

## Learning Styles among Medical Students of Sulaimani University/Kurdistan Region/Iraq

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### Abstract

**Background:** Learning styles refers to the methods of gathering, processing, interpreting, organizing and thinking about information. Students have different learning styles, which is the reason for the diversity seen in classrooms in regards to how students acquire information. This study objected to evaluate and compare knowledge, attitude and practice among different colleges of medicine, dentistry and pharmacy.

**Methodology:** A cross-sectional study on medical students surveyed regarding their knowledge, attitude and practice about learning style. The Questionnaires were posted online on 15-16th December 2016. Data were collected then analysed

**Results:** About 59.3% of the study population considered lecture as their main source of learning and the highest frequency among college of medicine with a significant association (P value = 0.001). However about 52.4% of the students were most energized for learning in the morning. The majority of the students 82.2% have tried to improve the way they manage their time. with a non significant association (p value = 0.16).

**Conclusions:** Most of medical students were aware of their learning style, believed that knowing about their learning style can improve and facilitate their learning. The majority of students were visual learners and cared about their time management and took notes while they learnt new information.

**Keyword:** Learning Styles, Students, Sulaimani

### Introduction

Learning is the process of gaining understanding that leads to the modification of attitudes and behaviors through acquisition of knowledge, skills and values, through study and experience. Learning causes a change of behavior that is persistent, measurable, and specified or allows an individual to formulate new mental construct or revise a prior construct.

Learning styles refers to the methods of gathering, processing, interpreting, organizing and thinking about information. Students have different learning styles, which is the reason for the diversity seen in classrooms in regards to how students acquire information.<sup>(1)</sup>

A learning style is a student's consistent way of responding to and using stimuli in the context of learning.<sup>(2)</sup> Learning styles are defined as the personal preference for using certain learning strategies and techniques.<sup>(3)</sup>

#### Dunn and Dunn model:

According to the Dunn and Dunn model, 'learning style is divided into 5 major strands called stimuli. The stimulus strands are: environmental, emotional, sociological, psychological, and physiological elements that significantly influence how many individuals<sup>(2)</sup> The environmental strand incorporates individuals' preferences for the elements of sound, light, temperature, and furniture or seating design. The emotional strand focuses on students' levels of motivation, persistence, responsibility, and need for structure. The sociological strand addresses students' preference

for learning alone, in pairs, with peers, as part of a team, with either authoritative or collegial instructors, or in varied approaches (as opposed to in patterns). The physiological strand examines perceptual strengths (visual, auditory, kinesthetic or tactile), time-of-day energy levels, and the need for intake and mobility while learning. Finally, the psychological strand incorporates the information-processing elements of global versus analytic and impulsive versus reflective behaviors.<sup>(4)</sup>

#### VARCK model:

(an acronym for Visual, Aural, Read/ Write and Kinesthetic, different way of learning styles) is a learning inventory categorized into the 'instructional preference' modal.

<sup>(1)</sup>We remember 20% of what we read; we remember 30% of what we hear. We remember 40% of what we see; we remember 50% of what we say. We remember 60% of what we do, remember 90% of what we read, see, hear, say and do<sup>(5)</sup>

The logic of lifelong learning suggests that students will become more motivated to learn by knowing more about their own strengths and weaknesses as learners.<sup>(4)</sup> Time management has been referred to as completion of specific tasks in specific time periods to achieve pre-determined goals.<sup>(6,7)</sup> Students' approaches to learning can be influenced by the perception that they gain from their learning environment.<sup>(8)</sup> Engaging environments and healthy interaction between students is the key to quality behavior and learner growth.<sup>(9)</sup>

The ability to take good notes is crucial for learning and succeeding in school. Good note-taking requires students to mobilize their attention abilities..<sup>(10)</sup>

### Objective

1-To identify and compare knowledge, attitude and practice of medical colleges students regarding learning styles.

### Methodology

A cross-sectional study was used among medical students from (Medicine, Dentistry, Pharmacy colleges) in the University of Sulaimani/Kurdistan Region/Iraq. The time during which data was collected 15-16<sup>th</sup> December 2016. An online self administrative questionnaire was posted to include students of medical colleges as a convenient sampl in this study, a pilot study was done before including the whole number of participants which was 445 syudents .

Data collection was conducted through an online self-administration method using internet- based method through Google Forms for conducting the survey, we sent the link of the questionnaire form to the students from different medical colleges in University of Sulaimani

Data was collected from Google form then transferred to excel and analysed by SPSS 23<sup>rd</sup> version, to get descriptive analysis, the Chi-Squared test was used for determining the association between the colleges & P value of equal & less than 0.05 considered to be the level of significant.

### Ethical considerations:

For initiating the research an official permission was taken from the department of (Family and Community Medicine) College of Medicine/Sulaimani University. Informed consent was taken from the participants via online Google form

### Results

From total of all students that participated in this survey which were 445 students.

**Table (1)** shows the knowledge of the participants, in which (84%) answered yes regarding the question if learning is a skill , and (82.7%) were aware of their learning style, the highest percentages were from college of medicine (86.9%),(84.7%) repectively. About (59.3%) of the students gained their source from lectures in which (66.5%) were students of college of medicine and ( p value = 0.001) which was significant. About exam motivation (58.9%) of the students were motivated by exams , on the other hand (94.8%) of the students were motivated by patient and practical application for their learning. Most of the students didn't know about vark model of learning, which was (91.2%), and (84%) of the students said yes that teachers way of teaching affects learning.

**Table (2)** About (50.3%) of students were not satisfied with their learning style . (94.2%) of students believed that knowing about their learing style can improve their memory, and (93.5 %) of students believed that awareness of learning style can facilitate learning, (50.6%) of students preferd learning both alone and in a group. (52.4%) believe that they are most energized in the morning and there 's a significant association (P value =0.012).

**Table (3)** The majority of visual learners with percentage of (87.7%) were at the college of medicine. The majority of auditory learners (62.3%) were dentistry students. The highest percentage of pharmacy students( 86.2 %) learn by read/write. Highest percentage of students (58.2%) from dentistry college were not kinesthetic learner Regarding time management question the highest percentage (71.3%) of the dentistry students made constructive use of their time in learning. The highest percentage (86.4%) of students who have tried to improve the way they managed their time were at college of medicine and there 's a significant association (P value =0.016).

**Table( 1) knowledge of medical students regarding learning styles.**

		College								p.value
		Dentistry		Medicine		Pharmacy		Total		
		N.	%	N.	%	N.	%	N.	%	
learning is a skill	No	24	19.7	31	13.1	16	18.4	71	16	0.220
	Yes	98	80.3	205	<b>86.9</b>	71	81.6	374	<b>84</b>	
	Total	122	100	236	100	87	100	445	100	
Aware of the learning style	No	26	21.3	36	15.3	15	17.2	77	17.3	0.366
	Yes	96	78.7	200	<b>84.7</b>	72	82.8	368	<b>82.7</b>	
	Total	122	100	236	100	87	100	445	100	
The main source of learning	Lecture	64	52.5	157	<b>66.5</b>	43	49.4	264	<b>59.3</b>	<b>0.001</b>
	(books & internet)	58	47.5	79	33.5	44	50.6	181	40.7	
	Total	122	100	236	100	87	100	445	100	
Exam motivate you to learn	No	48	39.3	95	40.3	40	46	183	41.1	0.585
	Yes	74	<b>60.7</b>	141	59.7	47	54	262	<b>58.9</b>	
	Total	122	100	236	100	87	100	445	100	
Patient & practical application motivate you to learn	No	6	4.9	9	3.8	8	9.2	23	5.2	0.188
	Yes	116	95.1	227	<b>96.2</b>	79	90.8	422	<b>94.8</b>	
	Total	122	100	236	100	87	100	445	100	
Do you know what (VARK) learning model is?	No	111	91	214	90.7	81	<b>93.1</b>	406	<b>91.2</b>	0.776
	Yes	11	9	22	9.3	6	6.9	39	8.8	
	Total	122	100	236	100	87	100	445	100	
Teachers' way of teaching affect learning	No	18	14.8	35	14.8	18	20.7	71	16	0.424
	Yes	104	<b>85.2</b>	201	<b>85.2</b>	69	79.3	374	<b>84</b>	
	Total	122	100	236	100	87	100	445	100	

**Table (2 )Attitude of medical students about ,Learning Styles .**

		College								P value
		Dentistry		Medicine		Pharmacy		Total		
		N.	%	N.	%	N.	%	N.	%	
Are you satisfied with your learning style?	No	51	41.8	130	<b>55.1</b>	43	49.4	224	<b>50.3</b>	0.057
	Yes	71	58.2	106	44.9	44	50.6	221	49.7	
	Total	122	100	236	100	87	100	445	100	
Do you think it is useful to know your learning style for improving your memory?	No	11	9	10	4.2	5	5.7	26	5.8	0.207
	Yes	111	91	226	<b>95.8</b>	82	94.3	419	<b>94.2</b>	
	Total	122	100	236	100	87	100	445	100	
Do you believe awareness of learning style can facilitate your learning?	No	9	7.4	12	5.1	8	9.2	29	6.5	0.384
	Yes	113	92.6	224	<b>94.9</b>	79	90.8	416	<b>93.5</b>	
	Total	122	100	236	100	87	100	445	100	
you prefer learning ...	Alone	59	48.4	101	42.8	32	36.8	192	43.1	0.524
	Both	55	45.1	120	50.8	50	<b>57.5</b>	225	<b>50.6</b>	
	in group	8	6.6	15	6.4	5	5.7	28	6.3	
	Total	122	100	236	100	87	100	445	100	
When do you think, you are most energized for learning?	afternoon	12	9.8	23	9.7	3	3.4	38	8.5	<b>0.012</b>
	Evening	12	9.8	36	15.3	12	13.8	60	13.5	
	Morning	71	<b>58.2</b>	125	53	37	42.5	233	<b>52.4</b>	
	Night	27	22.1	52	22	35	40.2	114	25.6	
	Total	122	100	236	100	87	100	445	100	

**Table (3) Practice of Learning Styles Among Medical Students.**

		Dentistry		Medicine		Pharmacy		Total		
		N	%	N	%	N	%	N	%	
Visual	No	22	18	29	12.3	15	17.2	66	14.8	0.274
	Yes	100	82	207	87.7	72	82.8	379	85.2	
	Total	122	100	236	100	87	100	445	100	
Auditory	No	46	37.7	98	41.5	34	39.1	178	40	0.768
	Yes	76	62.3	138	58.5	53	60.9	267	60	
	Total	122	100	236	100	87	100	445	100	
Read/Write	No	33	27	49	20.8	12	13.8	94	21.1	0.063
	Yes	89	73	187	79.2	75	86.2	351	78.9	
	Total	122	100	236	100	87	100	445	100	
Kinesthetic	No	71	58.2	130	55.1	45	51.7	246	55.3	0.648
	Yes	51	41.8	106	44.9	42	48.3	199	44.7	
	Total	122	100	236	100	87	100	445	100	
Do you make constructive use of your time in learning?	No	35	28.7	92	39	29	33.3	156	35.1	0.140
	Yes	87	71.3	144	61	58	66.7	289	64.9	
	Total	122	100	236	100	87	100	445	100	
Do you stick to your plan?	No	63	51.6	127	53.8	43	49.4	233	52.4	0.769
	Yes	59	48.4	109	46.2	44	50.6	212	47.6	
	Total	122	100	236	100	87	100	445	100	
Have you tried to improve the way you manage your time?	No	23	18.9	32	13.6	24	27.6	79	17.8	<b>0.016</b>
	Yes	99	81.1	204	86.4	63	72.4	366	82.2	
	Total	122	100	236	100	87	100	445	100	
Do you take notes while you are learning new information ?	No	18	14.8	42	17.8	14	16.1	74	16.6	0.754
	Yes	104	85.2	194	82.2	73	83.9	371	83.4	
	Total	122	100	236	100	87	100	445	100	
Does it help you to remember what you have learnt?	No	12	9.8	30	12.7	6	6.9	48	10.8	0.282
	Yes	110	90.2	206	87.3	81	93.1	397	89.2	
	Total	122	100	236	100	87	100	445	100	

**Discussion:**

This study had done in order to evaluate the knowledge, attitude and practice of medical students at the University of Sulaimani regarding learning styles. Regarding the fact about learning skill (84%) of the medical students said that learning is a skill and about (82.7%) of the students were aware of their learning styles while a study which was done in the University of Louisiana at Lafayette<sup>(11)</sup> In this study (93.5%) of students believe that awareness of learning style can facilitate learning, this difference in percentage maybe due to the fact American students depend on different ways of learning. About (59.3%) of the participants were gaining their information from lectures, while, (40.7%) of the participants were using ( books and internet) as their source of learning, and P value = 0.001 which was significant, while in a research done in Technische University München (TUM), showed that most of the students their source for learning were lecture slides, then internet search and e-learning cases followed by textbooks.<sup>(12)</sup> about (58.9%) of the students were motivated by exams and (94.8%) of them were motivated by patient and practical application in the medical field in comparison with a research done at Dongguk University medical school (DUMS) in Korea, (74%) of the participants chose those related to intrinsic motivation, (22%) chose those pertaining to extrinsic motivation, and (4%) chose other reasons, which demonstrates that intrinsic factors have more effect on the medical students for learning such as the students desire to learn and patient and practical application, but extrinsic factors had less effect on the students such as exams.<sup>(13)</sup> regarding the VARK model of learning (91.2%) of the students had an idea about it and what was VARK model of learning which indicates that the medical students of University of Sulaimani were aware of their learning style. In this study (84%) of the medical students the teachers way of teaching affect their learning this goes in contrast to a study done in the Faculty of Medicine University of Dundee, UK.<sup>(14)</sup> Regarding satisfaction of learning style (50.3%) of students were not satisfied with their learning style, and there's not a significant association (P value =0.057) in contrast to a study was done among medical students Robert Wood Johnson Medical School in USA (88.5%) of students were satisfied with their learning style.<sup>(15)</sup> This big difference may be due to the fact that most Kurdish students were not aware of their learning style and they tend to use the same way they used to be taught at school.

In this study (94.2%) of students believed that knowing about their learning style can improve their memory, this goes with a study was done among medical students of Robert Wood Johnson Medical School whose response was (88.7%),<sup>(15)</sup> this little difference may be due to the fact that

Kurdish students suffer more in recalling information because they think the way they learn still is not qualitative enough to help them in recalling information. In this study (93.5%) of students believed that awareness of learning style can facilitate learning, and there's not a significant association (P value =0.384). This goes with a study was done among medical students of Robert Wood Johnson Medical School<sup>(15)</sup> whose response was (100%) this difference in percentage maybe due to the fact American students depend on different ways of learning that have helped them in their facilities to learn while Kurdish students still have issue in the ways of learning. About 50.6% of students prefer learning both alone and in a group, and there's not a significant association (P value =0.524) in contrast this goes with another comparative study between Turkish and American students in Ohio State University<sup>(16)</sup> in which Turkish and American students in the study preferred to study both alone and in a group and there was not a significant association (P value =0.77) ,This maybe due to the fact that group learning allows for varied views, insights and information to be shared in one place. That sharing creates an open discussion and enhances thinking skills. Students who study together tend to share notes and other class materials, building and broadening understanding of the subject. In this study (52.4%) of medical students believed that they are most energized in the morning, and there's a significant association (P value =0.012). In contrast to a study between Turkish and American students in Ohio State University was done, in which Turkish students prefer early morning hours to study while American students are tending more toward late afternoon and evening hours, and there was a significant association (P value =0.01).<sup>(16)</sup> this difference may be due to the fact that life in USA is not easy, students have to work during the daytime while Kurdish and Turkish communities are somehow close to each other and they prefer early morning. A percentage of (21%) of students are visual learners, and there is no significant association (P value =0.274). this goes with a research that was done in University of Louisiana at Lafayette in which (25%) of their students were visual learners<sup>(11)</sup> this similarity could be due to the reason that the students at both universities might be unimodal and prefer learning by images, charts and diagrams to organize information. A percentage of (15%) are auditory learners and there was no significant association (P value = 0.768). while in the research done in University of Louisiana at Lafayette (42%) of them were auditory learners.<sup>(11)</sup> This could be due to the fact that only a small number of the students are auditory and generally the auditory learner will remember 75% of what they hear in a lecture plus using the

auditory modality is the most difficult way to learn new material. A percentage of (20%) of the students learnt by reading/writing and there was no significant association (P value = 0.063) while in a research done in Wayne State University School of Medicine, Detroit, Michigan only (7.8%) of the students learn by reading/writing<sup>(17)</sup> This difference reflects the way that the medical students at University of Sulaimani preferred reading to learn better and were used to it which is satisfactory with their future career as they need to read more rather than using other modes of learning. Regarding kinesthetic learners in this research (11%) of the students were kinesthetic learners while in a study done in University of Louisiana at Lafayette (13%) were kinesthetic learners<sup>(11)</sup> These low percentages could be due to the fact that the students at both universities preferred other methods of learning rather than using physical style, using touch, action, movement and hands-on to work on learning activities. More than half of the students (64.9%) made constructive use of their time in learning, this goes with a research done at the Hashemite University in Jordan<sup>(18)</sup>, another research done at Karadeniz technical university in Turkey, in which (88.09%) of the students manage their time<sup>(19)</sup> this difference reflects the fact that the medical students at university of Sulaimani need to improve the way they manage their time. Less than half (47.6%) of the medical students in this research stick to their plan and there was no significant association (P value = 0.769) this goes with a research done at Hashemite University in Jordan in which the students did not seem to be aware of their time management skills<sup>(18)</sup> this can be explained by that the students set goals that they are not excited or motivated about or something is fundamentally broken in their planning process and set big goals but did not keep track of them. It seems that students at both universities need to set and honor priorities, the majority of the students (82.2%) have tried to improve the way they manage their time and there was a significant association (P value = 0.016), similarly a research done at the Hashemite University in Jordan and there was no significant association (P value = 0.420) and their results showed that the students' skill regarding time management were low,<sup>(18)</sup> this result shows that the medical students are aware of their time management skill and have tried to make a good use of their time. A high percentage of the students (83.4%) take notes while learning new information a similar study done in New York has shown that 99% of college students state that they take notes during lectures<sup>(20)</sup> this shows that the students are aware of their learning styles and they should take notes in order to learn better and remember the new information later on. A high percentage of the medical students in this research (89.2%) claimed that taking notes helps them to remember what they

have learnt, this goes with a research done at University of Michigan which confirms that students recall more lecture material if they record it in their notes.<sup>(21)</sup>

In conclusions majority of the students were aware of their learning style and the main sources of learning were lectures and most of them were from college of medicine. Most of the students were motivated by exam for learning, and teachers' way of teaching affects their learning, most of them from college of dentistry. Majority of students believed that knowing about their learning style can improve and facilitate their learning and they were visual learners, had tried to improve the way they manage their time, took notes while learning new information most of them from college of medicine

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