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Learning style preferences among physiotherapy students enrolled in a Malaysian University: A cross sectional study

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Abstract
Current physiotherapy students face enormous challenges in paddling their canoes through learning process. This started off the students and the researchers mind to explore for various strategies to improve the student's academic performance. One of the effective strategies is to identify the student's learning style preferences. The objective of this study is to determine the association between gender, year of study and learning style preferences among physiotherapy students. Self-designed demographic questionnaire and VARK questionnaire were administered to all physiotherapy students of University Tunku Abdul Rahman. The response rate for the survey was 97.99%. Majority of the students (male, 80.4% and female, 64.8%) were multimodal learners and most of students from each year of study (Y1= 67.8%, Y2=62.5%, Y3=73.8% and Y4=69.2%) were multimodal learners; with predominant kinesthetic preferences in learning mode. Learning preference, learning mode and types of modality mix, show no statistical difference between gender and year of study. However, presence of auditory component in student's modality combinations show significant difference ($p = 0.031$) when compared with females (59.0%) and males (78.0%). Interestingly, number of working hours per week was found statistically significant when compared with learning mode ($p = 0.000$) and learning preference ($p = 0.001$). Academicians should be attentive and aware from these differences in order to investigate more effective teaching methods and enhancing opportunity which able to correlate with the student's learning style preferences. Students who have the idea of their own learning style preferences should also take the initiative to approach and obtain study materials which can fit with their own learning style preferences.

Keywords: Learning Style, Physiotherapy, Students, Malaysia, University

Introduction

Education in physiotherapy is an ever-changing process in this modern era as it has become a very challenging task in the life of every health sciences student. With explosions of up-to-date knowledge worldwide, current physiotherapy students face enormous challenges in paddling their canoes through learning process. Such knowledge can be obtained from various learning resources like medical reference books, medical articles, journals and online database. Wading through these established learning resources are vital, as they help students to develop a more concrete, comprehensive and thorough understanding of literature knowledge (Gupta, 2014). However, the demanding environment requires them to input huge amount of knowledge within short period of time, in such a manner it can be retrieve, recall and apply efficiently (Samarakoon *et al*, 2013). This gives the health sciences students a greater responsibility to learn in wider aspects such as clinical examination, clinical procedures, and hands-on skill practices (Sinha *et al*, 2014). Besides, the Department of Statistics, Malaysia (2014) reported that the unemployment rate in Malaysia in the year of 2014 is 2.7%. This might be due to the number of fresh graduates rose from year to year. Eventually, it increases the competition among the fresh graduates for being employed. Fresh graduates who are not competent enough will not be employed by the employer and this will strongly increase the unemployment rate in Malaysia. This phenomenon can also happen in physiotherapy field, which can be the source of burden for the students. In addition, some institution's teaching styles are not able to correlate with student's learning preference.

The lecturer teaches the student according to their own teaching style preference, which does not deliver information to the student effectively. Some lecturers were unable to match their teaching methods with student's need in learning. There is a lack in effectiveness of information convey, and therefore students fail to accommodate. This increases the risk in degrading student's academic performance and increases student's boredom in lecture class (Slater, Lujan & Di Carlo, 2007). This started off to trigger the students and the researcher's mind to explore for effective and dynamic academic implication to improve the academic performance of students. Various strategies has been discovered and practiced to improve the health science student's academic performance in order develop them to be a better health care profession in clinical settings. One of the strategies is to identify the students learning style preferences (Sinha *et al*., 2014).

The term 'learning style' is widely used to describe how learners retrieve, analyses, re-construct, and store information when expose to specific learning environment or performing any learning activity (Chick, 2014). Learning styles can be identified by using a group of factors including behavior and attitudes. It can also be used as an option to facilitate learning. The amount that an individual can learn is directly related to their learning style preference, rather than based on their own intelligence level. To identify an individual's learning style

preference is not an easy task. Learning style is something very vast, complex and it may not easy to be truly understood. Everyone has different psychosomatic traits. Each student has their own different learning style preferences (Murphy *et al*., 2004). Several inventories have been invented mainly to identify a person's learning style preferences such as Kolb Experimental Learning Theory, Gregorc Learning Style Model, VARK Model, Felder-Silverman Learning Style Model, Dunn and Dunn Learning Style Model and Revised Approaches to Studying Inventory (RASI) (Hawk and Shah, 2007). These inventories are useful for helping the students to proceed toward understanding and hence improving in their academic performance (Sinha *et al*., 2014). Hence, they are widely utilized among the students who are concern about their own learning style preferences. One of the inventory tools which gained popularity in educational arena is VARK learning style instrument. It is a current invention, which consists of 4 protocols that used in learning, namely Visual, Aural, Reading or Writing and Kinaesthetic (Tait, 1998). According to the four established protocols from VARK, it can be used to identify an individual's learning pattern and preferable style. There are certain arguments and critics that knowledge of learning style can be useful not only for students but for teachers as well. This is because it might give awareness to the teachers to tailor pedagogy which can correlate with the learning style of the students (Lubawy, 2003). Theoretically, the most effective teaching method is to put students' learning style preference into consideration (Olson, 2000). This can be a powerful tool to enhance student's academic performance. Similarly, students that aware of their own learning style could be empowered to identify and use the best techniques of learning when exposed to different learning environment. This can result in a greater educational satisfaction and promote high improvement in student's academic performance.

According to a study conducted in Sri Lanka, there are possible differences in learning style among the medical students regardless of the year. The learning approaches shifted positively towards deep and strategic learning as the students step towards a higher level of studies. This is due to the complexity of the medical syllabus and different exploration and exposure in clinical settings. The students tend to use more strategic learning method to approach more complex syllabus. Besides, most of the medical students in the entry-level programs preferred a learning style with the combination of reviewing and thinking skills, rather than experiencing or planning skills, which are important in clinical settings (Samarakoon *et al*., 2013). The researchers believed that these changes and differences of learning styles do not only happen among medical students; but for other health sciences students as well. Thus, we hypothesize that there would be a significant differences in learning styles seen between the first, second, third and fourth year students of physiotherapy program. Besides, there is insufficiency of high level evidences shown in Malaysia; because not much related research has been conducted in Malaysia among physiotherapy students. The educators in entry-level programs can explore more enhancing opportunity and develop learning experiences that will improve students' experience and planning skills for future needs in clinical setting. At the same time, a good body of research stated that males and females have significantly different learning style. The actual reason is still unclear. However, it might be due to natural tendency of learning between both genders (Wehrwein *et al*., 2006). However, the relatively sparse research on learning style preferences among physiotherapy students has left room for further research. The aim for this study was to identify the learning style preferences among UTAR physiotherapy students. This research was also aimed to determine the influence of gender differences and year of study on learning style preferences of UTAR physiotherapy students.

Materials and Methods

This cross-sectional study was conducted at Sungai Long campus of University Tunku Abdul Rahman (UTAR) between October and December 2014. Participants comprised of all physiotherapy students enrolled in UTAR for Bachelor of Physiotherapy course. A total number of 149 students participated in this study. To be eligible for the study the subjects should fulfill the following inclusion and exclusion criteria. Both males and females were included in the study. Participants were classified as either Year One, Year Two, Year Three and Year Four by viewing through their major units currently taken and/or completed until Oct 2014 Trimester. We hypothesized that gender and year of study will influence the learning style preferences among UTAR physiotherapy students.

Instruments

Self-designed demographic questionnaire: This questionnaire was self-designed by the researchers with the purpose of inquiring subject's demographic data such as name, gender, age, ethnicity, first language, state of origin, residential background, degree entry type, year and trimester of study, number of units or subjects enrolled in current trimester, number of working hours per week and previous health care experiences. The questionnaire was presented with the combinations of open-ended, partially close-ended and close-ended questions, which approximately required 2-3 minutes for each participant to fill them up.

VARK questionnaire: VARK is a questionnaire that provides users with a profile of their learning preferences. These preferences are about the ways that they want to take-in and present information. VARK inventory was initially developed by Neil Fleming in Christchurch, New Zealand in 1987 (Fleming, 2014). VARK questionnaire is developed to measure four perceptual preferences: visual (V), aural/auditory (A), read/write (R), and kinaesthetic (K). Individuals with visual (V) preference learn information via charts, diagrams, graphs, as well as through symbolic devices such as arrows, rather than using words. However, the author mentioned that visual preference does not consist of still pictures, photographs, movies, and videos, as these presentations also involves the perceptual modes of aural / auditory (A), read / write (R), and kinaesthetic (K) (Fleming, 2014). Individuals with aural/auditory (A) preference learn best through talking and speaking session, such as in lectures, group discussion and web-chat (Fleming, 2001).

Individuals with read/write (R) preference learn information through words and texts, in which the author stated that it is a strong preference of mode among teachers and students This preference stresses on text-based input and output, which can be presented as reports, assignments, essays, manuals, Internet and PowerPoint (Fleming, 2014). Individuals with kinaesthetic (K) preference learn through experience, example, practice, and simulation (Fleming, 2001; Fleming, 2014). The author stated

that individuals who prefer this mode are connected to reality, and these experiences may invoke other modes of perceptual preferences. It can be presented as demonstrations, videos, movies, case studies, practice and applications. Multimodality (MM) is the combination of students' learning preferences listed above, when subjects do not get significant outstanding score among the four perceptual preferences. Participants who obtained an outstanding score for one of the learning preferences (either V, A, R, or K) were considered as unimodal learners. Possibilities for subjects to obtain multimodal outcomes (either bimodal, trimodal, or quadrimodal) of learning style preferences were present, if they score two, or three, or all of the V, A, R, and/or K component(s), respectively, with their final score(s) resembles or relatively close to one another. The VARK questionnaire version 7.0 was used to conduct the survey. This can be accessed from http://www.ct.gov/ctdn/lib/ctdn/the_vark_questionnaire.pdf.

Procedure

Survey forms were pilot studied among a small group of subjects, and was peer-reviewed by senior academicians for validity and reliability prior to distribution. Our research study obtained ethical approval from UTAR Scientific and Ethical Review Committee. Participation was voluntary, and informed consent was obtained from each participant. All the study participants were assured full confidentiality of the data collected.

Statistical Analyses

The survey data collected were analyzed through Statistical Package for Social Sciences (SPSS) Version 20. Percentages of student's gender (female and male) and year of study (Y1, Y2, Y3 and Y4) were calculated by using number of students exposed to that attribute divided by total number of students (e.g. percentages of female students = number of female students / total number of students x 100%). Statistical analyses like cross tabulation method and Chi-square test were done to study the presence of significant difference in relationships between IVs (gender, year of study, age, ethnicity, first language, state of origin, residential background, degree entry type, number of working hours per week and previous healthcare experiences) and DVs (learning modes, learning preferences, presence of V, A, R, or K in student's learning modality). Microsoft Excel was used to formulate tables, based on statistical results obtained from SPSS. Analysis for the subject's individual VARK component was performed online, via the VARK home page (http://vark-learn.com/home/). Responses towards VARK questionnaire on the survey form obtained from subjects were inserted into the system, and their mode of perceptual preference for presentation of learning materials was returned.

Results

Out of 149 participants, there were 146 (41 males and 105 females) physiotherapy students responded to the survey form, with the total response rate of 97.99%. Among the 146 respondents, 59 of them (40.4%) were from Y1, thirty two of them (21.9%) were from Y2, forty two of them (28.8%) were from Y3, and thirteen of them (8.9%) were from Y4. Demographic information, the independent variables (IV), obtained from subjects (i.e. gender, year of study, age, ethnicity, state of origin, primary language, residential background, type of degree entry, number of working hours per week, and previous healthcare experience) were used to study their relationship with learning preference and learning mode, the dependent variables (DV). A statistical analysis of Chi-square test was done to interpret the relationships mentioned above. Most of the relationships between IVs and DVs, including gender and year of study were unable to prove for statistical significance. Interestingly, "number of working hours per week" however, was able to stand out from other demographic information, which successfully proved its significance when compared with learning mode and learning preference. The difference between the number of working hours per week and learning mode (uni-, bi-, tri- or quadrimodal) had shown statistical significance, with X2 = 26.913 and P value = 0.001 (see Table: 1).

Table1: Contingency Table of Number of Working Hours per Week vs. Learning Mode

	Unimodal	Bimodal	Trimodal	Quadrimodal	Total	X^2	P Value
Do not work	40	14	24	41	119	26.913	0.001*
Only work during university holidays	3	2	1	14	20		
0-10 hours per week	3	0	0	2	5		
>20 hours per week	0	2	0	0	2		
Total	46	18	25	57	146		

*Level of significance: P < 0.005

Furthermore, the difference between number of working hours per week and specific uni- and/or multimodal learning style preference (V, A, R, K, VK, ARK, VARK etc.) was also shown to achieved statistical significance, with X2 = 110.420 and P value = 0.000 (see Table 2).

Table 2: Contingency Table of Number of Working Hours per Week vs. Learning Preferences (Level of significance: P < 0.005)

Working hour/ Learning Preferences	V	A	R	K	VR	VK	AR	AK	RK	VAK	VRK	ARK	VARK	Total	X^2	P
Do not work	9	6	10	15	2	3	2	7	0	12	7	6	40	119	110.42	0.000
Only work during University holidays	1	1	1	0	0	2	0	0	0	1	0	0	14	20		
0-10 hours per week	0	2	1	0	0	0	0	0	0	0	0	0	2	5		
>20 hours per week	0	0	0	0	0	0	0	1	1	0	0	0	0	2		
Total	10	9	12	15	2	5	2	8	1	13	7	6	56	146		

Out of total number of 146 subjects, students who do not work (do not have part time job) consisted of n=119 (81.5%) and those who work (having part time job) consist of n= 27 (18.4%). Among students who do not work, forty of them (33.6%) were unimodal, fourteen of them (11.8%) were bimodal, twenty four of them (20.2%) were trimodal and forty one of them (34.5%) were quadrimodal. Twenty subjects work during university holidays, in which three of them (15%) were unimodal, two of them (10%) were bimodal, one of them (5%) are trimodal and fourteen of them (70%) are quadrimodal. Only five students who work for 0-10 hours per week, out of which three of them were unimodal and two of them, were quadrimodal. Only two subjects reported to work for >20 hours per week, from which both of them were bimodal learners. There were no gender differences in the percentages of female and male students who preferred unimodal, bimodal, trimodal and quadrimodal modes of learning preference. (See Table 3; P value = 0.115). It has been analyzed that there were no gender differences in female and male students who favoured unimodalor multimodal as their learning preference upon information presentation (see Table 4, P value = 0.064).

Chi square test was performed to identify the relationship between year of study and specific learning mode (unimodal, bimodal, trimodal and quadrimodal). X2 value for the test was 10.591. Cross tabulation indicated no significant association between year of study and learning mode**.** (See Table 5, X2 =10.591, P value = 0.305). Chi square test was performed to identify the relationship between year of study and style of learning (V, A, R, K and multimodal). X2 value for the test was 15.706. Cross tabulation indicated no significant association between year of study and learning preferences (unimodal or multimodal) (See Table 6, X2 =15.706, P=0.205).

Table 3: Contingency table of gender vs. learning mode

		Learning Mode				Total
		Unimodal	Bimodal	Trimodal	Quadrimodal	
Gender	Female	37	15	18	35	105
	Male	9	3	7	22	41
Total		46	18	25	57	146

Table 4: Contingency table used gender vs. learning preferences

Gender	Single V	Single A	Single R	Single K	Multimodal	Total
Male	1	4	1	3	32	41
Female	9	5	11	12	68	105
Total	10	9	12	15	100	146

There were a total of one hundred students who preferred multimodal learning approaches. Of the female and male students who preferred bimodal (two modes) information presentation; some students preferred V and R (2% female vs. 3% male) and some students preferred A and K (9% female vs. 6% male). Only female students preferred bimodal information presentation with combinations of VK (7% female vs. 0% male), AR (3% female vs. 0% male), and RK (2% female vs. 0% male) respectively. Of the female and male students who preferred trimodal (three modes) information presentation, similar percentages of gender preferred V, A and K (13% female vs. 13% male). Some students preferred V, R and K (6% female vs. 9% male), and some students preferred A, R and K (7% female vs. 3% male). The percentage of female and male students that preferred quadrimodal (four modes) information presentation V, A, R and K were 51% and 66% respectively.

Chi square test was performed to identify the relationship between gender and specific multimodal learning preference. X2 value for the test was 6.058. There were no gender differences in specific multimodal learning preference between females and males (see Table 7, X2 = 6.058, P value = 0.641). Generally, there was no Y1 student who has the learning preferences of VK, AR, and RK. None of the Y2 students had the learning preferences of RK and VRK. There was no Y3 student who has the learning preferences of VR and RK. Similarly, none of Y4 student has the learning preferences of VR, AR and AK. Chi square test was performed to identify the relationship between year of study and specific multimodal learning preference. X2 value for the test was 33.739. There were no year of study differences in specific multimodal learning preference between Y1, Y2, Y3 and Y4 students (see Table 8, P = 0.089).

Table 5: Contingency table of year of study vs. learning mode

Year of Study	Unimodal	Bimodal	Trimodal	Quadrimodal	Total
Year 1	19	4	11	25	59
Year 2	12	7	5	8	32
Year 3	11	4	6	21	42
Year 4	4	3	3	3	13
Total	46	18	25	57	146

Table 6: Contingency table year of study vs. learning preferences

Year of Study	Single V	Single A	Single R	Single K	Multimodal	Total
Year 1	1	7	5	6	40	59
Year 2	4	2	3	3	20	32
Year 3	5	0	3	3	31	42
Year 4	0	0	1	3	9	13
Total	10	9	12	15	100	146

Table 7: Contingency table of gender vs. specific multimodal preferences for learning

		Multimodal Preference									Total number of students
		VR	VK	AR	AK	RK	VAK	VRK	ARK	VARK	
Gender	Female	1	5	2	6	1	9	4	5	35	68
	Male	1	0	0	2	0	4	3	1	21	32
Total		2	5	2	8	1	13	7	6	56	100

Although there were no significant association between gender and year of study with learning preference and learning mode shown, it was interesting to note that majority of the students are actually multimodal learners. It was also interesting to note that out of the six possible bimodal combinations (VA, VR, VK, AR, AK and RK), five were represented in female populations which are VR, VK, AR, AK and RK but only two types of bimodal combination are represented in male population which is VR and AK in their population. Out of four possible trimodal combination (VAR, VAK, ARK, and VRK), three were represented in female and male population which are (VAK, VRK, and ARK). Furthermore, less than total half of percentages of female multimodal learners (33.33%) were reported to have a preference for using all four sensory modalities (VARK). This was in contrast to the male population, in which well over half (51.22%) of multimodal male learners reported using all four sensory modalities as their preference (VARK). As for year of study, out of six possible bimodal combinations, only two were represented on Y1 students (VR and AK); four were represented on Y2 students (VR, VK, AR and AK); three were represented on Y3 students (VK, AR and AK); and only two were represented on Y4 students (VK and RK).

Table 8: Contingency table of year of study vs. specific multimodal preferences for learning

		Multimodal Preference									Total number of students
		VR	VK	AR	AK	RK	VAK	VRK	ARK	VARK	
Year of study	Year 1	1	0	0	3	0	6	4	1	25	40
	Year 2	1	2	1	3	0	2	0	3	8	20
	Year 3	0	1	1	2	0	4	2	1	20	31
	Year 4	0	2	0	0	1	1	1	1	3	9
Total		2	5	2	8	1	13	7	6	56	100

Out of four possible trimodal combinations, three were represented on Y1, Y3 and Y4 students (VAK, VRK and ARK); and only two were represented on Y2 students (VAK and ARK). For quadrimodal combinations, there were 62.5% of Y1 students; 40% of Y2 students, 64.5% of Y3 students and 33.3% of Y4 students preferred VARK for learning preference. Among all female learners, the percentages of those who contained V in their learning preferences (whether it was subject's unimodal choice or contained within one of the female multimodal mix, for instance, VA, VR, VK, VAR, VAK, VRK, or VARK) was 60.0%. In contrary, 73.2% of males preferred V in their multimodal combination. Similar percentages were found in female and male students (59.0% vs. 78.0%) who preferred A as either their unimodal preference or as a part of multimodality mix. R was preferred by 56.2% of females and 65.9% of males as their uni- or one of multimodal preference; while K was preferred by 73.3% of females and 82.9% of males in their uni- or multimodality combination. Most of the difference stated above failed to reach statistical significances, except for the difference between gender and preference of A in student's learning modality, which had the $X2 = 4.643$ and P value = 0.031 (see Table 9). As for year of study, percentages of Y1, Y2, Y3 and Y4 students who preferred V in either their uni- or multimodal learning combination were 62.7%, 53.1%, 76.2% and 53.8% respectively. None of the difference shown above had successfully reached statistical significance, but the differences worth for further investigation.

Table 9: Contingency Table of Gender vs. Presence of Auditory (A) Preference in Student's Learning Mode

Gender / Presence of A	No	Yes	Total	X^2	P value
Female	43	62	105	4.643	0.031*
Male	9	32	41		
Total	52	94	146		

* Level of significance, $P < 0.05$

Discussion

Our results report that both male and female students preferred multimodal learning. Similarly, students belonging to year one to year four also favor in multimodal learning style. In general sense, physically unimpaired students are multimodal learners because they will be using all their senses to gather any information (Slater, Hujan & DiCarlo, 2007). Multimodal learners have an important advantage during learning, which is to acquire new knowledge in very efficient manner by using various types of senses (Bataduwaarachchi *et al*., 2013). Studies have been conducted in USA and Turkey report similar results as shown in this study (Samarakoon *et al*., 2013). Those who are multimodal in their preferences can be more flexible about how they take in and give out information than those with a VARK profile that emphasizes a single preference. They tend to be able to match their preferences with whatever mode(s) are

being used. But because those who are multimodal need to have at least two, three or four modes involved in learning before they are satisfied, that can be a disadvantage.

The influence of gender on learning styles is an area of active research. Many studies had discussed about the correlation between the gender and their predominant learning style. In this study, it were clearly seen that females have more diverse combination compared to males. For example, in this study females have (VR, VK, AR, and AK) but, even in this category male chose the option of (VR and AK) only. In the light of these findings, it can be generalized that females have wider spectrum to grasp new knowledge compared to males. Females preferred mixture combination of learning process. In contrast, males condensed or narrowed down the combination of learning style. Males have smaller division of learning style compared to females (Urval, 2014). Males and females are very unique on their own learning style preference. Specifically, males prefer more rational evaluation and logic value, whereas females use resources which being taught in an elaborative process. This shows that males were likely to be more externally focused and females are thoughtful and self-critical (Choudhary, 2011).

The researchers found that there was significant difference between gender and the presence of Auditory (A) component in students learning mode (either as their unimodal preference or contained within their multimodal combinations). For instance, male students tend to more favored to have A-preference in their learning mode compared to female students. This finding was contradictory to the results of another study in which they did not reach a statistical significance when the same variables as above were being tested (Slater, Hujan and DiCarlo, 2007). This vast difference might be due to some cultural disparities between two countries (Malaysia vs. USA), which causes male students in Malaysia more preferable to engage in discussion, peer interaction and recalling methods in learning process, compared to American male students. The actual reason behind this, however, merits for further researches in near future. Students classified as unimodal learners by VARK learning instrument expressed a stronger learning style preference for retrieving information by using a single sensory modality (either V, A, R or K). Based on the results of present study, only minority of both male and female population preferred unimodal style of learning. In this minority population, the number of female students preferred unimodal learning style were thirty seven students and most of them have a predominant sensory modality of kinaesthetic. Whereas the minority number of eight male students preferred unimodal learning style and most of them had a predominant aural modality. There was non-statistically significant association between the relationship of gender difference and learning mode (unimodal or multimodal).

The findings of current research have shown that majority of physiotherapy students from different year of study had multimodal learning style which is 68.4% and only 31.5% had unimodal learning style. The majority of physiotherapy students who had multimodal learning styles came with kinaesthetic modality as a predominant component. An almost similar research conducted in Sri Lanka, stated the majority of undergraduate health science students had multimodal learning style and minority having unimodal learning style preferences. However kinaesthetic learners were only small minority (Samarakoon *et al*., 2013). In addition, the first year students who had unimodal learning style preference tend to have a predominant auditory sensory modality to retrieve information but the learning style seems to shift from auditory to kinaesthetic sensory modality as the students move up the ladder from first year to final year of study. The reason for this slight shift might be due to the exposure to clinical settings where students have more chances to approach clinical practice and other practical training which further develop their own hands-on skills and increase their adaptation of learning in clinical settings instead of just attending lecturer class. A study conducted in USA showed the majority (63.8%) of undergraduate health science students are having multimodal learning style preferences only 36.1% having unimodal learning style preferences, however the kinaesthetic learners are only presented with small minority (Lujan, 2006). The differences of results observed in the students were obscure. However, there might be chances due to other several factors such as difference in pre- university education, previous experience from working, or health-science society such as first aid society. These factors play an important role in affecting an individual's learning style behaviour.

Based on this research, the common observation is that students from all year of studies with previous working experiences preferred kinaesthetic style of learning. This might be due to the exposure to working environment and practical setting might changes the focus of a student from didactic learning to practicality as the students develop skills rather than just obtaining theory. Moreover, the difference of previous institution teaching style may be explained the learning behaviour as well (Samarakoon *et al*., 2013). For example students who are taking Diploma as their pre-university education will obtain more skillful knowledge compare to other student from other pre-university education this is because the teaching styles and syllabus for Diploma education system are more focusing in specific aspect such as practical training and clinical practice rather than just focus at lecture.

The findings of current study depict that there was no significant association between the years of study and learning style preferences. The result showed the majority of students from all years of study (Y1, Y2, Y3 and Y4) preferred multi-sensory input, with kinaesthetic being the predominant component. Our results were contradicted with another study that conducted in from Sri Lanka. Based on their study found, the majority of undergraduate students preferred multimodal sensory input but there were a shift in learning style among the multimodal learners from a predominant auditory to a predominant kinaesthetic learning style as the students move up the ladder of medical education. The reasons for non-significant changes in current study are obscure. Though our results have not statistically shown significant changes in the majority group of students those who preferred multimodal learning style, there was a slight change occurred among the minority population of students who preferred unimodal learning style. Based on our results, the first year students who had unimodal learning style preference tend to have a predominant auditory sensory modality to retrieve information but the learning style seems to shift from auditory to kinaesthetic sensory modality as the students move up the ladder from first year to final year of study. The reason for this slight shift might be due to the exposure to clinical settings where students have more chances to approach clinical practice and other practical training which further develop their own hands-on skills and increase their adaptation of learning in clinical settings instead of just attending lecturer class.

Conclusion

In conclusion, there was no significant association between learning style preferences among the physiotherapy students with regard to gender and year of study. The majority of students with different gender and year of study were multimodal learners. The number of hours they spend on part-time job per week, (i.e. the number of working hours per week), has shown statistical significance when compared with learning mode and learning preference.

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