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Learning Style Preferences of First-Year Residents in Various Medical Specialties in Ramathibodi Hospital, Thailand

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Background: Learning styles preferences play an important role in helping learners acquire knowledge. Because each individual establishes different learning styles, knowing students' learning preference may help instructors design appropriate teaching methods which aids students to achieve learning outcome more effectively.

Objective: To determine the learning styles in first-year residents of various medical specialties, using the VARK model.

Methods: This cross-sectional descriptive study recruited all first-year residents of academic year 2021 to 2022, at Ramathibodi Hospital. Ninety-five residents gave their consent and submitted the VARK questionnaire. The results were classified into 3 groups of specialties, based on its major characteristics being surgery-based, cognitive-based, or diagnostic-procedure-based.

Results: The VARK preferences in the surgery-based group were as followed; 7.9% aural learners, 26.3% kinesthetic learners, and 65.8% multimodal learners, with none being visual and read/write learners. In the cognitive-based group, the VARK preferences were 7.7% visual learners, 19.2% aural learners, 3.8% read/write learners, 19.2% kinesthetic learners, and 50.0% multimodal learners. In the diagnostic-procedure-based group, the VARK preferences were 8.3% visual learners, 37.5% kinesthetic learners, and 54.2% multimodal learners with none being aural and read/write learners.

Conclusions: The VARK preferences showed that Ramathibodi's overall first-year residents were mostly multimodal learners with the surgery-based and the diagnostic-procedure-based groups having more kinesthetic preference learners in their specialties.

Keywords: Medical resident, Learning preferences, VARK

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Introduction

Learning preferences can be referred to as students' liking for some elements of learning and chosen ways of interaction with the elements of learning.[1] There are many methods to determine one's learning preferences and questionnaires are one of the most used tools for this purpose.

Visual, aural, read/write, kinesthetic (VARK) questionnaire is one of the most widely accepted questionnaires among medical educators. It comprises 16 questions that divides learners into 4 groups according to their preferred method of learning. There are visual learner, aural learner, read/write learner, and kinesthetic learner.[2, 3] If the learners have one dominant preference, they are unimodal learners. If they have multiple preferences, they are referred to as multimodal learners. Since our study focuses on more advanced learners, we assumed that it is an advantage of the VARK questionnaire that can detect learners with multimodal preferences.

Previously, there are many studies on learning preferences, especially among medical students or junior learners. Literature reviews from 2011 to 2021 showed prevalence according to the VARK model as follows, 5.5% to 16.2% were visual learners, 4% to 34% were aural learners, 2% to 12% were read/write preferred learners, 8.2% to 35% were kinesthetic learners, and 52.5% to 91.5% were multimodal learners.[2-9] There are very little data on postgraduate students. Kim et al[10-12] reported prevalence of VARK in surgical residents as follows, 6% to 7% were visual learners, 8% to 10% were aural learners, 5% to 8% were read/write preferred learners, 17% to 21% were kinesthetic learners, and 57% to 61% were multimodal learners.

We noticed that the numbers of each element of VARK vary more among medical students than specific samples from the same subspecialty of medicine. This study focused on VARK learning styles in residents who were already committed to a specific area of interest which might help educators in planning their method of teaching in the future.

Methods

Participants

This study was a cross-sectional descriptive study of first-year medical residents in a single tertiary-care institution. All first-year residents of Ramathibodi Hospital in academic year 2021 to 2022 were recruited in the study and gave informed consent via e-mail or direct contact. Ninety-five residents were enrolled.

Ethics

Informed consent was obtained from all participants. The study started after it had been approved by the Committee of Human Rights Related to Researches Involving in Human Subjects Faculty of Medicine, Ramathibodi Hospital, Mahidol University (No. MURA 2021/556 on July 05, 2021).

Data Collection and Measurements

Demographic data included age, sex, and department (specialty) of all participants. The English version of Flemming's online VARK questionnaire, available at https://vark-learn.com/the-vark-questionnaire, which contains 16 questions and 4 choices for each scenario, was given to each participant via an online link through e-mail or QR code by direct contact. The total of 447 questionnaire were sent to residents. Participants were able to choose more than one choice for each item. Scores were then reported in each sensory modalities including visual, aural, read/write, kinesthetic, and multimodal learners.

Statistical Analysis

The study reported demographic data of age and sex in percentage of residents. The number of residents in each mode of learning style was divided by the total number of responses to determine the percentage of each preference. Hypothesis testing and association of variables was done using chi-square test and Fisher exact test. *P* value at less than .05 is considered to be statistically significant. The statistical analysis was done using SPSS version 16.0 (SPSS for Windows, Version 16.0. Chicago, SPSS Inc; 2007).

Results

The total of 447 residents recruited, 95 (21.3%) were enrolled in this study (mean [range] age, 27.2 [24 - 35] years; 52 [54.7%] female; 43 [45.3%] male). All participants completed the VARK questionnaire and showed that most participants were multimodal learners (57.9%), followed by kinesthetic learners (27.4%), aural learners (8.4%), visual learners (5.3%), and read/write learners (1.0%). Percentage of residents in each learning style preference, along with those result were defined as multiple learning style, are shown according to their medical specialties (Table 1).

Because of the variety of subspecialties in our hospital, the numbers of participants in some specialties were rather small. We categorized all specialties based on the similarity of their tasks into 3 groups. The surgery-based group includes obstetrics and gynecology (OB-GYN), ophthalmology, surgery, anesthesiology, orthopedics, and otolaryngology. The cognitive-based group includes emergency (ER), pediatrics, internal medicine, family medicine, psychology, and physical medicine and rehabilitation (PM&R). The diagnostic-procedure-based group includes radiology and pathology (including forensics) (Figure 1).

In the surgery-based group and the diagnostic-procedure-based group, the results showed more kinesthetic preference learners (26.3% and 37.5% respectively), compared to the cognitive-based group (19.2%), as anticipated due to the nature of the tasks. However, there was no statistically significant association between each group and their kinesthetic preference by Fisher exact test (P = .11). Further grouping of data was performed and showed that there was a statistical significance of kinesthetic preference between the surgery-based combined with the diagnostic-procedural-based group compared to the cognitive-based group by chi-square test (P = .02) (Table 2).

Table 1. Learning Style Preferences of First-Year Residents in Each Medical Specialty

Medical Specialty	No. (%)				
	Visual	Aural	Read/Write	Kinesthetic	Multimodal
Overall (N = 95)	5 (5.3)	8 (8.4)	1 (1.0)	26 (27.4)	55 (57.9)
OB-GYN (n = 1)	0	0	0	0	1 (100.0)
ER (n = 2)	0	1 (50.0)	0	0	1 (50.0)
Ophthalmology (n = 2)	0	0	0	0	2 (100.0)
Radiology (n = 13)	1 (7.7)	0	0	5 (38.5)	7 (53.8)
Surgery (n = 19)	0	2 (10.5)	0	5 (26.3)	12 (63.2)
Pediatrics (n = 5)	0	2 (40.0)	0	1 (20.0)	2 (40.0)
Internal medicine (n = 9)	1 (11.1)	2 (22.2)	0	1 (11.1)	5 (55.5)
Pathology (n = 11)	1 (9.1)	0	0	4 (36.4)	6 (54.5)
Family medicine (n = 10)	1 (10.0)	0	1 (10.0)	3 (30.0)	5 (50.0)
Anesthesiology (n = 3)	0	0	0	0	3 (100.0)
Orthopedics (n = 2)	0	1 (50.0)	0	0	1 (50.0)
Psychology (n = 4)	0	0	0	1 (25.0)	3 (75.0)
Otolaryngology (n = 11)	0	0	0	5 (45.5)	6 (54.5)
PM&R (n = 3)	1 (33.3)	0	0	1 (33.3)	1 (33.3)

Abbreviations: OB-GYN, obstetrics and gynecology; ER, emergency; PM&R, physical medicine and rehabilitation.

Figure 1. Learning Preferences of First-Year Residents in Groups of Specialties

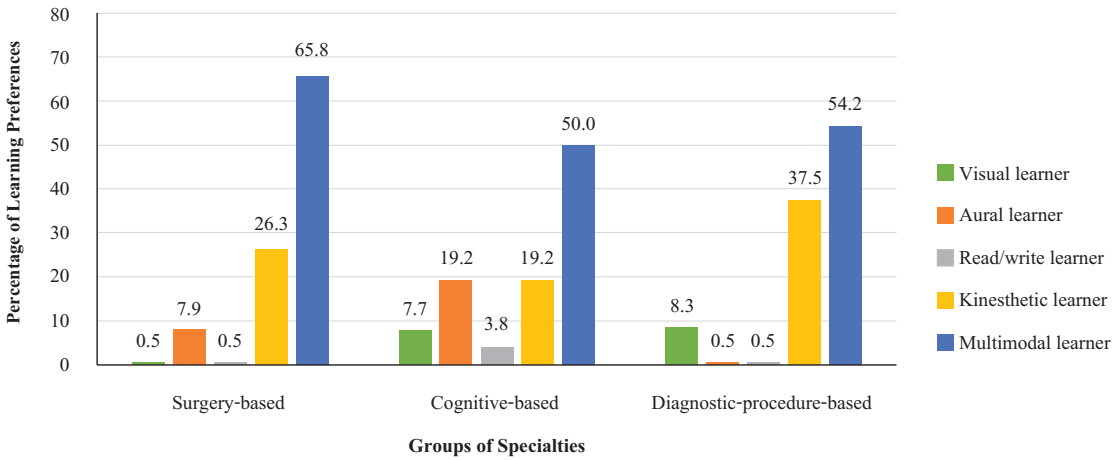

Table 2. Learning Preferences in First-Year Residents Grouped According to Kinesthetic Preference

Group	No. (%)			*P* Value**
	Non-Kinesthetic*	Kinesthetic	Multimodal	
Groups of specialties based on tasks similarity				
Surgery-based (n = 38)	3 (7.9)	10 (26.3)	25 (65.8)	.11[a]
Diagnostic-procedure-based (n = 24)	2 (8.3)	9 (37.5)	13 (54.2)	
Cognitive-based (n = 26)	8 (30.7)	5 (19.2)	13 (50.0)	
Groups of specialties based on psychomotor domain of the task				
Surgery- and diagnostic-procedure-based (n = 62)	5 (8.1)	19 (30.6)	38 (61.3)	.02[b]
Cognitive-based (n = 26)	8 (30.7)	5 (19.2)	13 (50.0)	

* Non-kinesthetic group included visual, aural, and reading preference learners.

** Between-group comparisons based on [a]Fisher exact test and [b]chi-square test, with a significant threshold of $P < .05$.

Discussion

Previous studies showed learning styles prevalence among medical students, according to the VARK model, most students were multimodal learners (53.5% - 91.5%), followed by kinesthetic, aural, and visual learners, depending on the studies.[2-10] In this study, we hypothesized that residents who are interested in the same subspecialty might have similar learning preferences.

The study was conducted by having participants complete an online VARK questionnaire which they can do either via e-mail or in person. The response rate was lower than expected which might be because it was in English and took approximately 10 to 15 minutes to complete. The questionnaires were sent via e-mail, some technical errors might have been encountered and there was not any form of reinforcement applied. Lastly, the residents might not see the importance of the questionnaire. The results showed that most residents were multimodal learners (57.9%), followed by kinesthetic learners (27.4%), aural learners (8.4%), visual learners (5.3%), and read/write learners (1.0%), respectively.

There are 14 specialties in our hospital, with lower response rates, the numbers in each subspecialty was too low to determine the difference between each group, we were grouped specialties, based on the similarity of their major tasks into 3 groups; the surgery-based group, the cognitive-based group, and the diagnostic-procedure-based group.

We postulated that since our participants were more advanced learners, they were more likely to develop various skills during their earlier learning experiences which resulted in higher percentage of multimodal learners. We also found that the percentage of single modal read/write learners were very low among overall participants, and it was the lowest in every specialty. We hypothesized that because nowadays, knowledge was very easily accessible through a variety of media, rather than just books, students might find newer, more exciting ways to acquire their knowledge rather than reading textbooks or taking notes. In the surgery-based group, the study results showed, as we anticipated due to the nature of their tasks, more kinesthetic preference learners as well as the diagnostic-procedure-based group. We combined the surgical- and diagnostic-procedural-based groups and found that there was a statistically significant difference in kinesthetic preference learners compared with the cognitive-based group.

Most of the literature review in higher education reported multimodal as the most preferred way of students learning, but the each VARK differs greatly. Kim et al[10-12] reported 14.8% to 21% kinesthetic, 8% to 10.2% read/write, 7.5% to 8% aural, and 3.9% to 6% visual learners, which was a similar results to this study. Howerever, Hassanzadeh et al[14] reported only 7% of ophthalmology residents, who would be grouped as surgical-based in this study, were kinesthetic learners. Turner et al[15] reported that 90% of pediatric residents, who would be grouped as cognitive-based in this study, were also kinesthetic learners. The rather high percentage in Turner's study was due to their calculating method of adding the students who were multimodal learners with kinesthetic dominant in the kinesthetic preference group.

Further study can be conducted with a larger number of participants in each specialty and subspecialty to be able to better determine the differences or associations of the learner's learning styles and thus help create more suitable course syllabus and shape a tailor-made learning experience that will better benefit the learners and the teacher all together.

Conclusions

This study focused on advanced learners and found that overall VARK preferences to be mostly multimodal, followed by kinesthetic, aural, visual, and read/write learners, respectively. The study also showed that VARK preferences were different in different groups of specialties. Regardless of multimodal learners, the percentage of kinesthetic learners was higher in the surgical-based and diagnostic-procedure-based groups, while compared with the cognitive-based group, the VARK preferences are more diverse. This information might be useful to medical instructors to design their teaching material in the future.

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ความถนัดของรูปแบบการเรียนรู้ของแพทย์ประจำบ้านชั้นปีที่ 1 จำแนกตามภาควิชา ณ โรงพยาบาลรามาธิบดี

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บทนำ: รูปแบบการเรียนรู้มีบทบาทสำคัญช่วยให้ผู้เรียนได้รับความรู้อย่างเต็มที่ เนื่องจากผู้เรียนแต่ละคนมีรูปแบบการเรียนรู้ที่แตกต่างกัน การทราบถึงความถนัดของรูปแบบการเรียนรู้ของผู้เรียน อาจช่วยให้ผู้สอนสามารถออกแบบแผนการสอนที่เหมาะสม และช่วยให้ผู้เรียนได้ประโยชน์จากการเรียนการสอนมากขึ้น

วัตถุประสงค์: เพื่อศึกษาความถนัดของรูปแบบการเรียนรู้ของแพทย์ประจำบ้านชั้นปีที่ 1 ในสาขาวิชาที่หลากหลาย โดยใช้แบบสอบถาม VARK

วิธีการศึกษา: การศึกษาเชิงพรรณนาที่จุดเวลาใดเวลาหนึ่งในแพทย์ประจำบ้านชั้นปีที่ 1 ปีการศึกษา 2564 ถึง 2565 ณ โรงพยาบาลรามาธิบดี จำนวน 95 คน ซึ่งให้ความยินยอมและตอบแบบสอบถาม VARK โดยผลคะแนนแบ่งออกเป็น 3 กลุ่ม ตามลักษณะหลักของแต่ละสาขาวิชา ได้แก่ กลุ่มหัตถการการผ่าตัด กลุ่มความคิดวิเคราะห์ และกลุ่มหัตถการการวินิจฉัย

ผลการศึกษา: ความถนัดของรูปแบบการเรียนรู้ของแพทย์ประจำบ้านชั้นปีที่ 1 พบว่า กลุ่มหัตถการการผ่าตัดเป็นผู้เรียนรู้ทางโสตประสาท คิดเป็นร้อยละ 7.9 ผู้เรียนรู้ทางร่างกายและความรู้สึก คิดเป็นร้อยละ 26.3 และผู้เรียนรู้แบบผสม คิดเป็นร้อยละ 65.8 โดยไม่พบผู้เรียนรู้ทางสายตาหรือทางการอ่าน/เขียน กลุ่มความคิดวิเคราะห์เป็นผู้เรียนรู้ทางสายตา คิดเป็นร้อยละ 7.7 ผู้เรียนรู้ทางโสตประสาท คิดเป็นร้อยละ 19.2 ผู้เรียนรู้ทางการอ่าน/เขียน คิดเป็นร้อยละ 3.8 ผู้เรียนรู้ทางร่างกายและความรู้สึก คิดเป็นร้อยละ 19.2 และผู้เรียนรู้แบบผสม คิดเป็นร้อยละ 50.0 กลุ่มหัตถการการวินิจฉัยเป็นผู้เรียนรู้ทางสายตา คิดเป็นร้อยละ 8.3 ผู้เรียนรู้ทางร่างกายและความรู้สึก คิดเป็นร้อยละ 37.5 และผู้เรียนรู้แบบผสม คิดเป็นร้อยละ 54.2 โดยไม่พบผู้เรียนรู้ทางโสตประสาท หรือทางการอ่าน/เขียน

สรุป: ความถนัดของรูปแบบการเรียนรู้ของแพทย์ประจำบ้านชั้นปีที่ 1 โรงพยาบาลรามาธิบดี ส่วนมากเป็นผู้เรียนรู้แบบผสม โดยกลุ่มสาขาวิชาที่มีหัตถการเป็นความถนัดหลัก ผู้เรียนมีรูปแบบการเรียนรู้ทางร่างกายและความรู้สึกมากกว่ากลุ่มสาขาวิชาอื่น

คำสำคัญ: แพทย์ประจำบ้าน รูปแบบการเรียนรู้ แบบสอบถาม VARK

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