

A Cross – Sectional Study on the Prevalence of Learning Styles among First Year Medical Students in a Private Medical College in South IndiaVellimalai K¹, Venkatesan S², Stephen Jayakumar M³¹Associate Professor, Department of Physiology, PSG IMSR²Assistant Professor, Department of Community Medicine, PSG IMSR³Postgraduate Student, Department of Physiology, PSG IMSR

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Conflict of interest: Nil

Abstract:

Students adopt multiple learning styles in internalizing information. Some like to learn by visual (V), auditory (A), read/write(R) and kinesthetic (K) modalities. A cross-sectional study was conducted among 60 medical students of the first year MBBS students of PGS IMSR to determine the prevalence of learning styles among students. VARK inventory questionnaire was administered to determine the preferred instructional mode based upon the four sensory modalities. Results of the study revealed both male (52%) and female (60%) students preferred unimodal information presentation, and 48% of males and 40% of females followed multiple modes of information presentation. In our study, no gender differences in any of the specific preferences tested and none of these differences reached statistical significance. Understanding a student's learning style preference is an important consideration when designing classroom instruction. It is the responsibility of the instructor to address this diversity of learning styles and develop appropriate learning approaches.

Keywords: Visual, Auditory, Read-Write, Kinesthetic, Learning Modes, VARK.

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Introduction

Learning is an individual way of perceiving, processing and retaining new information. Learning style is defined as the manner in which learners most efficiently and effectively learn and they store, and recall whenever needed. It may vary according to the sensory modality that one most prefers to use when internalizing information. The concept of learning styles has become a cornerstone of good teaching practice. The field of learning styles is complex, with over 70 different learning style models identified in a recent review.

Previously in all the Medical Colleges, it was assumed that students are all "Auditory Learners". So the learning style followed was by lecture classes [1].

Students who prefer a single method of information presentation are referred to as unimodal learners whereas others preferring more than one instructional mode are called as multimodal learners.

Will the instructor has to modify his teaching style to cater the needs of vibrant student community?

Amongst the various tools used to determine learning preferences, VARK questionnaire [2] is one of the most widely accepted and used for assessing instructional preferences. The latest VARK version

8.01 uses four major sensory modalities: visual, auditory, read/ write and kinesthetic for determining learning style preferences. VARK study is a simple test useful in the long run.

Learning strategy is developed using a combination of learning styles and study practice. Students are known to have preferences for the modes in which they receive information. In the arena of medical research, most of the previous studies have been conducted on first year medical students [3,4] and the results obtained have shown vast variations. However, further studies need to be conducted to focus on identifying a variation in the pattern of learning styles of students. Students with visual preference use diagrams and pictures, symbolic devices such as graphs and flow charts. Auditory learners gather information best by hearing and enjoy discussions, lectures and tutorials. Read/write learners prefer printed material to gain knowledge. Kinesthetic learners prefer simulations of real life experiences, field trips, demonstrations, workshops and hands on experiences.

Aims and Objectives:

Primary Objective : To find out the prevalence in learning styles among the first year medical students

attending a private medical college in the first year in South India.

Secondary Objective: To propagate the conclusion obtained in the study to all the faculty in all the medical colleges and use it to enrich the knowledge obtained by the students in lecture classes.

Materials and Methods

Study Design: The study was conducted among the first year medical students of PSG Institute of Medical Sciences and Research after obtaining clearance from the institutional human ethics committee. The students in the class were randomly selected. The VARK questionnaire developed by Fleming was used to identify student learning styles; it measures four perceptual learning preferences (visual, auditory, reading/writing and kinaesthetic).

The questionnaire was given to the subjects as a hard copy to be completed in class within 15 –20 min. Each question carries four options. Participants were permitted to choose one or more than one option or omit a question as found suitable.

Methodology:

Flow chart: Sixty subjects from first year medical college (private) were randomly selected.

(Both male and female) → VARK questionnaire contained 16 MCQ questions. It was given to randomly selected students --→ 20 minutes time was given to the students to fill up the questionnaire → Scoring chart (answer key) was used to analyse the result from 60 students. Based on the difference between any 2 highest scores, tabular column was drawn and was compared among the results → The strength and type of learning style was found out → Results was used in drawing pie chart → Data was used for publication in indexed journal

Sample Size and its Justification: The sample size was calculated by standard formula and 60 subjects were included in the study

Inclusion / Exclusion Criteria:

Inclusion Criteria:

1. Age 18 years and above
2. Ist year Medical student
3. Studying at PSGIMS&R
4. Both Male & Female students
5. Who are interested in the study
6. Students getting any amount of Marks

Exclusion Criteria:

1. Age less than 18 years
2. Second year and above medical students
3. Who are not interested in the study
4. Students from outside PSG IMS & R

Potential risks and benefits: There are no risks involved in the study. The potential benefits are to present the lecture in a format that will be retained by majority of students in the class.

Result/ Statistical Analysis: Questionnaires were evaluated on the basis of scoring instructions available on the VARK website. The data thus obtained was compiled using Microsoft excel spreadsheet and statistically was analyzed for a percentage of male and female students with unimodal and multimodal preferences with SPSS Version 28.

The pattern of learning style which is most prevalent is KAVR (Kinesthetic/ Auditory/ Visual/ Read – write pattern). The mean value of total responses is 20.5 ± 6.1 and the mean value for the difference between 1st highest score and 2nd highest score is 2.90 ± 1.7 . The learning style which is first preferred among study participants is Kinesthetic – 50%, next visual –18% and lastly Auditory – 32%. No preferred learning style for Read – write methodology. The percentage of multimodal learning style was 45% and rest 55% comprised unimodel learning style.

The pattern of learning style:

Table 1: Pattern of learning style among medical students

	Frequency	Percent
AKRV	1	1.7
AKVR	10	16.7
ARKV	3	5.0
ARVK	2	3.3
AVK	1	1.7
AVKR	1	1.7
AVRK	1	1.7
KARV	3	5.0
KAV	1	1.7
KAVR	15	25.0
KRAV	1	1.7
KRV	1	1.7
KVA	2	3.3
KVAR	6	10.0

KVRA	1	1.7
VAKR	2	3.3
VARK	2	3.3
VKAR	4	6.7
VKRA	1	1.7
VRKA	2	3.3
Total	60	100.0

Table 2: Modality of learning style

	Frequency	Percent
Mild- Unimodal	11	18.3
Strong - Unimodal	10	16.7
Very Strong –Unimodal	12	20.0
Multimodal	27	45.0
Total	60	100.0

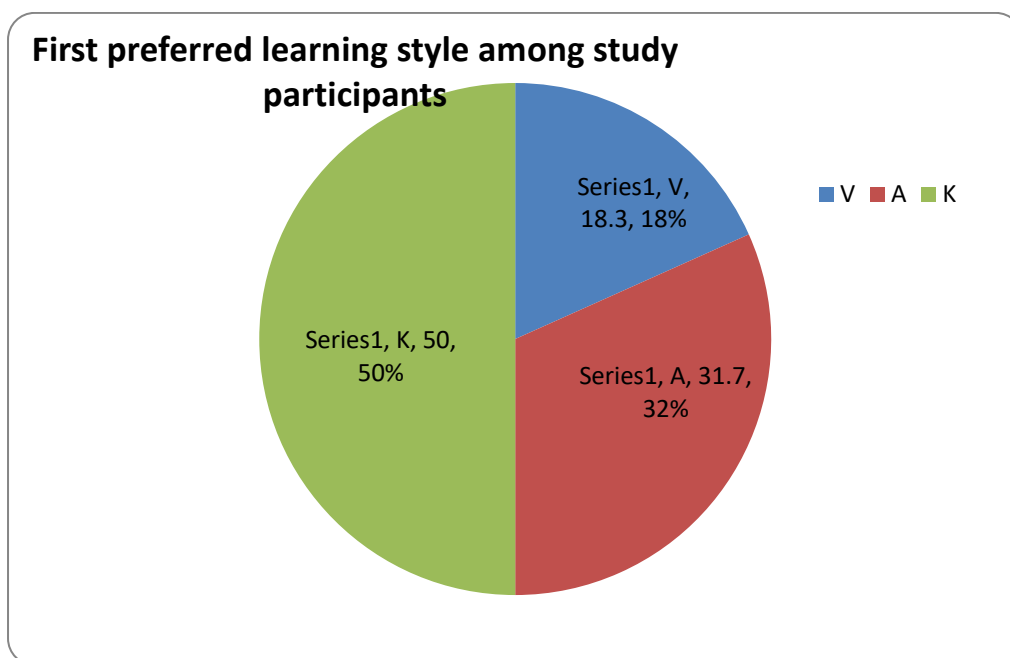


Figure 1: First Preferred Learning Style among Study Participants

Legend: Kinesthetic-50% Visual -18% Auditory-32% Read/Write -0 %

Table 3: Assessment of Learning Styles

Column My total number of responses is	The difference between any two highest scores was:						
	ZERO.	ONE.	TWO.	THREE.	FOUR.	FIVE.	SIX or MORE
Less than 17	Multi-Modal	Multi-Modal	Mild	Strong	Very Strong	Very Strong	Very Strong
Between 17 and 22	Multi-Modal	Multi-Modal	Multi-Modal	Mild	Strong	Very Strong	Very Strong
Between 23 and 26	Multi-Modal	Multi-Modal	Multi-Modal	Multi-Modal	Mild	Strong	Very Strong
More than 26	Multi-Modal	Multi-Modal	Multi-Modal	Multi-Modal	Multi-Modal	Mild	Strong

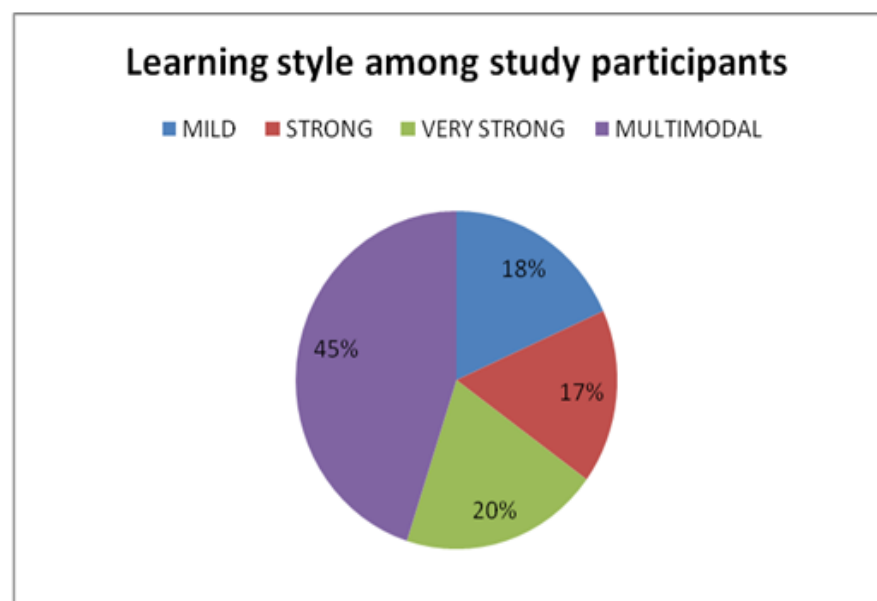


Figure 2: Learning Style among study participants

Legend: Multimodal -45 % Unimodal Mild - 18%
Unimodal Strong - 17% Unimodal Very Strong - 20%

Discussion:

Knowing the students preferred modes of learning style can provide a focus for developing strategies that are tailored for individuals. In so doing, this helps to overcome the predisposition of many educators to treat all the students in a similar way. To meet the demands, teaching should be multisensory and filled with variety. To achieve this goal, it becomes important to use active learning strategies.

Cooperative learning exercises [5], role playing [6], simulations, models, debates [7], and games are active learning strategies that can be used effectively in large classrooms.

Most students are able to learn effectively as long as the teacher provides a blend of visual, auditory, reading/writing, and kinesthetic activity. However, some students prefer one of the modalities over the other three so strongly that they struggle to understand the subject matter unless special care is taken to present it in their preference mode. To meet these needs, teaching should be multisensory and filled with variety. To achieve this goal, it becomes important to use active learning strategies.

We were interested in assessing the preferred learning styles among the first year medical students. Factors which influence the learning practice include gender [8], age, academic achievement, brain processing, culture and creative thinking. This information may assist in the development and implementation of specific teaching approaches which would maximize student motivation and learning by tailoring instruction to

student needs. Several studies were conducted so far with a wide variation in the selection of subjects. Majority of the studies were from United States of America, some were from the Gulf region. Such studies are so far absent in Indian student community.

In one of the studies conducted in Wayne State University, Michigan, USA using first year medical students as subjects, 54.2% of females and only 12.5% of males preferred a single mode of information presentation. Among the 54.2% in female students, 33.3% preferred kinesthetic mode, 16.7% preferred R modality, 4.2% chose preference for Visual modality and none chose A(Auditory) method of information presentation. In the 12.5% among the male students, they chose the domains ARK almost equally of about 4.1% each while 0% chose V (Visual) domain. In another study conducted at the same place a year later showed a different pattern—both male (56.1%) and female students (56.7%) preferred a multiple modality of information presentation. Not only were that, the percentage of students and types of sensory modality chosen not significantly different between the genders.

In the present study, 45% of students exhibited multimodality indicating that they use a combination of learning styles for gaining knowledge. These findings are coherent with previous study. The learning style which is first preferred among study participants is kinesthetic - 50% of total participants.

In conclusion, in the passive lecture format, all students are assumed to be "Auditory Learners". But only 32% were found to be Auditory Learners.

Conclusion

Knowledge of learning style of students needs to be addressed so that it can help educators to ensure that their students become more effective learners. In our study, several conclusions were arrived at. They are with active learning strategies [5,6,7], visual learners are targeted by the presence of models and demonstrations. Auditory learners are reached through discussion during peer instruction, collaborative testing, debate, games, and answering questions. Manipulating models and role playing satisfies kinesthetic learners. Writing essay and reading text in printed material format helps in Read/Write method of learners. Cooperative learning exercises, role playing, simulations, models, debates, and games are active learning strategies that can be used effectively in large classrooms. These activities also promote working in groups and generate high levels of motivation and enthusiasm. Drastic reduction in passive lecture hours is advised and the teachers should provide a blend of V, A, R, K activities in their lecture classes

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