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Research Article

IDENTIFY THE LEARNING STYLES OF MEDICAL STUDENTS OF KHAWAJA MUHAMMAD SAFDAR MEDICAL COLLEGE SIALKOT PUNJAB PAKISTAN

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Objective: The aim of this study is to identify the learning styles of medical students of Khawaja Muhammad Safdar Medical College Sialkot Punjab Pakistan.

Methodology: Stratified Random sampling was used and 320 students were selected. VARK questionnaire version 7.8 by Neil Flemming was used. Responses of students were acquired and then analyzed by SPSS software version 23.

Results: Medical students of Khawaja Muhammad Safdar Medical College, Sialkot, Punjab, Pakistan have 32% preference for Kinesthetic modality; 26% for Aural; Visual 21% and Reading/Writing 21%. They 53% preference for Bimodal modality; 41% for Unimodal; 5% for Trimodal and 1% for Multimodal.

Conclusions: Students of Khawaja Muhammad Safdar Medical College, Sialkot, Punjab, Pakistan have Highest preference for Kinesthetic modality; second one is Aural and Visual; Reading/writing have equal preferences. Moreover, they have preferred modalities as Bimodal and Unimodal respectively. Least preferred modalities were Trimodal and Multimodal respectively.

Keywords: Learning Styles, Visual, Aural, Read/Write, kinesthetic, Unimodal, Bimodal, Trimodal, Multimodal.

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INTRODUCTION:

Learning processes varies from person to person due to differences in cognitive processing. [1] The trend in medical teaching in Pakistan is to tutor all students in the same manner. Educators prefer traditional lecture format over others considering the need to cover the content, the relative ease of information passing, a long history of didactic lecturing and possibly due to their own preferences in learning. Adult learning is more self-directed than a dependent form of teaching-learning. To encourage student's active involvement in their own education, tools can be provided to help them become better learners. One tool that can be used to encourage active participation is a learning style inventory. [2] There is a strong relationship between the learning style preferences and achievements. Because understanding students learning styles help teachers to facilitate students effectively. More over students themselves can use this knowledge to change their learning habits and ultimately results. Students' learning styles have received increasing attention in higher education. Matching students' learning styles with a learning framework has resulted in improved test scores, whereas a mismatch between learning styles and curriculum has led to low levels of academic achievement. [3]

Every student has different learning styles and that is the reason why classrooms are a diverse group of students in aspect of acquiring knowledge. While acquiring a huge amount of knowledge in medical colleges, MBBS students in Pakistan experience a different learning environment than non-medical students. Studies have shown that each student typically adapts his, or her learning preferences to their learning environment. [4] Styles of learning are as important as intellectual ability and ignoring it will put learning to jeopardy. Learning in MBBS in Pakistan is more self-directed than a dependent form of teaching-learning. If medical students in Pakistan will be aware of their preferences of learning styles, and if the method of information delivery to them conforms to their learning style, they will learn better.

The lack of a comprehensive definition for learning and methods to quantify it has meant that it is difficult to demonstrate the effects of an improved teaching method or methods that is claimed to better student learning. [4] The students were explained the purpose of this study, and informed consent in writing was obtained before the VARK questionnaire could be administered. Along with the questionnaire, demographic data were also collected.

Literature review

A literature reviewed identified different theories of learning styles i.e. visual, aural, Kolb's learning inventory and various other models were developed to explain different learning styles. [5] One of the study carried by Mary Johnson in (2009) was reviewed and found that they have differences in multimodal learning style visual learning and kinesthetic learning. Awareness of student learning style could provide a basis to optimize teaching method. Learning style diversity can enable more students to achieve success. In another study carried by Narasimha Othman, Mohd Hasril Amiruddin (2010) it is found that VARK learning style doesn't involve intelligence or inherent skills but is closely related to how we acquire or understand information or new knowledge. It can be used for acquiring knowledge, positive skills and attitude.

Another literature reviewed in which study was carried by Urval RP, Kamalh a Ullah, Shenoy AK, Shenoy N. Udupa LA in (2014) in which they found that most of the students were multimodal learners Aural and Kinesthetic were preferred sensory modalities of learning. Neither gender nor any previous academic performance had any relation to learning style preference. One of the study carried in (2015) by Turkey Amigbal on medical students in which he demonstrated that large portion of medical students preferred to learn using all VARK modalities.¹⁴ The second highest group was the students who preferred to use Aural modality. The students learning styles were also associated with different teaching curriculum.

Every student has different learning styles and that is the reason why classrooms are a diverse group of students in aspect of acquiring knowledge. While acquiring a huge amount of knowledge in medical colleges, MBBS students in Pakistan experience a different learning environment than non-medical students. Studies have shown that each student typically adapts his, or her learning preferences to their learning environment. [6] Styles of learning are as important as intellectual ability and ignoring it will put learning to jeopardy.

Learning in MBBS in Pakistan is more self-directed than a dependent form of teaching-learning. If medical students in Pakistan will be aware of their preferences of learning styles, and if the method of information delivery to them conforms to their learning style, they will learn better.

OBJECTIVES:

➤ To know the class wise opinion of students regarding preferences of learning styles.

METHODOLOGY:

Study Design: Cross-Sectional Study

Study Setting: Khawaja Muhammad Safdar Medical College, Sialkot, Punjab, Pakistan.

Study Population: All students of Khawaja Muhammad Safdar Medical College, Sialkot, Punjab, Pakistan

Study Duration: The whole study was completed in two months of April and May.

Sample Size: 320

Sampling Technique: Stratified Random Sampling

Inclusion Criteria: Medical students who were willing to participate.

Exclusion Criteria: Medical students who were not willing to participate.

Data Collection Tool: Data was collected internationally recognized Visual, Aural, Read/Write and Kinesthetic (VARK) questionnaire 7.8 version by Flemming.

DATA COLLECTION PROCEDURE:

A hard copy of the VARK questionnaire, which was downloaded from VARK's official website, was distributed to medical students in their first, second, third, fourth, fifth year during regular classes. There were 500 medical students in total in these years. 320 questionnaires were distributed to all medical students who were available at the time of study. Students were informed that the VARK questionnaire was designed to measure the learning style preferences of students, participation was voluntary and the study findings would only be used for research purposes.

Data Analysis: Data was entered, cleaned and analyzed on SPSS Version 23.

Ethical Consideration: Informed consent from students was taken. They were told about the purpose of study in simple and understandable language. Full confidentiality of respondents and data was ensured.

Analysis

The VARK questionnaire (version 7.8) in a printed format was provided to students.⁶ It consists of 16 questions with 4 choices, each of which corresponds to a sensory modality preference. Students were free to select one or more than one option, thus varying

combinations of multiple sensory modalities could be obtained. The preferred sensory modality was the one that received the highest marks. The questions describe circumstances of everyday occurrence; thereby connecting to a person's learning experience. Students were instructed to encircle the letter next to the option that best explained their preference. They could opt for more than one choice or leave vacant any question if they perceived it as being not applicable to them. Questionnaires were assessed based on previously validated scoring instructions and a chart [7] as each of the options exemplifies a sensory modality preference; the same was calculated for every individual by summing up the responses for all 16 questions. The entire exercise was completed in less than 30 min, after which the students returned the questionnaire with demographic data.

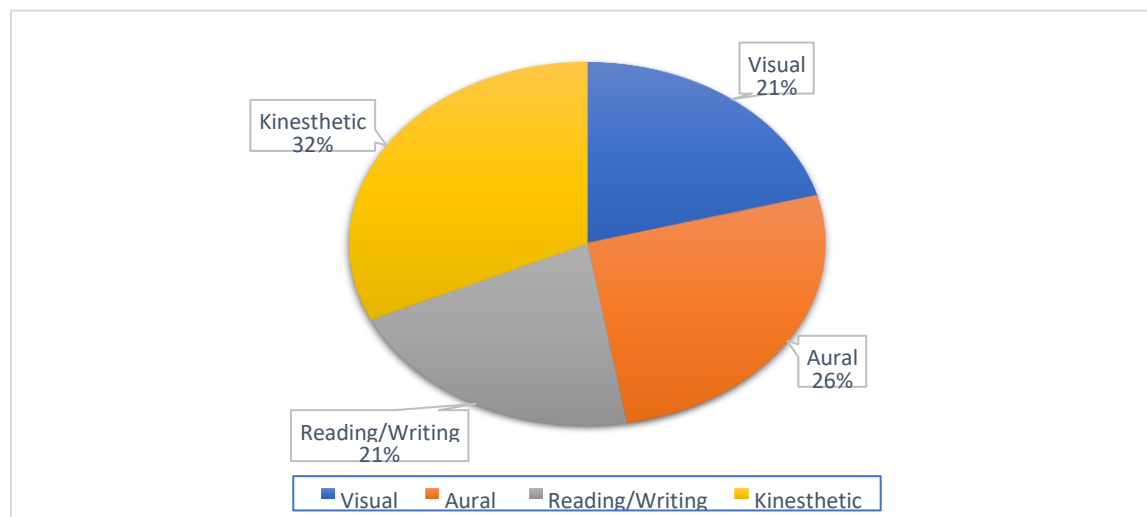
Data from VARK Questionnaire responses were decoded into visual, aural, read/write and kinesthetic using the VARK Questionnaire methodology provided in VARK Questionnaire version 7.8 by Neil Flemming. Data was analyzed using the IBM SPSS Statistics for Windows, (Version 23) (IBM Corp, Armonk, NY, USA). [8] The distribution of VARK preferences was calculated by Neil Flemming, the VARK designer. [9] The number of students who preferred each mode of learning style was divided by the total number to calculate the percentage of students in each category.

RESULTS:

Questionnaires were distributed to 320 MBBS students of Khawaja Muhammad Safdar Medical College Sialkot Punjab Pakistan and 320 students responded. The responses obtained were decoded to VARK, and VARK score was calculated. Following are the results obtained in the form of Pie diagrams, Histograms and Tables of the data obtained through these questionnaires which were distributed among medical students and then analyzed by the SPSS version 23.

Figure 1 A:

This Pie diagrams describes the preferences of the students for their learning modalities. The highest learning preference for the medical students of Khawaja Muhammad Safdar Medical college, Sialkot, Punjab, Pakistan is for Kinesthetic modality being the 32%. They learn more by practical way. The second most preferred modality is through Aural way (i.e. auditory methods) having the percentage of 26%. While the remaining two sensory modalities Reading/Writing and Visual have equal preferences comprising percentages of 21% each.

**Figure 1 B:**

The total number of questionnaires provided to the students were 320 and each questionnaire have 16 questions. The data obtained from all those questions is analyzed and expressed on Histogram with class wise preference for the Visual, Aural, Reading/Writing, Kinesthetic respectively. These are the responses of questions in favor of respective learning modalities. The preference of first year class of medical Students of Khawaja Muhammad Safdar medical College Sialkot, Punjab, Pakistan are as out all responses 247 (22.47%) were in favor of Visual Learning. 276 (25.11%), 225 (20.47%) and 351 (31.93%) were in favor of Aural (i.e. Auditory methods), Reading/Writing, And Kinesthetic respectively. For Second year results were 205 (19.12%), 294 (27.42%), 227 (21.17%) and 346 (32.27%) for Visual, Aural, Reading/Writing and Kinesthetic respectively. For third year results were 213 (19.83%), 292 (27.18%), 228 (21.22%) and 341 (31.83%) respectively. Fourth year results were 225 (19.84%), 324 (28.57%), 221 (19.48%) and 364 (32.09%) respectively. Fifth year results were 234 (22.65%), 252 (24.39%), 224 (21.68%) and 323 (31.26%) respectively.

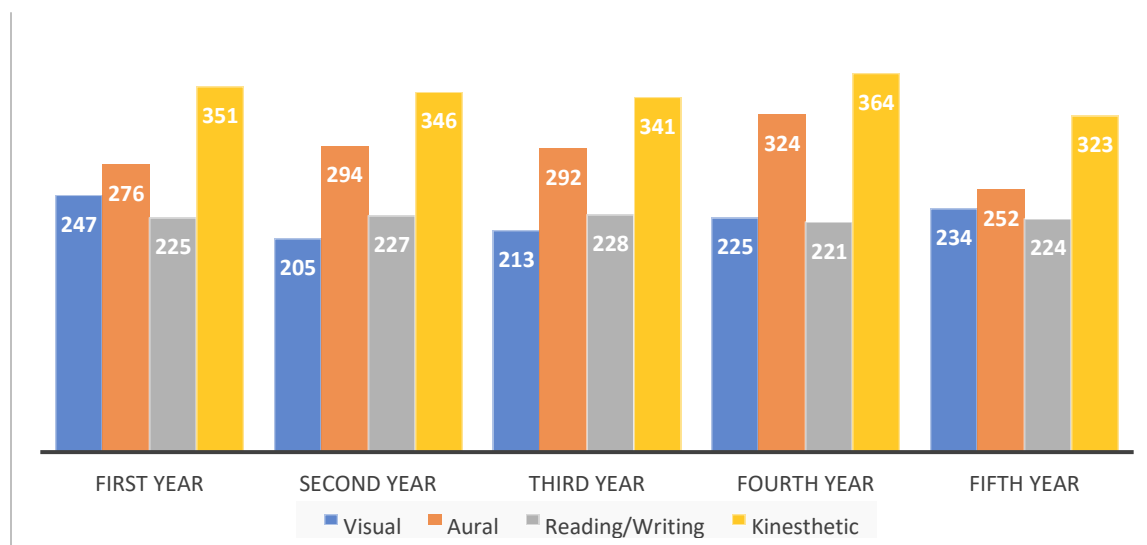


Figure 1 C:

Responses of all questionnaires were also tabulated and they depict the preferences for learning modalities as 1124 (21%), 1438 (26%), 1125 (21%) and 1725 (32%) for Visual, Aural, Reading/Writing and Kinesthetic respectively.

	Visual	Aural	Reading/Writing	Kinesthetic
1st Year	247	276	225	351
2nd Year	205	294	227	346
3rd Year	213	292	228	341
4th Year	225	324	221	364
5th Year	234	252	224	323
Total	1124 21%	1438 26%	1125 21%	1725 32%

Figure 1.1:

Based on responses of questionnaires preferences of learning modalities among the students of First Year Class of MBBS students of Khawaja Muhammad Safdar Medical College, Sialkot, Punjab, Pakistan were Kinesthetic 32% being the most preferred; Aural 25% at the second; Visual 23% and Reading/Writing 20% accordingly.

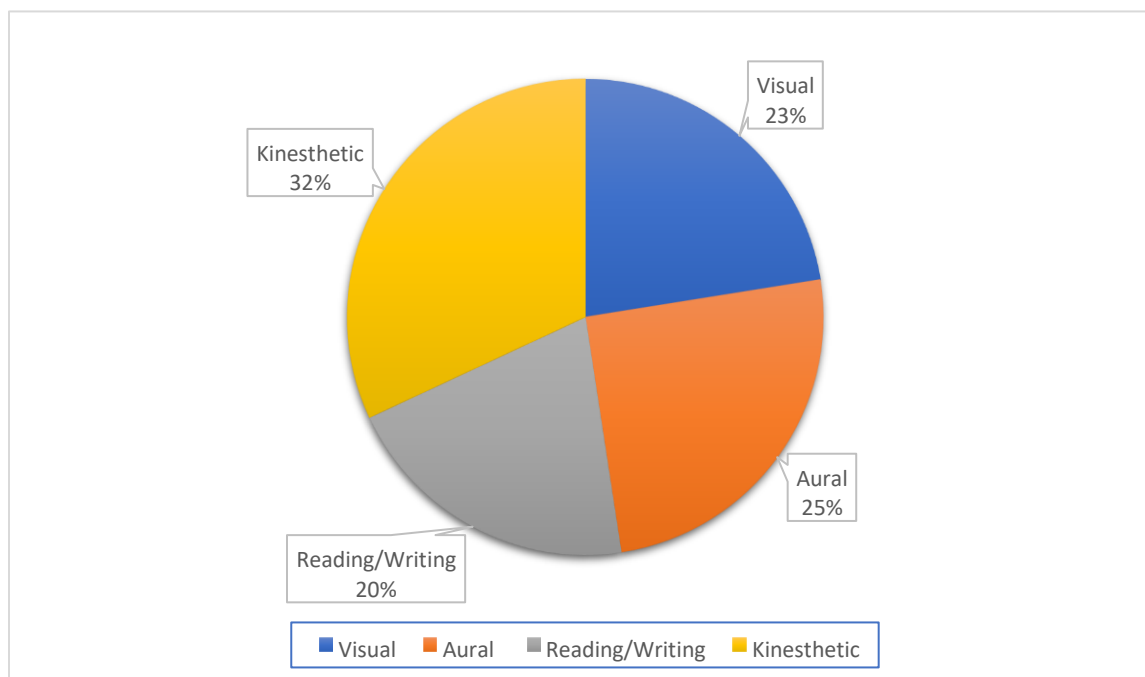


Figure 1.2: Responses of second year class were 32%, 28%, 21% and 19% for Kinesthetic, Aural, Reading/Writing and Visual modalities respectively.

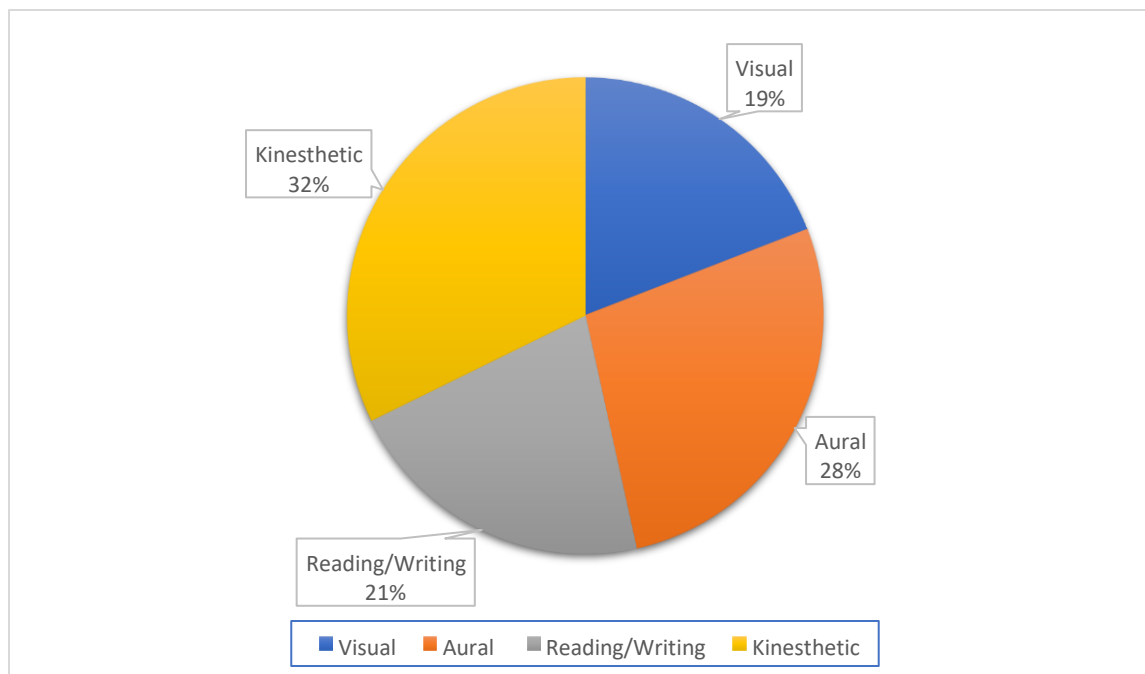


Figure 1.3: Third year results are 32%; 27%; 21% and 20% for Kinesthetic, Aural, reading/Writing and Visual modalities respectively.

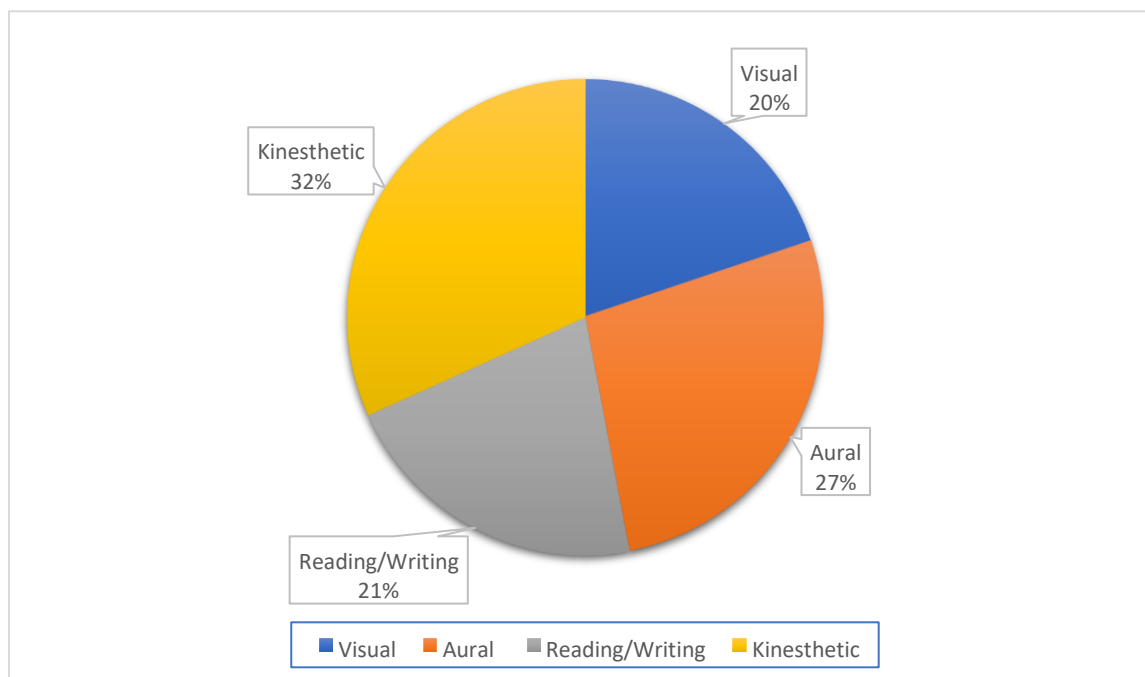


Figure 1.4: Fourth year results were 32%; 29%; 20% and 19% for kinesthetic, Aural, Visual and Reading/Writing modalities respectively.

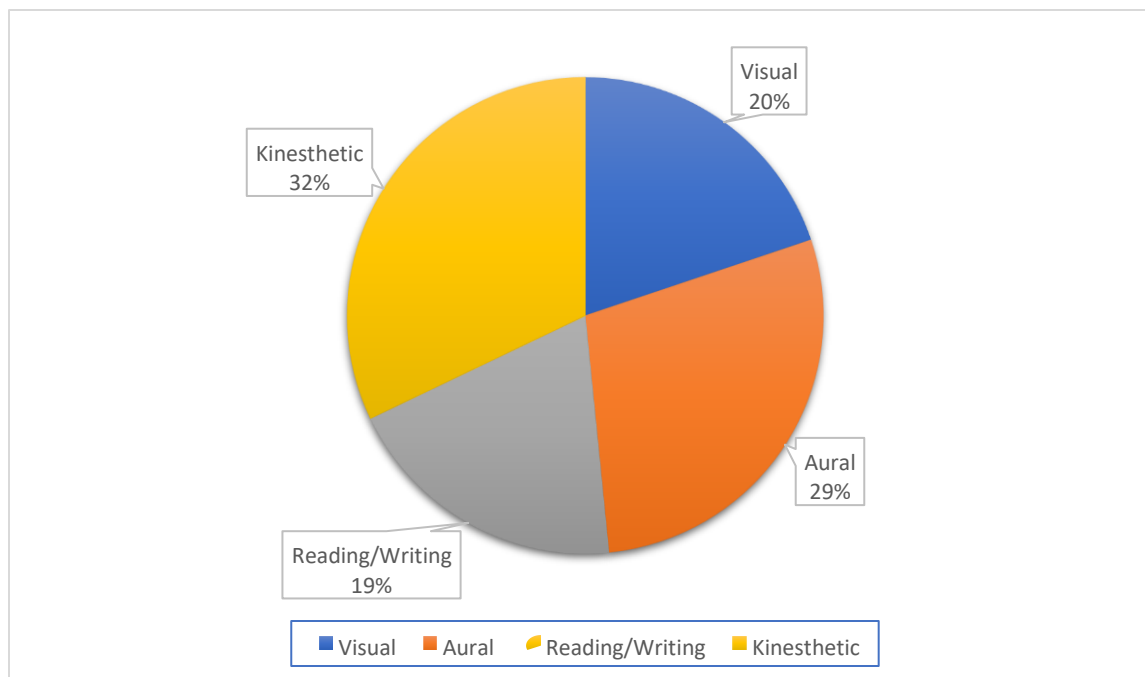


Figure 1.5:

Fifth year results were 31%; 24%; 23% and 22% for Kinesthetic, Aural, Visual and Reading/Writing modalities respectively.

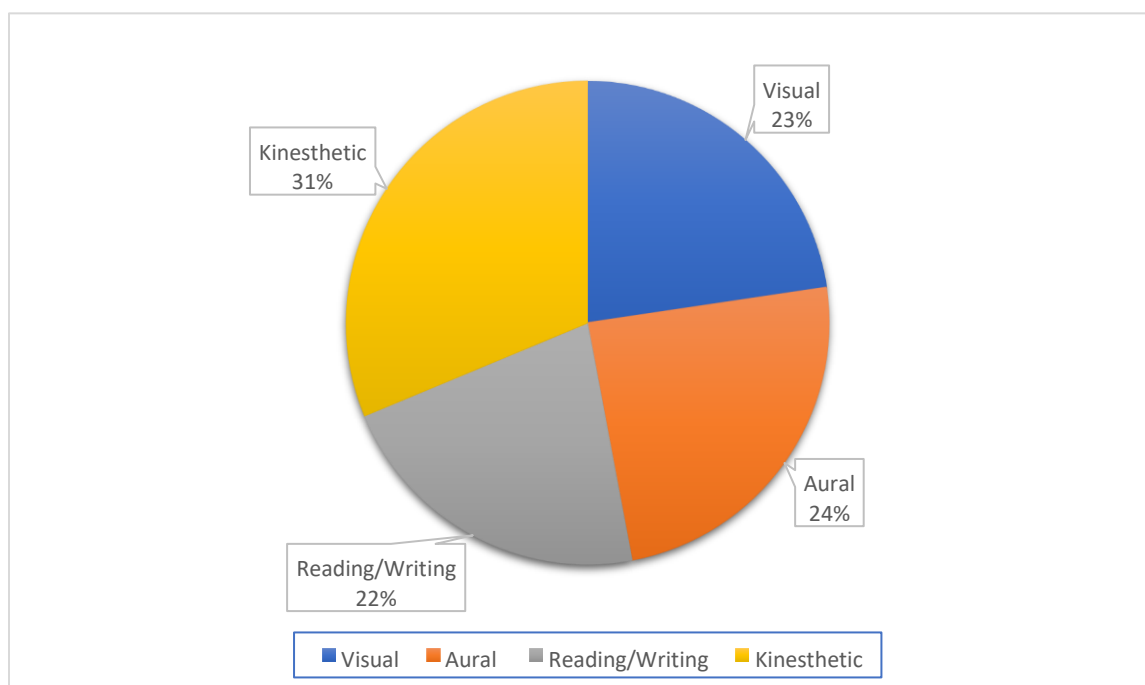
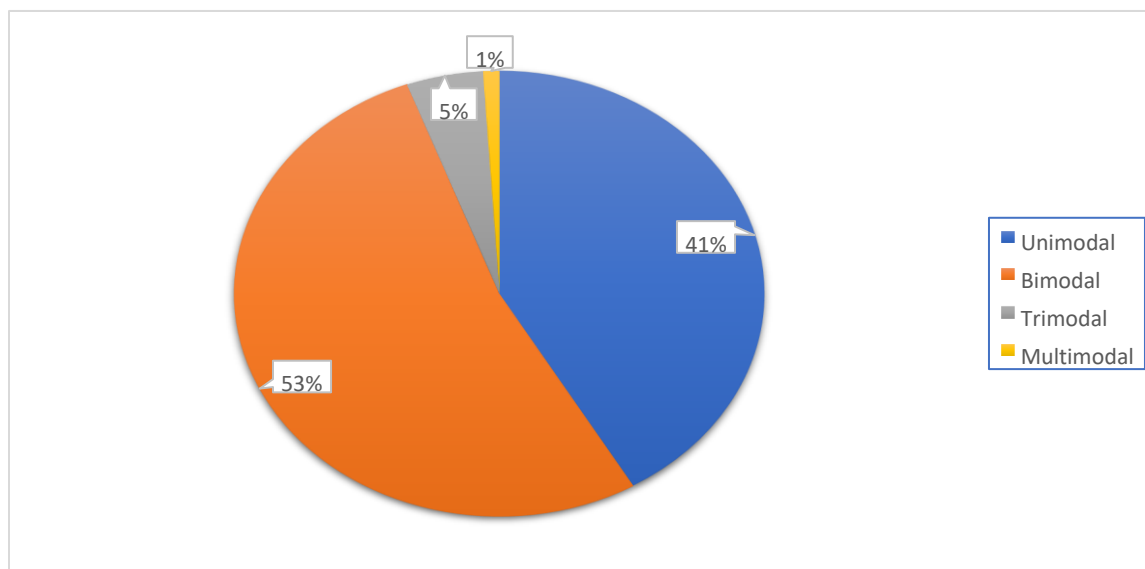


Figure 2 A:

Some learners prefer to learn through one learning style (Unimodal); others prefer to learn through a combination of two learning styles (Bimodal); or with a combination of three learning styles (trimodal). Multimodal learners don't have a dominant preference for any single learning style, instead they use all four learning styles.¹⁰ A multitude of elements, such as psychological, social, physical, and environmental aspects affect learning.¹¹ The VARK questionnaire was not intended for complete assessment of learning style. It only points to preferred learning modality (modalities). Out of 320 medical students 53% have Bimodal learning modalities; 41% have preferred Unimodal learning modalities while trimodal 5% and Multimodal 1% preferences.

**Figure 2 B:**

Histogram of data obtained from responses questionnaires explains the preferences all five years of MBBS students separately. Among 64 students of First year 33 (51.56%) have unimodal preference; 29 (45.31%) Bimodal; 1 (1.56%) for trimodal and Multi modal each. Second year 64 have these respective preferences Unimodal 27 (42.18%); Bimodal 33 (51.56%); trimodal 4 (6.25%) and not even a single student preferred to through Multimodal learning modality among second year students. 64 students of third year students respond the following way Unimodal 27 (42.18%); Bimodal 34 (53.12%); Trimodal 3 (4.68%) and no one preferred to learn through Multimodal modality. Forth year student's results were Unimodal 27 (42.18%); Bimodal 34 (53.12%); trimodal 3 (4.68%) and no preferred to learn using multimodal modality. Third year and Fourth year have same learning preferences for modalities. Fifth year results are Unimodal 19 (29.68%); bimodal 39 (60.63%); trimodal 4 (6.25%) and Multimodal 2 (3.12%). Most preferred one is Bimodal and second one is Unimodal among all students.

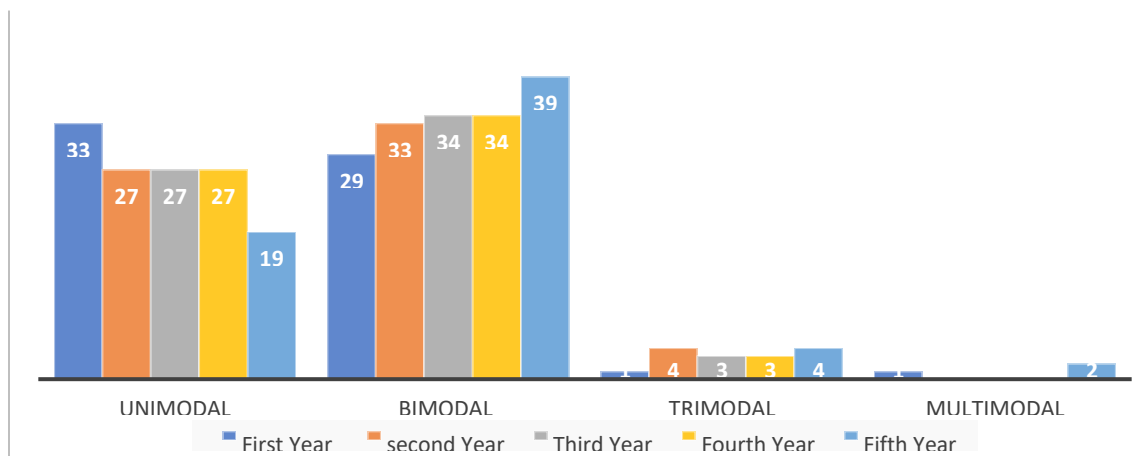


Figure 2 C:

Tabulated data of response generated from questionnaires suggest that out of 320 students 133 (41.56%) preferred to learn using Unimodal modality; 169 (52.81%) preferred to learn through Bimodal modality while 15 students preferred trimodal modality and 3(0.93%) students out of 320 preferred multimodal modalities.

	Unimodal	Bimodal	Trimodal	Multimodal
1st Year	33	29	1	1
2nd Year	27	33	4	0
3rd Year	27	34	3	0
4th Year	27	34	3	0
5th Year	19	39	4	2
Total	133 41.56%	169 52.81%	15 4.68%	3 0.93%

Figure 2.1:

First year students have learning preferences as follows Unimodal 51%; bimodal 45%; Trimodal 2% and multimodal 2%.

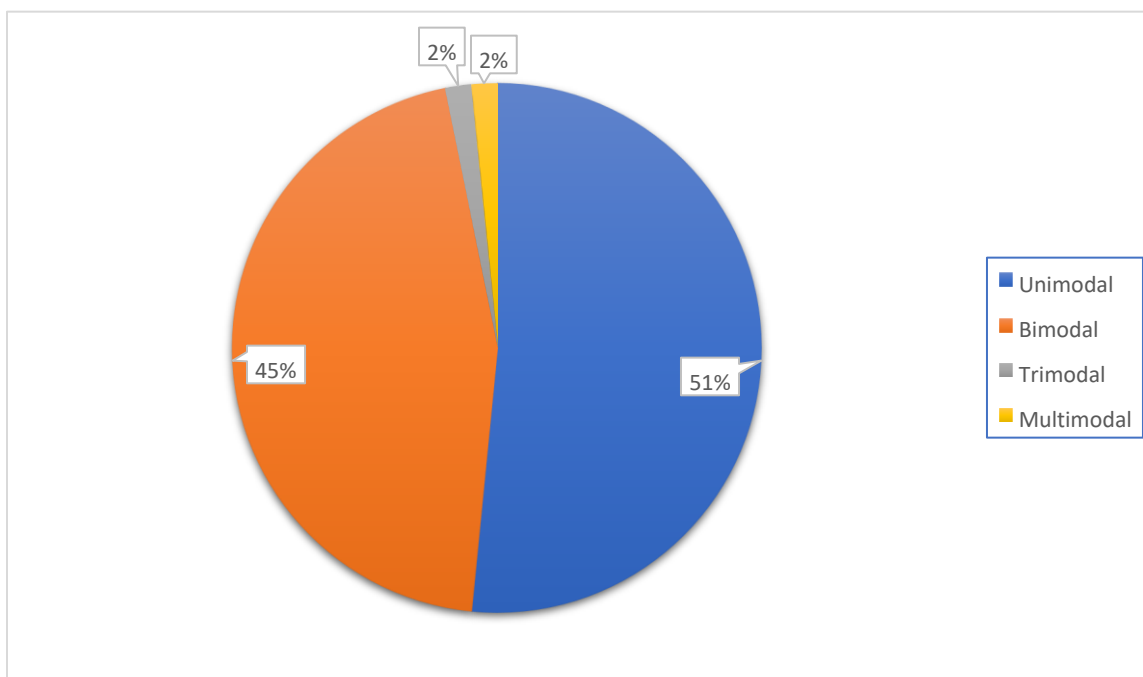
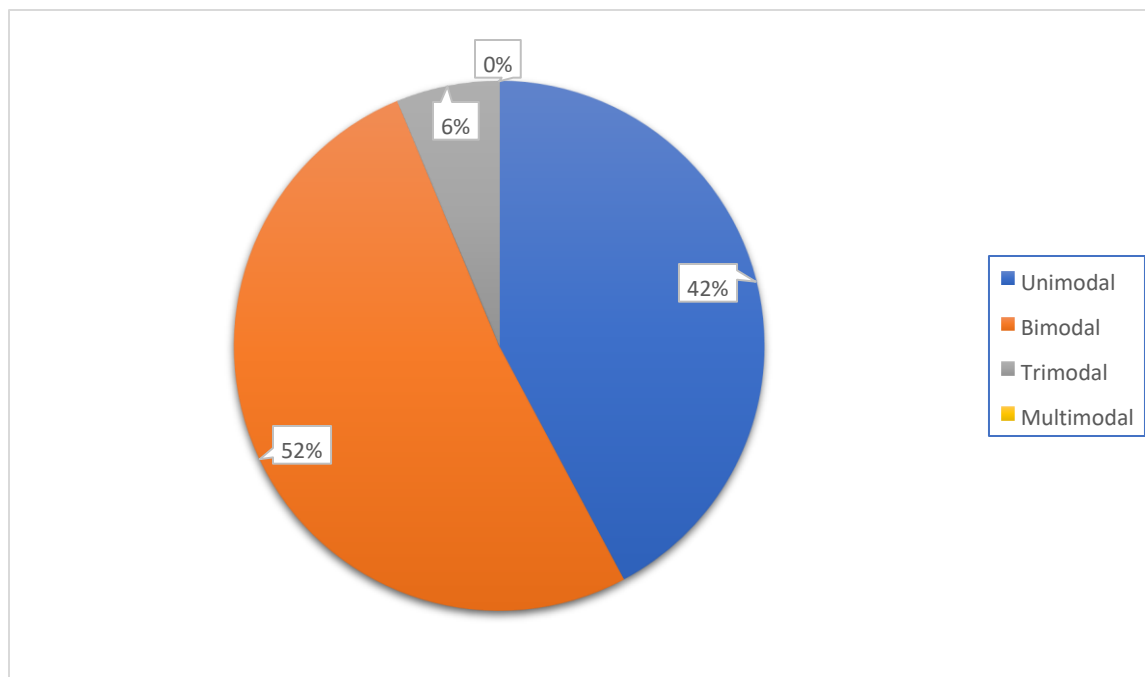


Figure 2.1:

Second year student's preferences were Unimodal 42%; Bimodal 52%; Trimodal 6% and Multimodal 0%.

**Figure 2.3:**

Third year have almost same results as second year. Unimodal 53%; Bimodal 42%; Trimodal 5% and Multimodal 0%.

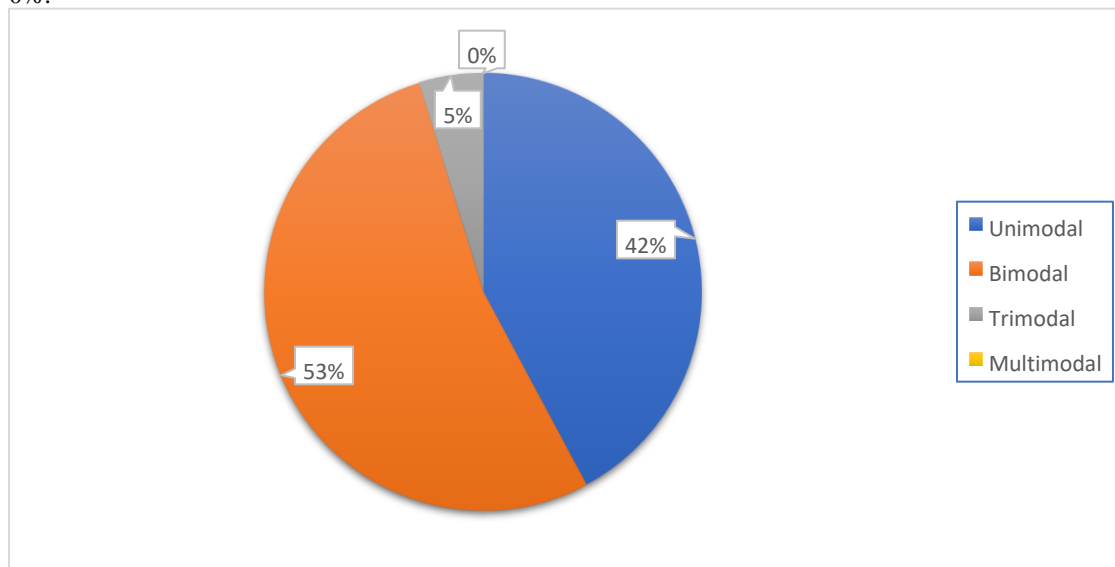


Figure 2.4:

Fourth year have exact same results as third year. Unimodal 53%; Bimodal 42%; Trimodal 5% and multimodal 0%.

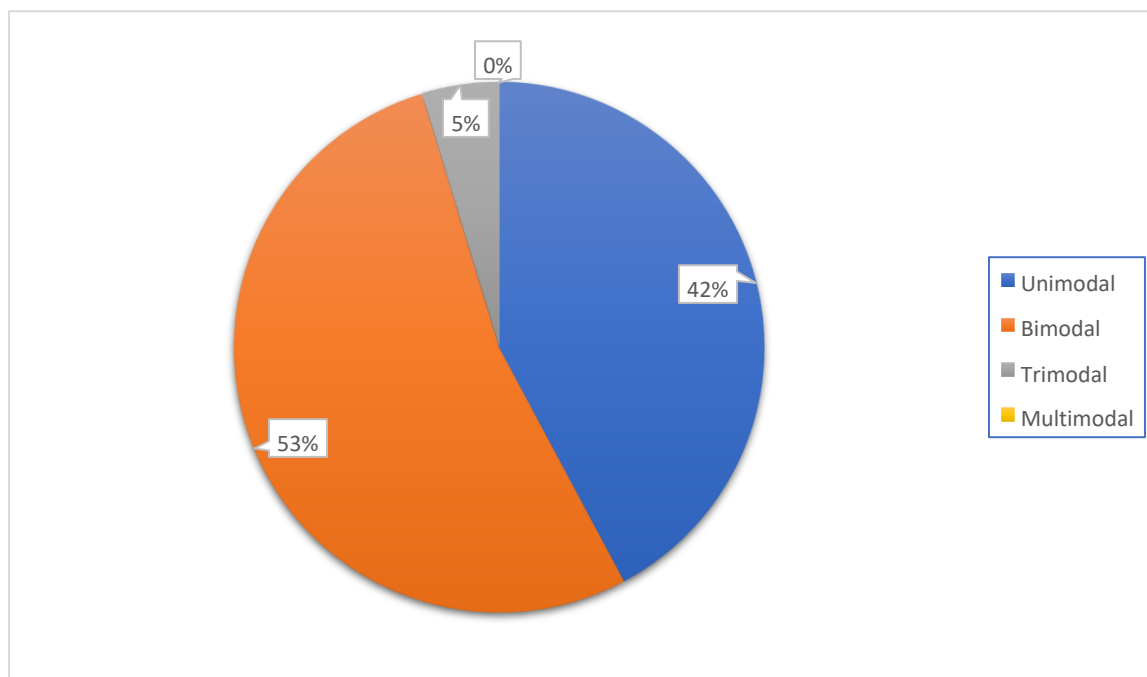
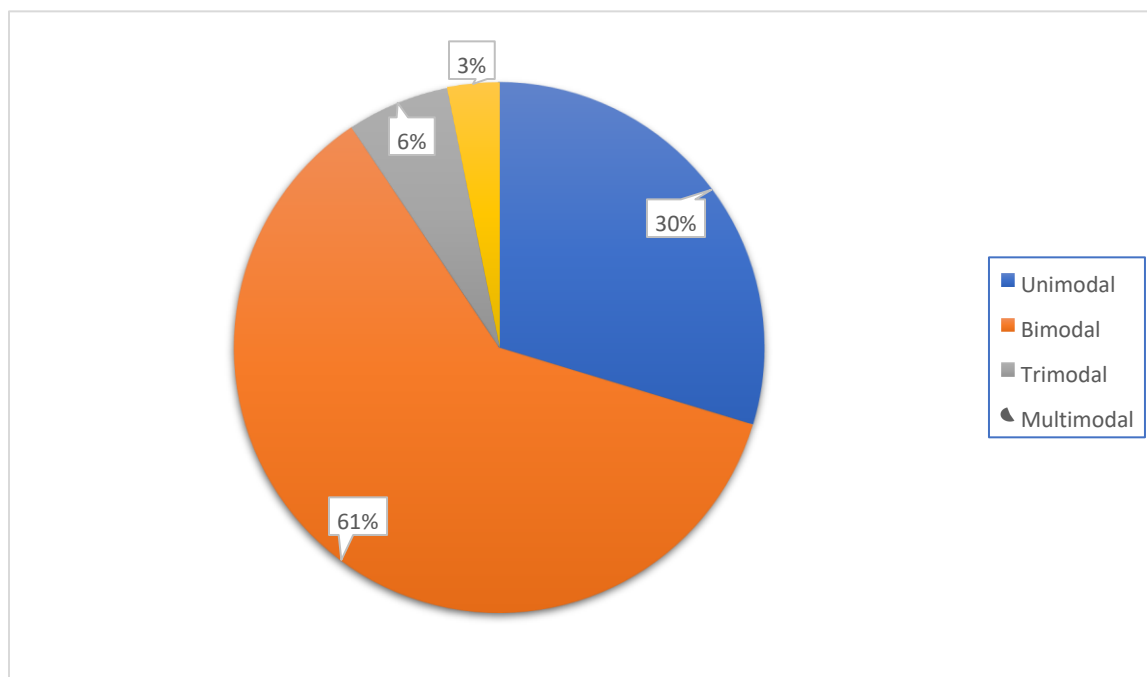


Figure 2.5: Fifth year students have the following results. Unimodal 30%; Bimodal 61%; trimodal 6% and multimodal 3%.



DISCUSSION:

Students' learning style preference is one of the most important factor for academic and career success. Self-learning also will become more effective if medical students are aware of their learning styles and enhances their ability to become a lifelong learner. [12] An important quality of a successful doctor is his/her ability to be a lifelong learner. Thus, for both academic achievement and career, medical students should be lifelong learners. Identifying learning styles leads to most effective teaching-learning methods. Self-learning also will become more effective if learning style is identified. Knowing the learning style of our students will enable the facilitators for a better curriculum planning. We are not aware, whether there is a difference in the learning style of students across different regions and countries. As this gap in our knowledge exists, this study was planned. [13]

This study investigated the Preferences of learning styles among the MBBS students at Khawaja Muhammad Safdar Medical College Sialkot Punjab Pakistan. This study was undertaken after obtaining the assent of the Ethics Committee of Community Medicine department of Khawaja Muhammad Safdar Medical College Sialkot Punjab Pakistan and from Ethics Committee of the Institution by explaining them that those students will be involved who will give consent and on voluntary basis. Both genders will be included and strict confidentiality will be maintained. Three hundred and twenty undergraduate students undergoing MBBS at Khawaja Muhammad Safdar Medical College were invited to participate in the exercise.

Students were not given any incentive for participation. Sampling technique used is stratified random sampling. All five professional years of MBBS in Khawaja Muhammad Safdar Medical College are included. 320 questionnaires are distributed in all five professional years. 64 questionnaires to each year.

The VARK questionnaire version 7.8 by Neil Flemming provides greater understanding about information processing preferences including a learner's ability to simultaneously use more than one learning style. The visual, aural, read/write, and kinesthetic (VARK) questionnaire is a freely available, simple tool, which is easy to administer and encourages students to characterize their learning behavior in a way they can relate with and accept. [14]

CONCLUSION:

Based on results, we obtained we found that Among the students of Khawaja Muhammad Safdar Medical College Sialkot, Punjab, Pakistan the most preferred learning modality is Kinesthetic, Aural i.e. Auditory being the second one and Visual; Reading/Writing are equally preferred. Second year, third year And Fourth year have resemblance in their preference of Modalities of VARK while First and fifth year have slight differences in their preference of learning modalities. If we look at the data that which modes are preferred among these medical students that it is found that have huge preference for Bimodal learning modality and Unimodal being the second one. They have less preference for trimodal and multimodal modalities respectively.

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