Learning Styles Preferences of Pre-Clinical Medical Students in Basic Medical Science Subjects

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Abstract

Pre- clinical year medical students are exposed to diverse methods of teaching and learning. Different students employ different learning styles during their medical education. Therefore, understanding students' learning style preference is an important attention for a high quality and effective teaching and learning process. The aim of the study was to assess the variation of learning styles among pre-clinical year medical students in National Defence University of Malaysia (NDUM), Malaysia. A cross sectional study was performed by using self-administered questionnaires including VARK (Visual, Audio, Reading and Kinesthetic) to assess the learning style preference. The participants of 90 (n=90) pre-clinical students were included in this study. Descriptive statistics was used to identify the learning styles of the students. More than half of the students preferred multimodal as their learning style. In addition, the female students had more diverse preferences than male students. In our study, majority of students had chosen multimodal as their learning style preferences. The results of this study can provide certain extents of information to improve the teaching and learning methodology. We need further study including other medical schools to combine the data of their learning styles to enhance the quality of medical education and learning experiences of pre-medical students in basic medical science subjects.

Keywords: learning styles, pre-clinical medical students, basic medical sciences subjects

Background

Medical education has changed significantly since the last two decades. Medical students are expected to gain, retain and apply the knowledge and skills in a limited time during their training in medical school. The students to learn effectively, progress have been made to improve teaching methods from traditional didactic lectures towards more student-centered learning including problem-based learning, team-based learning and active learning. There are different basic biomedical subjects within a medical course. The recent study revealed the first year medical students improve their performance in their subjects by adopting new sensing learning techniques. Instructors can also benefit by modifying and adapting more appropriate teaching approaches in medical science subjects [1]. The first year subjects are included for them to study such as anatomy, physiology, biochemistry, affective domain training1 and medical professionalism [2-4]. Second year subjects are Microbiology and Immunology, Pathology and Pharmacology in their curriculum for medical training in most medical schools. Pre-clinical year medical students are exposed to diverse methods of teaching and learning. Most of the students commence their medical training with different educational and scholastic backgrounds and take along with them a various range of learning experiences that affect their success in medical education [5,6]. Now a day, more than 70 learning styles models have been documented [7]. Therefore, understanding students' learning style preference is an important attention for a high quality and effective teaching and learning process. The aim of the study was to assess the variation of learning styles among pre-clinical year medical students in National Defence University of Malaysia (NDUM), Malaysia.

Research Methodology

The participants of 90 (n=90), Male (n=29) and Female (n= 61) were randomly chosen for the study. The pre-clinical year medical students of Year 1 and Year 2 (2018-2019 batch, September Intake) from National Defence University of Malaysia were included in our study. A cross sectional study was carried out to assess the learning preferences among the medical students in different sessions without interrupting their on-going lectures. Explanation was provided to assist the participants in completing the

questionnaire during the session. The students were asked to provide informed consent prior to the administration of the questionnaire. A set of self- administered questionnaires was distributed to the participants. The questionnaire consisted of question with multiple options using modified VARK learning preferences[8]. All the statistical analyses were conducted using SPSS version 22 (IBM, Armonk, NY, USA)[9]

Results

Table 1: Percentage distribution of unimodal and multimodal learning preferences between male and female

	General learning preferences of male and female students			
		Unimodal	Multimodal	Total
Gender	Male	13	16	29
	%	44.8	55.1	
	Female	20	41	61
	%	32.7	67.2	
	Total	33	57	90

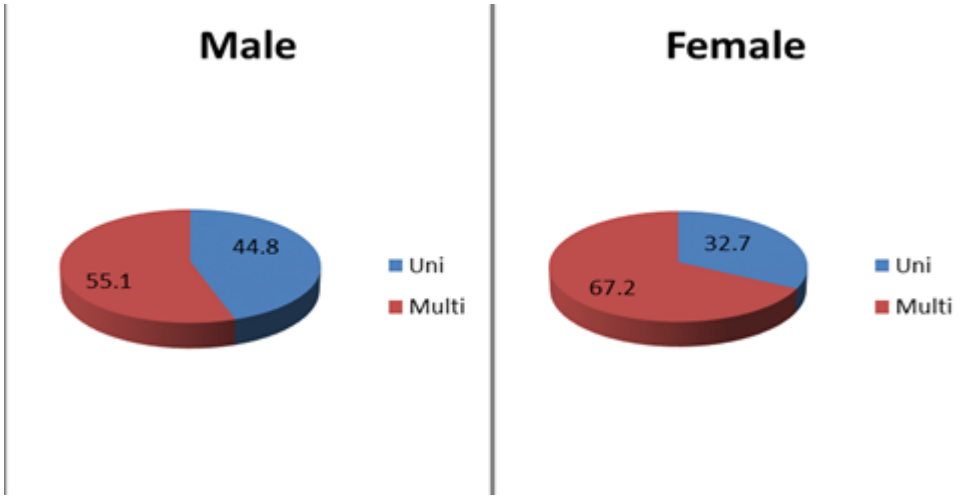

Fig 1. Pie chart showing the percentages of male and female students who preferred unimodal and multimodal learning styles

Figure 1 shows 44.4% of male and 32.7% of female students preferred using a single sensory modality for information intake and are described as unimodal. 55.1% of male and 67.2% of female students preferred information to reach them via multiple sensory modalities (multimodal).

Table 2: Percentage distribution of learning preferences (unimodal, bimodal, trimodal and quadrimodal) between male and female

		General unimodal and multimodal learning preferences of male and female students				
		Unimodal	Bimodal	Trimodal	Quadrimodal	Total
Gender	Male	13	1	3	12	29
	%	44.8	3.4	10.3	41.3	
	Female	20	5	9	27	61
	%	32.7	8.19	14.75	44.26	
	Total	33	6	12	39	90

Fig 2. Pie chart showing the percentages of male and female students who preferred unimodal, bimodal, trimodal and quadmodal learning styles

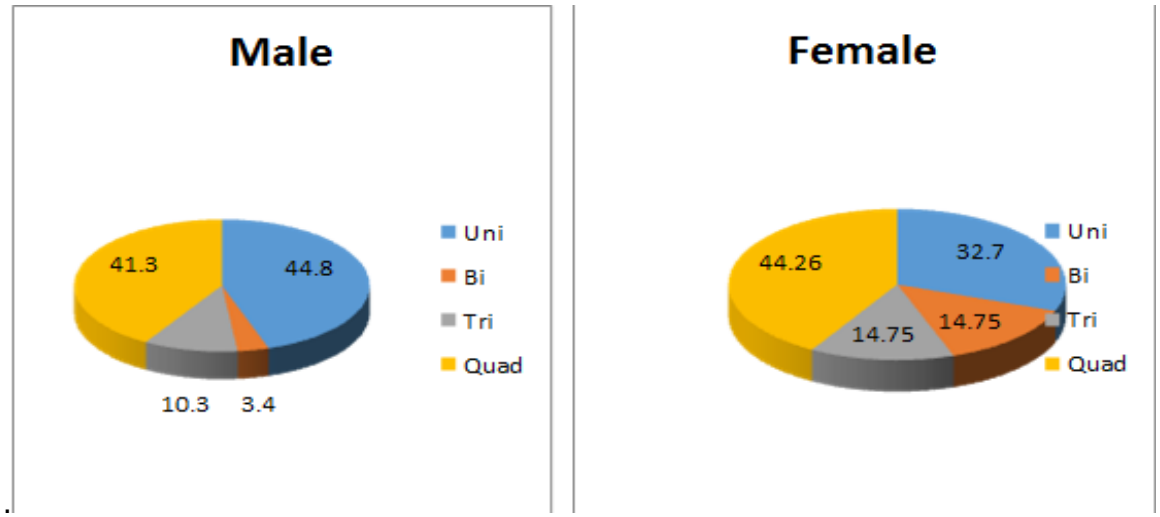

Figure 2 and table2 shows the 44.8, 3.4 ,10.3and 41.3 percentages of male and.32.7,14.75,14.75 and 44.26 the percentages of female for unimodal, bimodal, trimodal, and quadmodal preferred learning style respectively.

Table 3: Percentage distribution of learning preferences between male and female and specific unimodal and multimodal learning preferences (V, A, R, K, VA, VR, VK, AR, AK, RK, VAR, VAK, VRK, ARK and VARK).

	Specific unimodal and multimodal learning preferences of male and female students																
		V	A	R	K	VA	VR	VK	AR	AK	RK	VAR	VAK	VRK	ARK	VARK	Total
Gender	Male	2	3	2	6	0	0	0	0	0	1	1	1	0	1	12	29
	%	6.8	10.3	6.8	20.6	0	0	0	0	0	3.44	3.44	3.4	0	3.4	41.3	
	Female	3	3	8	6	1	1	1	0	1	1	3	3	1	2	27	61
	%	4.9	4.9	13.1	9.8	1.6	1.6	1.6	0	1.6	1.6	4.9	4.9	1.6	3.27	44.2	
	Total	5	6	10	12	1	1		0	1	2	4	4	1	3	39	90

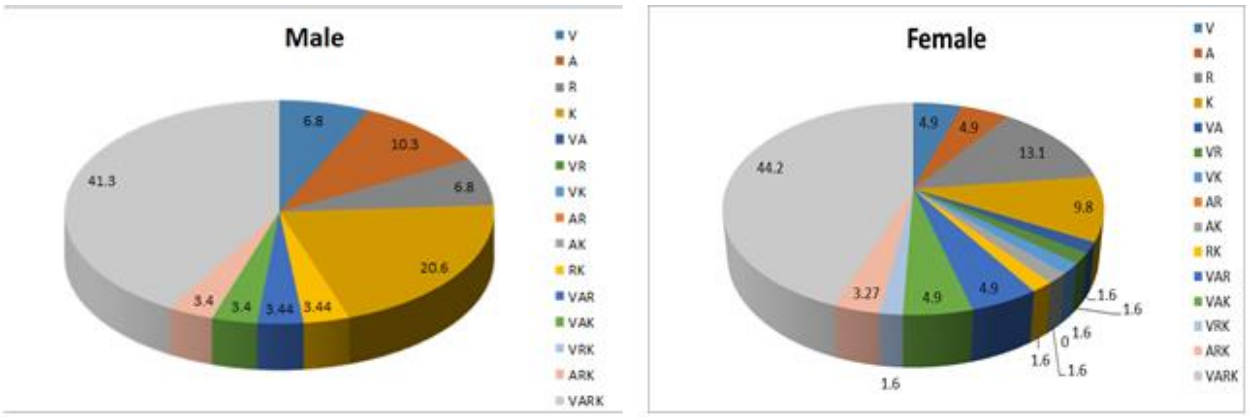

Fig 3. Pie chart showing the percentages of male and female students who preferred Unimodal and multimodal specifically.

[Legend: V: Visual VR: Visual & Read/Write VAR: Visual, Aural & Read/Write A: Aural VK: Visual & Kinaesthetic VAK: Visual, Aural & Kinaesthetic R: Read/Write AR: Aural & Read/Write VRK: Visual, Read/Write & Kinaesthetic K: Kinaesthetic AK: Aural & Kinaesthetic ARK: Aural, Read/Write & Kinaesthetic VA: Visual & Aural RK: Read/Write & Kinaesthetic VARK: Visual, Aural, Read/Write & Kinaesthetic]

Discussions

The study was aimed to assess learning style preferences among pre-clinical medical students. Identifying one's learning style is important as it allows the student to process and memorize the information easily and successfully. As a preclinical medical student, knowing his or her own learning style is definitely an advantage to him or herself.

In our study the majority of male students (55.1%) and female students (67.2%) preferred multimodal learning. The results of the majority preferring multimodal learning were not surprising because all physically unimpaired students are multimodal in nature. They tend to use all their senses to receive and process information that passed to them. There is a possibility that multimodal learners have the advantage compared to unimodal learners, which gives them a better chance for the admission into medical schools[10]. Although the majority of students from both genders preferred multimodal learning, some variations can be seen when further classification were made based on the possible combinations of sensory modalities. Those unimodal learners who were classified by the VARK algorithm showed a stronger preference for collecting information by a single sensory modality and the learners did not exclude any of the other sensory modalities. For example, a strong Visual (V) preference unimodal learner will still choose some of the options other than "V" in the questionnaire. For the female students, the most common possible combinations after the quadrimodal was the unimodal of Reading (R), while the male students tend to have Kinesthetic (K) as their second most common possible combinations after the quadrimodal. However, the majority in the unimodal section tend to choose "R" as the domineering learning style, other than "K". This finding did not match the study done locally in Manipal Medical College, where 35% of their clinical students preferred "K" as their learning style preference [11]. Since the results from our study shown that the majority are multimodal learners, there is a necessity to inform the medical educators, as one model of teaching will create a monotonous learning environment and everyone will not enjoy the process of learning [12]. Furthermore, student-centric classes should be encouraged to replace traditional teacher-centric classes for the benefit of the majority. All sensory modalities teaching can also allow all types of students to participate the learning session actively and meaningfully [13]. Others also supported the previous statement by stating that most of the successful learner learns in several ways [14-16]. Perhaps the learning process which involved more than one sensory modality showed that it is more efficient and quality assured than unimodal learning. Future studies can be done by using different questionnaires which are related to learning style, so that comparison can be made between this study and the others. As mentioned previously, we are curious as well about the statement that "successful learner learns in different ways to succeed", so studies regarding academic performance and learning style can also be done to validate

the statement stated above. The sample size of our study can be expanded as well to include the other medical students as well as clinical years in order to study their learning styles. Other than this, by having a larger sample size, errors that might have occurred during data collection and analysis can be reduced. It was also advisable to compare the learning style preferences of the students studying the same course across academic years to see if an indicator for the general direction to take can be identified.

Conclusion

The majority of students, both male and female, had chosen quadrimodal as their learning style preference. This study demonstrated the potential of using the VARK questionnaire for identifying learning style preferences to help the design of teaching format. It also suggested the usefulness of identifying the students' learning style preferences at the beginning of the medical course to help the lecturers to make adjustments in the teaching methods in order to facilitate the learning of the students. We need further study including other medical schools to combine the data of their learning styles to enhance the quality of medical education and learning experiences of pre-medical students in basic medical science subjects. Therefore, the lecturers would be able to comfortably design their course materials and teaching styles based on the finding of the study.

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