically dependent educational system. Social media, WhatsApp groups, and emails were used to get in touch with the students. This is similar to other previous studies.[5,22] Participation in the study was completely optional. Multimodal learning was the most common learning style among students (64.2%), a finding in agreement with published studies [23,24] while it is in sharp contrast to the finding of Hamid Reza Mozaffari's et al, as they reported unimodal learning style as the most common learning style.[1] According to cognitive load theory, information gathered from a range of sensory stimuli facilitates its transfer into long-term memory.[25] The most common approaches were kinesthetic (K) and visual (V), with 35.8% of students stating that they favored a unimodal approach. This result differs from previous studies. Kinesthetic (K) and read/write (R) learning modes were the most popular among Barbados students.[24] Saudi Arabian dental students opted for kinesthetic (K) and auditory (A) learning styles.[11] Iranian children displayed a comparable result.[26] A previous study in Pakistan found that medical students favored kinesthetic (K) learning over aural (A) learning.[27] Students may have begun relying on internet resources to enhance their study. Studies show that 83.9% of medical students use YouTube as a learning tool. [28,29] Students prefer the kinesthetic (K) approach, according to numerous studies. [30,31] indicating that they employ active learning strategies. The preference shift of medical and dental students from auditory (A) to visual (V) learning may be due to the increasing use of online learning. The healthcare sector requires critical thinking and problem-solving abilities in order to provide patients with the care they need. Children are encouraged to think actively through kinesthetic learning.[32] Pakistan has been teaching dentistry education in the same manner for a long time. The COVID-19 pandemic forced educators to adopt online instruction. We believe that the findings of this study will help health professional educators modify their lesson plans to better fit the needs of today's learners. It is also important to encourage students to learn from different teaching philosophies. The results of the study will also assist university management in making the necessary modifications to the teaching style.

Secondly, learning outcomes for dental students can be improved, and this will have an impact on dental practice in the future. The research findings will also help teachers create or prepare successful lessons based on the learning patterns of dentistry students. Awareness of the evolving learning styles of medical and dental students. It also highlights the ways in which a student's gender, academic year, and academic record affect their preferred methods of learning. Health professional educators can modify their class plans to better meet the needs of today's students by using this knowledge. In the same way, students should be encouraged to learn from a range of teaching methods.

One of the study's limitation is the small sample size, which make generalizability of the results difficult. Larger sample size studies are required as follow-up studies in order to attain generalizability.

Conclusion:

This study found that while fewer dentistry students learned using unimodal methods, most students employed multimodal teaching and learning strategies. The most common learning styles among unimodal learners were kinesthetic and visual. A substantial sample size from a range of contexts should ideally be included in future studies looking into the connection between learning style and academic achievement. Instructors ought to make an effort to adapt their lesson plans to their students' preferred methods of learning, especially by experimenting with multimodal learning.

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Veena Kumari	Conceived idea, literature Review.
Gotam Kumar	Developed Proforma
Ruqayya Ayoob Chandio	Write introduction
Mehwish Noor Chandio	Data Collection
Partab Puri	Manuscript draft writing
Pirya Goswami	Data collection/ grammatical review