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Research article

HOW DO MEDICAL STUDENTS LEARN? A STUDY FROM TWO MEDICAL COLLEGES IN SOUTH INDIA – A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: "Learning style" is defined as an individual's preferred method for approaching learning and gaining knowledge. As a teacher, it is important to understand the different learning styles of the students in acquiring the information, and hence one can make the necessary changes that best match the learning style of the students. Assessment of learning styles can be done in various ways but Visual Auditory Reading Kinesthetic (VARK) questionnaire is the most accepted one among them. The present study was undertaken to determine the learning preferences of first year medical students in South India. The study was also aimed at determining whether males and females have similar pattern of learning styles. **Materials and Methods:** This study was jointly conducted in Mamata Medical College, Khammam, Telangana and Sapthagiri Institute of Medical Science and Research Center, Bangalore, Karnataka. VARK-questionnaire Version 7.8 was used after obtaining permission. The VARK-questionnaire along with information about age and sex was distributed among 200 first year students of both colleges on the same day and response rate was 80% (Males 49% and Females 51%). **Results:** VARK questionnaire results revealed that none of our respondents preferred unimodal method. 3% were bimodal, 32% were trimodal and 63% were quad modal. There was no statistical difference between the individual scores between male and female respondents. **Implication:** The implication of this study is applicable to teachers to understand his/her student's pattern of learning. Although none of the students learn only by one method, all the multimodal learners will have a predominance of a particular learning style either it be visual/auditory/read/kinesthetic.

Keywords: Learning style, VARK questionnaire, Trimodal, Quadmodal.

INTRODUCTION

The term "learning style" is defined as an individual's preferred method for approaching learning and gaining knowledge^[1]. As a teacher, it is important to understand the different learning styles of the students in acquiring the information, and hence one can make the necessary changes that best match the learning style of the students.

The major three learning theories or models are: 1. Adult Learning Theory by Malcolm^[2], 2. Visual, Auditory, Read/Write and Kinesthetic (VARK)

Learning Style Model by Neil Fleming^[3] and 3. Kolb's Experiential Learning Theory and Learning Styles Model^[4]. One of the commonly used inventories is the VARK questionnaire developed by Neil Fleming. The alphabets in VARK correspond to visual, auditory, reading/writing and kinesthetic respectively. Hence depending upon the preference of learning one can be a visual learner who learns by seeing or auditory learners who learns by hearing or reading/writing learners who learns by interactions or

kinesthetic learners who learn by self-practice or performing activity. One can adapt multiple ways of learning and hence they can be called as unimodal, bimodal, trimodal and quadmodal learners. The present study was therefore undertaken to determine the learning preferences of first year medical students in two medical schools in South India using VARK questionnaire. The study was also aimed at determining whether males and females have similar pattern of learning styles.

MATERIALS AND METHODS

This cross-sectional study was jointly conducted in Sapthagiri Institute of Medical Science and Research Center, Bangalore Karnataka and Mamata Medical College, Khammam, Telangana. After obtaining informed-consent from the students, VARK questionnaires in hard copy were administered to 200 first year MBBS students in both the colleges. Along with the questionnaire, information regarding the age and sex of the students were also taken. The VARK questionnaire [3] has 16 multiple choice questions which have four answer options. Students can choose one or more than one answer depending on their preference. Each option shows his or her preference of learning either visual, auditory, read/write and kinesthetic. Each student took an average of 15 minutes to mark their preferences. The questionnaires were administered on the same day in both the colleges. The study was approved by the Institutional ethics committee of Sapthagiri Institute of Medical Science and Research Center, Bangalore and of Mamata Medical College, Khammam, Telangana. Permission to use VARK questionnaire was obtained from the developers and the copy of the questionnaire along with the analysis guidelines was sent from the developers via e mail. **Statistical analysis:** The response from the students was entered in a Microsoft Excel sheet. The distributions of the VARK preferences were calculated in accordance with the guidelines sent. Descriptive statistics were used for each VARK component. To calculate the percentage of students for each VARK component the number of students who preferred each learning style modality was divided by the total number of students.

RESULTS

The study population comprised of first year medical

students of two medical colleges in south India. The VARK questionnaire was distributed to 200 students of both colleges on the same day. A total of 160 students response were received making the response rate of 80%. Out of 160 respondents 78 were males and 82 were females with mean age of 18 years. The results are shown in table 1.

Table 1: Shows the demographics of the respondents with their mean age

| | Total | Mean age \pm SD |
|---------|-------------|-------------------|
| Males | 78 (48.75%) | 18 \pm 0.69 |
| Females | 82 (51.25%) | 18 \pm 0.75 |

VARK questionnaire results revealed that none of our respondents preferred unimodal method. 3.125% were bimodal, 31.875% were trimodal and 63.125% were quadmodal.

Further, the results were reanalyzed by dividing the respondents into males and females. The mean score of individual V, A, R, K were calculated which is shown in figure 1. There was no statistical difference between the individual scores between male and female respondents. Our results showed that 2.56% were bimodal, 20.51% were trimodal, 74.36% were quadmodal in males as shown in figure 2. 3.66% were bimodal, 40.24% were trimodal, and 52.44% were quadmodal learners in females as shown in figure 3.

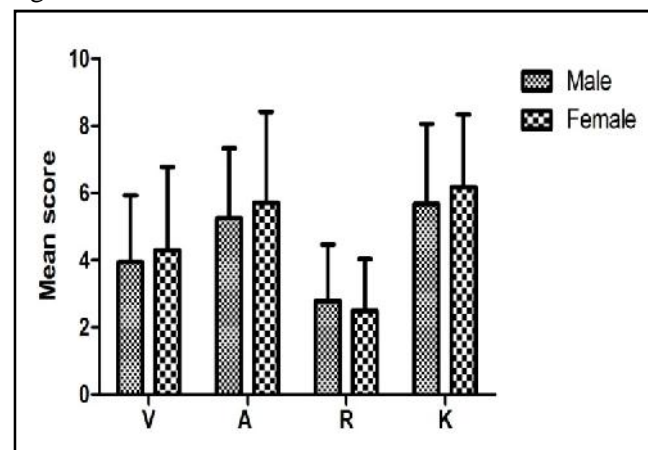


Fig 1: Shows the mean V, A, R, K scores individually for both male and female respondents. Results showed no significant difference between the mean scores between boys and girls. Data showed as Mean \pm SD.

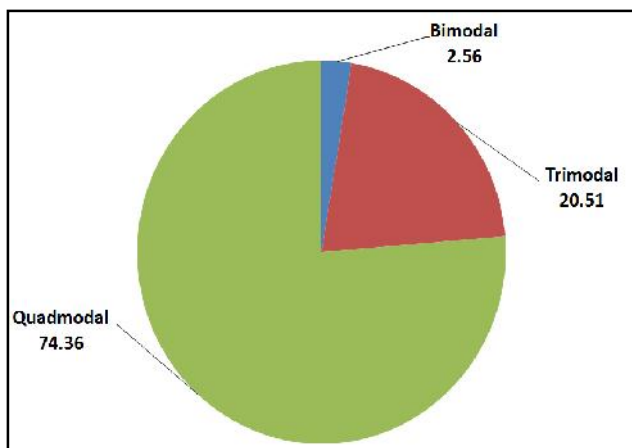


Fig 2: Percentage of Males that preferred Bimodal or Trimodal or Quadmodal preference.

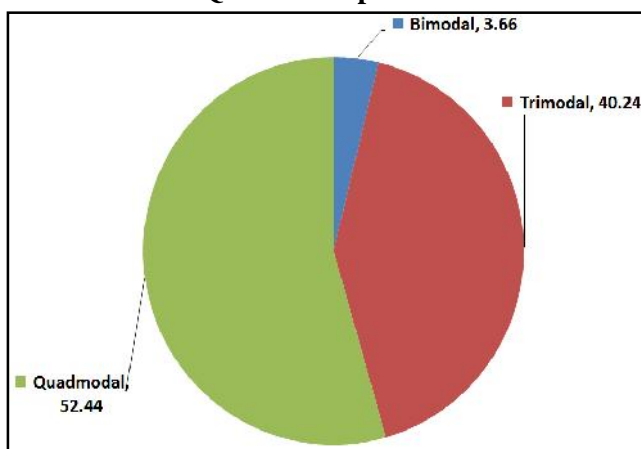


Fig 3: Percentage of Females that preferred Bimodal or Trimodal or Quadmodal preference.

DISCUSSION

This study was aimed in understanding different learning styles of medical students and the influence of sex on learning. Our study revealed that none of the students preferred unimodal way of learning. Maximum student preferred quadmodal (63%) then trimodal (32%) and bimodal (3%). Another major finding of the study is that both males and females preferred quadmodal way of learning compared to bimodal or trimodal way of learning. We also observed that female respondents chose more trimodal method compared to boys who preferred quadmodal method compared to female respondents (Figure 2 & 3). Our results showed that 2.56% were bimodal, 20.51% were trimodal, 74.36% were quadmodal in males and 3.66% were bimodal, 40.24% were trimodal, 52.44% were quadmodal learners in females. We also observed that both males and females had less mean score for read modality when compared to visual/auditory/kinesthetic

modality and there was no significant difference between the mean scores between male and female students.

Literature review from both national and international levels has shown different results in students studying different disciplines using VARK inventory. Most of the studies points out that student prefer multimodal way of learning irrespective of the discipline they study. In a study by Lujan and DiCarlo from a US medical school observed that first year medical students prefer multimodal way of learning and kinesthetic was the most preferred modality [5]. Similar reports from medical school were also reported from Malaysia [6], Saudi Arabia [7], Turkey [8], China [9]. Similar observation is also made in a recent study from India by Shenoy et al. [10] which showed that 70% of the respondents preferred multimodal way of learning and they opted for kinesthetic. It was also found that there existed no correlation between the learning style and performance in their previous exams. Our results are also similar the existing findings except for the fact that none of our respondents preferred unimodal way of learning. There is also a study to show that students preferred unimodal way of learning than multimodal. A study by Rajaratnam et al on dental students has shown that 55% preferred unimodal learning and preferred were either aural (47%) or kinesthetic (41%) [11]. The influence of sex on learning styles is an area of active research. In our study, most of the female undergraduate medical students (68.3%) were multimodal. Among multimodal learners, most of the female students preferred trimodal way of learning compared to their male counterparts. Apart from this difference there was no difference found in the pattern of learning between boys and girls.

CONCLUSION

Majority of the students from the two medical colleges preferred multimodal way of learning and there were no unimodal learners in our study group. The found no statistical difference between the individual scores between male and female students. We also found that the percentage of trimodal preference in female respondents were more when compared with the male students. **Implication:** The implication of this study is applicable to teachers to understand his/her student's pattern of learning.

Although none of the students learn only by one method, all the multimodal learners will have a predominance of a particular learning style either it be visual/auditory/ read/ kinesthetic. A Visual learner learns by looking at pictures, graphs, videos, and graphics. An auditory learner receives learning by listening method, by speaking or from music, discussion, and explanation. Read modality student prefer words and texts as an information obtaining method. They like presentation style, by text or writing and kinesthetic learners are more likely to experience through physical movement aspect while studying, such as, touch, feel, hold, perform and move something. They prefer hands on work, practical, project, and real experience. The knowledge of the students dominant pattern of learning allows a teacher to shift from his/her own preferred mode of teaching towards the learning preferences of students which may help to develop their knowledge, skills and attitudes.

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Conflict of Interest: Nil

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