JMSR
Journal of Medical and Surgical Research

Research Article

ISSN: 2351-8200

JMSR 2017 Vol. III, N 3: 322- 326

Medical students' study habits and their impact on academic performance

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ABSTRACT

Background: Medical studies represent a particularly stressful experience for many students. and require a great effort of adaptation and a significant investment to be successful. The present study aimed to describe the study habits of medical students in Morocco and the potential impact of these habits and attitudes on their academic performance.
Methods: This is a descriptive and analytical cross-sectional study. 1262 medical students enrolled in five different medical schools. filled-in an anonymous online questionnaire aimed at assessing their attitudes and practices towards their medical studies.
Results: 62% of our participants were women. 31% were enrolled in the faculty of medicine of Oujda, and pursuing their studies in the 2nd cycle for 60% of them. For study habits and attitudes, 7% did not attend classes, 40% didn't organize their study notes and materials, 50% resorted to cramming rather than spaced practice, 51% skipped chapters during revision, and 84% studied alone. For the academic performance, 36% were high performers while 18% were low performers and 46% considered themselves as medium performers. Many independent factors were significantly associated with being low performer, such as skipping chapters during revision for exams, not using the spaced repetition strategy, and lower personal investment ($p < 0.05$).
Conclusion: Success in medical studies is associated with factors related to students' own attitudes and degree of investment in their studies, as well as to factors related to the teaching and assessment strategy specific to each institution. These different factors must be taken into account in any reform aimed at improving performance in medical studies.

Key Words: Medical students, study, impact on academic

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INTRODUCTION

It is widely recognized that medical studies represent a particularly stressful experience for many students around the world [1-2]. These studies require a great effort to face both academical and psychological challenges, encountered throughout the medical training journey [3.4]. Indeed, the level of adaptation and social integration in the university environment can affect the students' chances of success, especially at the early years of their studies [5].

In medical school, most students are able to successfully complete their medical education and graduate, while others experience tremendous difficulty in accomplishing this goal with iterative failures and sometimes even reorientation towards

JMSR
Journal of Medical and Surgical Research
Research Article
ISSN: 2351-8200
JMSR 2017 Vol. III, N 3: 322- 326

other training fields [6-8]. Previous studies have identified several reasons that may explain the academic difficulties encountered by some medical students, such as poor time management, inability to integrate large amounts of information, and failure to implement effective for-exam-revision strategies [9-11].

In Morocco, only brilliant students who have obtained their high school degree (baccalaureate) with the best grades and who passed a very selective entrance exam are admitted to medical schools. However, at the end of each academic year, a significant number of students, representing up to 20% of all students in the class, may be required to retake the year and an even larger proportion may not pass unless they take several resit exams. This situation may seem surprising, especially that it concerns a highly competitive population which was selected based on its great high school performance.

It could be assumed that these "struggling" students lack specific skills that would enable them to succeed. Hence, their academic difficulties would be linked to their study habits and attitudes, both in terms of courses attendance and reviewing for exams.

The present study aimed at describing the different attitudes and study habits of medical students in Morocco and exploring the possible associations between these attitudes and the students' academic performance.

METHODS

Population and setting

This cross-sectional survey was conducted using an anonymous questionnaire distributed online for the duration of 30 days. It targeted medical students from the five oldest and largest medical schools in Morocco located in Rabat, Casablanca, Fez, Marrakech and Oujda, using a snowball sampling strategy. The questionnaire was first distributed in all social media groups dedicated to Moroccan medical students, then these were asked to pass it over to their friends and colleagues from the same institution, using all possible communication means.

Data collection

The questionnaire included questions about personal and academic information (sex, faculty of study, level of study), and usual study habits (class attendance, using supplementary documentation sources, rewriting notes, reviewing lessons alone or within a group of students, using spaced practice or not, skipping major parts of the lessons during revision, memorizing techniques). The students were invited to assess their general academic performance within 3 categories ; High-performance (always passing with good grades), medium performance (mixture of satisfactory and unsatisfactory grades) and low-performance (usually retaking exams and low grades when passing). They were also asked to identify their personal involvement in their studies within 3 categories: high involvement (I am very demanding and perfectionist and I like to have full grades), acceptable involvement (I do the best I can without putting too much pressure on myself) and low involvement (I would rather succeed with the least possible effort).

Analysis

Statistical analyzes were carried out using SPSS 20 software. For the qualitative variables, the percentages are specified. To assess the factors associated with academic performance of medical students, we conducted univariate analyzes with Chi2 tests for qualitative variables, as well as a multivariate analysis using binary logistic regression. The threshold for statistical significance was set at $p<0.05$.

RESULTS

1262 students took part of the study and completed the questionnaire.

General information

836 (66.2%) of our participants were women, 191 (15%) were enrolled in the first cycle of medical studies (preclinical cycle), 751 (60%) were enrolled in the second cycle (clinical cycle), and 320 (25%) in the third cycle (full-time rotations). As shown in figure 1, our participants pursued their medical studies in 5

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ISSN: 2351-8200
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different institutions; with the faculties of medicine of Casablanca and Oujda being the most represented (340 (27%) and 316 (25%) students respectively).

Students' study habits

Table 1 details all explored students' study habits.

Students' academic performance and personal involvement

While 459 participants (36%) identified themselves as high performers, 580 (46%) of them classified themselves as medium performers and 223 (18%) as low performers. As for their personal studies involvement, only 19% of our participants declared being highly involved, while acceptable and low involvement was recognized by 66% and 15% of our participants respectively.

Table 1. Study habits of Moroccan medical students.

Study habits	N (%)
During classes	
Class attendance	
All classes	553 (44%)
Some classes	621 (49%)
No class	88 (7%)
Rewriting/organizing notes	
Yes	753 (60%)
No	509 (40%)
Supplementary sources	
Yes	1174 (93%)
No	88 (7%)
Studying for exams	
Learning strategy	
Spaced practice	527 (42%)
Cramming	753 (58%)
Skipping chapters	
Never	621 (49%)
Yes	641 (51%)
Memorizing technique	
Using one's own words	346 (27%)
Learning by heart	916 (73%)
Revising mode	
Alone	1055 (84%)
With a group	207 (16%)
During exams period	
Revision efficiency	
I revise what I had learnt	922 (73%)
I discover my lessons	340 (27%)

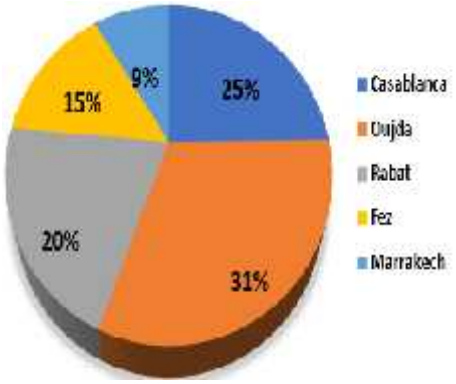

Figure 1. Distribution of participants according to their institution (medical school).

Factors associated with academic performance of medical students

To identify the factors associated with the participants' academic performance, students identified as medium performers (N = 580) were excluded from the univariate and multivariate analysis. Hence, we only compared two categories; high performers and low performers, representing a total number of 682 students.

As illustrated in Table 2, univariate analysis found a significant association between high performers and class attendance ($p<0.001$), reorganization of class notes ($p=0.001$), and using supplementary resources ($p=0.005$). High performing students were also significantly associated with spaced learning strategy ($p<0.001$), memorizing in the student's own words ($p=0.005$), never skipping chapters during revision ($p<0.001$), working alone ($p<0.001$), and being highly involved in one's studies ($p<0.001$).

Multivariate analysis identified five risk factors for low academic performance, namely non-attendance to classes nce ($p=0.001$), non-use of supplementary documents ($p=0.023$), skipping chapter during revisions ($p<0.001$), resorting to cramming as learning strategy ($p=0.001$) and low personal involvement in one's studies ($p<0.001$) (see Table 2).

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ISSN: 2351-8200
JMSR 2017 Vol. III, N 3: 322- 326

Table 2. Factors associated to medical students' academic performance.

	Academic performance					
	Univariate analysis			Multivariate analysis		
Items	**High performers N (%)**	**Low performers N (%)**	**p-value**	**OR**	**CI**	**p-value**
Sex				-	-	-
Women	309 (66.9)	153 (33.1)	0.402			
Men	150 (68.2)	70 (31.8)				
Study level				-	-	-
1st Cycle	94 (71.2)	38 (28.8)				
2nd Cycle	280 (68.5)	129 (31.5)	0.120			
3nd Cycle	85 (60.3)	56 (39.7)				
Class attendance						**0.001**
All classes	267 (81.7)	60 (18.3)		1		
Some classes	80 (50.0)	80 (50.0)	**<0.001**	2.2	[1.1 – 5.9]	0.021
No class	18 (40.0)	27 (60.0)		2.6	[1.4 – 3.3]	0.000
Rewriting/organizing notes				_-	-	-
Yes	305 (71.6)	121 (28.4)	**0.001**			
No	154 (60.2)	102 (39.8)				
Supplementary sources						**0.023**
Yes	436 (68.7)	199 (31.3)	**0.005**	1		
No	23 (48.9)	24 (51.1)		2.5	[1.1 – 5.6]	
Learning strategy						**0.001**
Spaced practice	242 (77.8)	69 (22.2)	**<0.001**	1		
Cramming	217 (58.5)	154 (41.5)		2.0	[1.3 – 3.1]	
Skipping chapters						**<0.001**
Never	293 (82.3)	63 (17.7)	**<0.001**	1		
Yes	166 (50.9)	160 (49.1)		3.3	[2.1 – 5.2]	
Memorizing technique				-	-	-
Using one's own words	314 (64.3)	174 (35.7)	**0.005**			
Learning by heart	145 (74.7)	49 (25.3)				
Revising mode				-	-	-
Alone	400 (70.1)	171 (29.9)	**<0.001**			
With a group	59 (53.2)	52 (46.8)				
During exams period				-	-	-
I revise what I had learnt	371 (74.1)	130 (25.9)	**<0.001**			
I discover my lessons	88 (48.6)	93 (51.4)				
Personal involvement						**<0.001**
High	164 (95.3)	8 (4.7)		1		
Acceptable	273 (66.1)	140 (33.9)	**<0.001**	6.6	[3.0 – 14.3]	0.000
Low	22 (22.7)	75 (77.3)		23.2	[9.0 – 59.0]	0.000

DISCUSSION

The present study results largely confirmed our initial hypothesis, and highlighted the existence of undeniable and statistically significant links between some study habits of medical students and the academic performance of these students, as reflected by their grades in exams. Indeed, univariate and multivariate statistical analyses underlined strongly significant association between performance and class attendance, learning strategies, modes and techniques, skipping chapters, and above all the degree of personal involvement in one's studies. Our participants were female for two-thirds of the population studied, which reflects the current composition of medical students with a clear female majority that has been increasingly marked over the past fifteen years [12]. They were also well distributed between the 3 different cycles of medical studies and represented the five largest public faculties of medicine in Morocco. In contrast with previous studies emphasizing that women generally demonstrate higher academic performance than men [13-14], the gender of our participants did not influence their performance. This could be explained by the fact that our evaluation of academic performance was based on student self-assessment. And it is already established that in the field of science, women generally tend to undermine their own level,

ISSN: 2351-8200
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skill or achievement less [15-16].Our results also highlighted that not attending classes at all, increased the risk of academic difficulty by 2.6-fold compared to attending all classes. Class attendance is not compulsory in Moroccan medical schools. Hence, young students, who may lack necessary hindsight and judgement skills, are free to decide whether to attend or not, with consequences on their academic performance as shown by our results. That said, evidence from the literature was mixed on the issue of "class attendance" and its impact on the academic performance of medical students, with some studies pointing to a link between class absence and academic failure [17-18] and others not finding this link [19-20]. On the other hand, revision strategy plays a fundamental role in academic results. Different learning strategies have largely demonstrated their effectiveness in boosting memory retention capacity, including "spaced practice" [21-22]. Consequently, it appears necessary to introduce a specific course on learning techniques into the medical studies curriculum in order to better prepare medical students to become effective learners. Working alone or in a group can have a significant impact on academic performance. Indeed, group work can boost episodic memory, thanks to the convivial context in which revisions take place [23], especially if the individuals in the study group use the elaboration technique (one person explains the lesson to the others), widely recognized for its very favorable effects on memory capacity [24]. In contrast, working alone may be more effective on concentration with fewer distractions caused by group interactions [25]. In our study, working alone was associated with better academic results in the univariate analysis, but this association was no longer significant when the other factors were incriminated (multivariate analysis). Finally, the intrinsic motivation and the degree of investment of each student in his/her studies represent a major determinant in academic success. Indeed, our results showed that adopting the strategy of " passing exams with the least effort" was associated with a 23-fold increased risk of academic difficulty compared to those who were "very demanding of themselves regarding their studies". Logically, when we invest the most, we succeed the best.

CONCLUSION

Succeeding in medical studies requires the combination of different factors, some of which are directly related to the students themselves, their degree of commitment, their attendance to classes and involvement in revisions, as well as their learning strategies and techniques. However, other factors independent of the students' efforts are also involved in success or failure, such as teaching and assessment methods, which require permanent reassessment by professors and faculty members in order to achieve the highest success rates for their students, and lighten the burden of devastating failure.

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