



**Research Article**

**LEARNING STYLE PREFERENCES AMONG FIRST YEAR AND SECOND YEAR MEDICAL STUDENTS: A CROSS SECTIONAL STUDY**

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**ARTICLE INFO**

**Article History:**

Received 15<sup>th</sup> March y, 2019

Received in revised form 7<sup>th</sup>

April, 2019

Accepted 13<sup>th</sup> May, 2019

Published online 28<sup>th</sup> June, 2019

**Key words:**

Visual, Aural ,Kinestic , Quad Mode

**ABSTRACT**

**Background:** Educational researchers have postulated that each individual has a unique learning style. Many methods are available for assessing the learning styles, with each method offering a distinctly different view of the learning style preferences visual, aural, reading and writing and kinesthetic (VARK)

**Aim:** To assess the learning style among first and second year medical students.

**Materials and method:** Two hundred MBBS students from first and second year were included and VARK questionnaire were administered which consisted of 16 questions with 4 options for each. The entire exercise was completed in 15–20 min. Hence, the modality that received the highest marks was the preferred sensory modality. Since students were free to select more than one option, multiple modalities of varying combinations could be obtained.

**Results:** Of 200 students, 100 each from first and second year were included in our study. The mean age of the participants was 20.9(standard deviation (SD) + 1.08) years. The majority (88%) of the medical students preferred multimodal learning styles. The most common VARK mode distribution among students was Trimodal (45%) followed by bimodal (40%), unimodal (12%), and quadrimodal (3%). Among the unimodal learners (12%), the majority of students preferred kinesthetic style (47%) Among multimodal learners, 45% were trimodal learners with auditory- kinesthetic and visual types predominating.

**Conclusion:** Using the VARK questionnaire, we learnt that medical students differed in their learning preferences the preferred learning style of the medical students were trimodal. The correlation between students' learning preferences and their academic performance is not well established

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**INTRODUCTION**

The learning style is defined as the composite of the characteristic cognitive, affective and the physiological characters that serve as the relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment[1]. The undergraduate medical education, as with any other educational program, needs ongoing improvements to meet the changing demands of the medical practice in the 21st century. Although the complexities of the medical care have dramatically increased over the last few years, the method of teaching medicine has hardly changed. Recently, there is a widespread interest in the evaluation of the learning technique since its adoption.

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Educational researchers have postulated that each individual has a unique learning style [2]. Many methods are available for assessing the learning styles,

with each method offering a distinctly different view of the learning style preferences visual, aural, reading and writing and kinesthetic (VARK) is one of the instruments which can be used to determine the learning styles. The VARK questionnaire was primarily developed by Lincoln University of New Zealand in 1998. It is based on three principles, which are as follows: 1. everyone can learn academic issues; otherwise everyone has their own styles. 2. The learner's motivation is increased when different learning styles of learners are taken into account and 3. Educational concepts are learned through utilization of senses and different perceptions [3]. From this perspective, people acquire environmental knowledge through four sensory modalities: visual, auditory, reading/writing and kinesthetic [4]. In other words, students

learn the education force process by experience, projection, contemplation and accomplishment [5].

The Visual learners prefer the use of symbolic devices such as diagrams, graphs, flow charts and models that represent the printed information. The Auditory learners prefer “heard” information and, thus, they learn better through discussions, lectures, tutorials and talking, through material, with themselves or others. The Read-write learners prefer printed words and texts as a means of acquiring new information; they thus prefer textbooks, lecture notes, handouts, lists and glossaries. Kinesthetic learning employs a combination of the sensory functions; such learners have to feel or live the experience to learn; they prefer simulations of real practices and experiences, lessons that emphasize on performing an activity, field trips, exhibits, samples, photographs, case studies, “real-life examples,” role-plays, and applications to help them understand the principles

**MATERIALS AND METHOD**

This study was conducted following the approval of the Institutional Ethics Committee. Two hundred MBBS students from first and second year were recruited for this study. The purpose of the study was explained to the students, and written informed consent was obtained before the VARK questionnaire was administered.

Participants were asked to describe their learning style(s) by choosing from the following options: 1) visual (learning from graphs, charts, flow diagrams, and demos); 2) aural (learning from speech, lectures, and discussions); 3) reading/writing (learning from reading and writing); and 4) kinesthetic (learning from performing an activity, touch, hearing, smell, taste, and sight). It consisted of 16 questions with 4 options for each.

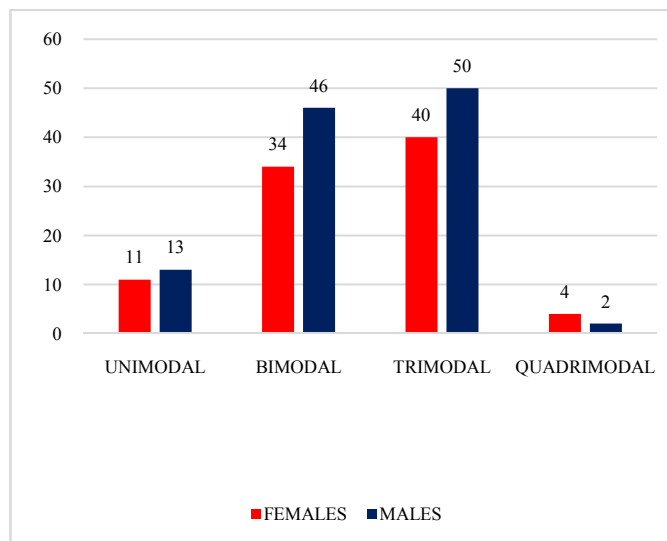
Students were instructed to choose the answer that best explained their preference and circle the letter(s) next to it. They could choose more than one option or leave blank any question that they felt was not applicable to them. Questionnaires were evaluated on the basis of previously validated scoring instructions [6].The entire exercise was completed in 15–20 min.Hence, the modality that received the highest marks was the preferred sensory modality. Since students were free to select more than one option, multiple modalities of varying combinations could be obtained.

**RESULTS**

A total of 200 students participated in the study. Hundred each from first and second year were included in our study. The mean age of the participants was 20.9(standard deviation (SD) ± 1.08) years. Themale: female ratio of the participants was 1.1:1 with 105 (55%) male participants and 95 (47%) female. The majority (88%) of the medical students preferred multimodal learning styles. The most common VARK mode distribution among students was Trimodal (45%) followed ±by bimodal (40%), unimodal (12%), and quadrimodal (3%).

Among the unimodallearners (12%), the majority of students preferred kinesthetic style (47%) (Figure 1). Among multimodal learners, 45% weretrimodal learners with auditory-kinesthetic andvisual types predominating. The percentages of students who preferred two, three, and four sensory modalities of learning. Mean VARK scores for individual sensory modalities of learning .The mean score was highest for kinesthetic

learning (male 7.30 ± 1.98, female 6.89±2.12) and lowest for read – write (male 3.46 ± 2.19, female 3.66±1.98). No significant gender differences were observed in the learning style preferences.(Table 1)



**Figure 1** Modality preference of males and females

**Table 1** Comparison of vark score among males and females

Sex	Visual	Auditory	Read- Write	Kinaesthetic
Male	4.73 ± 2.19	4.51 ± 1.76	3.46 + 2.19	7.30 ± 1.98
Female	5.72 ± 2.13	4.04 ± 1.56	3.66 ± 1.98	6.89± 2.12
P value	0.03*	0.13	0.39	0.002*

(\* P value < 0.05, students t test)

**DISCUSSION**

The educational world is acknowledging the importance of understanding the students’ different learning style preferences and their role in attaining academic success [6,7]. In the present study, therefore, we administered the VARK questionnaire to the first year medical students to determine their learning style preferences. A majority of the students (61%) exhibited multimodal learning style preferences, which indicated that they preferred multiple modes of information presentation. The results of previous studies which were conducted on first year medical students from various other countries also reported similar results; however, the percentage of students with multimodal learning style preferencesin these studies varied from 59-85% [4, 8-10].This implies that most of the students learn effectively as long as the teaching methods include a blend of activities that stimulate the visual, aural, read-write and the kinesthetic sensory modalities. The increasing use of multimedia in teaching can provide opportunities for presenting multiple representations of the content (text, video, audio, images and interactive elements) to cater more effectively to the diverse learning styles of the students.

Many studies have been done using the VARK questionnaire among preclinical medical students, but the preferred mode of learning was variable in different parts of the world[11].

It was observed that most of the students in this study were Kinesthetic learners (47%) regardless of their gender, age, nationality and educational backgrounds. This finding was similar to those reported by Kharb *et al.* for Indian medical students [12] as well as Baykan and Nacar for Turkish medical

students [13]. In a recent study done in the United States (Michigan) amongst first-year medical students, it was found that 43.45% preferred quad-modal and that 36.1% selected single modal learning styles [14]. However, in the present study, these rates were found to be 3% for quad-modal and 12% for single modal styles.

If we compare our results with other studies, we find inconsistent results regarding the relationship between learning styles and gender. Dobson demonstrated significant differences between learning styles and gender among students in physiological classes. [18] Choudhary *et al* also found the same results among first-year medical students. [15] However, Alkhasawneh *et al* did not find any differences between gender and learning styles, nor did Dobson in another study. This difference may be due to the large sample size in our study compared with their sample sizes, which were comprised of 64 and 92 students. [17,16]

## CONCLUSION

Using the VARK questionnaire, we learnt that our preclinical medical students differed in their learning preferences. This information encouraged us to accommodate the students' learning preferences in our lesson plan and incorporate some of the learning strategies suitable for a large classroom setting. It is argued that learning style is not a stable construct and may vary with age and according to the task being undertaken. The correlation between students' learning preferences and their academic performance is not well established and there remains much debate over the effectiveness of matching learning style and instructional style on students' academic performance. These issues will be addressed in an extension of this pilot study that aims to longitudinally assess of the learning style preferences of the same cohort of students during their clinical years.

## References

1. Baykan Z, Nacar M. Learning styles of first-year dental students attending Erciyes University in Kayseri, Turkey. *Adv. Physiol. Edu.* 2007;31: 158-60.
2. Murphy RJ, Gray SA, Straja SR, Bogert MC. Student learning preferences and teaching implications. *J. Dental Educ.* 2004;68: 859-66
3. Mills DW. Applying what we know student learning styles. Retrieved April. 2002;7:2009.
4. James WB, Gardner DL. Learning styles: Implications for distance learning. *New Directions for Adult and Continuing Education.* 1995;1995(67):19-31.
5. Boyle EA, Duffy T, Dunleavy K. Learning styles and academic outcome: The validity and utility of Vermunt's Inventory of Learning Styles in a British higher education setting. *British Journal of Educational Psychology.* 2003;73(2):267-90.
6. Williamson MF, Watson R L Learning styles research: Understanding how teaching should be impacted by the way learners learn: Part III: Understanding how learners' personality styles impact learning. *Christian Education Journal.* 2007; 4(1): 62-77.
7. Sternberg R, Grigorenko E, Zhang L. Styles of learning and thinking matter in instruction and assessment. *Perspectives on Psychological Science.* 2008; 3(6): 486-506.
8. Bahadori M, Sadeghifar J, Tofighi S, Mamikhani JA, Nejati M. Learning Styles of the Health Services Management Students: a Study of First-year Students from the Medical Science Universities of Iran. *Australian Journal of Basic and Applied Sciences.* 2011; 5(9): 122-27.
9. Ding Y, Liu J, Ruan H, Zhang X. Learning Preferences to Physiology of Undergraduate Students in a Chinese Medical School. *IJEME.* 2012; 2(2):1-5.
10. Choudhary R, Dullo P, Tandon R V Gender differences in learning style preferences of first year Medical students. *Pak J Physiol.* 2011;7(2):42-45.
11. Khanal L, Shah S, Koirala S. Exploration of preferred learning styles in medical education using VARK modal. *Russian Open Medical Journal* 2014; 303-305
12. Kharb P, Samanta P, Jindal M, Singh V. The learning styles and the preferred teaching-learning strategies of first year medical students. *J Clin Diagn Res.* 2013;7:1089-92.
13. Baykan Z, Nacar M. Learning styles of first year medical students attending
14. Erciyes University in Kayseri, Turkey. *Adv Physiol Educ.* 2007;31:158-60.
15. Lujan HL, DiCarlo SE. First-year medical students prefer multiple learning styles. *Adv Physiol Educ.* 2006;30(1):13-6.
16. Choudhary R, Dullo P, Tandon RV. Gender differences in learning style preferences of first year medical students. *Pak J Physiol* 2011; 7: 42-45.
17. Dobson J. A comparison between learning style preferences and sex, status, and course performance. *Adv Physiol Educ* 2010;34: 197-204.
18. Alkhasawneh IM, Mrayyan MT, Docherty C, Alashram S, Yousef HY. Problem-based learning (PBL): assessing students' learning preferences using VARK. *Nurse Educ Today* 2008; 28:572-579.
19. Dobson J. Learning style preferences and course performance in an undergraduate physiology class. *Adv Physiol Educ* 2009; 33:308-314.

### How to cite this article:

Sumitra Sudharkodhy and Balan K (2019) 'Learning Style Preferences Among First Year and Second year Medical Students: a Cross Sectional Study', *International Journal of Current Advanced Research*, 08(06), pp. 19067-19069.  
DOI: <http://dx.doi.org/10.24327/ijcar.2019.19069.3663>

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