Advances in Medical Education and Practice

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Study Habits of Highly Effective Medical Students

Khalid A Bin Abdulrahman
Ahmad M Khalaf
Fahad B Bin Abbas
Omran T Alanazi

Department of Medical Education, College of Medicine, Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia

Background: Study habits have been the most significant indicator of academic performance and play a unique role in students' academic accomplishment. The study is aiming to determine the most common study habits of highly successful medical students and their relation to academic achievement.

Methods: A cross-sectional observational study was conducted from September to December 2019 among medical students of both gender from six medical colleges in Saudi Arabia. The students answered the standardized questionnaires to study the different learning habits among medical students, including learning prioritization, knowledge retention strategies, motivation, daily hours of studying, study learning resources.

Results: Six hundred and seventy-five medical students enrolled themselves electively into the study. The results showed a significant correlation between study habits and students' academic accomplishments. The top ten study habits of highly effective medical students are managing their time effectively, they get rid of interruptions (phone, family, friends) that disrupt their daily work, they use goal-setting to determine their most important activities, their daily study hours is ranging between 3 and 4 hours, they study alone for knowledge retention of medical information, learn from multiple sources and invest in technology with high efficiency, they contribute to the teaching of their peers, they study the main lecture slides with notes when no exam is coming, and they study lecture slides with notes and previous exam questions when preparing for upcoming exams; finally, they maintained motivation for self-gratification and fulfillment of their family dreams.

Conclusion: This study's outcomes consolidate general study practices that can be credited to learning achievement and expand recognition to inspire less accomplished students by investigating and exploring factors that have enhanced and worked for many accomplished students.

Keywords: Saudi Arabia, study habits, medical students, medical education, higher education

Introduction

Every year, tens of thousands of elite high school graduates compete for limited places in Saudi medical schools. There is no doubt that most of those admitted to medical colleges are students who have proven their ability and willingness to adapt to the study of medicine and overcome the challenges of successive exams and long study hours, especially since the medium of instruction in Saudi medical colleges in the English language.[1–3] Although many Saudi medical colleges have developed their curricula, some have even adopted modern curricula and methods in medical education that focus on active learning, problem-based learning, vertical and horizontal integration. It also allows the student to learn and participate in solving community health problems.[4–7] All this to maximize and improve the student's experience and ease the tension and

Correspondence: Khalid A Bin Abdulrahman
Department of Medical Education, College of Medicine, Imam Mohammad Ibn Saud Islamic University (IMSIU), P.O. Box: 7544, Othman Bin Affan Road, Al-Nada, Riyadh, 13317 – 4233, Saudi Arabia
Tel +966 505445384
Email kab@imamu.edu.sa

Received: 9 March 2021
Accepted: 25 May 2021
Published: 8 June 2021

pressures students complain about in the old curricula. Some studies have indicated that successful students in medical schools can define their learning styles and use them in a way that makes them adapt to different circumstances, manage their time effectively, learn from multiple sources, invest in technology with high efficiency, and contribute to the education of their peers.[8–16]

Medical college presents a specific difficult task to undergraduates because of the patent volume and broadness of data students who recently performed scholastically in college are confronted with. They are therefore compelled to devise better approaches to study adequately and advantageously. Deciding on powerful techniques to study in medical school is of utmost significance.[17]

Subsequently, a comprehension of the kinds of study habits that are best in medical school is imperative, as the early realization of the study habits that are associated with progress can assist students in reaching their maximum capability and accomplishing proficiency during the pre-clinical and clinical years, which will help them in the residency selection program.[18,19]

One of the core academic aims has always been the enhancement of student success. Several studies have been conducted to classify factors that affect students' performance and achievement (positive or negative). It is a very complex process defining these variables and the connection between them.[20] It has been observed that participant attributes, behavior, learning environment, and educational activities affect their performance and achievement.[16] It has also been found that there are associations between academic performance and study skills, study habits, research attitudes, and motivation.

A study showed that medical students were significantly affected by academic burnout and engrossed in a literary adaptation. Medical students with significant intellectual flexibility will experience less academic burnout, more engrossment in learning, and better educational performance. Examining academic adaptability and approaches to upgrade such habits may help medical schools improve such skills and commitment.[21] A previous study showed that most medical students prefer to study lecture handouts containing what the teacher says.[15] Moreover, high GPA students enjoy learning more than lower GPA students (85.52–83.80%) and use textbooks more often (12.50–6.66%).[15] Nonetheless, another study on medical students elucidated that internal motivation is an essential stimulus for self-regulation strategies and better academic performance.[22]

This study aims to determine the everyday study habits of highly effective medical students and examine their correlation with their academic achievement.

Materials and Methods

Study Design

This was a cross-sectional institutional-based observational study conducted among medical students at various medical colleges in Saudi Arabia. The study was conducted after approval from the IMSIU IRB committee number 68–2019 dated 17 November 2019.

Participants and Sampling

All medical students of either gender with a high GPA (4 and above out of 5) of the pre-clinical and clinical years were invited by email through the vice-dean of academic affairs of the six medical colleges in Saudi Arabia. Two reminder email messages were sent to enhance the response rate. The data was collected from the responded medical students in the six medical colleges, namely Imam Mohammad Ibn Saud Islamic University (IMSIU), King Abdulaziz University, King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), Qassim University, Alfaisal University, and King Saud University.

Study Questionnaire

The questionnaire was designed to study medical students' learning habits, including time management and study resources. The students were informed about the purpose of the study. Instructions regarding the questionnaires were provided to volunteering students. The confidentiality of information was also ensured. Once students voluntarily signed the informed consent, they were requested to fill the study questionnaires. The questionnaire was adapted from different resources and manuscripts, which made it suitable for our study. The questionnaire was subjected to piloting testing by 25 students; some questions were modified accordingly. All students were emailed to participate and been reminded by emails and via an SMS web link. The Institute Review Board at Imam Mohammad Ibn Saud Islamic University had approved the study and it was according to the declaration of Helsinki.

Measures

The medical students' prioritization was measured employing five indicators. However, the students' overall perceived prioritization was calculated using the first four

items' mean. The multiple response dichotomy analysis was employed to describe the students' preferred methods for memorization.

Statistical Data Analysis

The means and standard deviations were employed to describe the continuous variables, frequency, and percentages for categorical variables. Cronbach's alpha test was used to evaluate the reliability of medical students' measured prioritization indicators. One item among the four indicators (measuring the students' procrastination) was reversed before computing the total prioritization mean score. The SPSS IBM V20 was employed for data analysis, and the statistical significance alpha level was considered at a level of 0.050. Microsoft Excel Program was used for creating figures and depictions.

Results

Six hundred and seventy-five medical students enrolled themselves electively into the study. Table 1 summarizes the demographic characteristics and the daily study hours of medical students who participated in the study. The descriptive analysis of the medical students' perceived indicators of prioritization of studies and activities are shown in Table 2. The students' mean collective prioritization was rated as 3.41/5, SD=0.78 points, denoting that the students prioritized between medium and high on average; if expressed as a percentage, it is 3.41/5 X 100= 68.2% out of hundred percent prioritization ability in general. The commonest used study method was studying alone according to 85.3% of the medical students, followed by group study according to 34% of the medical students, followed by teaching another student according to 26.4% of the medical students, and discussion with the course teacher according to 12% of the medical students Table 3.

The students were also asked to select from a list of all the study methods they used when no exams approached Table 4. More than 83.0% of the medical students used main lecture slides with notes, 76.1% used video software like YouTube and Osmosis.

Medical students were asked to indicate their best methods of studying when they had exams approaching. The most used study method by the students was main lectures according to 92.4% of the students, 74.8% of the student's used previous exam questions, 34.4% used multiple-choice questions (MCQ) exam review books, 17.9% of the students also used self-assessment MCQ tests from the internet, 62.1% of the students used video software like YouTube and Osmosis, 35.7% used reference textbooks, 14.4% of the students used additional relevant medical books. Furthermore, the students were asked to suggest their best sources of motivation for success. The highest motivation according to the medical students was self-gratification and fulfillment of their family dreams, followed by maintaining a high level of educational status according to 62.8% of the students, followed by getting prepared to satisfy the requirements for joining the competitive medical residency program according to 52.9% of the medical students, and recognition of the fact that being a doctor may bring high income according to 43.6% of the medical students. However, 22.6% of the medical students were motivated by the reward of being highly distinctive

Table 1 The Medical Students' Sociodemographic and Academic Characteristics N=675

Variables		Frequency	Percentage
Gender	Female	301	44.6
	Male	374	55.4
Age	18–24	614	91
	25-34	61	9
Marital status	Never married	654	96.9
	Ever married	61	3.1
Place of residency	Student's Dormitory	24	3.6
	Family Privately rented house	619	91.7
		32	4.7
College of medicine	IMSIU	131	19.4
	Alfaisal University	143	21.2
	King Abdulaziz University	110	16.3
	KSAU-HS	108	16
	King Saud University	69	10.2
	Qassim University	114	16.9
Level of education	1st year	150	22.2
	2nd year	121	17.9
	3rd year	118	17.5
	4th year	90	13.3
	5th year	136	20.1
	Internship year	60	8.9
Level of study	Pre-clinical phase (1–3 years)	271	40.1
	Clinical phase (4–6 years)	404	59.9
Academic GPA	<4 out of 5	196	2971
	≥4 out of 5	479	
Daily study hours	Less than 1 hour	56	8.3
	1–2 hours	129	19.1
	3–4 hours	293	43.4
	5–6 hours	133	19.7
	>6	64	9.7

Table 2 The Descriptive Analysis of the Medical Students' Perceived Indicators of Prioritization of Studies and Activities

Variables	Mean	Standard Deviation
I tend to leave things till the eleventh hour.	3.21(1.1)	1.06
I work on the highest priority tasks throughout the day	2.88(0.88)	0.88
I use goal setting to determine my most important activities	3.54(1.17)	1.17
I usually spare a project time -in advance- for most important things	3.44(1.17)	1.17
I get interruptions from (phone, family, friends) that disrupt my daily work	3.72(1.1)	1.09

Table 3 The Medical Student's Used Methods of Knowledge Retention of Medical Information N=675

Variables	Frequency	Percentage
Study alone	575	85.3
Group study (a discussion for knowledge or practice for OSPE/OSCE)	229	24
Teaching other students (peer teaching)	178	26.4
Discussion with teacher	81	12
Watch online medical videos (post-studies)	8	1.2
Discussion with peers	16	2.4
Re-revising and rehearsing	10	1.5

Table 4 The Studying Methods Used by Medical Students When Exams Were Not Expected N=675

Variables	Frequency	Percentage
Main lecture slides with notes	563	83.4
Videos (YouTube, Osmosis, etc. …)	514	76.1
Student's handouts	187	27.7
Additional relevant books	155	23
Teacher handouts	139	20.6
Reference textbooks	311	46.1
Internet sources	27	4
Standardized international review books and question banks (eg, Kaplan)	12	1.8
Others	8	1.2

students. Figure 1 summarizes the top ten study habits of highly effective medical students. Regarding the social status of the students, high GPA students were introverted primarily (66.2%), and the low GPA group was also predominantly introverted (62.2%) (p=0.330). The high GPA students also indicated that they were somewhat satisfied with their social life (44.9%) than 40.8% in the low GPA group. 37.8% of high GPA students were satisfied than 36.7% in the low GPA group (p=0.286).

Discussion

Decent time management strategies and skills improve academic achievement.[10] Students who do not design their time adequately use up all available time to overcome and master the content. In this regard, giving assistance and aid to students in time management should help them utilize their study time more productively and adequately. This measure ought to improve their educational performance.[13] In our study, most participants preferred to study alone (85.3%) as it is the most common method of knowledge retention regardless of their total GPA. Other students also used different medical information retention techniques like peer tutoring (26.4%) and group study (24%). This finding may indicate that most of the students' overall study method is studying alone, which was also the same result obtained in a study that compared male and female medical students' study habits.[15] When there were no exams expected, the majority of participants used the main lecture slides with their notes (83.4%), followed by videos such as YouTube and Osmosis (76.1%) and reference textbooks (46.1%). Similarly, when exams were close, the studying methods

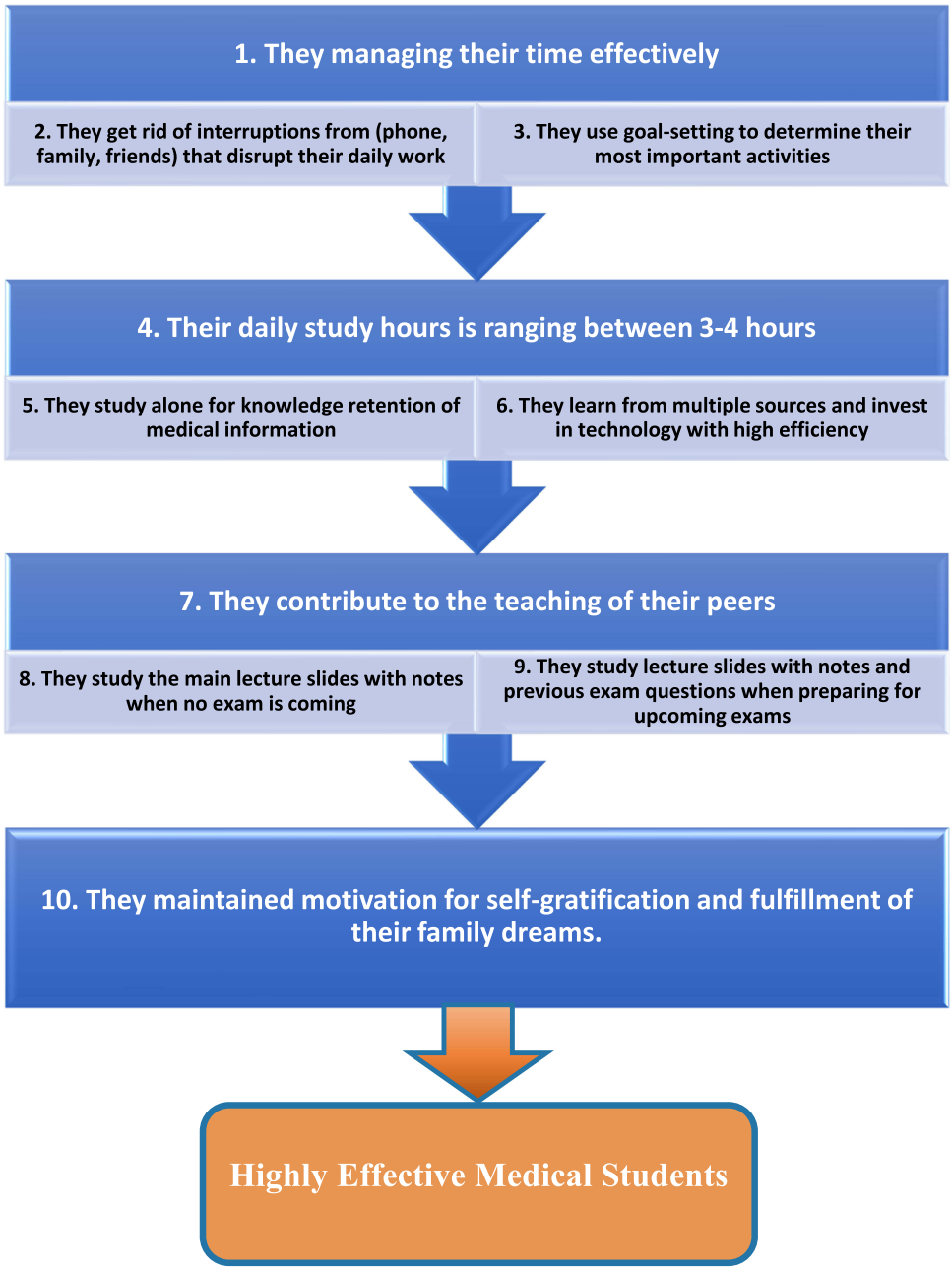

Figure 1 The top ten study habits of highly effective medical students.

did not change drastically. Most of the study members used main lecture slides with their personalized notes (92.4%) and videos (62.1%). Surprisingly, most students utilized previous exam questions as a studying method (74.8%). Homogeneous results have also shown that most medical students prefer to study lecture handouts containing what the teacher says.[15] It is striking that most students rely on lecture slides and student notes in their daily study, especially to prepare for the various exams, and they ignore reading from reference books. Perhaps the explanation for this is that students focus on the sources that revolve around the content of the exams. This is undoubtedly an unhealthy phenomenon that students avoid reading from reference books, and their biggest concern is to get the highest scores on exams only. Here, we advise professors of medical colleges to devise methods and strategies that direct and motivate students to read from reference books and selective medical articles. Most students' concept of motivation was to satisfy themselves and their family (75.4%), other students

opined that their motivation was to maintain a high level of educational status (62.8%), having a good income as doctors (43.6%), and getting rewarded for being one of the top students in the class (22.6%). Students with superior study techniques have more active and dynamic learning styles and are more engaged in educational subjects; they will also have better retaining and memory capacities.[23] Furthermore, high GPA students enjoy studying more than lower GPA students (85.52–83.80%) and use textbooks more often (12.50–6.66%).[15] Regarding the study hours per day, students with higher GPAs studied on average 3–4 hours daily (45.5%) than lower GPA students (38.3%) regardless of whether the exam is close or not, with no statistical difference detected. Another comparable study on 257 medical students showed that 43% of students with high GPA study 10–14 hours close to the final exam, and 50% in the lower GPA group. Furthermore, 47% of female students preferred studying 10–14 hours close to the final assessments compared to 44% of the male group. For study hours not close to the final exam, 75% of students with high GPAs chose to study 1–4 hours daily compared to 65% of the lower GPA group. Also, 64% of female students favored studying 1–4 hours each day compared to 78% (p=0.050).[15] It appears that their students, whether in the high or low GPA group, either male or female, invested only the energy required to meet the least requirements, which implies that they express more surface learning.[24] Although this does not apply to our students due to the increase in study hours. Regarding the social status of the students, high GPA students were introverted primarily (66.2%), and the low GPA group was also predominantly introverted (62.2%) (p=0.330). The high GPA students also indicated that they were somewhat satisfied with their social life (44.9%) than 40.8% in the low GPA group. 37.8% of high GPA students were satisfied than 36.7% in the low GPA group (p=0.286). Another study that was conducted on 640 Latino adolescents to find out if there is any relationship between academic performance and loneliness revealed that just about a fourth of the Latino adolescents struggled to find their ideal position, thus, suffering from chronic or increasing loneliness, which had impending ramifications for their future educational achievement.[25] This study's outcomes consolidate general study practices that can be credited to learning achievement and expand recognition to inspire less accomplished students by investigating and exploring factors that have enhanced and worked for many accomplished students.

Limitations

The current study has a few limitations. For instance, factors investigated here were of potential associations and not intended to imply causation implicitly. Consequently, the investigation report provided here was established on the bivariate comparison (high versus low GPA). Another limitation is that a student may comprehend each question distinctly, and it should be noted that the GPA and other components of the questionnaire were self-reported. It is also crucial to recall that what works for one student may not work for another, so students should also be urged to discover study habits that work efficiently and effectively for them. The habits introduced here are intended to be a guide that might be of aid to students whose current study habits are not working efficiently and effectively.

Conclusion

The top ten study habits of highly effective medical students are; managing their time effectively, they get rid of interruptions from (phone, family, friends) that disrupt their daily work, they use goal-setting to determine their most important activities, their daily study hours is ranging between 3–4 hours, they study alone for knowledge retention of medical information, learn from multiple sources and invest in technology with high efficiency, they contribute to the teaching of their peers, they study the main lecture slides with notes when no exam is coming, and they study lecture slides with notes and previous exam questions when preparing for upcoming exams; finally, they maintained motivation for self-gratification and fulfillment of their family dreams.

Disclosure

The authors reported no conflicts of interest for this work.

References

1. Bin Abdulrahman KA, Saleh F. Steps towards establishing a new medical college in the Kingdom of Saudi Arabia: an insight into medical education in the Kingdom. *BMC Med Educ*. 2015;15(1):85. doi:10.1186/s12909-015-0366-6
2. Al Rumayyan AR, Al Zahrani AA, Hameed TK. High school versus graduate entry in a Saudi medical school – is there any difference in academic performance and professionalism lapses? *BMC Med Educ*. 2016;16(1):16. doi:10.1186/s12909-016-0834-7
3. Kaliyadan F, Thalamkandathil N, Parupalli SR, Amin TT, Balaha MH, Al Bu Ali WH. English language proficiency and academic performance: a study of a medical preparatory year program in Saudi Arabia. *Avicenna J Med*. 2015;5(4):140–144. doi:10.4103/2231-0770.165126

4. Bin Abdulrahman KA, Harden R, Patrício M. Medical education in Saudi Arabia: an exciting journey. *Med Teach*. 2012;34(sup1):S4–5. doi:10.3109/0142159X.2012.660509
5. Bin Abdulrahman KA. The current status of medical education in the Gulf Cooperation Council countries. *Ann Saudi Med*. 2008;28 (2):83–88. doi:10.5144/0256-4947.2008.83
6. Aldayel AA, Alali AO, Altuwaim AA, et al. Problem-based learning: medical students' perception toward their educational environment at Al-Imam Mohammad Ibn Saud Islamic University. *AMEP*. 2019;10:95–104. doi:10.2147/AMEP.S189062
7. Liew S-C, Sidhu J, Barua A. The relationship between learning preferences (styles and approaches) and learning outcomes among pre-clinical undergraduate medical students. *BMC Med Educ*. 2015;15.
8. Shahidi F, Dowlatkhah HR, Avand A, Musavi SR, Mohammadi E. A study on the quality of study skills of newly admitted students of Fasa University of Medical Sciences. *J Adv Med Educ Prof*. 2014;2 (1):45–50.
9. Kleijn WC, van der Ploeg HM, Topman RM. Cognition, study habits, test anxiety, and academic performance. *Psychol Rep*. 1994;75 (3):1219–1226. doi:10.2466/pr0.1994.75.3.1219
10. West C, Sadoski M. Do study strategies predict academic performance in medical school? *Med Edu*. 2011;45(7):696–703. doi:10.1111/j.1365-2923.2011.03929.x
11. Bin Eid A, Almutairi M, Alzahrani A, et al. Examining learning styles with gender comparison among medical students of a Saudi University. *AMEP*. 2021;12:309–318. doi:10.2147/AMEP.S295058
12. Miller CJ. Implementation of a study skills program for entering at-risk medical students. *Adv Physiol Educ*. 2014;38(3):229–234. doi:10.1152/advan.00022.2014
13. Salamonson Y, Everett B, Koch J, Wilson I, Davidson PM. Learning strategies of first-year nursing and medical students: a comparative study. *Int J Nurs Stud*. 2009;46(12):1541–1547. doi:10.1016/j.ijnurstu.2009.05.010
14. Farkas GJ, Mazurek E, Marone JR. Learning style versus time spent studying and career choice: which is associated with success in a combined undergraduate anatomy and physiology course? *Anat Sci Educ*. 2016;9(2):121–131. doi:10.1002/ase.1563
15. Alzahrani SS, Park YS, Tekian A. Study habits and academic achievement among medical students: a comparison between male and female subjects. *Med Teach*. 2018;40(sup1):S1–9. doi:10.1080/0142159X.2018.1464650
16. Credé M, Kuncel NR. Study habits, skills, and attitudes: the third pillar supporting collegiate academic performance. *Perspect Psychol Sci*. 2008;3(6):425–453. doi:10.1111/j.1745-6924.2008.00089.x
17. Liles J, Vuk J, Tariq S. Study habits of medical students: an analysis of which study habits most contribute to success in the preclinical years. *MedEd Publish*. 2018;7:1.
18. Dort JM, Trickey AW, Kallies KJ, Joshi ART, Sidwell RA, Jarman BT. Applicant characteristics associated with selection for ranking at independent surgery residency programs. *J Surg Educ*. 2015;72(6):e123–9. doi:10.1016/j.jsurg.2015.04.021
19. Go PH, Klaassen Z, Chamberlain RS. Residency selection: do the perceptions of U.S. programme directors and applicants match?: the residency selection process. *Med Edu*. 2012;46(5):491–500. doi:10.1111/j.1365-2923.2012.04257.x
20. House JD. The independent effects of student characteristics and instructional activities on achievement: an application of the input-environment-outcome assessment model. *Int J Instr Media*. 2002;29(2):225–240.
21. Xie YJ, Cao DP, Sun T, Yang LB. The effects of academic adaptability on academic burnout, immersion in learning, and academic performance among Chinese medical students: a cross-sectional study. *BMC Med Educ*. 2019;19(1):211. doi:10.1186/s12909-019-1640-9
22. Abdulghani HM, Al-Drees AA, Khalil MS, Ahmad F, Ponnamperuma GG, Amin Z. What factors determine academic achievement in high achieving undergraduate medical students? A qualitative study. *Med Teach*. 2014;36(sup1):S43–8. doi:10.3109/0142159X.2014.886011
23. Mashayekhi F, Rafati S, Mashayekhi M, Rafati F, Mohamadisardoo MR, Yahagh E. The relationship between the study habits and the academic achievement of students in Islamic Azad University of Jiroft Branch. *Int J Current Res Acad Rev*. 2014.
24. Hamm S, Robertson I. Preferences for deep-surface learning: a vocational education case study using a multimedia assessment activity. *Austral J Educ Technol*. 2010;26:7. doi:10.14742/ajet.1027
25. Benner AD. Latino adolescents' loneliness, academic performance, and the buffering nature of friendships. *J Youth Adolescence*. 2011;40 (5):556–567. doi:10.1007/s10964-010-9561-2