Learning Style Preferences of First Year Medical Students of a Rural Medical College, West Bengal, India

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Abstract: ***The goal of this study was to determine preferred learning styles of first year medical students of BankuraSammilani Medical College, Bankura, a rural medical college of West Bengal, India. Methods: A cross sectional study of first year medical students with 65 male and 30 female (n=95) was performed. The validated VARK questionnaire Version7 was used to categorize the preferred mode of learning styles of students. Descriptive statistics were used to identify the learning styles of the students. Results: 95%was the response rate. 84.21% of students preferred multiple learning styles. Among multi modal learners bimodal learners (32.63%) surpass quad modal (30.52%) and tri modal (21.05%) learners. The most preferred combination of learning style among bimodal students were Auditory-Kinesthetic (9.47%) and Kinesthetic- Reading/Writing (9.47%). Conclusion: The result of this study shows that most students of this medical college are able to learn effectively as long as the teacher provide a blend of visual, auditory, reading/writing and kinesthetic activities***

Keywords: First year medical students, learning style, learning preference, the VARK, rural medical college.

1. Introduction

Learning style is defined as the 'composite of characteristic cognitive, affective and physiological characters that serve as relatively stable indicators of how a learner perceives'. [1,2] Educational researchers postulate that everyone has different learning styles.[3,4,5] One characterization of learning styles is to define the learners' preferred mode of learning in terms of the sensory modality by which they prefer to take in new information.[6] Flemming and Miles [7]defined four sensory modalities of learning: Visual, auditory, read-write and kinesthetic. Visual learners are those who generally think in terms of pictures. They find maps, graphs, charts, and other visual learning tools to be extremely effective. Auditory learners are those who learn best through hearing things. Some students use reading and writing as their first preferences for assimilating and accommodating to information. A kinesthetic student typically learns best by hands-on methods. [8]

The Visual-Aural-Reading/writing-Kinesthetic (VARK) questionnaire has been specifically developed in the context of modalities and strategies of learning styles. Fleming's VARK questionnaire (English version) was recently validated [9], but potential problems related to item wordings were found. The reliability estimates for the scores of the VARK subscales were 0.85, 0.82, 0.84 and 0.77 for the Visual, Aural, Read/write and Kinesthetic subscales, respectively. [9] Over the past year, the VARK has been used in some countries to asses learning style preferences of medical students. [10]

As medical instructors, it is our task to assess and teach knowledge, attitudes, and skills, and lectures will be more effective when the educational needs of all students are met.[11,12,13] Student motivations and performance improves when instruction is adapted to student learning styles.[14,15,16,18,19]

The transition from undergraduate to first-year medical education can be difficult for students because of the dramatic increase in the volume of content. Furthermore, today's medical students represent a broad spectrum in terms of age, experience, culture, ethnicity, and level of preparedness as well as learning preferences and styles. This diversity is welcomed; however, it also presents a challenge for instructors to meet the educational needs of all students.

Several previous studies have shown that cultural and ethnic difference [20, 21], gender difference [22, 23], difference in socio-economic status [24] and proficiency in English language[25] may affect learning styles. These studies are mostly done among Western population. But little is known about the distribution of learning preferences of first year medical students of medical colleges of rural West Bengal, India, where the culture and medical education differ greatly from Western countries. Therefore, the purpose of the study was to categorize learning preferences of First year medical students of medical college of rural West Bengal using the latest English version 7.0 of VARK questionnaire.

2. Material and Methods

A descriptive cross sectional study was conducted in 2012. Of the 100 first year medical students at Bankura Sammilani Medical College and Hospital, Bankura, West Bengal, 95 volunteers (65 male and 30 female) participated in this study. Version 7 of the VARK questionnaire was used in this study. The questionnaire measures four perceptual preferences (V, A, R and K). It consists of 16 questions with four options each. The purpose of each question is to categorize the learning style preferences of respondents. Respondents can choose more than one option for

identifying the preferences for multiple learning styles. Satisfactory levels of reliability and validity of the VARK have been reported using factor analysis techniques. [9]

2.1 Procedures

In 2012, VARK questionnaire was distributed to first year medical students during regular classes and they were explained that the questionnaire was designed to measure the distribution of learning styles preferences of students and we would use the study findings for research purposes. The study was approved by the Institutional Review Board of BankuraSammilani Medical College and Hospital, Bankura, West Bengal.

2.2 Statistical Analyses

The distributions of the VARK preferences were calculated in accordance with the guidelines given in the VARK website. [4] Descriptive statistics were used for each VARK component.

3. Result and Analysis

In our study the response rate was 95%. Mean and standard deviation for each VARK component are presented in **Table 1**. In our study the Mean VARK scores for aural (7.4) and kinesthetic learners (6.9) were more than that for reading/writing (6.78) and visual (5.87) learners. However, a further analysis showed that the vast majority of students (84.21%) preferred to learn by multiple sensory modalities **(Figure 1)**. Of these, 32.63%, 21.05% and 30.52% were bimodal, trimodal and quad modal respectively (**Figure 2**). From **Figure 3** we can see that the dominant learning preferences of the bimodal students were auditory, kinesthetic (9.47%) , reading/writing, kinesthetic (9.47%) and auditory, reading/writing (8.42%). Only 3.16% of students preferred visual, reading/writing and 2.10% of students preferred visual, kinesthetic. Figure 3 also shows that 30.52% of students who preferred quadmodal use all components for learning i.e visual, auditory, reading/writing and kinesthetic. This figure also shows the dominant learning preferences of the trimodal students were auditory, reading/writing and kinesthetic (9.47%).

Table 1: Mean and standard deviation for the VARK questionnaire administered to 95 medical students at BankuraSammilani Medical College and Hospital, West Bengal, India

VARK	*MEAN±SD*
Visual	5.87 ± 2.88
Auditory	7.4 ± 2.75
Reading/Writing	6.78 ± 2.67
Kinesthetic	6.9 ± 2.42

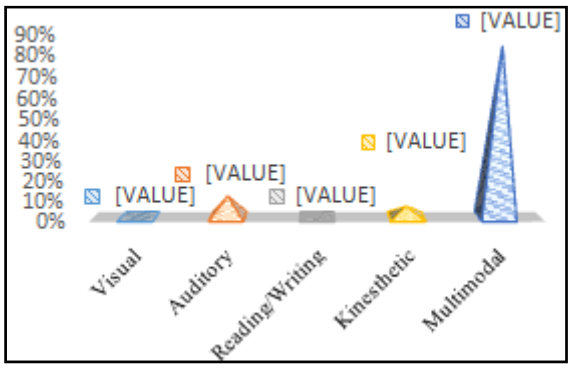

Figure 1: The preferences of students with singular and multi modal learning preferences (n= 95)

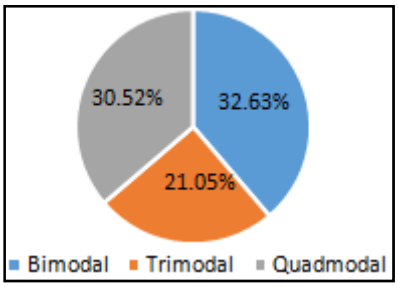

Figure 2: The percentage of students who preferred two, three or four modes of the learning style preferences (n=95)

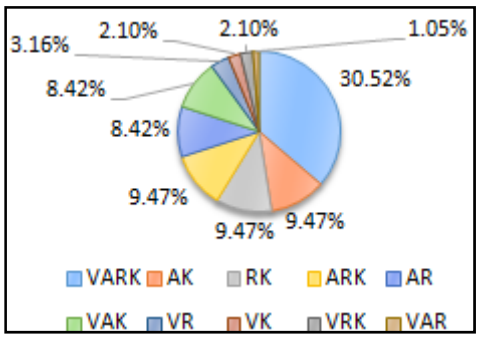

Figure 3: The percentage of students with a preferred combination of learning styles (n=95)

4. Discussion

In this study, we administered the VARK questionnaire to our first year medical students to determine their preferred mode of information presentation .Ninety-five of the one hundred students (95%) returned the completed questionnaire. Learning style varies from one group to another based on culture, the nature of the studies and the characteristics of students. A study in Malaysia showed that the mean VARK scores of kinesthetic (5.0) and read/write students (4.9) were more than auditory (4.7) and visual learners (3.1).[26]It has also been reported that science and engineering students were kinesthetic learners whereas business students were reading/writing learners.[27]

In our study the Mean VARK scores for aural (7.4) and kinesthetic learners (6.9) were more than that for reading/writing (6.78) and visual (5.87) learners. Our findings regarding multimodal preferences in the first year medical students of this rural medical college are in agreement with the study that has been reported for American medical students.[8] Only 15.78% of students preferred a single mode of information presentation (either

visual, auditory, reading/writing or kinesthetic). Of the students who preferred a single mode of information presentation, only 10.52% of students preferred receiving information by speech, which arrives to the learner's ear and is therefore coded as auditory by the questionnaire. Similarly only 5.26% preferred their learning by using all their senses, including touch, hearing, smell, taste and sight. This group was described as kinesthetic. These students prefer concrete, multisensory experiences in their learning. Although learning by doing matches their needs, they can easily learn conceptual and abstract material provided it arrives with suitable analogies, real-life examples or metaphors. [28] None of the student prefer visual and reading/writing as a single sensory modality of learning. Most of them (84.21%), however, preferred multiple modes of information presentation. This implies that most students of this medical college are able to learn effectively as long as the teacher provide a blend of visual, auditory, reading/writing and kinesthetic activities.

Among the multi modal learners bimodal learners (32.63%) surpasses quad modal (30.52%) and tri modal (21.05%) learners. The most preferred combination of learning style among bimodal students were Auditory-Kinesthetic (9.47%) and Kinesthetic- Reading/Writing (9.47%). This could be due to the fact that the students of this rural medical college depend more on class lectures and practical hands-on experiences at pre-clinical laboratory to develop their knowledge, skills and attitudes. As all of them reside at hostels unlike urban medical colleges of West Bengal, where most of the students are day-scholars, learning by listening through peer instruction which is a part of auditory learning could play a major role in their learning process.

The rational for this descriptive study was to help medical teachers design a lesson plan that addresses all students. This enables them to shift from their own preferred mode of teaching towards the learning preferences of medical students. In this institution they may try to introduce more auditory learning through collaborative testing [29, 30], debate [31], game [32], listening during peer instruction [33, 34] and answering question [35]. Implementation of role playing [36] or manipulating model [37] in lectures may prove beneficial for the kinesthetic learners.

5. Limitations of the study

This study has some limitations. A convenience sample of students from a single institute was used. Therefore the sample may have been biased and might not represent the population of medical students of all rural medical colleges of West Bengal. Further studies using multiple centers with a large sample size on the current topic are therefore recommended.

6. Conclusion

The result of this study shows that most students of this medical college are able to learn effectively as long as the teacher provide a blend of visual, auditory, reading/writing and kinesthetic activities. However, more research on this topic needs to be undertaken before the association between learning style preferences and teaching and learning strategies is more clearly understood.

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