A Study of Learning Style Preferences among First Year Undergraduate Medical Students Using VARK Model

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ABSTRACT

Introduction: Medical students have a wide range of diversity in their learning preferences. This has been always a challenge for the teachers to meet the demands of all the medical students. VARK (Visual, Aural, Read/write and Kinaesthetic way of learning styles) is a learning inventory grouped under "instructional preference" model. **Methods:** This study analysed the learning style and approaches to learning among the first year undergraduate students in a tertiary care teaching hospital using VARK questionnaire version. **Results:** Our study revealed that, unimodal learning preference was among 48% of the students and multimodal learning styles being with 52% of students. Among the unimodal learning preferences, kinaesthetic and auditory learning styles were predominant (35% and 34% respectively). Among multimodal learning style preferences Kinaesthetic, Aural (KA) and Visual, Aural, Kinaesthetic (VAK) styles were predominant. There was no difference in the learning preferences among the sexes (p = 0.208). **Conclusion:** Since the most preferred learning styles were kinaesthetic and auditory, the strategies employed by students could be recordings of lectures, audio recordings of power point presentations, increased frequency of early clinical exposure to patients in wards and use of models and problem solving questionnaires. This will also help the teachers to act in accordance with students need and guide them in achieving their academic goals.

Keywords: VARK, Learning style, Learning inventory, Medical students, Undergraduates

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INTRODUCTION

Medical education is extensive and students have to gain vast knowledge within a restricted time. Medical students have a wide range of diversity in their learning preferences. This has been always a challenge for the teachers to meet the demands of all the medical students. Learning styles refers to information achieved by gathering, processing, interpreting, organising and thinking. Adult learning according to Dr. Malcolm Knowles' theory is "learner-centred" and each individual prefer their own way of learning styles (1). Claxton and Murrell had divided learning styles into four categories: personality models, information-processing models, social-interaction models, and instructional preferences models (2).

There are various models proposed for analysing learning styles which includes Kolb's Learning Style instrument (LSI), Learning Style Questionnaire (LSQ), the Canfield Learning Style Inventory (CLSI), Index of Learning Survey (ILS), and Cognitive Styles Analysis (CSA) (3). LSI grouped learners as divergers, convergers, assimilators, or accommodators whereas LSQ described learners as activists who learn primarily by experience, reflectors who learn from reflective observation, theorists who learn from exploring associations and interrelationships and pragmatics who learn from doing or trying things practically (4). Index of Learning Survey (ILS) categorised learners based on their mode of information perception, approaches to organising and processing information and the rate at which students understand. The effectiveness of ILS survey was analysed with CSA and the results were similar to LSI (5). Though all these models were used for analysing learning styles in business and management settings, their roles in classrooms among medical students is questionable.

VARK (Visual, Aural, Read/write and Kinaesthetic way of learning styles) is a learning inventory grouped under "instructional preference" model. VARK categorises learning by sensory preferences. Visual (V) learners prefer diagrammatic representations like pictures, graphs and flow charts. Aural (A) learners like to process information by listening to lectures, tutorials and seminars. The "R" (read/write) learners prefer to take notes and read the written words repeatedly. Finally, kinaesthetic (K) learners prefer to learn by connecting to reality and they acquire information through experience and practice (6, 7). Students also prefer "multimodal" category which can be a combination of any of these learning styles.

In this present study VARK Questionnaire (version 7.8) is used because of its simplicity and reliability. Moreover VARK model is supported by study strategies for each style and this would help us in formulating teaching strategies based on student preferences.

Various studies have been done on learning style preferences world-wide and the results were highly variable implying the diversity among medical students. With this knowledge we are interested in knowing the learning style among our first year undergraduate students. This would help both the students and the instructors in knowing the prevailing learning style and altering the existing teaching methods.

METHOD

Institutional ethics committee approval was obtained for the study. All first year undergraduate students were briefed about the study. Informed consent was obtained. VARK Questionnaire was downloaded after permission was sought from the developers. VARK Questionnaire version 7.8 was distributed to all students who consented for the study. VARK Questionnaire consists of 16 multiple choice questions and based on the scores students learning style preferences were found. Microsoft Excel was used to analyse the data statistically. Learning style preferences among sex was analysed with chi-square test.

RESULTS

A total of 152 students consented and completed the questionnaire. Among them, only 144 questionnaires were completely filled up and taken into analysis.

Out of 144 students 57 were males and 87 were female students. Among the students who participated in the study, 48% of the students were unimodal and 52% were multimodal in their learning preferences (Figure 1).

Among the unimodal learning preferences, kinaesthetic (35%) and auditory (34%) were most preferred among the students. The preference for visual mode and read/write
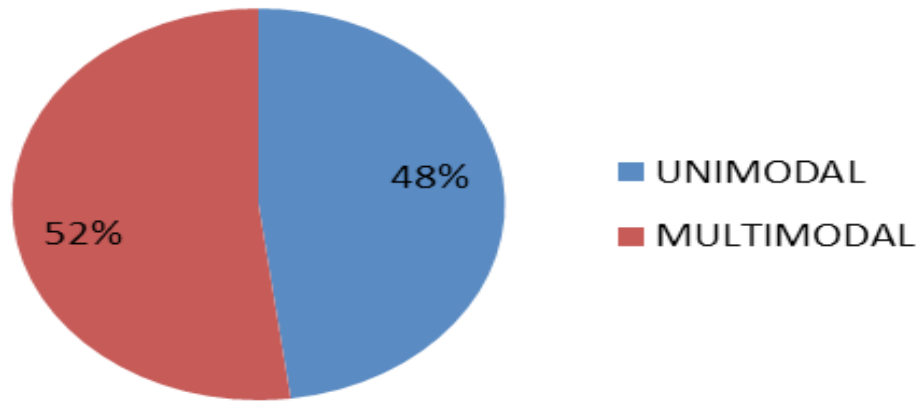
Figure 1: Unimodal and Multimodal learning preferences in percentage.
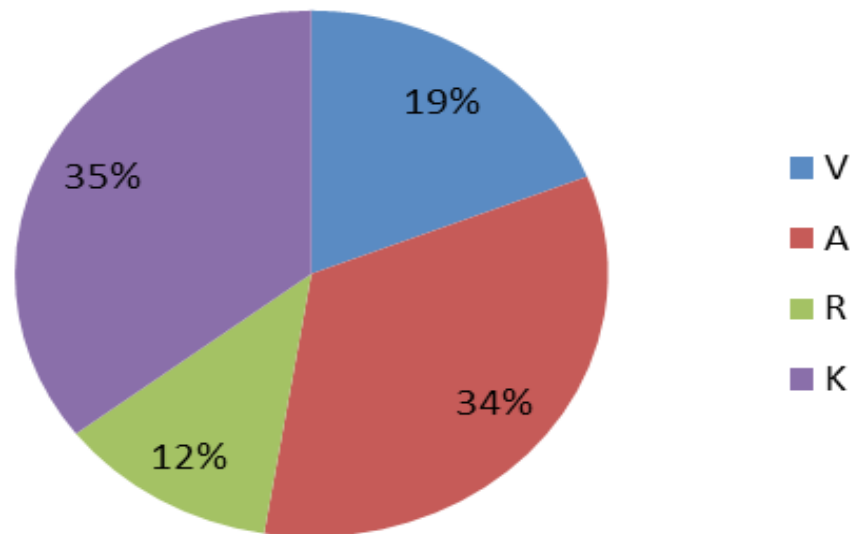

Figure 2: Different unimodal preferences in percentage.

mode for learning were less and accounted for 19% and 12% respectively (Figure 2).

In bimodal preferences, a combination of auditory and kinaesthetic approaches were used much (57%) (refer Table 1).

In trimodal preferences, a combination of visual, auditory and kinaesthetic approaches were used much (71%) (refer Table 2).

Figure 3 shows the percentage distribution of unimodal, bimodal, trimodal and quadrimodal preferences of learning among students. From all the data it was evident that kinaesthetic and aural were most preferred among students.

Figure 4 shows that there was no difference in the learning preferences among the sexes ($p = 0.208$).

Table 1: Different bimodal preferences in percentage

BIMODAL preferences	Total (%)
KA	57
KR	6
KV	20
VA	8.5
AR	8.5

Table 2: Different trimodal preferences in percentage

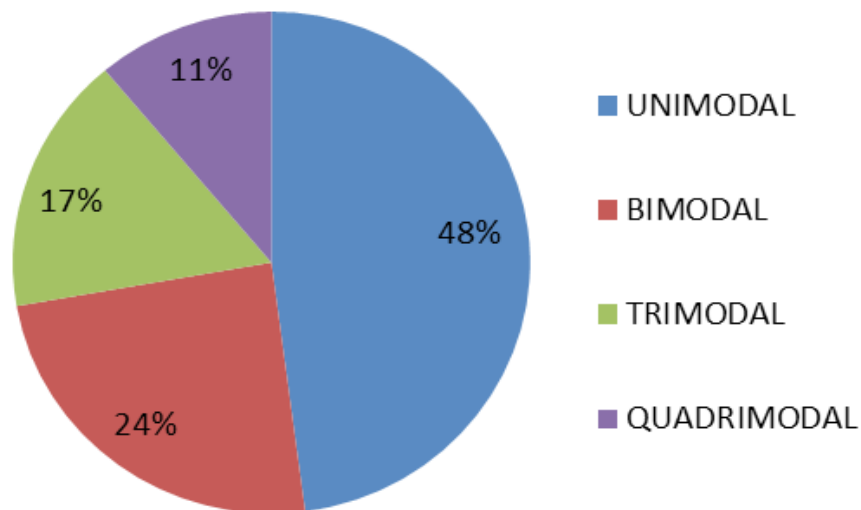| TRIMODAL preferences	Total (%)
VAK	71
ARK	21
VRK	4
ARV	4

Figure 3: Unimodal, Bimodal, Trimodal, Quadrimodal preferences in percentage.
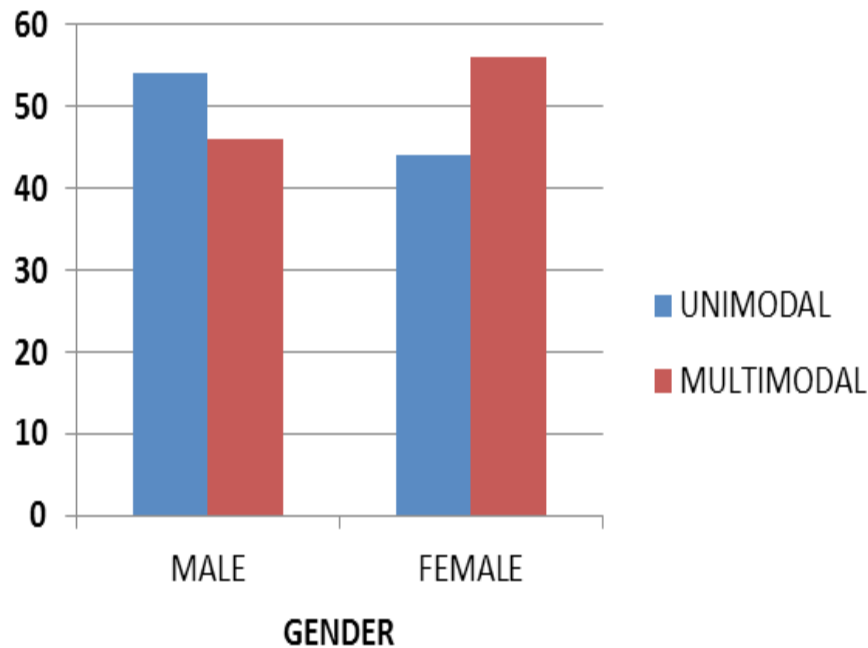
Figure 4: Learning style preferences between the sexes.

DISCUSSION

Medical science being so intricate, vast and comprehensive requires interactive, problem based and student centred learning process. The learner centred shift in the medical education will promote self-directed learning among the students which will in turn help them to retain, remember and interpret the knowledge. This will improve the critical thinking process of students and make them grow into better problem solvers (8).

Active involvement by the learners will help them to identify tools to improve the learning process. Recent research studies had revealed that, this involvement will emerge in students, when they were allowed to learn the information in their preferred learning styles (9).

Dunn et al. has defined the "learning styles" as different and unique ways used by individuals to learn and recall information (10). Studies also have shown that identification of the students learning styles and approaches have a significant bearing on the academic success (11).

The VARK learning style inventory measures four sensory modalities used for learning, namely visual, aural, read/write and kinaesthetic. According to individual preferences, the learners can be classified as unimodal if they show predominantly one learning preference or multimodal if preference is shared between two or more learning styles (12).

This study analysed the learning style and approaches to learning among the first year undergraduate students. Our study revealed that, unimodal learning preference was among 48% of the students and multimodal learning styles being with 52% of students.

Among the unimodal learning preferences, kinaesthetic and auditory learning styles were predominant. Among multimodal learning style preferences KA and VAK styles were predominant.

These results are similar to the study conducted by Kharb et al. on the first year undergraduate students (13). In the study, 61% of students had multimodal VARK preferences and kinaesthetic being the most preferred learning style.

The results of our study shows that if the information was given to students in connection with reality, experience and practice the kinaesthetic learners would acquire the information in a better way and learning can be accomplished effectively.

Since our study revealed that many students preferred multimodal learning preferences, the increased use of multimedia (text, video, audio, images, and interactive elements) to cater more effectively, the varied learning styles of the students.

Results of our study showed that there was no difference between the learning style preferences between males and females. But female students were more diverse than the male students in choosing the learning style preferences. These results are consistent with study conducted by Slater et al. with the students of Wayne State University (14).

The female students had five different bimodal learning style preferences, whereas males had only four. Among the trimodal learning preferences, females had four different combinations (VRK, VAK, ARK, and ARV) while males had only two. Twelve out of 57 female students had preferences to all the VARK learning style, but only 4 out of 57 male students had preference to all.

Since students possess a wide diversity of the learning styles, awareness about learning styles would benefit the teachers to employ different combinations of educational strategies which would help the learners immensely (15).

The most preferred learning styles were kinaesthetic and auditory and so the strategies employed could be recordings of lectures, audio recordings of power point presentations, increased frequency of early clinical exposure to patients in wards and use of models and problem solving questionnaires.

CONCLUSION

Exposing the learners earlier to practice and evidence, help them in achieving their academic goals. To attain the higher level of student learning process, it is important to identify the preferred learning style of students and use innovative, multimodal teaching methods to make the classroom setting more stimulating and interactive. This will help the information disseminate to great extent of students and challenge all the students to grow as efficient "Learners".

REFERENCES

1. Curry RH, Hershman WY, Saizow RB. Learner centred strategies in clerkship education. Am J Med. 1996;100(6):589–95. https://doi.org/10.1016/S0002-9343(97)89424-7.

2. Claxton CS, Murrell PH. Learning style: implications for improving educational practice. ASHE - ERIC Higher Education Report No. 4. Washingston, DC: George Washington University; 1987.

3. Romanelli F, Bird E, Ryan M. Learning styles: a review of theory, application, and best practices. Am J Pharm Educ. 2009;73(1):9. https://doi.org/10.5688/aj730109.

4. Kolb DA. Learning style inventory: self-scoring inventory and interpretation booklet. Boston, MA: McBer and Co; 1985.

5. Felder RM, Silverman L. Learning and teaching styles in engineering education. Engr. Educ. 1988;78(7):674–81.

6. Fleming ND, Mills C. Not another inventory, rather a catalyst for reflection. To Improve the Academy. 1992;11:137–144.

7. Marcy V. Adult learning styles: how the vark learning style inventory can be used to improve student learning. J Assoc of Physician Assist Programs 2001;12(2):1–5. https://doi.org/10.1097/01367895-200107000-00007.

8. Khanal L, Shah S, Koirala S. Exploration of preferred learning styles in medical education using VARK modal. Russian Open Medical Journal. 2014;3(3):1–8. https://doi.org/10.15275/rusomj.2014.0305.

9. 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(5):572–9. https://doi.org/10.1016/j.nedt.2007.09.012.

10. Dunn R, Giannitti MC, Murray JB, Rossi I, Geisert G, Quinn P. Grouping students for instruction: effects of learning style on achievement and attitudes. J Soc Psychol. 1990;130(4):485–494. https://doi.org/10.1080/00224545.1990.9924610.

11. Newble DI, Gordon MI. The learning style of medical students. *Med Educ*. 1985;19(1):3–8. https://doi.org/10.1111/j.1365-2923.1985.tb01132.x.

12. Prithishkumar IJ, Michael SA. Understanding your student: using the VARK model. J Postgrad Med. 2014;60(2):183–6. https://doi.org/10.4103/0022-3859.132337.

13. 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(6):1089–92. https://doi.org/10.7860/jcdr/2013/5809.3090.

14. Slater JA, Lujan HL, DiCarlo SE. Does gender influence learning style preferences of first-year medical students? Adv Physiol Educ. 2007;31(4):336–42. https://doi.org/10.1152/advan.00010.2007.

15. Peyman H, Sadeghifar J, Khajavikhan J, Yasemi M, Rasool M, Yaghoubi YM, Nahal MMH, Karim H. Using VARK approach for accessing preferred learning style of first year medical sciences students: a survey from Iran. J Clin Diagn Res. 2014;8(8): GC01-GC04.