



ASSESSMENT OF LEARNING STYLES PREFERRED BY MEDICAL STUDENTS USING VARK QUESTIONNAIRE

¹*Dr. Syed Sheraz Ali, ²Dr. Junaid Ali, ³Dr. Waris Khan, ⁴Dr. Paras Ali Shah, ⁵Dr. Ibrar Ahmad and ⁶Dr. Qaisar Ali Khan

¹Training Medical officer, Department of Surgery, Saidu Group of Teaching Hospital Swat KP.

²Training Medical Officer, Department of Surgery, Bacha Khan *Medical Complex Swabi*.

³Medical Officer, Department of Forensics, Bacha Khan *Medical Complex Swabi*.

⁴Training Medical officer, Department of Internal Medicine, Saidu Group of Teaching Hospital Swat KP.

⁵General Practitioner, Department of Andrology, Malka Andrology & Infertility Clinic Roshan Hospital Saidu Sharif Swat.

⁶Training Medical Officer, Department of Internal Medicine, Hayatabad Medical Complex.

***Corresponding Author: Dr. Syed Sheraz Ali**

Training Medical officer, Department of Surgery, Saidu Group of Teaching Hospital Swat KP.

Article Received on 26/07/2023

Article Revised on 16/08/2023

Article Accepted on 05/09/2023

ABSTRACT

Background: Among the numerous available methods in assessing different learning styles of students, the ‘visual-aural-read/write-kinesthetic (VARK) questionnaire’ is the most simple, freely available method that can be easily administered to facilitate students understanding their learning behaviors. **Aims and Objectives:** Our aim focuses upon the learning style preferred by medical students of KMU-IMS Kohat. **Settings & Design:** Descriptive Cross-sectional study carried out in a Public Sector Medical College (KIMS) located in KPK (Pakistan). **Materials and Methods:** A total of 237 undergraduate medical students of our college were encouraged to take part in the study using modified “VARK questionnaire”. The participated students were then categorized accordingly for principle learning modality used. **Statistical Analysis:** Data was analyzed using Microsoft Excel (2019) and SPSS (version 25.0) software. **RESULT:** In our study the majority of students preferred Unimodal preference (74%) with Kinesthetic (61%) predominant modality, followed by aural (22%), visual (10%) and read/write (7%). Those who were multimodal (26%) in their learning styles, majority were Bimodal (15%) followed by Quad modal (8%) and trimodal (3%).

KEYWORDS: Learning styles, Medical students, Visual, Auditory, Read/Write, Kinesthetic.

INTRODUCTION

Students depict unique methods in order to grasp concepts. Everyone has a peculiar taste in grasping concepts. One might have noticed that while studying for the same thing some people are able to acquire the knowledge smartly while others can't. Have you wondered why that happens, it's because some students make use of learning modalities best suited for them. It means that everyone has his/her own learning style.

Medical knowledge is not certainly confined to health & diseases but it wraps nearly all boundaries of human activities as well as the social information regarding medicine. With each passing day medical knowledge is updating with researches carried in different fields. We are all aware of the pool of information a medical student has to attain, memorize and interpret in a short time period. This leads to revolutionary change in medical education with modification from conventional method of teaching to the practice of problem based and two way interactive learning styles.^[1] The several ways of learning between the instructor & students is quite often

reasoned. The purpose is to opt a valid teaching method that coincides with the gaining ability of a student at the same time.^[2] With this approach it will prove beneficial for the students to be at par with learning educational information and appropriate satisfaction. Faulty methods taken by the learner along with not being aware of the method chosen for learning ; gives them no chance of analyzing & amending themselves logically.^[3] This is where the use of appropriate learning style takes the lead to facilitate the students towards the desirable objectives of education.^[4]

With several current procedures that evaluates various learning systems regarding student's interests, the “visual-aural-read/write-kinesthetic (VARK) questionnaire” is the most basic, freely available approach simply encompassing the learning objectives of students. The aim focuses upon the learning style preferred by medical students.

The VARK MODALITY SYSTEM: It was Neil Fleming a teacher from New Zealand who launched the VARK

model through his work done in Lincoln University (1987).^[5]

VARK describes four very basic learning modalities.

V - Visual

A - Auditory

R- Read/Write

K - Kinesthetic

Visual (V)

This modality is defined as “depiction of information in maps, spider diagrams, charts, graphs, flow charts, labelled diagrams, and all the symbolic arrows, circles, hierarchies and other devices that instructors use to represent what could have been presented in words. It could have been called Graphic (G) as that better explains what it covers”. Videos, movies, and power point are not included in it.

Aural / Auditory (A)

Aural mode represent the knowledge which is gained by hearing or speaking. Those who are aural and auditory learner gain their knowledge best from talks, speeches, mails, speaking, and chats (group discussion).

Read/Write (R)

Read/Write-can be defined as “information displayed as words”. The read and write learners mainly use books, power point, internet, dictionaries, written description and words. There is no doubt that many academics use this modality.

Kinesthetic (K)

Kinesthetic states to “perceptual preference related to the use of experience and practice (simulated or real)” which can be superimposed over other modalities. The point is that, these people learn from their mistakes, life experiences, fieldwork etc. i.e. they are mainly practical and realistic.^[6]

MATERIALS AND METHODS

This was a descriptive cross-sectional study which was performed at **KMU-Institute of Medical Sciences (KIMS) Kohat, KPK (Pakistan) from 30 Sep 2021 to 10th January 2022.**

The research sample consisted of 237 students (130 males and 107 females) of KMU-IMS Kohat. Students were briefed about study purpose, VARK Modalities and questionnaire, So that they will be able to identify their preferred modality.

For ethical purposes, before the distribution of modified VARK questionnaire, a fully written informed consent was obtained from the participating students.

A self-modified VARK questionnaire in hard copy along with consent form was given to the all participated students. The questionnaire consists of 16 questions and each question have four options. Students were directed

that they can mark one or more options to each question. On the basis of the key in the guide, answers were analyzed as V, A, R, & K. To find the predominant learning modality of each individual score were calculated according to given instructions for VARK inventory.

The statistics collected was then enrolled into Microsoft Excel (2019) worksheets which was analyzed using SPSS (Version-25.0) software and Mean and standard deviation were calculated for individual VARK component.

Scoring system steps

Calculating the total scores of VARK by use scores of stepping distance (Table 1).

Steps

- i) Calculate total scores of VARK by adding the replies of V, A, R, and K to find the S score from Table-1. (S - Stepping distance).
- ii) Organize VARK score in descending order (descending order $x_1 > x_2 > x_3 > x_4$ respectively).
- iii) If $x_1 - x_2 \geq S$ it means that the learner has Unimodal preference of learning, otherwise follow step-iv if less than S.
- iv) If $x_2 - x_3 \geq S$ means that the learner has bimodal Preference. Follow step v in case it is less than S.
- v) If $x_3 - x_4 \geq S$ means that the learner has trimodal preference. If less, it means the learner has quad modal preference.

Table 1: Use Scores Of Stepping Distance To Calculate The Score Level Of Learning Style.^[7]

Total VARK scores	Stepping distance-S
14-21	01
22-27	02
28-32	03
32+	04

STATISTICAL ANALYSIS

Students have been classified on the basis of their preferred modality into different percentages and their VARK scores is calculated as means \pm standard deviation.

RESULT

Students are classified as Unimodal and multimodal (i.e. Bi, Tri and Quad modal) learners on the basis of their predominantly practicing modality whether they are using single learning style (V, A, R, K) or their combination (VA, AR, RK, VAR, ARK, VARK etc.) They are classified into bimodal learners (VA, VR, VK, AR, AK, & RK) learner if they are using combination of two learning styles, trimodal learners if they are using three modalities (VAR, VRK, KVR, RAK etc.) and quad modal learners if practice all four (VARK) modalities.

Students are predominately found to be Unimodal (n=175, 74%) as shown in Fig-1. The Fig-2 shows the

Unimodal learners, in which the preferred style of learning is Kinesthetic modality (n=107, 61%). This is trailed by aural (n = 38, 22%), visual (10%) and read/write (7%).

Those who are multimodal (26%) in their learning styles, majority strongly favored the Bimodal (15%) followed by Quad modal (8%) and trimodal (3%).

Among bimodal (15%), AK/KA (61%) is preferred followed by KV/VK (16%), AV/VA (10%), RK/KR (7%) and VR/RV (6%).

Figure 4 and 5 shows Trimodal (3%) and Quad modal (8%) preference respectively with ARK/KAR/KAR (56%) predominant among trimodal followed by VAK/KVA (33%) and VRK (11%).

Mean individual VARK scores are shown in Table 2. The mean score was highest for kinesthetic (7.04 ±2.70) and lowest for read/write styles (3.50 ± 2.37).

Figure 1:

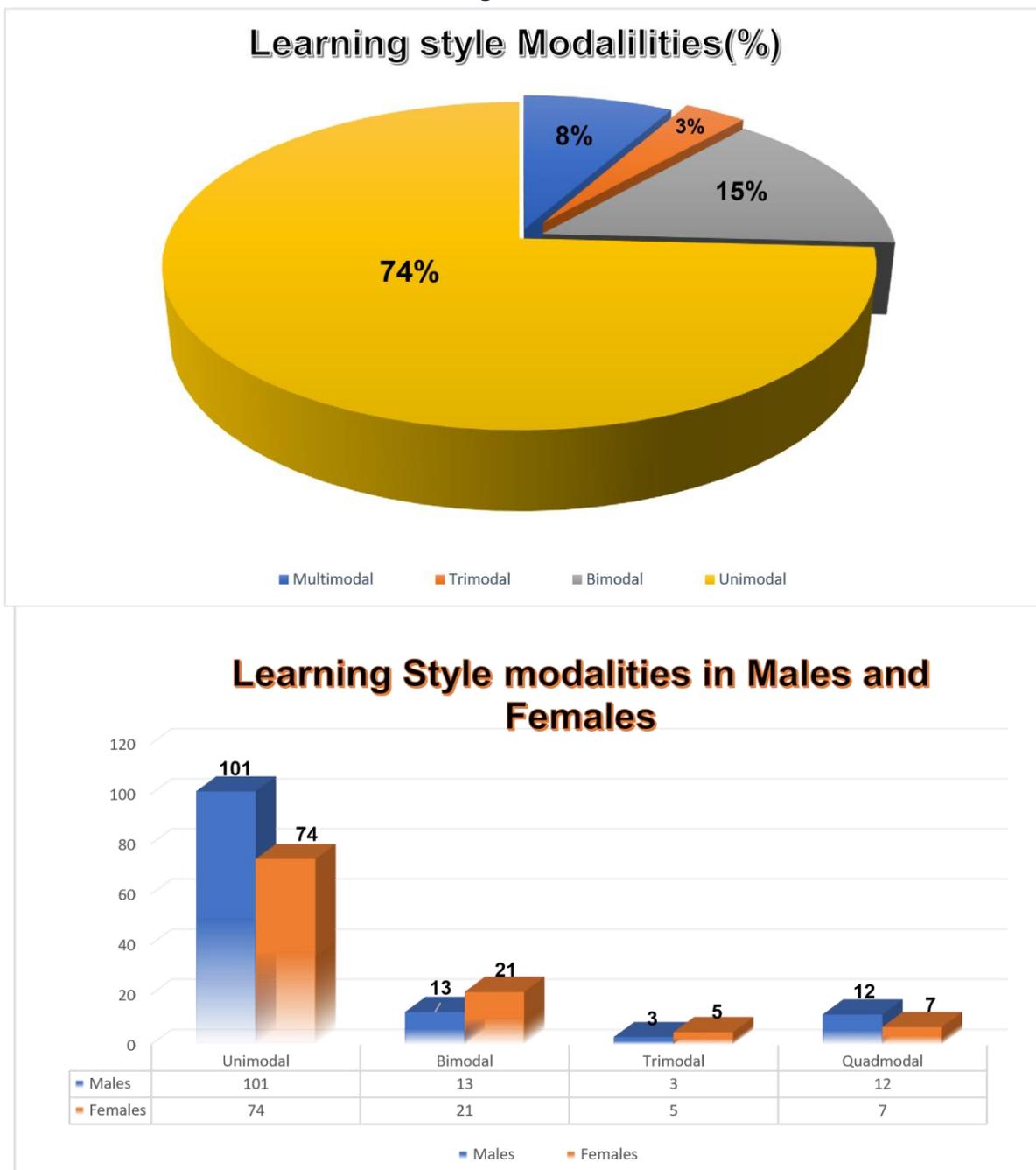


Figure 2:

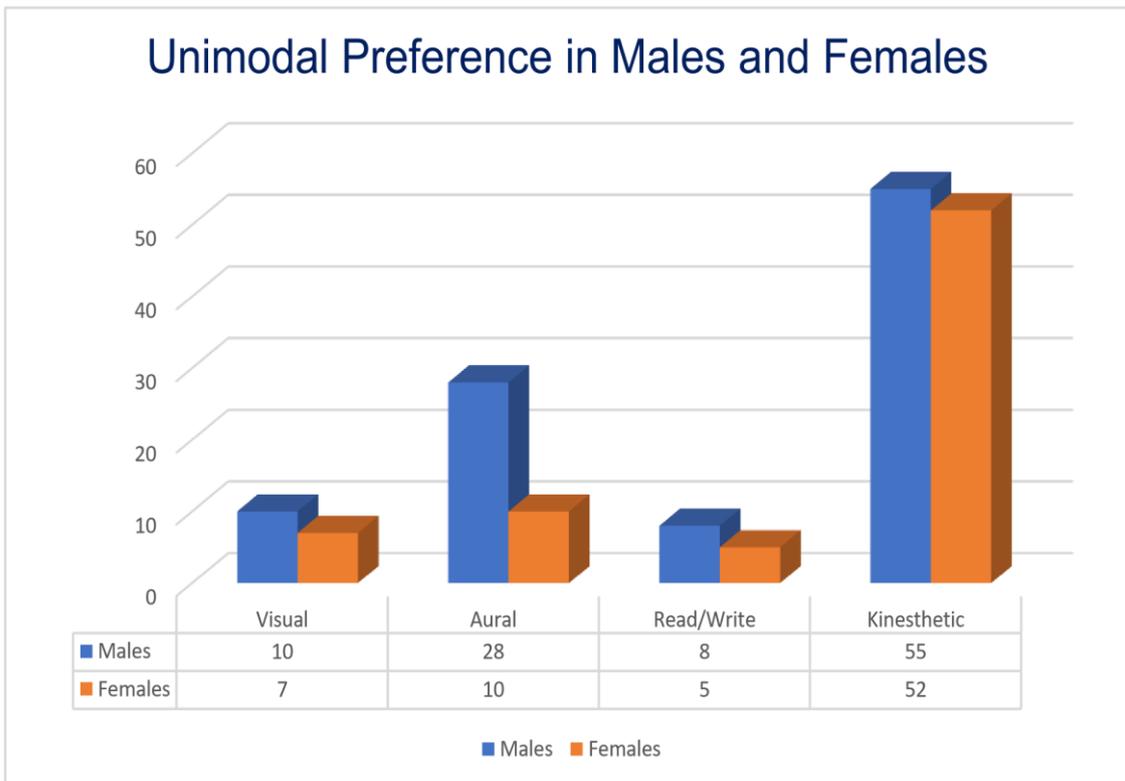
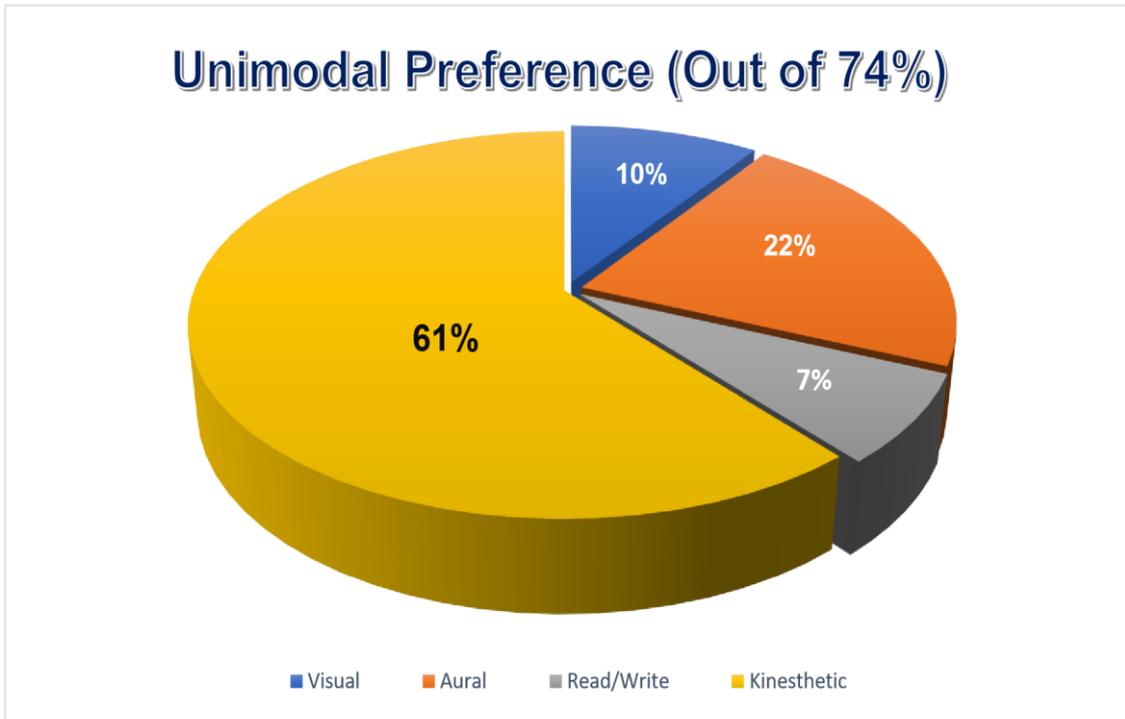
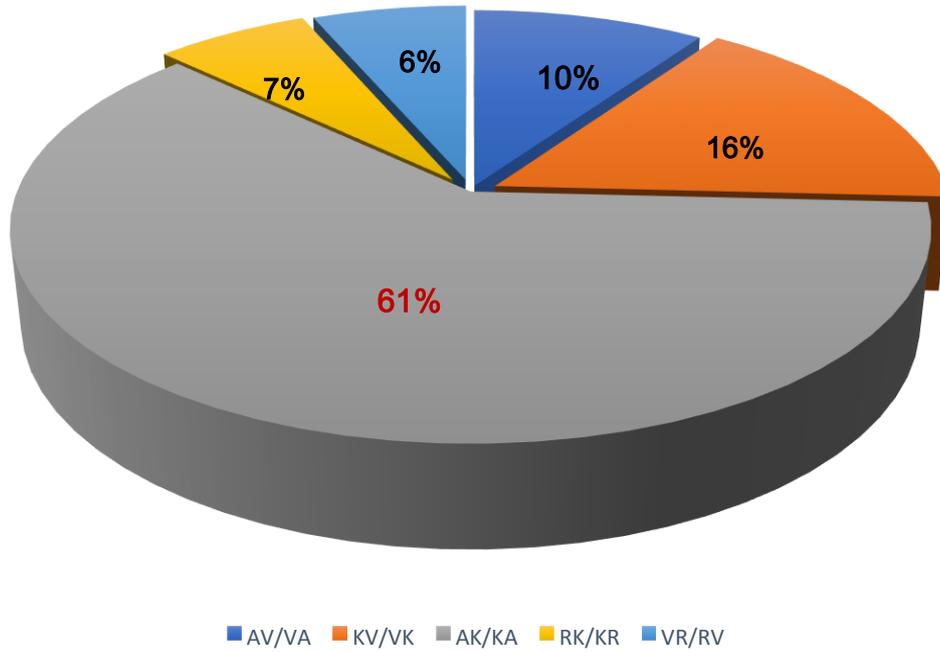


Figure 3 :

Bimodal Preference(Out of 15%)



Bimodal Preference in males and females

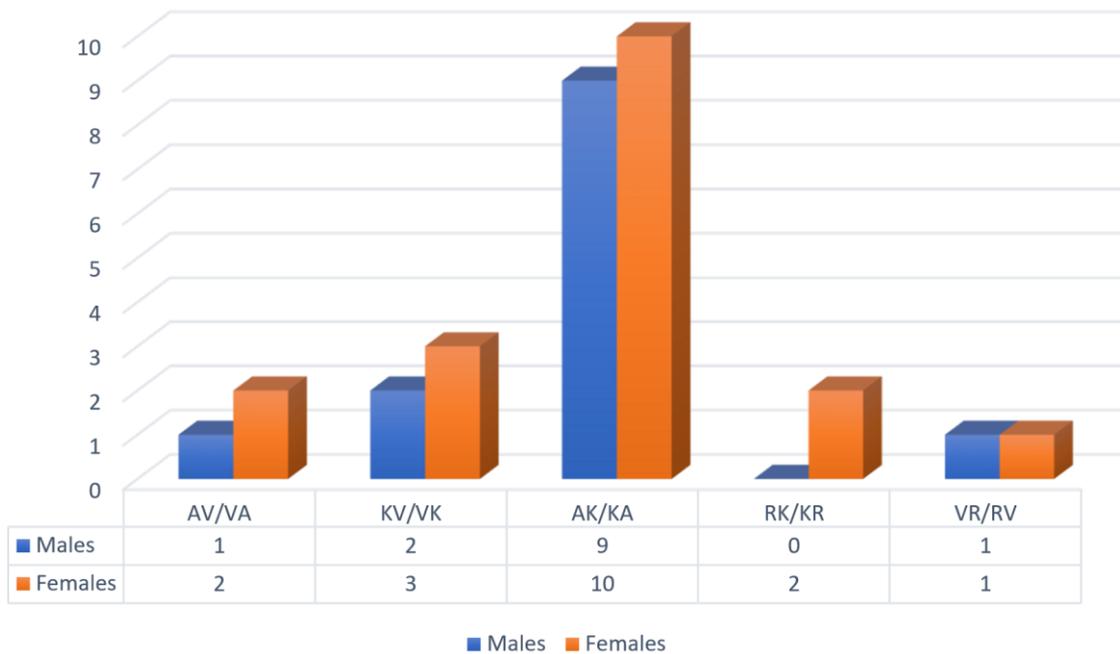
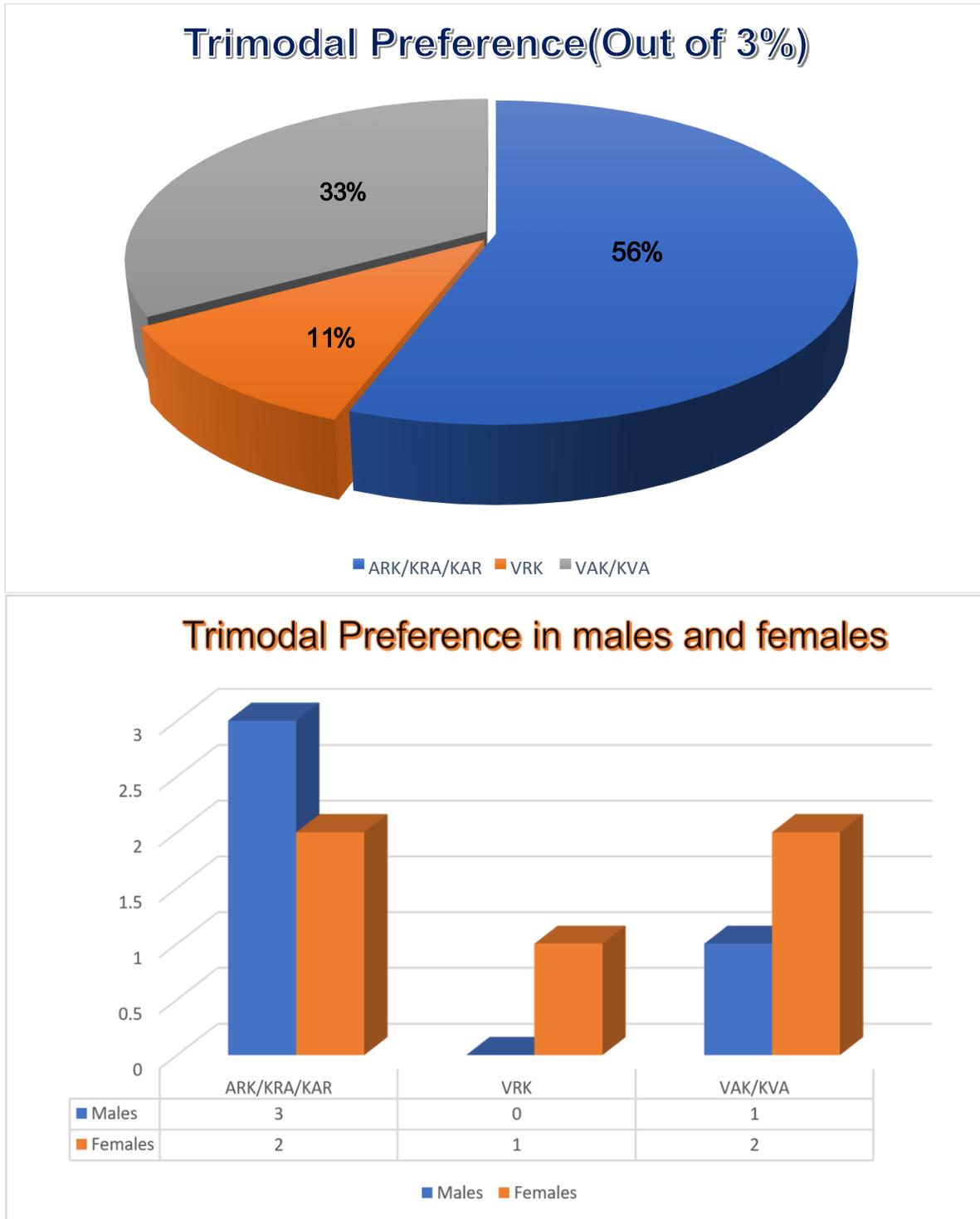
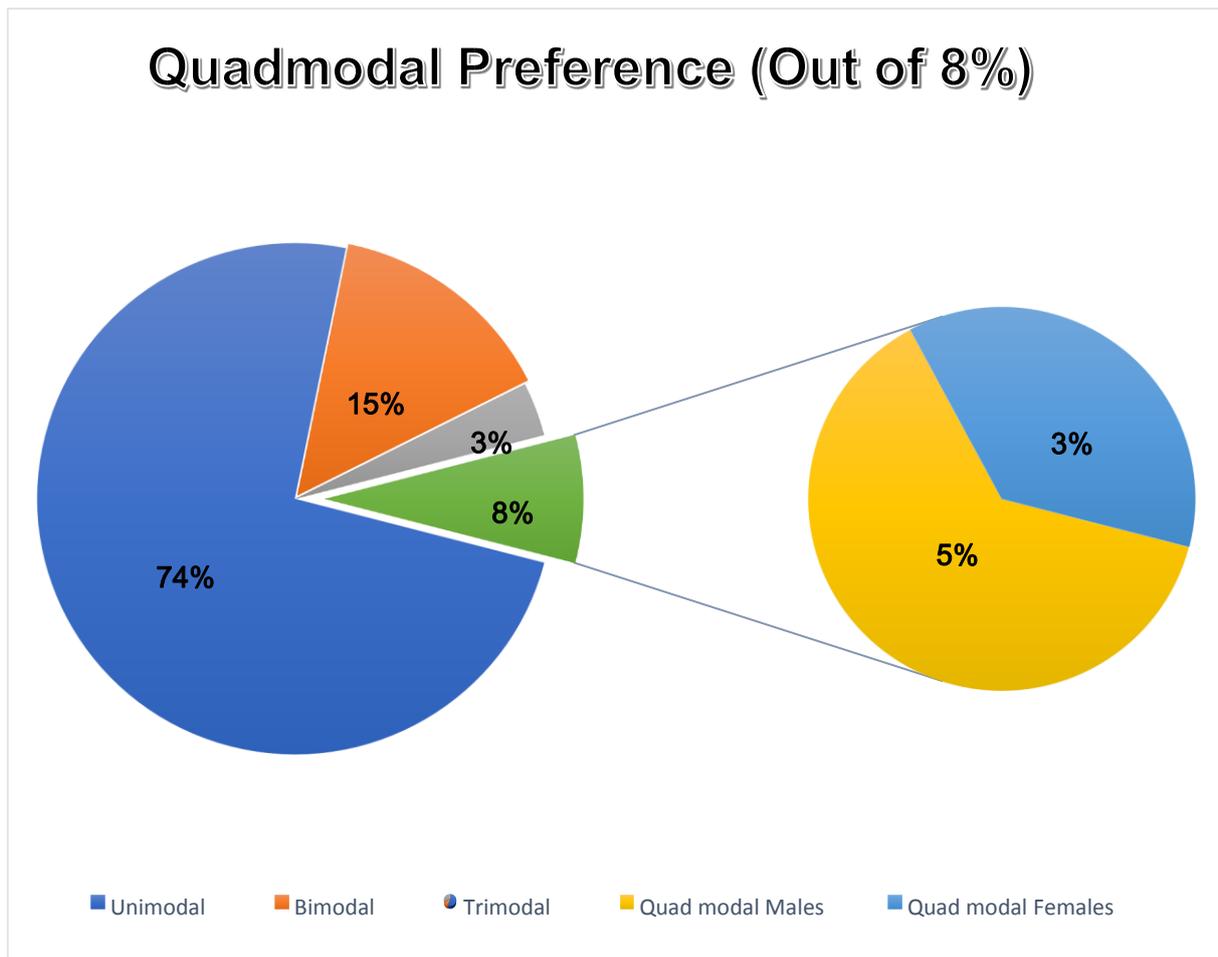


Figure 4:





DISCUSSION

Assessment of learning style of students is a precious skill in education. Awareness about different learning styles favor students to solve learning problems, thus serves students to be more effectual learner.

In this study, we administered the VARK questionnaire to our 1st, 2nd, 3rd, and 4th year MBBS medical students to conclude their ideal learning modality. The 237 students (130 males and 107 females) responded the questionnaire. 74% of our students favored Unimodal preferences, in which only 10% are visual modality learner. These students prefer learning by using maps, labelled diagrams, flow charts, circles graphs and other devices. Similarly, only 22% of students give preference to learning by speech, which is perceived by ear and is therefore categorized as aural by definition. In the same way, only 7% preferred learning from printed words like PowerPoint, internet, lists and dictionaries etc. These students were considered as reading/writing learners because they use reading and writing as their preferred form of learning. And 64% of the students were in the category who learn from their mistakes, life experiences, fieldwork etc. i.e. they are mainly practical and realistic. This group were called as kinesthetic.

Our study is compatible with data collected from VARK website in which preferred modality is Kinesthetic. The

data collected from medical college in Lahore Pakistan^[8] also suggest that the students preferred unimodality but their preferred style is visual but they used only two classes for data collection. The findings of^[9-15] suggest that students preferred multiple modality but if we observe unimodality of these students most pronounced style of learning is kinesthetic which favors our study. The data of^[15-17] also suggest that students favored multimodality but their unimodality suggest auditory and aural is their style of learning.

CONCLUSION

All the students participated in our study are selected for medical studies on the basis of concept-based entrance test. And as we know kinesthetic learning style is an excellent way to make concepts, supports in developing cognitive skills and increase comprehension. This style develops social connectivity and for medical student it is very necessary to be interactive hence it is predominant learning style in this setup. As truly stated by someone "If I hear, I forget
If I see, I remember
If I do, I know" So Kinesthetic is a productive form of learning.

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