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LEARNING HABITS AS FACTORS INFLUENCING ACADEMIC PERFORMANCE IN MEDICAL STUDENTS

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ABSTRACT

The objectives of the study were multifaceted: first, to explore the various learning habits preferred by medical students; second, to examine the predictive association between various learning habits and academic performance; third, to examine the age-wise, gender-wise, and education level-wise (i.e. pre-clinical and clinical) differences on learning habits. The sample comprised of 361 medical students of King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) with an age range of 17-28 years. The results indicated that most commonly used learning habit by medical students were motivation and metacognition and self-regulation. Further, learning habits of motivation, test taking anxiety and metacognition and self-regulation are seen as significant predictors of academic performance. Moreover, age-wise and education-level wise differences are evident only on metacognition and self-regulation whereas gender-wise differences are found on information processing learning habits. It is concluded that factors of learning habits can increase the students' performance in the examination.

Keywords: Study Habits, Academic Performance, Gender, Medical Students

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INTRODUCTION

Students in medical colleges come from very different setups of pre-medical status so do face multiple paradigm shifts in medical colleges where they enter into a new era of career oriented professional education. Globally medical education emphasizes on the principles of adult learning and with that stresses on self-directed learning and deep learning rather than surface learning. Different authors have described learning habits differently but in general it signifies the degrees of students' engagement in regular studies in a conducive learning environment. Three educational theories that are in practice to promote the culture of authentic learning environment are: Social Constructivism, Experiential Learning and Communities of Practices (CoPs; Kaufman, 2003).The focus of discussion in all these theories is "Learner and Learning".

In the same line van Merriënboer and Sweller (2010) discussed the cognitive load theory and classified it into three types: Intrinsic, Extraneous and Germane Load. Intrinsic refers to the learning that taught in isolation. Extraneous load is instruction that is designed by the instructor and teaching strategies where learner has no control on their learning. Germane load refers to the actual learning process that deals with intrinsic cognitive load (Cook, 2005). This looks that germane load incorporates metacognition, self-regulation, motivation, organization, time management, information processing and so on. The effective learning habits may optimize germane load and may facilitate learning. The instructional strategies and learning habits are found important factors in retention of knowledge and improved performance (Mayer, 2010).

Adebisi (2011) have postulated that it is a well-established fact that every human-being, does not keep and follow same learning skills and behavior they use in their learning process. So the learning habits are a process of continuous evolution mostly influenced by numerous versatile factors and eventually affecting the academic performance. Learning skills and motivation demonstrated a significant association with Grade Point Average (GPA) imperative to predict academic performance over and above any other non-cognitive variable. There is a lot of variation in ways of students learning including "*thinking, reading, observing, listening, talking, memorizing and writing, note taking, and doing things in both structured and unstructured situations"* (Adebisi, 2011). Hendricson and Kleffner (2002) diagnosed ineffective study habits as one of the six potential causes of inadequate student performance. The first on the list mentioned is cognitive factor, including poor

metacognition which influence the student's monitoring skill and reflective sense and is more commonly reported among professional students. Metacognition and self-regulation is defined as a process of awareness where a learner is aware of studying process, monitoring study effectiveness and evaluate one's own progress (Credé & Kuncel, 2008). Students with poor metacognition are labeled as either challenging or difficult students. On the other hand, students with high metacognitive and self-regulatory skills are expected to be involved actively in their own learning process, professional development and careful monitoring of the task (Cutting & Saks, 2012; Downing, 2006).

Beech (2011) described the following seven habits of highly effective medical students:-*Know thyself, Understand the "big picture" – the ultimate goal, Develop a foundation, Plan ahead (for lectures, exams, clinical rounds), Practice Excellence, Fine-tune strengths, Give your all to every task (Always bring your "A" game).* Winston and colleagues (2012) in a qualitative research identified the role of two factors cognition and emotion, in fostering self-regulation, metacognition and critical thinking as remediation of at-risk medical students. They further highlighted on organizing and integrating large amounts of information, time management, ineffective study strategies, weakness in literacy, a general lack of self- regulatory, test-taking and test anxiety as problems in at risk students who need remediation. In this regard, for remedies, teacher's facilitation, encouragement and motivation are prominent features to improve the students learning habits and performance (Rehman, Razi, & Sultan, 2011).

The influence of age and gender on learning habits has also been investigated by many researchers. The results of studies on learning habit as a function of age and gender have been very interesting and illuminating though findings have differed from one study to another. For instance, Powell (2011) found that students whose ages were above 23 reported using deeper level study habits more often than younger students. The younger students adopted more of the superficial level of study habits which correlated positively with lower academic performance. Slater, Lujan and DiCarlo (2007) studied gender influence on learning preferences in medical students. The female student preferred a broader range of sensory modality combinations. In another study, Abbasali and colleagues (2008) observed differences among male and female students. It is reported that male students scored lower in concentration, time management and comprehension compared to female students. Additionally, Griffin MacKewn, Moser and Ken (2012) in their study observed that females

scored superior to males in the subscales of anxiety, information processing, self-testing and time management.

Evidences indicate the differences on learning habits employed by pre-clinical and clinical years' medical students. The pre-clinical group showed multimodal preference with auditory learning. Abbasali, Mousavinasab, Fehr, and Mohammadi (2008) in a comparative study concluded that students possess better status in comprehension, study habits and note taking compared to other areas. The pre-clinical students had problems with time management, concentration, reading speed, note taking. However, the differences regarding various types of learning habits is still under researched area and further needs to be explored.

In the light of literature review it can be inferred that learning styles in medical students significantly influence the clinical experience and success in examination. However, it is observed that very few researchers in Saudi Arabia have ventured into the area of effective learning habits and its association with final GPA in undergraduate medical education. This is a big default and gap in curriculum in medical education. It is imperative to integrate curriculum objectives and teaching strategies with learning habits and styles so all the students can perform well in the examination. This study was undertaken: *first*, to explore, the various learning habits preferred by medical students; *second* to examine the predictive association between various learning habits and academic performance; *third*, to examine the age-wise, gender-wise and education level-wise (i.e. pre-clinical and clinical) differences on learning habits. This will serve a very important tool in future planning of classroom and help students in modifying their study habits and also in remediation of students performing below the satisfactory level. It will also be helpful in, preventing academic failure, as well as burnout.

METHOD

Participants

The non-probability convenient sampling technique was used to recruit the sample. The sample comprised of 361 medical students (276 females & 85 males) of King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh. The age of the participants was from17-28 year with a mean age of 20.49 (±*SD* 1.708). Out of these 361 medical students, 191 (53%) were preclinical

students (i.e. students of first to fourth semester) and 170 (47%) were students from clinical side (fifth to tenth semester; Table 1).

Measures

Learning Habits Questionnaire (LHQ)

The Learning Habit Questionnaire on 5-point Likert scale ranging from *strongly agree* to *strongly disagree* was designed. Through extensive review of the literature, a long list of learning habits was obtained (Winston, Van Der Vleuten, & Scherpbier, 2012; Lynch, Woelfl, Steele, & Hanssen, 1998; Wilkinson, Wells, & Bushnell, 2007). The factors more commonly reported were selected and included in the questionnaire. On categorical organization, seven subscales emerged, i.e. time management, concentration, information processing, information discrimination, motivation, test taking anxiety, metacognition and self-regulation.

A questionnaire consisted of 71 items was constructed at an early stage. The constructed questionnaire was pre-tested by conducting a pilot study on a group of final year medical students (N=25) during their clinical posting. The data from this pilot study was not included in the final analysis. The questionnaire was then revised to increase its clarity; four questions were deleted and 10 questions were revised. Finally, sixty seven questions were retained in the final questionnaire. The Cronbach's alpha was calculated to determine the internal consistency of the questionnaire. The Cronbach alpha of total Learning Habit Score was .87 whereas for the subscales was: time management (α= .75), concentration (α= .41), information processing (α= .60), information discrimination (α= .52), motivation (α= .69), test taking anxiety (α= .50), and metacognition and self-regulation (α= .84). The final Questionnaire was approved from ethical committee of research department of KSAU-HS.

Academic Performance

Academic Performance (AP) was measured through Grade Point Average. The AP refers to the marks scored in the last examination possessed GPA 2.0-4.0 by the medical student.

Procedure

To collect the data several steps were taken. Firstly, an ethical approval was sought from the ethical review committee of King Abdulaziz International Medical Research Centre (KAIMRC). Then, written informed consent was obtained from all those approached. The participants were assured that all the information would be kept confidential and will only be used for research purposes. Those who consented voluntarily were asked to fill Learning Habit Questionnaire. The questionnaires were given serial numbers to assure anonymity to the participants, and none of the participants' identity was inferred in the study directly. Data about academic performance (GPA) was collected from the administration of college of medicine.

Scoring & Statistical Analysis

After data collection, the research measures were scored. The data was analyzed by Statistical Package for Social Sciences (SPSS; Version 20). The descriptive statistics, Linear Regression, Multiple Regression and *t*-test were employed to analyze the data.

RESULTS

Table 1
Baseline Characteristics of the Respondents

Variable	*Categories*	*Frequency*	*%*
Gender	Females	276	76.5
	Males	85	23.5
Level	Preclinical	191	52.91
	Clinical	170	47.09
Age	< 21 years	264	73.13
	> 21 years	97	26.87
	M	***SD***	
	20.49	1.708	

Table # 2
Cronbach's Alpha for Sub-scales of Learning Habits Questionnaire

Learning Habits	***No. of Items***	***α***
Time Management	11	.75
Concentration	8	.41
Information Processing	9	.60
Information Discrimination	6	.52
Motivation	12	.69
Test Taking Anxiety	10	.50
Metacognition and Self-Regulation	11	.84
Total Learning Habit Score	67	.87

Table # 3
Learning Habit of the Medical Students (N=361)

Learning Habits	***M***	***SD***	***f***	***%***
Time Management	34.36	7.26	226	62.5
Concentration	28.19	3.77	254	70.5
Information Processing	30.29	5.20	243	67.3
Information Discrimination	19.65	3.76	237	65.5
Motivation	41.53	6.28	250	69.2
Test Taking Anxiety	30.96	5.16	225	61.9
Metacognition and Self-Regulation	44.29	5.87	291	80.5

Table 4

Regression Analysis with Learning Habits as predictors of Academic Performance (N = 361)

Scales	*B*	*SE*	*β*	R^2	*F*	*Sig.*
Constant	1.27	.24				
Learning Habits (Total Score)	.01	.00	.36	.13	54.76*	.000

*$p < .05$; $df = 1, 359$

Table 5

Multiple Regression Analysis with Types of Learning Habits as predictors of Academic Performance (N = 361)

Variables	*B*	*SE*	*β*	*t*	*p*	R^2	*F (Sig.)*
(Constant)	1.12	.26		4.22	.000*	.17	10.90 (.000*)
Time Management	-.01	-.00	.00	.009	.99		
Concentration	-.00	.02	-.02	-.317	.75		
Information Processing	.00	.01	.03	.515	.61		
Information Discrimination	-.01	.01	-.03	-.613	.54		
Motivation	.02	.01	.23	3.53	.000*		
Test Taking Anxiety	.02	.01	.22	4.30	.000*		
Metacognition and Self-Regulation	.012	.005	.13	2.32	.02*		

*$p<.05$; $df = 1, 359$

Table 6
Age-wise Differences in the Learning Habits of Medical Students

Variable		*N*	*M*	*SD*	*t*	*Sig.*
Time Management	< 21 Years	264	34.39	7.17	.150	.88
	> 21 Years	97	34.26	7.52		
Concentration	< 21 Years	264	28.15	3.70	-.329	.74
	> 21 Years	97	28.30	3.96		
Information Processing	< 21 Years	264	30.12	5.32	-.966	.34
	> 21 Years	97	30.72	4.86		
Information Discrimination	< 21 Years	264	19.73	3.62	.712	.48
	> 21 Years	97	19.41	4.14		
Motivation	< 21 Years	264	41.40	6.35	-.612	.54
	> 21 Years	97	41.87	6.11		
Test Taking Anxiety	< 21 Years	264	30.85	5.13	-.650	.52
	> 21 Years	97	31.25	5.28		
Metacognition and Self-Regulation	< 21 Years	264	43.91	5.98	-2.041	.04*
	> 21 Years	97	45.33	5.45		
Total Learning Habit Score	< 21 Years	264	228.78	24.48	-.884	.38
	> 21 Years	97	231.14	24.46		

***p<.05; df=359*

Table 7
Gender-wise Differences in the Learning Habits of Medical Students

Variable		*N*	*M*	*SD*	*t*	*Sig.*
Time Management	Male	276	34.10	8.16	-.373	.71
	Female	85	34.44	6.97		
Concentration	Male	264	28.22	4.06	.091	.93
	Female	97	28.18	3.68		
Information Processing	Male	264	28.98	4.77	-2.674	.01*
	Female	97	30.69	5.27		
Information Discrimination	Male	264	20.20	3.48	1.556	.12
	Female	97	19.47	3.84		
Motivation	Male	264	41.43	7.39	-.162	.87
	Female	97	41.56	5.91		
Test Taking Anxiety	Male	264	31.37	4.86	.859	.39
	Female	97	30.83	5.25		
Metacognition and Self-Regulation	Male	264	44.94	6.69	1.163	.35
	Female	97	44.09	5.60		
Total Learning Habit Score	Male	264	229.26	25.62	-.003	.10
	Female	97	229.27	24.14		

***p<.05; df =359*

Table8
Education Level-wise Differences in the Learning Habits of Medical Students

Variable		*N*	*M*	*SD*	*t*	*Sig.*
Time Management	Pre-Clinical	170	34.48	6.78	.315	.75
	Clinical	191	34.24	7.77		
Concentration	Pre-Clinical	170	28.21	3.75	.126	.90
	Clinical	191	28.16	3.80		
Information Processing	Pre-Clinical	170	30.13	5.39	-.617	.54
	Clinical	191	30.46	4.99		
Information Discrimination	Pre-Clinical	170	19.88	3.43	1.254	.21
	Clinical	191	19.38	4.10		
Motivation	Pre-Clinical	170	41.34	6.13	-.614	.54
	Clinical	191	41.75	6.46		
Test Taking Anxiety	Pre-Clinical	170	30.85	5.17	-.419	.68
	Clinical	191	31.08	5.16		
Metacognition and Self-Regulation	Pre-Clinical	170	43.38	6.03	-3.146	.00*
	Clinical	191	45.31	5.53		
Total Learning Habit Score	Pre-Clinical	170	228.27	24.16	-.818	.41
	Clinical	191	230.38	24.83		

***p<.05; df =359*

DISCUSSION

The findings regarding the *first objective* of the study indicate that the most commonly used learning habits by medical students were metacognitions and self-regulation (80.5%; Table 3). This might be due to the fact that from the beginning at KSAU-HS, students are exposed to Problem Based Learning (PBL) method where they are expected to take the responsibility of their own learning and use their cognitive and self-regulatory skills to understand and solve the real life health problems. Further, the commonness of other learning habits (Table 3) was as such: concentration (70.5%); motivation (69.2%); information processing (67.3%), information discrimination (65.5%), time management (62.5%) and test-taking anxiety (61.9%). In contrast, the less common learning habits were test-taking anxiety and time management. This implies that the medical students need remedies on subscales of time management and test taking anxiety. Since, findings in our study indicate a positive association between both of these learning habits and academic performance (Table 5). One could argue that some of the habits still need to be addressed in medical education.

Regarding the *second objective* of the study, our findings indicate a significant predictive association between learning habits and academic performance (Table 4). Specifically, motivation, test-taking anxiety, and metacognitions are demonstrated as significant predictors of academic performance (Table 5). These findings are in line with the previous studies. For instance, Ferguson, Jame and Madeley (2002) and Bakar et al. (2010) carried out a meta-analysis on factors associated with success and described motivation as an important factor in all models especially tripartite model in medical students. The same findings were reported by other researchers (Stegers-Jager, Cohen-Schotanus, Themmen, 2012; Elias, Mustaf, Roslan, & Noha , 2011). On contrary, possibly, lack of motivation may develop negativity, anxiety, depression and disturbed mental wellbeing that lead to lower academic performance (Hassanbeigia & Askarib, 2010; Palos, Munteanu, Costea, & Macsinga, 2011) and may be key barriers to lifelong learning (Yousefy, Ghassemi, & Firouznia, 2012).

Further, our findings indicate a predictive association between test taking anxiety and academic performance. The mixed findings are evident in the previous literature regarding the association of test-taking anxiety and academic performance. Some studies have demonstrated the negative influence (e.g., Moadeli, Ghazanfari, 2005; Onyeizugbo, 2010) whereas others have shown no

association between the two (e.g., DordiNejad et al., 2011). These inconsistencies in findings may be attributed to the use of varied samples from different disciplines. For our sample, the findings imply that increase in test anxiety can increase the student's performance. Moreover, in existing literature the importance of metacognition and self-regulation is well documented and supporting our results (Kocak & Boyac, 2010; Winston, Van Der Vleuten, & Scherpbier, 2012). Kocak and Boyac (2010) put forwarded that, self-regulation skills increases ownership of learner over how, when and where to learn by decreasing dependency on tutors. This is the main key feature of metacognition which helps students in academic success. Thus, it can be concluded from the findings of our study that learning habits of the medical students are a crucial factor associated with academic performance.

The findings regarding third objective of the study indicate significant age-wise (Table 6) and education level-wise (Table 8) difference on metacognition and self-regulation whereas insignificant differences on other learning habits are evident. Further, findings indicate gender-wise differences only on information processing whereas insignificant differences on other learning habits are seen (Table 7). There is wide variation in results in other relevant studies. For example Martin and associates (2000) and Ossai (2012) reported that study habits improve with age and female students report better study habits than males. A significant relationship between clinical experience and organized deep-learning styles suggest that knowledge gained from clinical experience is related to learning style. Moreover, female students were found better in time scheduling, concentration, listening, note-taking and Reading. This point may be elaborated that more experience and clinical exposure may lead to better development of learning habits.

Conclusion

From the above study it is concluded that learning habits of motivation, test-taking anxiety, and metacognitions and self-regulations in medical students influences their academic performance. According to age, genders and educational level-wise medical students did not differ on most of the learning habits. The age and education-level wise differences are seen only on metacognition and self-regulation skills whereas gender differences are evident on Information processing. In sum, we need a new conception of teaching and learning by deepening and increasing our understanding of students' individual differences in cognitive characteristics and behavioral strategies. The study is of

vital as it will serve as a baseline and guidance for need assessment of the students that is a basic pillar of learning and outcome. There is a need to formulate training programs in this direction. Remedial programs within the campus are required to establish especially on the areas such as test taking anxiety and time management. This may further help students who are facing repeated failures.

The study has some limitations. This study is conducted on only one University and learning environment of it may differ from other universities. Our study does not account for confounding factors such as teaching strategies, college environment, and family factors and so on. However, some basic facts of study results are applicable to all settings. Institutions can use the findings in developing teaching strategies that shall meet the needs of students

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