

Learning Style Preferences among Pre-clinical Medical Students in a Public University in Pahang

Nurjasmine Aida Jamani¹, Karimah Hanim AbdAziz², Hanis Syazana Che Ab Karim¹, Fatma Azzahraa Nizar³, Husna Najihah Dzulkarnain¹, Muhammad Irham Azimi¹

¹Department of Family Medicine, Kulliyah of Medicine, International Islamic University Malaysia Kuantan.

²Department of Community Medicine, Kulliyah of Medicine, International Islamic University Malaysia Kuantan.

ABSTRACT

Educational experts affirm that students prefer various type of learning preference. It is known that the learning style preferences vary among medical students worldwide. Knowing the types will help medical educators to improve their way of conveying lectures and teaching in a more effective learning environment. This study aims to describe the learning style preferences of pre-clinical medical students and the association with their socio-demography. This is a cross sectional study done among Year 1 and Year 2 pre-clinical year medical students in a public university in Kuantan Pahang. Medical students who fulfilled the inclusion and exclusion criteria were recruited using systematic random sampling. A validated learning style questionnaire (VARK) was used to assess their learning style. Descriptive statistics and bivariable analysis was used using SPSS version 23. A total of 166 pre-clinical year medical students participated in this study. The mean age was 21.3 (0.84). Majority of them were Malays (98.2%) and females (69.9%). Most of the students preferred unimodal learning style (80.0%) with the most preferred learning style preferences being kinaesthetic (39.1%). Bivariable analysis showed female students preferred kinesthetic learning style compared to male students ($p=0.03$). In this study, majority of the pre-clinical year medical students preferred 'life-like' learning experience in their study. Hence, we recommend that medical educators to be more aware of the varieties of learning style preferences in order to improve the quality of teaching and learning experiences.

KEYWORDS: learning style, Muslim students, pre-clinical, Islamic Institution

INTRODUCTION

Students show different types of learning style preferences. Medical students are not exception in this as it is important for them to have their own style of learning in order to excel in studies. Learning styles can be defined in various ways. Learning pattern is a complex of characteristic intellectual, affective and physiological aspects that serve as corresponding fixed indicators for a learner to identify, interact and react with the learning environment.¹ There are few types of learning styles which are visual, audio, reading and kinaesthetic.

One of the inventories to assess learning styles is the VARK Questionnaire. Fleming described that the VARK learning styles inventory measures four sensory modalities which are visual (V), aural (A), Reading-Writing (R) and Kinaesthetic (K). Briefly, a student who likes images prefers to learn visually whereas another 'aural' student uses listening techniques to learn. Some students use reading and writing as their main preference for assimilating and accommodating information. A kinaesthetic student experiences learning by all sensory channels, including

somatosensory, auditory, olfactory, gustative and visual.²

The re-evaluation of the educational process is necessary due to changes in healthcare delivery systems as well as the global burden of disease.³ There is excessive amount of course material and heavy workload in pre-clinical subjects of the medical curriculum that may lead to inappropriate learning techniques which may deter students' abilities to understand important principles.⁴ When there is a contrast in the learning styles of students and the teaching styles of lecturers, students are likely to become distressed, bored and inability to focus in class, get poor result, become confused about the courses, curriculum and themselves. And in some extreme cases they may change to other curricula or quit medical school.⁵

Therefore, educators must understand the differences in how their students learn in order to effectively prepare and produce qualified health professionals. Unfortunately, educators often oversee the effect of learning process and teaching as if differences of learning style between students do not exist.⁶ Consequently, students often feel dissatisfied with the learning process and face difficulties in understanding the relevance of their learning materials.⁴ This results in difference in the assessment from student to student. Therefore, acknowledging the differences in learning process among students can promote deeper learning and

Corresponding author:
Karimah Hanim Abd Aziz
Department of Community Medicine,
International Islamic University Malaysia
Jalan Sultan Ahmad Shah, 25200 Kuantan
Tel : 09-5704597
Email: karimahanim@iium.edu.my

improve the acquisition of knowledge,⁷ which is crucial for the understanding and practice of medicine.

The mission of the medical programs is to prepare and provide future qualified health professionals, who will have adequate knowledge and skills for future practice in their respective fields. To achieve these goals, it is important to identify characteristics of students that may impact the learning process, such as the learning styles of students. Thus, the aim of this study is to identify the learning style preferences of medical students in which can be beneficial to educators. Furthermore, medical teachers can develop their pedagogical strategies if they know the preferred modes of learning of their students.

METHODOLOGY

Ethical Consideration

Ethical approval was obtained from the Kulliyah of Medicine (KOM) and International Islamic University Malaysia (IIUM) Research Ethics Committee (IREC 630). A written consent was obtained from each student and all students were given all information prior to their participation. The names of the students were not recorded on the questionnaire, which rendered the data as anonymous.

Study design, population and sampling method

This was a cross sectional study conducted in a public university in Kuantan Pahang, Malaysia from 18th July 2016 till 27th August 2016. A total of 166 pre-clinical medical students were selected using systematic random sampling. The inclusion criteria were consented pre-clinical medical students in KOM, IIUM. Students who were in their clinical years of training and studying in other health sciences courses were excluded from this study.

Study tool

Self-administered questionnaire was used for data collection. The questionnaire consisted of two sections; Part A: Socio-demographic characteristic of the respondents and Part B: Learning assessment tool (VARK). The VARK questionnaire, as a learning preference assessment tool, consisted of 16 multiple choice questions, each having four choices. All choices correspond to the four sensory modalities which are measured by VARK (visual, aural/auditory, read/write, and kinesthetic). The students can select one or more choices, based on the sensory modalities which are preferred by them, to take in new information during the course. The researchers distributed the questionnaires to students in their classes and students entered their responses after a brief explanation. Upon completion these questionnaires were then collected.

VARK score were calculated and the preferences were obtained from the score. Those who had one preference was considered as unimodal learner (V or A or R or K), bimodal learners were those who

have two preferences (VA or VR or VK or AR or AK or RK), those with three preferences were trimodal and lastly the quad-modal learners were those who preferred all four components (VARK). Among the unimodal learners, the highest score among the VARK component was obtained and considered as their single preference.

Statistical Analysis

Data were reported as percentages of students in each category of learning style preference. The number of students who preferred each mode of learning style were divided by the total number of responses to determine the percentage. Data were entered and analysed using the IBM SPSS for Windows version 23.0. Descriptive and univariate statistics were used whenever appropriate.

RESULTS

Characteristics of the respondents

A total of 166 pre-clinical students participated in this study. Their mean (SD) age was 21.3(0.84). Majority of them were females (69.9%), Malays (98.8%) and Malaysian (98.2%). The socio-demographic characteristics of the students are summarized in Table 1.

Table 1 Socio-demographic characteristics of the respondents

Variable	n (%)
Age	21.3(0.84)*
Gender	
Female	116(69.9)
Nationality	
Malaysian	164(98.8)
Non-Malaysian	2(1.2)
Ethnicity	
Malay	163(98.2)
Others	3(1.8)
Marital status	
Single	164(98.8)
Married	2(1.2)

*mean(SD)

Distribution of learning modalities

Majority of students (80%) preferred unimodal of sensory modality of learning. The percentage of students who preferred bimodal, trimodal and quadmodal of sensory modalities of learning are shown in Figure 1.

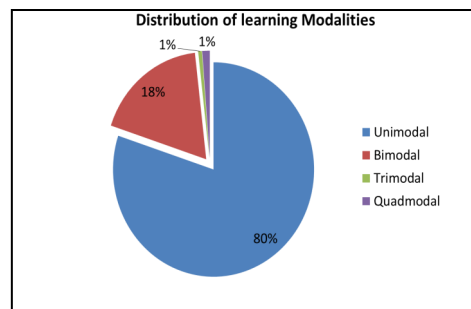


Figure 1 Distribution of learning modalities among pre-clinical year medical students.

Distribution of learning styles preferences among unimodal learners

The preferred sensory modality among the unimodal group are shown in Figure 2. Majority of the students preferred kinaesthetic (39.1%) followed by reading/writing (24.1%), aural (19.5%) and the least preferred was visual (17.3%).

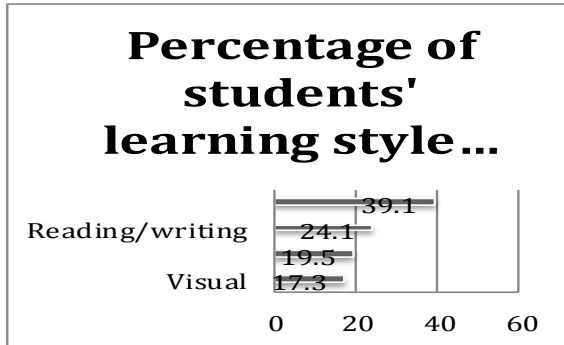


Figure 2 Distribution of learning styles preferences among unimodal learners

Distribution of Learning Styles Preferences among Bimodal Learners

The preferred combination of sensory learning modalities among the bimodal group is shown in Figure 3. Bimodal learners preferred six possible learning preference combinations, respectively, and the aural style was preferred for use in combination with other mode. Among these students in this group, the commonest VARK learning style based on the scores was kinaesthetic-aural learning (23.3%)

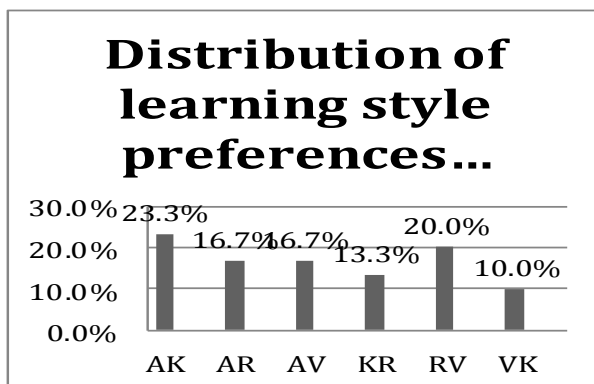


Figure 3 Distribution of learning styles preferences among bimodal learners

Association between gender and learning style preferences

Table 2 shows the association between gender and learning styles preferences regardless of learning modalities. Kinaesthetic is the most preferred learning styles among the male as well as the female with predominance of 54.0% and 36.2% respectively, followed by reading/writing, aural meanwhile visual is the least preferred one among both gender. A significant gender difference was

seen in terms of the kinaesthetic learning style in the unimodal group. ($p < 0.05$)

Table 2 Association between gender and learning styles preferences.

	Male, n (%)	Female, n (%)	p-value
Visual	9 (18.0)	29 (25.0)	0.325
Aural	15(30.0)	32 (27.6)	0.751
Read- ing/writing	17(34.0)	33 (28.4)	0.474
Kinaesthetic	27(54.0)	42 (36.2)	0.033

DISCUSSION

Based on our study, it was found that majority of IIUM pre-clinical medical students (80%) preferred unimodal learning style. This finding was similar to a study done by Liew S et al in 2015. This might be because of the Malaysia's educational system which is mostly instructive in nature that leads to students adapting one style of learning method only.⁸ However, other studies found that medical students from other institutions preferred multimodal learning style.^{9,10-11} This indicates that different regions and cohort of students might have different preferences in learning style.

Of the unimodal learners, they prefer kinaesthetic over other learning styles, followed by reading/writing, aural, and visual. Other authors from different geographical locations also reported similar results in which the students prefer kinaesthetic more than other types.^{8-9,12} This is probably contributed by the institutional differences in teaching methodology.¹³ In other universities, educators often use the straight lecture format because of the relative ease of delivering information, the need to cover the content and perhaps due to their own learning preferences.¹⁴ Meanwhile, IIUM, the styles of teaching for the pre-clinical student mainly involved lectures, but also incorporates the practical sessions such as laboratory experiments, problem-based learning (PBL) session, anatomy dissection class, and many case presentations instead of solely theoretical discussion to experience the clinical settings which could be more appealing to them, and these are probably the reason for their preferences towards the kinaesthetic learning styles. Furthermore, in IIUM, the Islamic Input for Medical Practice (IIMP) sessions allow students to freely present their task allowing more creativity and usage of multisensory media in enhancing learning. In a study conducted by Samarakoon et al. (2013), they found that the postgraduate students prefer kinaesthetic due to the primary emphasis on practical setting, reduced amount of lecture time and encouragement to develop self-learning skill, meanwhile the undergraduates prefer aural due to more exposure on didactic learning.¹³

The influence of gender on learning styles and modalities is an area of active research. Our study found that there is a significant association between gender and learning styles particularly kinaesthetic ($p < 0.05$), in which both males and females prefer this than other types, with stronger preference from males (54.0 %) as compared to females (36.2%). Johnson (2008) showed that men prefer kinaesthetic and tactual learning style as they gain more benefits by mobility in informal environment than females.¹⁵

The fact that each student is known to have their personal learning preferences is no longer a breakthrough finding. Nevertheless, utilization of this information to enhance the teaching process is not formally established yet. Hence, many studies conducted to understand the preferred sensory modality (or modalities) of students for learning before.^{8,16-17} Both the educators and students may gain benefits from this study in which the educators can use this knowledge to facilitate student's learning. Increasing awareness regarding their learning style preferences may promote more effective learning and improve their performance.¹⁸¹⁹ While there are several tools to study learning styles of students, the visual, aural, read/write, and kinaesthetic (VARK) questionnaire is a simple, freely available, easy to administer tool that encourages students to describe their behaviour in a manner they can identify with and accept.²⁰

LIMITATION

This study has certain limitations as it does not represent the study population of medical students in IIUM (the entire 5 years) as a whole since only pre-clinical students are studied. Non-respond biased also involved in this study.

CONCLUSION

In the present study, the preferred learning style is kinesthetic learning style. Hence, we recommend that medical educators to be more aware of the varieties of learning style preferences in order to improve the quality of teaching and learning experiences. We hope that these data will help us to make our course contents better and make learning a more interesting experience.

ACKNOWLEDGEMENT

The authors would like to acknowledge the Kulliyyah of Medicine for providing information and support for this study. We would also like to thank all of the participating students for their cooperation.

FUNDING DECLARATION

No funding

REFERENCES

1. Keefe JW . Learning style theory and practice. ERIC.1987.
2. Nuzhat A, Salem RO, Quadri, MS et al. Learning style preferences of medical students: a single-institute experience from Saudi Arabia. *Int J Med Educ* 2011;2:70-73
3. Armstrong E, Parsa-Parisi R. How can physicians' learning styles drive educational planning? *Academic Medicine*.2005; 80:680-684.
4. Eyal L, Cohen R Preparation for clinical practice: a survey of medical students' and graduates' perceptions of the effectiveness of their medical school curriculum. *Medical Teaching*. 2006; 28:162-70.
5. Felder R, Silverman L Learning and teaching styles in engineering education. *Engineering Education*. 1988; 78:674-681.
6. Paul S, Bojanczyk M, Lanphear JH Learning preferences of medical students. *Medical Education*. 1994; 28:180-186.
7. Johnson JP, Mighten A A Comparison of teaching strategies: lecture notes combined with structured group discussion versus lecture only. *J Nurs Edu*. 2005; 44:319- 322.
8. Liew SC, Sidhu J, Barua A The relationship between learning preferences (styles and approaches) and learning outcomes among pre-clinical undergraduate medical students. *BMC Medical Education*. 2015;15:44.
9. Baykan Z, Naçar M. Learning styles of first-year medical students attending Erciyes University in Kayseri, Turkey Learning styles of first-year medical students attending Erciyes University. *Adv Physiol Educ*. 2007; 31:158-60.
10. Urval RP, Kamath A, Ullal S et al. Assessment of learning styles of undergraduate medical students using the VARK questionnaire and the influence of sex and academic performance. *Adv Physio Educ*. 2014; 38: 216-220.
11. Chaudhary MH, Ayub S, Aftab A et al. Association of academic performance with learning style preference of medical students : Multi-center study from Pakistan *J Contemp Med Edu*. 2012; 3: 111.
12. Kharb P, Samanta PP, Jindal M et al. The learning styles and the preferred teaching—learning strategies of first year medical students. *Journal of clinical and diagnostic research: JCDR*. 2013; 7:1089.
13. Samarakoon L, Fernando T, Rodrigo C et al. Learning styles and approaches to learning among medical undergraduates and postgraduates. *BMC Medical Education*. 2013; 13: 42.
14. Wehrwein EA, Lujan HL, DiCarlo SE Gender differences in learning style preferences among undergraduate physiology students. *Advances in Physiology Education*. 2007; 31:153-157.
15. Johnson M Evaluation of learning style for first year medical students. *International Journal for the scholarship of teaching and learning*. 2009; 3:1.
16. Almigbal TH Relationship between the learning style preferences of medical students and academic achievement. *Saudi medical journal*. 2015; 36:349-355.
17. Sinha MM, Naik SS, Jadeja JM et al Gender

- Differences In Preferences Of Various Modalities Of Learning Styles Among Undergraduate Medical Students. nt J Basic ApplPhysiol. 2013; 2: 88-93.
18. Kulkarni NS, Patil PA, Javali SB Learning Styles Preferences of First Year Medical Students Of J N Medical College Belgaum : A Single Institute Experience In Karnataka , India. National Journal of Integrated Research in Medicine. 2018; 6: 80-83.
 19. Dissanayaka TD The Learning Styles and the Preferred Teaching- Learning Strategies of First Year Physiotherapy Students. International Journal of Scientific and Research Publications. 2014; 4: 4-6.
 20. Fleming ND, Fleming ND, Mills C Not Another Inventory , Rather a Catalyst for Reflection Not Another Inventory , Rather a Catalyst for Reflection. To improve the academy. 1992; 11:137-155.

