

Learning Styles of Postgraduate Students at Shahid Beheshti Dental School Using VARK Questionnaire

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Abstract

Objectives Learning clinical sciences is challenging for medical students and requires a wide range of knowledge and skills in the clinical environment. There are several ways to learn, and choosing the best can be very effective in a student's learning success. Therefore; in this study, the learning styles of postgraduate students at Shahid Beheshti Dental School were evaluated.

Methods The study was performed on 92 postgraduate students at Shahid Beheshti Dental School. The data analysis tool was the VARK questionnaire, and the data obtained were analyzed using descriptive tests. The learning styles among the gender and age groups were comprised using Chi-square (Exact test) at $p < 0.05$.

Results Among the mentioned learning methods, the kinesthetic method had the highest frequency, followed by the auditory and visual methods. Auditory-reading-writing- kinesthetic and visual-reading-writing were the least common. Moreover, there was no significant difference between the distribution of learning styles among men and women ($p = 0.67$) and different age groups ($p = 0.7$).

Conclusion According to the results obtained from this study on the superiority of kinesthetic learning style among postgraduate dental students, it seems necessary for the educational system's officials and managers to plan appropriately for this group of learners' learning conditions to improve the quality of education.

Keywords Learning modalities; Postgraduate students; Dental education

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Introduction

Learning clinical science is a challenge for medical students and includes a wide range of knowledge and skills in the clinical environment. Many things affect learning, one of which is the learning style.¹

The learning method is a normal and unique behavior to gain knowledge, skills, and feedback through study or experience. It is a method that students prefer to use through various methods in the learning process, which is efficient and effective.^{2, 3} Therefore, each student has a personal style for receiving, processing, storing, and remembering new information, and students who become aware of their learning methods can learn more in less time.⁴ According to Fleming's observations, knowledge of learning methods helps students choose the best way to receive information and then change their study methods.⁴ Many studies have shown that the compatibility between teachers' teaching methods and students' learning methods encourages students to learn and achieve better educational achievements. Therefore, teachers need to be aware of their student's learning methods and try to choose the method of teaching and testing according to the student's learning methods.^{4, 5} Dental education in general and specialty courses combine theoretical and practical courses. Therefore, presenting students' learning style preferences is important to design an effective curriculum and create learning opportunities. Over the past four decades, several models have been proposed to describe students' learning patterns.^{6, 7} One of the common

models used to classify learning methods is the VARK model, presented by Fleming, which classifies the teaching methods of professors and the student learning methods into four modes based on sensory aspects: visual, aural, read/write, and Kinesthetic.⁸ Visual learners prefer to learn content by seeing and presenting information demonstratively. The aural learns better by listening and prefers to use lectures, podcasts, and oral discussions as a learning tool. Read/write learners learn better by taking notes and reading written or printed texts. Therefore, they prefer to obtain new information through printed words, books, pamphlets, tables, and lists, and they use writing to record and review new information.⁹ Kinesthetic learners learn better through practical and experimental samples and manipulation of objects in a physical process; they prefer to use experience or participate in a physical activity to learn. This activity can be done through field training, workshops, role play, and other conditions and combines different senses.^{9, 10} The VARK Learning Methods Questionnaire was developed by Lincoln University in New Zealand in 1998. The VARK questionnaire has been widely used in various studies in general student courses and to a lesser extent in specialty courses due to its simplicity, relative ease of implementation, good reliability, and sufficient credibility.⁹ The validity and reliability of the questionnaire have already been confirmed by Fleming and other researchers.^{4, 8, 11, 12} Some studies have examined learning methods among medical students with variable results. For example, a study conducted in Saudi Arabia on first-year dental students

showed that 59% of students prefer multiple learning methods.¹³ Another study in the United States showed differences in learning preferences between dental school years.¹⁴ In some studies, the learners' preference was the written and printed method and in others, the kinesthetic method was preferred.²

In Iran, several studies have used the VARK questionnaire in various fields of medical sciences; however, few have been conducted to identify the learning style preferences of dental students, and no study has been conducted in the specialty dental course.^{4,15} Specialty courses in medical sciences place more emphasis on professional, complete, and comprehensive learning of the specialty field than general education. Therefore, specialty students may have different learning preferences from general students.¹⁶ This study was conducted to determine the learning method among specialty dental students of Shahid Beheshti University of Medical Sciences to select educational methods appropriate to their capabilities.

Methods and Materials

This cross-sectional descriptive study was conducted at Shahid Beheshti Dental School after it was reviewed and approved by the ethics committee of the Dental School under the code of (IR.SBMU.DRC.REC.1398.238).

The study participants were specialty students who had completed at least one semester and were willing to participate. Sampling was done by counting and full enumeration among all the students of the specialty course at the Faculty of Dentistry, Shahid Beheshti University of Medical Sciences. The students' age, gender, and field of study were the required variables.

The standard questionnaire (VARK), consisting of 16 four-choice questions (Appendix 1), was distributed among the participants. The questions were designed based on individual performance in different situations. Each question consisted of four options, each measuring one of the dimensions of the learning method. Four learning methods included 1) visual, 2) aural, 3) read/write, and 4) kinesthetic. Each participant was able to choose more than one option and even select all of them. Each option associated with each method earned one point, giving each individual a maximum of 16 and a minimum of zero points in each learning method. Gaining a higher score in each type of learning method showed a greater willingness to use that method. For people who scored equal in two or more learning methods, the multi-performance learning method was considered. Then, the data were collected and statistically evaluated, thus obtaining the relative frequency of specialty students interested in each learning method and their preferences.

The obtained data were analyzed as response percentages using SPSS software. The Chi-square test (Exact test) was

used to compare learning styles between gender and age groups at a significance level of 0.05.

Results

In this research, 92 people participated (45 men and 47 women). As shown in Figure 1, the highest frequency of learning styles was related to kinesthetic style among men (35.6%) and women (29.8%). The lowest frequency among men was related to visual learning, and among women, the reading-writing style.

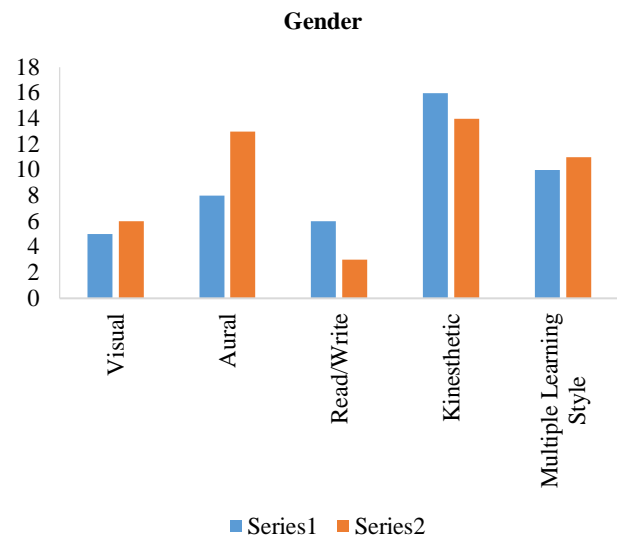


Figure 1: Frequency of different learning styles among men (blue) and women (orange)

The age of the participants was examined in three different age groups, as demonstrated in Table 1.

Age groups	25-30	31-35	Over 36
No of persons	62 (67.39%)	25 (27.17%)	5 (5.43%)

The frequency of learning styles in different age groups is demonstrated in Figure 2. In both age ranges of 25-30 years and 31-35 years, the highest frequency was related to kinesthetic learning (32.3% and 36%, respectively). However, in the range of over 36 years, the listening style was more frequent (40%).

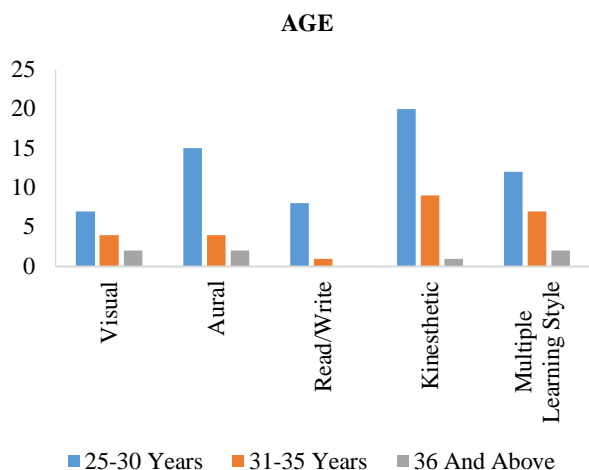


Figure 2: The frequency of learning styles in different age groups

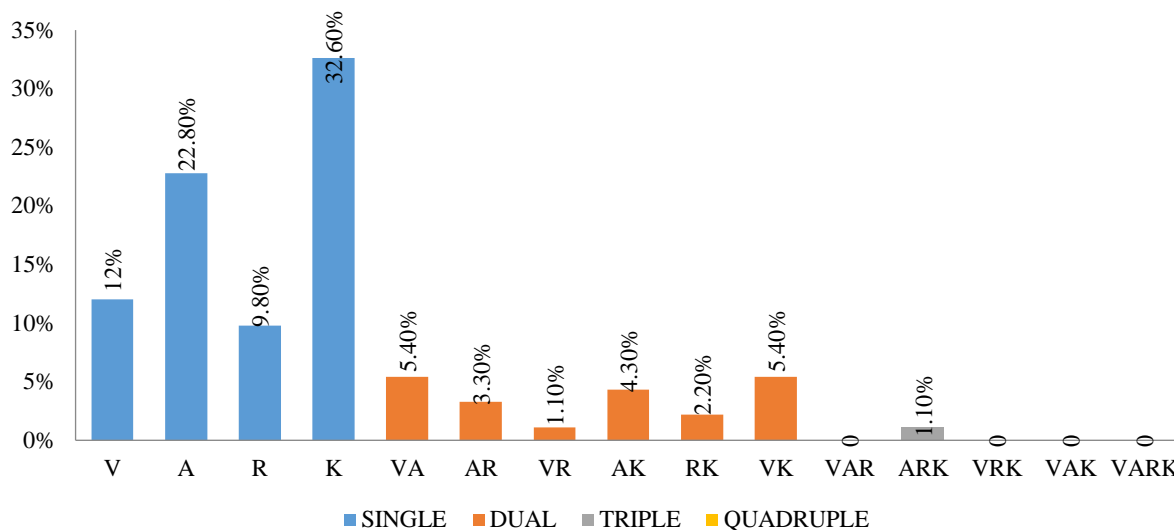


Figure 3: Percentages of students with unimodal, bimodal, trimodal and quadrimodal preferences

Discussion

This study was designed to determine the learning methods of specialty students at Shahid Beheshti Dental School. The results showed that the kinesthetic method has the highest frequency, followed by the auditory and visual methods according to the VARK questionnaire.

The results of the present study was different from the results of Amini et al (2010) on medical students, in which the most preferred style was visual, and the least was kinesthetic. The reason for this difference could be the combination of more practical courses and fewer theoretical courses in dentistry compared to medicine.¹⁷

In another study by Ahmadi and Alami among the health workers of Qazvin University of Medical Sciences, the learning style of reading and writing had the highest, and the visual had the lowest frequency, which is also in contradiction with the results of this study.¹⁸

In 2013, Alipour et al. conducted research among nursing

and midwifery students in Ramsar, which yielded contradictory results. They concluded that multiple learning styles is considered the most commonly used style, and also, contrary to this research, among individual learning styles, auditory learning style is considered the most common learning method among students.¹⁹ It seems that this difference in results is due to the difference between nursing, midwifery and dentistry in the type of clinical service and the need for dental students to learn more accurate manual skills.

In the study of Hejazi et al. In 2015, among the students of North Khorasan University of Medical Sciences, the results indicated that among the students of dental specialties, kinesthetic style was considered the dominant style, similar to the present study's results. And the reason can be the same field of study in both studies. Also, among the students of laboratory sciences, listening style, nursing students, writing-reading style, and among medical students, writing-listening style were identified as the dominant styles, which

Figure 3 demonstrates statistics related to the learning styles of the research model. The overall highest frequency was related to the kinetic learning method and the lowest frequency among the main learning methods was related to the read/write method. Although, in multiple learning, visual, auditory (VA) and visual, kinesthetic (VK) had the same rank (5.4%). Therefore, among the learning styles, kinesthetic, auditory, visual, and read-write learning styles had the highest frequency, respectively. Moreover, no significant difference between the distribution of learning styles among men and women ($p = 0.67$) and different age groups ($p = 0.7$) was observed.

is due to the difference between the nature of these fields and dentistry. Due to the unity of the teacher, the teacher strengthens and highlights listening and note-taking among nursing students without involving learners in the learning and teaching process.²⁰

In a study by Rahmanpour et al. in 2009, among technical-engineering students in comparison with students of Isfahan Faculty of Humanities, the researchers concluded that among humanities students, listening style, and among technical-engineering students, kinesthetic style were considered dominant, and the kinesthetic style and listening style were considered to be the two styles with the highest use.²¹ The probable reason for the similar results in this study to the present study is the existence of practical training in this field, similar to dentistry.

In the study of Mehdipour et al., which was conducted in 2016 on dental students of the International Campus of Shahid Beheshti University of Medical Sciences, the auditory style and then the movement-motor style had the highest frequency.²² Although the highest frequency of learning style in our study was not the same as this study, the two top learning styles, kinesthetic and auditory style, in both studies were among the most widely used learning styles among general and specialty dental students. The reason for this similarity of results is probably that general course training relies on basics, and specialty course training places more emphasis on professional learning in each specialty field.¹⁶

The present study's results show the superiority of kinesthetic learning style among students of specialty dental courses. The reason for using this style can be explained as follows: learners of dental specialties may be able to learn better with practical learning styles because they experience learning in their specialty field in a practical way.

It seems that identifying the dominant learning style among students and adapting teachers' teaching methods to the

learning style of learners by changing the way education is provided can be effective in improving students' academic achievement. Undoubtedly, further studies in this field will be needed and helpful.

Conclusion

According to the results of this study on the superiority of kinesthetic learning style among postgraduate dental students, appropriate planning according to the learning conditions of this group of learners seems quite necessary to improve the quality of education by the educational system's officials and managers.

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Author Contributions:

S.J.: conceptualized the study, developed the methodology, and wrote the original draft. M.M.: was responsible for data collection, analysis, and manuscript editing. A.M.: provided critical revisions and supervised the research. J.B.T.: contributed to data analysis and interpretation of results. S.D.: provided administrative support and assisted with manuscript preparation.

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Ethical Approval Code: This retrospective and cross-sectional study was approved by the ethics committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.DRC.REC.1398.238).

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflict of Interest: No Conflict of Interest Declared ■

References

1. Kharb P, Samanta PP, Jindal M, Singh V. The learning styles and the preferred teaching-learning strategies of first year medical students. *J Clin Diagn Res.* 2013;7(6):1089-92.
2. Sinha NK, Bhardwaj A, Singh S, Abas AL. Learning preferences of clinical students: A study in a Malaysian medical college. *Int J Med Public Health.* 2013;3:60-3.
3. Prabha V, Waheeda S. Gender differences in learning styles among the first year medical students. *J Evol Med Dent. Sci.* 2015; 4(89):15459-63.
4. Peyman H, Sadeghifar J, Khajavikhan J, Yasemi M, Rasool M, Yaghoubi YM, et al. Using VARK approach for assessing preferred learning styles of first year medical sciences students: a survey from Iran. *J Clin Diagn Res.* 2014;8(8):GC01-4.
5. Valizadeh L, Fathi azar S, Zamanzadeh V. Nursing and midwifery students' learning styles in Tabriz medical university. *Iranian J Med Educ.* 2006; 6(2):136-9.
6. Zhao B, Potter DD. Comparison of lecture-based learning vs discussion-based learning in undergraduate medical students. *J Surg Educ.* 2016;73(2):250-7.
7. Coffield F, Moseley D, Hall E, Ecclestone K. Learning styles and pedagogy in post-16 learning: A systematic and critical review. London: Learning and Skills Research Centre.2004; p:1-91.
8. Hosford CC, Siders WA. Felder-Soloman's index of learning styles: Internal consistency, temporal stability, and factor structure. *Teach Learn Med.* 2010;22(4):298-303.
9. Fleming ND, Mills C. Not another inventory, rather a catalyst for reflection. University of Nebraska - Lincoln. 1992;11(1):137-55.
10. Leite W L, Svinicki M, Shi Y. Attempted Validation of the Scores of the VARK: Learning Styles Inventory With Multitrait–Multimethod Confirmatory Factor Analysis Models. *Educ Psychol*

- Meas. 2010; 70(2): 323-39.
11. Shenoy N, Shenoy K A, U P R. The perceptual preferences in learning among dental students in clinical subjects. *J Clin Diagn Res.* 2013;7(8):1683-5.
 12. Al-Saud LM. Learning Style Preferences of First-Year Dental Students at King Saud University in Riyadh, Saudi Arabia: Influence of Gender and GPA. *J Dent Educ.* 2013;77(10):1371-8.
 13. Murphy RJ, Gray SA, Straja SR, Bogert MC. Student learning preferences and teaching implications. *J Dent Educ.* 2004; 68(8):859-66.
 14. Nasiri Z, Gharekhani S, Ghasempour M. Relationship between learning style and academic status of Babol dental students. *Electron Physician.* 2016; 8(5):2340-5.
 15. Sarabi-Asiabar A, Jafari M, Sadeghifar J, Tofighi S, Zaboli R, Peyman H, et al. The relationship between learning style preferences and gender, educational major and status in first year medical students: a survey study from iran. *Iran Red Crescent Med J.* 2014 Dec 27;17(1):e18250.
 16. Samarakoon L, Fernando T, Rodrigo C. Learning styles and approaches to learning among medical undergraduates and postgraduates. *BMC Med Educ.* 2013;13:42.
 17. Amini N, Zamani BE, Abedini Y. Medical Students' Learning Styles. *Iran J Med Educ.* 2010;10(2).
 18. Ahmadi M, Allami A. Comparison of Health Workers Learning Styles Based on Vark And Kolbs' Questionnaires and Their Relationship With Educational Achievement. *Res Med Edu* 2014; 6 (1) :19-28.
 19. Jannat Alipour Z, Navvabi N, Jahanshahi M. Evaluation of Nursing Students' Learning Styles Based on VARK Learning Pattern in Ramsar School of Nursing & Midwifery. *Med Edu J Babol.* 2013; 1 (2):37-45.
 20. Hejazi A., Taherpour M., Sobhani KH., Hosseini S.H., Hedayati M., Barzaegar A.. Evaluation Of Student Learning Styles Of North Khorasan University Of Medical Sciences Based On VARK Model. *J North Khorasan Uni Med Sci[Internet].* 2015;7(1):55-62. Available from: <https://sid.ir/paper/186985/en>
 21. Rahmanpour M, Palizban F, Zamani BB. Survey and Comparison of the Students' learning Styles in Engineering and Human Science Faculty of Isfahan University According to Gender, Academic Level and Course. *Iran J Eng Edu.* 2009;11(41):47-67.
 22. Mehdipour M, Mortazaavi H, Yazdani J, Namdari M, Moradi M. Learning styles of dental students at Shahid beheshti University of Medical Sciences using VARK questionnaire. *Iranian J Med Educ.* 2018;18:176-82.

Appendix 1: VARK questionnaire

https://www.researchgate.net/profile/Andrija_Kozina2/post/Is_there_any_validated_questionnaire_to_measure_students_learning_styles/attachment/59d6408e79197b807799cbdc/AS:431495853678594@1479888036474/download/VARK+Questionnaire.pdf