



## Learning styles and factors affecting them: A cross sectional study of medical and paramedical students from medical field

Authors

**Dr Shilpa Aditya Pratinidhi<sup>1</sup>, Dr Swati Sanjeev Raje<sup>2</sup>, Dr Harshal Pandve<sup>3</sup>**

<sup>1</sup>Professor and Head, Department of Biochemistry, MIMER Medical College, Talegaon Dabhade, Pune, Maharashtra

<sup>2</sup>Assistant Professor, Department of Community medicine, MIMER Medical College, Talegaon Dabhade, Pune, Maharashtra.

<sup>3</sup>Professor and Head, Department of Community medicine, ESIC medical college, Hyderabad

\*Corresponding Author

**Dr Swati S Raje**

### Abstract

**Introduction:** Students use different learning style to understand the subject. The most common learning style are Visual, Audio, Reading and kinesthetic which are combined referred as VARK model. Understanding the learning styles of students helps a teacher to plan a teaching – learning activity. A teacher would like to choose a teaching method which is suitable to maximum students to give maximum advantage to students.

**Aims and Objectives:** To identify the associated factors with these learning styles; in medical field.

**Material and Methods:** A cross sectional study was planned which included of 226 students from medical and para medical field. Data was collected using a structured questionnaire along with Version 7.0 of the VARK questionnaire in a printed form and was analysed in Microsoft Excel.

**Results:** Maximum (n=170) 75% students preferred multimodal style of learning. Amongst those who preferred unimodal style, number of students who preferred Aural was (n=23)10.13% comparable to those who preferred Kinesthetic was (n= 26) 11.43%, while very few preferred Visual or read and write style. Percentage of female students was more for aural and kinesthetic learning style as compared to males. Learning styles also differed with branch of study, with paramedical students preferring aural style as compared to those from MBBS course.

**Conclusion:** Teacher should modify learning style as per the preference of maximum students so as to give maximum academic benefit.

**Keywords:** Learning style, MBBS, BPTH, PBBS, VARK model.

### Introduction

Teaching learning process— involves two mechanism namely teaching and learning. –In order to make the teaching effective, it becomes inevitable for a teacher to understand the process of learning. It is a general belief that individuals

differ in how they learn. However, due to the variation in personalities and preferences each individual has different learning styles and sometimes a combination of them. Duff has defined learning style as a “cognitive composite, affective and psychological factor which act as an

indicator on how individuals interact and respond to learning environment<sup>(2)</sup>. Researchers have proposed that all people can be classified according to their 'style' of learning.

The idea of individualized learning styles became popular in the 1970s<sup>(1)</sup>. An individual can have more than one type of learning styles, which can be an advantage to him<sup>(3)</sup>. Out of the various learning styles identified by earlier studies, two learning style models that are commonly used are Dunn & Dunn<sup>(4)</sup> and VARK<sup>(5)</sup>. VARK learning style model has been modified from VAK model by Fleming in 2006. This learning style classifies students to four different modes based on different senses, namely Visual, Aural, Reading, and Kinesthetic, and the name of the model is a acronym for these senses.

#### **A. Visual**

Students predisposing with this style are likely to be provided with demonstration and can learn through description. Students who prefer Visual mode may get easily disturbed or are likely to lose their focus by movements or actions whereas, noise, usually do not bother them. Visual students like to use printed information such as figures, pictures, and symbolic tools such as graph, flowcharts, hierarchies, models, and arrow to understand as well as to explain a concept to others

#### **B. Aural**

Aural students learn something by listening<sup>(7)</sup>. These students give more attention to the words delivered by teachers. They prefer to listen than writing lecture notes To aid with their learning style, aural students prefer to discuss topics or to listen-to recording over the examination topics. Students who learn with this mode are easily interrupted noise<sup>(7)</sup>

#### **C. Reading**

Students with the tendency of reading prefer printed word and text as a method to gain information. They like list, glossary, textbooks,

lecture notes, or circulation. These students like to arrange lecture notes into sketch form, paraphrase classroom notes, and study multiple choice exam questions.

#### **D. Kinesthetic**

Kinaesthetic learning or tactile learning is a learning style in which learning takes place by the students carrying out physical activities, rather than listening to a lecture or watching demonstrations. According to Drago and Wager kinesthetic students emphasize more in experience in learning something and usually, they have high energy and prefer to apply touch, movement, and interaction to their environment<sup>(7)</sup>.

-Though the learning modalities differ from person to person it is not possible to attend to individual needs in a classroom teaching. Hence it becomes important for a teacher to choose the style which is suitable to maximum students. Present study aims to identify the most favoured learning style and the factors associated with them in student of medical and paramedical colleges-

#### **Methodology**

It was a cross sectional study conducted in a private medical college in western Maharashtra. The population consisted of students from medical and paramedical field. (Students were from MBBS course, Physiotherapy course and Post Basic BSc nursing course) Sampling type was cluster. One cluster of each profession was chosen by random allocation. Informed consent was obtained from all participants. Prior permission of institutional ethical committee was obtained. Data collection was done using a structured questionnaire.

Version 7.0 of the VARK questionnaire in a printed form was used. It consisted of 16 questions with 4 options for each. The questions describe situations of common occurrence in daily life, thereby relating to an individual's learning experience. 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 and a chart. Since each of the answers represents a sensory modality preference, the same was calculated for an individual participant by adding up the responses for all 16 questions. Hence, the modality that received the highest marks was the preferred sensory modality. Students' scores were computed based on the recommended scoring system provided by VARK producers. Data was analysed using Microsoft excel.

### Results

The study sample consisted of 226 students from medical and paramedical branch. There were 61 male and 165 female students. As medium of instruction till 10th standard plays important role in understanding the subject, data related to it was noted. English was the medium of instruction for 138 students, while Marathi was for 80 students. One student had Urdu as medium of instruction. Seven students reported semi English as medium of instruction, which means only science subject was taught in English while other subjects were taught in regional language.

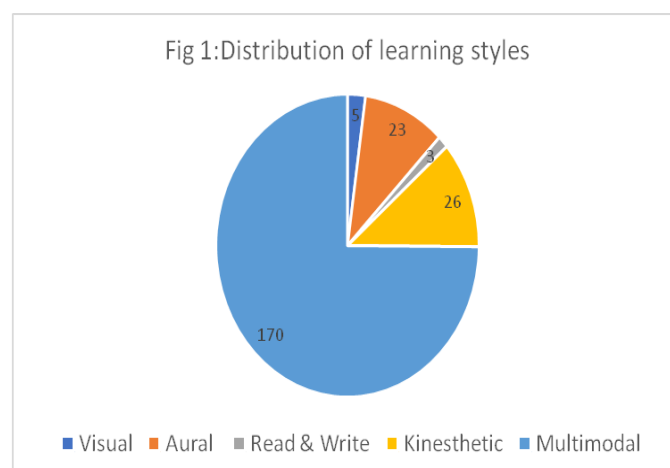
Results of VARK scale were analysed to see the learning styles preferred by the students. (Fig1). Since students were free to select more than one option, multiple modalities of varying combinations were observed. Maximum (n=170) 75% students preferred multimodal style of learning. Amongst those who preferred unimodal style, number of students who preferred Aural (n=23)10.13% was comparable to those who preferred Kinesthetic (n= 26) 11.43%, while very few preferred Visual or read and write style.

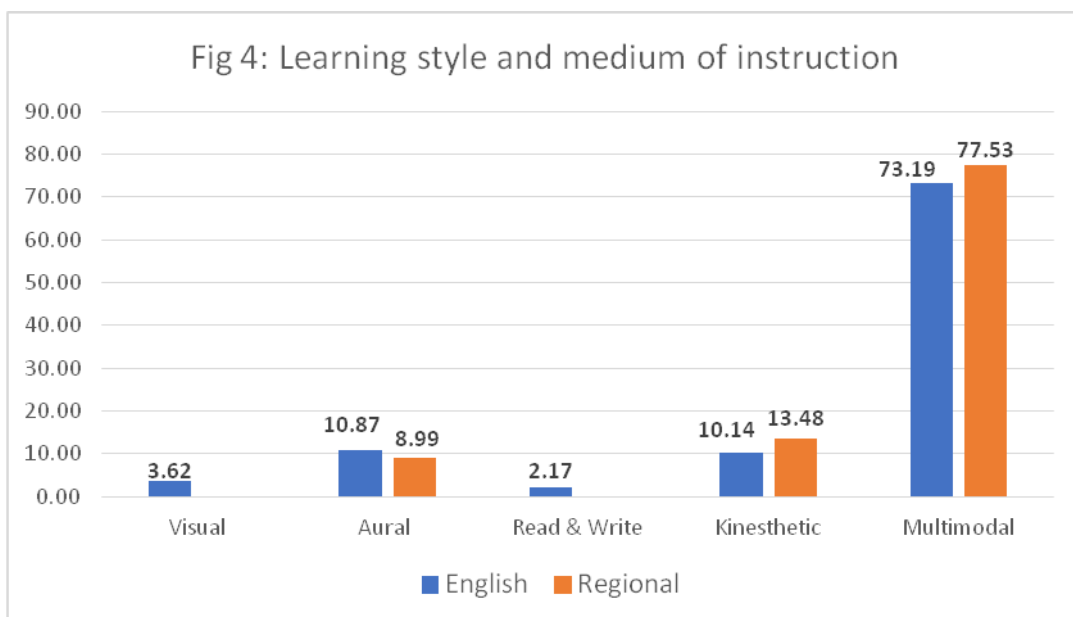
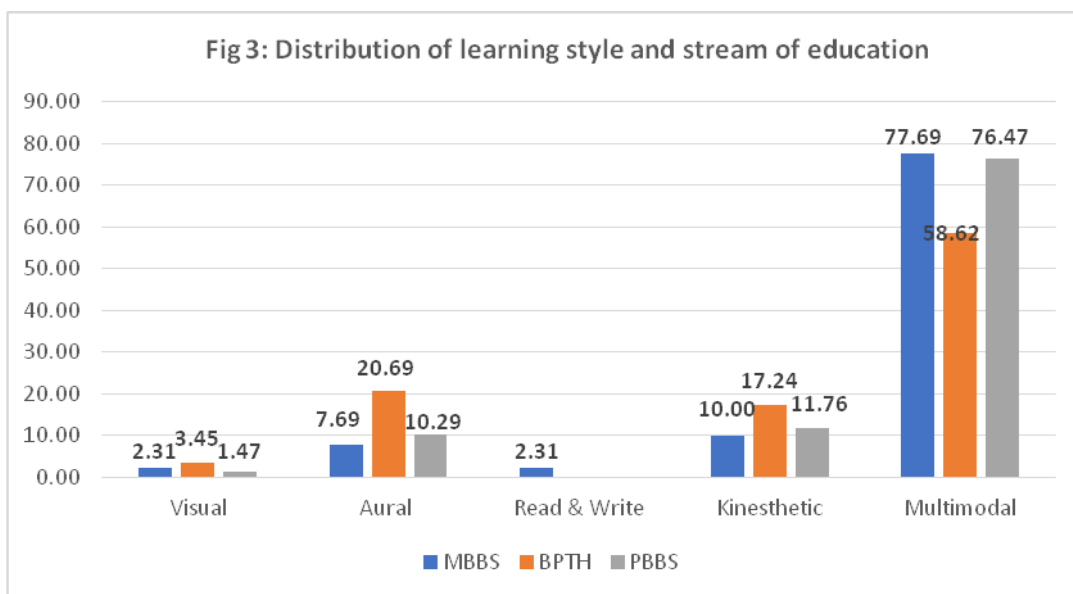
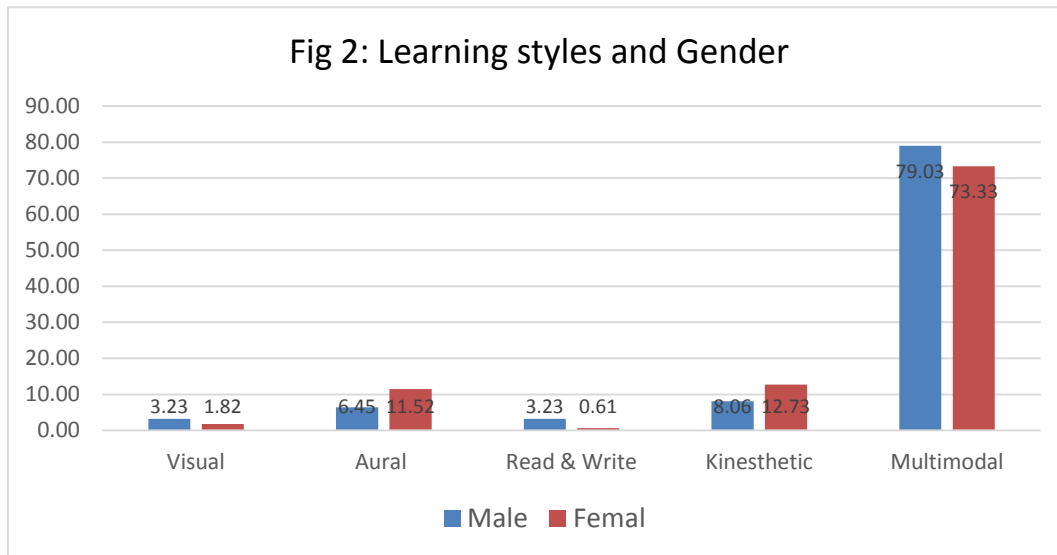
The learning styles were further analyzed with respect to gender, medium of instruction and stream of education. Fig 2 shows comparison of learning styles with respect to gender of students. Among both male and female students maximum preference was for Multimodal style. Further it was observed that percentage of female students

was more for aural and kinesthetic learning style as compared to males. As against this percentage of males was more for visual and read and write style. However, the difference was not statistically significant.

Results of distribution of learning styles with respect to stream of education is depicted in fig 3. It was observed that though maximum students from all streams preferred multimodal learning styles, within the multimodal group percentage of BPTH students was less (58.6%) as compared to that of MBBS and PBBS students. As against this within students who preferred aural learning style, percentage of BPTH students was almost twice than that of PBBS and MBBS students.

Data was also analyzed to see if language of instruction till school certificate examination made any difference to style of learning. (fig 4). None of the students who had regional language in school preferred visual or read and write style. At the same time these two styles was preferred by very few students from English medium too. Hence the difference was significant. It was also noted that learning style there was no difference with respect to medium of instruction in school in percentage of students who preferred aural or multimodal learning style.





## Discussion

The traditional unidirectional teaching methods are gradually shifting to student centered technologies<sup>(8-11)</sup>. Effectiveness of a Learning process is affected by various factors such as students interest in the topic, his or her motivation towards the subject, level of competency, their active participation and preferred learning styles.<sup>(12)</sup>

In a study done in first year dental students Prabha V observed that maximum students preferred single mode of learning<sup>(13)</sup>. As against this, studies done in medical students have noted that one single approach to teaching does not work for every student or even for most of the students.<sup>(14,15)</sup> Students in medical and paramedical colleges depend highly in the teacher's guidance.<sup>(16)</sup> As present study also indicates that students too prefer multimodal style, this approach will be helpful in teaching learning process.

In a study among the medical students in India, Busan observed that the predominate learning style is the visual style (33%), followed closely by the auditory style (26%). In a smaller percentage students prefer the kinesthetic style (14%) or combination of these. Our study supports these findings as the majority of the students were multimodal learners with no differences observed between males (59.5%) and females (60.0%). Rathnakar P. Urval observed that it is good to have most of the students preferring multimodal learning style from both a teaching as well as learning perspective.<sup>(17)</sup>

Studies have noted that gender is associated with specific learning style. For example in a study of 50 students from Quassim university, Huda Suliaman Alqunayeer and Sadia Zamir have concluded that female students are found to be Aural learners, whereas boys are found to be Kinesthetic learners.<sup>(18)</sup> Though differences with respect to gender were noted in present study, they were not statistically significant.

Ojech et al noted that awareness of learning styles was associated with learning modality but not

with academic performance, age or gender in pre clinical medical students.<sup>(14)</sup> In the present also there was no statistically significant difference with respect to gender and stream of education.

Conclusion: Students in medical and paramedical colleges depend highly on eachers's guidance. In this situation it is all the more necessary that the way in which information is transmitted to be consistent with the way in which students gain them. Teacher should modify learning style as per the preference of maximum students so as to give maximum academic benefit. As most of the students prefer multimodal learning styles, a perfect combination of all the four learning styles designed to satisfy the needs of the topic needs to be adopted to ensure the highest goal of education.

**Conflict of interest:** None

## References

1. Guraya SS, Guraya SY, Habib FA, Khoshhal KI. Learning styles of medical students at Taibah University: Trends and implications. *J Res Med Sci* 2014; 19:1155-62.
2. A. Duff Learning style of UK higher education students: Four studies of the reliability and replicability of the learning style questionnaire (LSQ). *Bristol Business School Teaching and Research Review*, 14 (3) (2000): 131-177.
3. Norasmah Othman and Mohd Hasril Amiruddin / *Procedia Social and Behavioral Sciences* 7(C) (2010): 652–660.
4. Dunn, R. & Dunn, K. (2003). The Dunn and Dunn learning style model: Theoretical cornerstone, research and practical applications. In S. Armstrong, M. Graff, C. Lashley, E. Peterson, S. Raynor, E. Sadler-Smith, M. Schiering & D. Spicer (Eds.) *Bridging theory and practice. Proceedings of the Eighth Annual European Learning Styles Information*

- Network Conference, University of Hull, Hull, UK
5. Fleming, N. D. (2007) VARK: A guide to learning styles. Retrieved 11-15-07 from <http://www.vark-learn.com/english/page.asp?p=questionnaire>
  6. Ismail, W. C. N., & Azman, N. (2010). Diverse learning styles of non-formal adult learners in community colleges in Malaysia. *Procedia-Social and Behavioral Sciences*. Elsevier, 7, 139-144.
  7. W.A. Drago, R.J. Wagner. VARK preferred learning styles and online education. *Management Research News*, 27 (7) (2004): 1-13. CrossRef View Record in Scopus
  8. Ilic D, Hart W, Fiddes P, Misso M, Villanueva E. Adopting a blended learning approach to teaching evidence based medicine: a mixed methods study. *BMC medical education*. 2013;13:169.[PMC free article] [PubMed]
  9. Tolsgaard MG. Clinical skills training in undergraduate medical education using a student-centered approach. *Danish medical journal*. 2013;60(8):B4690. [PubMed]
  10. Preeti B, Ashish A, Shriram G. Problem Based Learning (PBL) - An Effective Approach to Improve Learning Outcomes in Medical Teaching. *Journal of clinical and diagnostic research: JCDR*. 2013; 7(12):2896-7. [PMC free article] [PubMed]
  11. Othman N, Amiruddin MH. International conference on learner diversity. Different perspectives of learning styles from VARK model. *Procedia Soc Behav Sci* 2010;7:652-60.
  12. James W and Gardner D. Learning styles: implications for distance learning. *New Dir Adult Contin Educ* 67: 19-32, 1995.
  13. Prabha V. Learning styles among the first year dental students. *Int J Health Sci Res*. 2013;3(9):22-28.
  14. Nkemcho Ojeh, Natasha Sobers-Grannum, Uma Gaur, Alaya Udupa, and MD. Anwarul Azim Majumder. Learning style preferences: A study of pre-clinical medical students in Barbados. *J Adv Med Educ Prof*. 2017 Oct; 5(4): 185-194.
  15. Poonam Kharb, Prajna Paramita Samanta, Manisha Jindal,3 and Vishram Singh. The Learning Styles and the Preferred Teaching—Learning Strategies of First Year Medical Students(100 first semester medical students ).
  16. Buşan AM. Learning styles of medical students - implications in education. *Curr Health Sci J*. 2014 Apr-Jun; 40 (2):104-10.
  17. Rathnakar P. Urval, Ashwin Kamath,1 Sheetal Ullal, Ashok K. Shenoy,1 Nandita Shenoy and Laxminarayana A. Udupa. Assessment of learning styles of undergraduate medical students using the VARK questionnaire and the influence of sex and academic performance *Adv Physiol Educ* 2014. 38: 216 -220.
  18. Huda Suliaman Alqunayeer and Sadia Zamir. Identifying Learning Styles in EFL Classroom. *International Journal of Learning and Teaching* Vol. 1, No. 2, December 2015: 82-87.