

COMPARATIVE STUDY OF THE MOTIVATIONAL FACTORS THAT AFFECT THE ACADEMIC PERFORMANCE OF THE STUDENTS OF FACULTY OF MEDICINE, TAIF UNIVERSITY AND EFFECT OF GENDER OF STUDENTS ON THESE FACTORS

Mostafa T. Y. Gabr,^{1,3} Abdel-Hamid A. Serwah,^{*1,2} Waleed S. Mohamed,^{1,3} Mohamed A. Serwah,^{1,2} Abdelrahman Gazy,⁴ Abrar Abdulla Orajah,⁴ Hassan El Shehri,⁴ Sami M. Al Thebiti,⁴ Alsobiai⁴ and Naif Al Zahrani⁴

¹College of Medicine, Taif University, KSA.

²Faculty of Medicine Suez Canal University, Egypt.

³Faculty of Medicine Tanta university, Egypt.

⁴Medical Students College of Medicine, Taif University, KSA.

*Corresponding Author: Abdel-Hamid A. Serwah

College of Medicine, Taif University, KSA.

Article Received on 29/04/2017

Article Revised on 20/05/2017

Article Accepted on 09/06/2017

ABSTRACT

Background and study aims: Despite their recognized intellectual ability and achieved academic pursuits, medical students' academic achievement is influenced by motivation. This study aims to assess the possible role of different motivational factors in the academic performance of medical students and the possible effect of student gender on these factors. **Materials and Methods:** Four hundreds and five medical students, from 2nd to 6th year during the academic year 2016-2017, College of Medicine, Taif University participated in the completion of the motivation questionnaire, comprising 40 items and measuring seven domains of motivation. Data were computer analyzed. **Results:** About 55% and 60% of student agreed that self-efficacy and active learning styles respectively, are motivating factor for better performance. 60% of the students agreed that the curriculum related variables had an effect on their motivation. Administrative and learning environment factors; comfortable learning rooms, available computers and access to library, motivate students in their academic performance. 76% of the respondents accepted that just learning of medicine makes them motivated and inspire them to excellence. Most students agreed that intrinsic motivating factors were inspiring to them while, extrinsic motivation has a little role. **Conclusions:** The value of learning medicine, administration and learning environmental factors, characters of the curriculum according to the requirements of learning objectives were the most motivating factors agreed upon by the students. Extrinsic motivating factors were less to be accepted by students to make them work harder. There was a statistically significant difference between male and female students in few motivating items.

KEYWORDS: Medical Students, Motivation, Gender, Academic Performance, Herman's Questionnaire.

INTRODUCTION

It is believed that human behavior can be directed and empowered by certain processes that may be external or internal. Motivation is an internal process of this kind which is defined as an idea that can explain the common ground between the needs, recognition and excitement (Mohammadi 2009). Students need motivation to fulfill their requirements. It is this sort of motivation that helps them gain enough power to finish their studies successfully (Yousefi et al. 2009). As reported by Pintrich, the general socio-cognitive model of motivation consists of three components: expectancy, which relates to the students' beliefs regarding performing their duties and jobs; value, which concerns the learners' reasons for getting involved in certain learning activities; and

emotion, which involves the students' stress during examinations (Pintrich and Degroot 1990).

As reported by Knowels, adults are internally motivated and self-directed adult learners, and resist learning when they feel others are imposing information, ideas or actions on them. So, the main role of educators is to facilitate a student movement toward more self-directed and responsible learning as well as to foster the student's internal motivation to learn (Knowels 1984). Learner motivation focuses on those factors that affect learners' engagement with the task of learning. From the perspective of the instructor or instructional designer, motivation may be thought of as either stimulating and empowering a learner's intrinsic motivation; or, as providing extrinsic motivators that will energize learner

engagement. In reality, the motivation is the product of a system of influences that are both internal to the learner and externally in the learning environment (Pintrich 2003; Ford 1992).

Pintrich's study of Malaysian undergraduate students showed that while self-efficiency has a positive relationship with academic success, this self-efficiency can be itself the result of the students' achievement motivation (Pintrich 2003). In addition, other studies reveal that there is little or no significant correlation between gender and these factors in students. At the beginning of the 1970s, Hermans tried to devise a reliable test for measuring achievement motivation by determining its different factors. Hermans believed that it was possible to establish these factors based on the subjects' answers to the questions provided in certain questionnaires and also on the basis of other related research. Thus, he argued that the factors involved in achievement motivation include level of desire, perilous behavior, desire for promotion, sense of responsibility, perseverance, ability to predict, cognitive behavior, choice of friends and successful behavior (Costa 2007).

Regarding the effects of motivation on meaningful learning and academic performance, motivation is recognized as an important factor in health science education because it helps students achieving good academic performance, well-being and satisfaction, and also helps them to become better professionals (Hermans 1970). In the case of medical education, these variables are expected to contribute toward students' becoming good doctors. Yet, despite the implicit understanding of motivation's importance, many researchers think that researches that directly studying motivation in medical education is scarce (Mann 1999; Fidishun 2000; Crossley and Mubarik 2002). The writings on this topic in the medical education are scant (Ryan and Deci 2000). Nevertheless, some medical education developments, such as the Problem Based Learning (PBL) model and the integrated curriculum model, have resulted in stimulation of student motivation. In these models, the motivational aspect has been explicitly adopted and is now considered an aspect of those developments (Vidic and Weitlauf 2002).

Banosa and Ali 2000, addressed the relationship between student for learning and factors related to teaching, curriculum and administration. This study was conducted in the college of Medicine, King Faisal University, Dammam, Saudi Arabia (Fidishun 2000). They found some promoting factors as activation of students, revising previous lectures and showing respect to students. The authors also found some inhibiting factors, including content overload, unscheduled quizzes and difficult examinations as well as afternoon lectures (Dornan *et al.* 2006). Motivating the student is one of the most important tasks of instructors. Motivation, is considered as an independent variable, so, being so, it can affect learning and studying behavior, academic

performance, the choice of a specialty in medical education and intention to continue medical studies (Banosa and Ali 2000). There is an evidence in the literature that learning environments play an important role in motivation; however, the dependent variable on motivation is being researched less and more studies are required to be conducted in this field (Brissette and Howes 2010).

It is also recommended to incorporate the concepts in student motivation as an integral part of the foundation of medical curricula, particularly the concept of stimulating intrinsic motivation among medical students (i.e., learning for the sake of learning and patients) rather than extrinsic motivation (i.e., learning to be rewarded with good grades, honors, success, or money). Intrinsic motivation has been shown to lead to better learning, performance, and well-being among medical students (Kusurkar 2011). In light of how important the role of motivation in education, unfortunately, the publication on motivation in medical education is relatively poor (Crossley and Mubarik 2002). This may be partially explained by the fact that in medical education different terminology is often used to address components of motivation. However, there is still significant room for improvement, and great potential for future research.

MATERIALS AND METHODS

The study sample of this descriptive, analytical, cross-sectional study included students from 2nd to 6th years. This study was conducted in Medical School at Taif University (TU) in Saudi Arabia. TU Medical School has both vertically and horizontally fully integrated curriculum as the system to teach medicine. TU Medical School has followed a hybrid curriculum (Problem Based Learning (PBL) and interactive teaching methods in small group discussions). The last two and half year curricula consisted of clinical clerkship. For clinical rotations, students are exposed to a variety of specialties in tertiary care settings.

In this cross-sectional correlation study, 405 medical students were given a questionnaire to assess factors affecting their motivation to improve their academic performance. Each question in the questionnaire is generating a closed response. The students fulfilling the following set out criteria were enrolled in the study: 1. Informed consent from the medical school students for participating in the study. 2. From second to six year students of any age and gender. 3. Supervised questionnaire administration by the co-investigators and leaders 4. Completely filled sheet regarding demographic information. First, the study objectives were explained to the students. Informed consent was taken and full confidentiality was assured to the participants. They were made to fill out a pretested questionnaire which included 40 items distributed into 7 domains in line with the study objective to assess students motivation concerning medical education The questions in our questionnaire were carefully derived from other similar

questionnaires (Hermans 1970) after necessary modifications to be suitable for our situation and aims of the study.

In addition to the socio-demographic characteristics (age, study year, and gender), the questionnaire consisted of 40 items distributed on 6 sections: The following domain variables were assessed: self-efficacy, active learning strategies, Characters of the curriculum according to the requirements of learning objectives, administrative and learning environmental factors, value of medicine learning, intrinsic and extrinsic motivating factors. The questionnaire was written in the English and translated into Arabic with a 5-point Likert response scale ranging from one (strongly disagree) to five (strongly agree). The 5-point scale was later transformed during data analysis to a 3-point response scale ranging from A (disagree) to C (agree), with B corresponding to "neutral or uncertain". Participating students were advised to read each item carefully before responding. Help was given to students from the research team on demands.

The questionnaire was validated and pretested prior to data collection. It was administered in a private setting with guidance. This questionnaire's validity was checked using Cronbach's α estimate. It was validated by 2 psychologists and 2 experts in medical education. Reliability of the questionnaire was 0.77. . The overall internal consistency (alpha) of various component scales in the curriculum was 0.76 with a range of alpha 0.72-0.81 in various domains. So, this instrument used is both valid and reliable. A Pilot study was done to pretest the survey on 30 medical students. The pretest resulted in minor modifications to the questionnaire. The pretest responses were discarded, and the pretest participants were resurveyed with the rest of the medical student population.

Ethical Considerations

Approvals from Medical Ethics Review Boards of the college of Medicine and Al Taif University were taken. The names of students chosen to answer the questionnaire were kept anonymous All data were kept confidential. Students unwilling to participate and the incomplete questionnaires were excluded from the study. We ensured alignment with the rules of the Helsinki declaration by obtaining oral informed consent, voluntary participation, guarantee of confidentiality and freedom to withdraw from the study at any point in time without any explanation. Mentioning the confidentiality of the participant's personal information, students' average scores for the study years was used as the criteria for academic achievement.

Statistical Analysis

Data were collected and introduced into excel program. Data were statistically analyzed using SPSS package release 18 (SPSS Inc., Chicago, IL) used in Windows 8. Data were presented as tables. Percentages, means, and standard deviations were calculated for qualitative and

quantitative data. Chi-square test (X²) and Fisher's exact test were performed to statistically analyze qualitative data. Other tests were computed whenever indicated. Non-parametric tests were used when appropriate. A 2-tailed P value < 0.05 was considered to denote statistical significance.

RESULTS

There was a general agreement among students in their responses to a majority of items in the questionnaires. Table 1 shows the baseline characteristics of the participants. A total of 492 male and female student's (2nd - 6th year medical students) were asked to participate in the study. Only 82.4% out of 492 students consented to be included in the study based on the inclusion criteria. The male to female ratio in our study was 2.04:1 reflecting approximately the gender composition at the college of Medicine, Taif University. Participants aged around 22+2.8 years between 18 and 25 years. Two hundred seventy two students (67.16 %) were males whilst the remaining 133 students (30 %) were females with no significant statistical difference between both groups. The data regard the students' level is presented in table 1.

From table 2, it was observed that about 55% of student respondents agreed that self –efficacy is a motivating factor for better performance. Looking forward to medical science lessons was motivator as reported by about two thirds of the respondent students. Table 3 showed that about 60% of respondent students agree that active learning style and allowing students to take an active role in using a variety of strategies to construct new knowledge bases on their previous understanding are motivating factor. Giving clinical information in the basic science materials, using many audiovisual aids in learning and quality of teachers regarding showing respect for students and motivating them were agreed upon as motivators by three quarters of the respondent student. While other items within this domain, such as giving many lectures in the course, using some Arabic phrase and giving questions in the seminars and SGD were agreed upon by less than 50% of the students.

Table 4 showed that about 60% of the responding students agree that the curriculum related variables had an effect on motivation of medical students. Clarity of learning objectives, adequate references and suitability of learning methods for learning objectives and students' needs are agreed upon by about three quarters of students. About two thirds of students as shown in table 5 agreed that administrative and learning environment factors; comfortable learning rooms, available computers and access to library motivate students in their academic performance. Table 6 showed that 76% of the respondents accepted that just learning of medicine make them motivated and inspire them to excellence while 11% of the respondents disagreed with this opinion.

Intrinsic motivating factors as inspiring to medical students are demonstrated in table 7. Only 53% of the respondents agreed with the hypothesis that intrinsic motivation inspires students to improve their academic performance. However, about one quarter of the respondents disagreed with this view. In addition, 85% of the respondents accepted that patient care and opportunities for help people motivate students to work harder in academic work. Table 8 showed that extrinsic motivation has a little role in inspiring medical students to exert more efforts in academic work. Only one third of respondents agreed with that assumption. In addition, 45% of the respondents disagreed with this opinion. However, 62% of the respondents accepted that parental encouragement motivated them to work hard. The data of the current work suggest that there is a positive relationship between motivation and students' academic performance. From table 9, it was observed that about 60% of the respondents agreed that motivation of students improve their academic performance. While only one fifth of students in this study disagreed with this view and additional one fifth of respondents were neutral in this regard. The most inspiring issues are the values of

learning medicine followed by learning environmental factors and character of the curriculum in relation to the needs of students and to the requirements of learning objectives.

Table 1: Demographic data of studied students.

Profile of participants	
Age (mean + SD)	(22 + 2.80)
Gender No (%)	
Male	272 (67.16)
Female	133 (29.88)
Nationality (Saudi) , No (%)	405 (100)
Study Year No (%)	
2 nd year	71 (17.53)
3 rd Year	92 (22.72)
4 th Year	63 (15.56)
5 th Year	62 (15.31)
6 th Year	117 929.000
Social Status No (%)	
Single	398 (98.27)
Married	07 (1.73)

Table 2: Self-efficacy, Students believe in their own ability to perform well in medical science.

Items of domain 1	Disagree No (%)	Natural No (%)	Agree No (%)
I look forward to medical science lessons	60 (14.81)	83 (20.49)	262 (64.69)
Medical science is one of the most interesting college subjects.	115 (28.39)	125 (30.86)	164 (40.74)
The materials covered in medical science lessons are interesting.	81 (20)	84 (20.74)	239 (59.01)
Average domain I	85 (21.06)	97 (24.03)	223 (54.82)

Table 3: Active learning strategies, Students take an active role in using a variety of strategies to construct new knowledge based on their previous understanding.

Items of domain 2	Disagree No (%)	Natural No (%)	Agree No (%)
Giving questions in seminars, tutorials and SGDs	121 (29.87)	82 (20.42)	203 (50.12)
Giving many lectures in the topic/ course	142 (35.06)	133 (32.83)	130 (32.09)
Giving clinical information in the basic science materials/topics	52 (12.83)	53 (13.08)	301 (74.32)
Using some Arabic phrases and statements	105 (25.92)	115 (28.39)	185 (45.67)
Using many audiovisual aids in teaching	37 (9.13)	65 (16.04)	302 (74.56)
Quality of teachers' behaviors (showing respect for students, praising motivated students/blaming lazy (inactive) students	44 (10.86)	49 (12.09)	309 (76.29)
Average domain II	84 (20.61)	83 (20.47)	238 (58.84)

Table 4: Characters of the curriculum according to the requirements of learning objectives.

Items of domain 3	Disagree No (%)	Natural No (%)	Agree No (%)
Clarity of learning objectives provided in the curriculum	29 (7.16)	51 (12.59)	325 (80.24)
Good references (easy, available, suitable for learning objectives)	33 (8.14)	60 (14.81)	312 (70.03)
Suitability of learning methods for the learning objectives and students' needs	44 (10.86)	91 (22.46)	268 (70.61)
Informative assessments and feedbacks	127 (31.35)	100 (24.69)	178 (43.95)
Quality of the exams: difficulty and link to the learning objective	123 (30.73)	101 (24.93)	181 (44.69)
Average domain III	89 (17.65)	80.6 (21.70)	252.8 (61.9)

Table 5: Administrative and learning environmental factors.

Items of domain 4	Disagree No (%)	Natural No (%)	Agree No (%)
Taking and giving weight of attendance during learning activities	92 (22.71)	89 (21.97)	225 (55.55)
Good relationship between departments and students	52 (12.83)	76 (18.76)	276 (68.14)
Comfortable learning environments (lecture rooms, SGD rooms, available computers and audiovisuals, access to library)	53 (13.08)	42 (10.37)	310 (76.54)
Average domain IV	66 (16.20)	69 (17.03)	270 (66.74)

Table 6: Value of Medicine learning.

Items of domain 5	Disagree No (%)	Natural No (%)	Agree No (%)
Learning of Medicine let me acquire problem-solving competency	51 (12.59)	55 (13.85)	298 (73.58)
Learning of Medicine let me acquire stimulate my own overall and critical thinking	35 (8.64)	72 (17.17)	298 (73.58)
Learning of Medicine let me acquire experience the inquiry (question) activity	45 (11.11)	34 (8.39)	325 (80.24)
Learning of Medicine increases my competence and achievement	43 (10.61)	52 (12.83)	309 (76.29)
Average domain V	44 (10.73)	53 (13.06)	307 (75.92)

Table 7: Intrinsic Motivating Factors.

Items of domain 6	Disagree No (%)	Natural No (%)	Agree No (%)
I would be prepared to retake my final high school exams to get higher marks if this would be necessary to study Medicine.	205 (50.61)	71 (17.53)	126 (31.11)
I wouldn't consider any other profession than becoming a doctor	107 (26.41)	79 (19.50)	214 (52.83)
I would still choose medicine even if that meant I would never be able to go on holidays with my friends anymore or I could hardly maintain my social life.	94 (23.20)	103 (25.43)	205 (50.61)
Patient care and working with people: opportunities for help people, interesting with other people	16 (3.95)	40 (9.87)	346 (85.43)
I would still choose medicine even if that would mean studying in a foreign country using a very difficult language	72 (17.77)	100 (24.69)	231 (57.03)
This type of learning allows me to use personal skills: manual and mental skills	35 (8.64)	77 (19.01)	289 (71.35)
I intend to become a doctor even though that would mean taking CME (continuous medical education) courses two evenings a week throughout my professional career	71 (17.53)	99 (24.44)	232 (57.28)
General interest in science, opportunity to perform research work, science based education, evidence based decisions	40 (9.87)	104 (25.67)	257 (63.45)
My goals in science learning are to compete with other students	210 (51.85)	90 (22.22)	103 (25.43)
Performance goals: Winning is important to me	169 (41.72)	100 (24.69)	132 (32.59)
Average domain VI	102 (25.15)	87(21.40)	216 (52.91)

Table 8: Extrinsic Motivating Factors.

Items of domain 7	Disagree No (%)	Neutral No (%)	Agree No (%)
Teachers/doctors provide me with feedback	133 (32.83)	110 (27.16)	160 (39.50)
Medical education allows for professional independence	115 (28.39)	80 (19.75)	207 (51.11)
Teachers went through the procedure with me before I had to perform it by myself	126 (31.11)	165 (40.74)	111 (27.40)
There is an informal relationship between students and teachers	117 (28.9)	154(38.02)	130 (32.09)
My parental encouragement motivated me to study medicine	64 (15.80)	87 (21.48)	250 (61.72)
I would not have chosen Medicine if it would have caused me to have substantial financial problems during studying years	324 (80)	56 (13.82)	23 (5.67)
I would stop studying Medicine if I started scoring low marks and failing tests often.	291 (71.85)	53 (13.08)	58 (14.32)

I would quit studying as soon as it became apparent that there were no jobs or resident positions after graduation	221 (54.56)	78 (19.25)	104 (25.67)
I would quit studying medicine if I were certain that I could never become the specialist of my choice ¹ .	254 (62.71)	69 (17.03)	77 (19.01)
Average domain VII	183 (45.12)	94 (23.37)	128 (31.60)

Table 9: Overall motivation of all studied students regarding the seven disciplines.

All Domains	Disagree	Natural	Agree
Self-efficacy. Students believe in their own ability to perform well in medical science	85 (21.06)	97 (24.03)	223 (54.82)
Active learning strategies. Students take an active role in using a variety of strategies to construct new knowledge based on their previous understanding.	84 (20.61)	83 (20.47)	238 (58.84)
Characters of the curriculum according to the requirements of learning objectives	71 (17.64)	81 (19.89)	253 (61.90)
Administrative and learning environmental factors (Issues)	66 (16.20)	69 (17.03)	270 (66.74)
Medicine learning value.	44 (10.73)	53 (13.06)	307 (75.92)
Intrinsic Motivating Factors	102 (25.15)	87(21.40)	216 (52.91)
Extrinsic Motivating Factors	183 (45.12)	94 (23.37)	128 (31.60)
Total			

Table 10: Overall motivation of male and female students regarding the seven disciplines.

All Domains	Male (284)	Female (121)	Total (405)	P
Self-efficacy. Students believe in their own ability to perform well in medical science	149 (52.4)	74 (61.20)	223(55.82)	NS
Active learning strategies. Students take an active role in using a variety of strategies to construct new knowledge based on their previous understanding.	159 (56)	79(65.3)	238(58.80)	NS
Characters of the curriculum according to the requirements of learning objectives	174(61.3)	79 (65.3)	253(62.5)	NS
Administrative and learning environmental factors (Issues)	187 (65.8)	83 (69.00)	270(66.7)	NS
Medicine learning value.	201 (72.4)	106 (87.6)	307(75.8)	<0.05
Intrinsic Motivating Factors	134 (47.1)	82 (67.8)	216 (53.3)	<0.05
Extrinsic Motivating Factors	86 (30.3)	42 (34.7)	128(31.6)	<0.05
Average	141.3 (46.1)	78 (64.50)	239 (59.1)	

DISCUSSION

The response rate in our study is relatively high similar to that of studies conducted by many researchers (Sobral 2004). Female students were also represented in this study, so this study was conducted on both male and female sections of the College of Medicine, Taif University. The male to female ratio in our study was 2.04:1. The present study failed to find a significant relationship between gender and all motivation. However, female students were inspired more by value of medicine learning in addition to intrinsic and extrinsic motivating factors which is in line with other studies (Yousef et al. 2012). From table 2, it was observed that 55% of respondents agreed that self –efficacy is a motivating factor for better performance. Looking forward to medical science lessons was motivator as reported by about two thirds of the respondent students. According to one study, there are three general types of motivational beliefs in self-directed learning. First is self-efficacy, which includes self-assessment of an individual for a particular task. Students who believe in

themselves are better able to utilize self-regulated learning (Pintrich 1999).

It was shown in the present study that more than half of the students were overall inspired with many educational curriculum characters, active learning strategies; learning environment in addition to other different intrinsic and extrinsic issues Overall, motivation was more or less similar for both males and females with no statistical significance. This finding is in line with other studies (Ali J and McInerney 2009). Pintrich et al., demonstrated that students with high academic success are often self-regulated learners; that is, these students, compared to students with low academic success, set their learning goals more carefully and assess their achievement more regularly (Pintrich and Schunk 2002). Also, as Hirsch et al showed, contemplation of future basic needs and making provision for satisfying them highly increases the students' motivation for more activities (Hirsh 2001).

Given the importance of academic motivation for academic achievement, the present study, trying to fill

the current research gap, was designed to reveal the possible relationship between academic motivation and achievement. High total motivation scores reflected the students' quite high motivation and the task component appeared to gain the highest of the scores. This finding is in accordance with those of other studies (Askari 2006). The present study showed that there was also a relationship between motivation components and academic achievement, which was, to some extent, in accordance with other studies indicating a significant relationship between academic achievement and respect, power, praise, ability, competition, social status, goals, interest in education, and satisfying others (Mahler *et al.* 2011; Christiana 2009). Our data support the assumptions in the literature that motivation depends upon circumstances, goals, objectives and application of novel and advanced techniques (McInerney 2001). In our study, comfortable learning atmosphere using well equipped learning rooms with available audiovisuals and adequate library was agreed upon by 67% of respondents as inspiring factors. Inspiring of students may also be enhanced by comfortable learning environments with the availability of computers, adequate library with suitable books and audiovisuals to facilitate proper discussion. This finding is compatible with that of others (Christiana 2009; Rust *et al.* 2003).

CONCLUSIONS

The findings showed an average or below academic motivation for medical students, and there was a statistically significant difference between male and female students in few motivating items. The value of learning medicine, administrative and learning environmental factors, characters of the curriculum according to the requirements of learning objectives were the most motivating factors agreed upon by students. Extrinsic motivating factors were less to be accepted by students to make them work hard for excellence.

RECOMMENDATIONS

Based on the results of this study, the following recommendations are offered: Given the low academic motivation of undergraduate medical students, it is necessary for the university authorities to pay more attention to the factors associated with academic motivation to improve the academic performance of the students because this will reflect itself on the patient care in the future. Further studies are suggested to investigate the factors affecting achievement motivation in order to find appropriate ways to promote it. Students should also be conscientious and empowered to realise that no matter what anybody does to motivate them, they play the most important role of motivating themselves.

Strengths and limitations of the study

This study focuses on the motivating factors among medical students, unlike most studies, which focus on medical doctors and specialists. One of the limitations of our study was that the sample was not homogeneous.

Students from 2nd through six year MBBS were included, who can have different opinions due to variable experience with the variable included in this study. Some of the students could not differentiate between the factors enhancing motivation and what they wanted (due to personal likes). Students of senior classes came up with richer ideas compared to juniors. Generalizations based upon the results of this study were limited, as the student sample represented only medical students at one college in Saudi Arabia and may not represent the total population of the whole country.

ACKNOWLEDGEMENTS

The authors would like to acknowledge all students participated in this study and those shared in data collection and statistical analysis of these data; Medical students; college of medicine, Taif University; Omar Alghamdy, Turk S Almalky, Afanan A Jawad. A special thanks to Dr. Mohammad W Khan for his effort in data entry and analysis,

COMPETING INTERESTS

The authors declare that they have no competing interests.

FINANCIAL SUPPORT

This study was supported by the Taif University, KSA.

REFERENCES

1. Ali, J., and McInerney, D. M. An analysis of the predictive validity of the inventory of school motivation (ISM). In AARE 2005 International Educational Conference, 2005.
2. Askari, J. Assessment of risk factors of motivational deficiencies in university students from their viewpoints. Iranian journal of psychiatry and clinical psychology, 2006; 11(4): 455-462.
3. Bamosa, A. O., and Ali, B. A. Factors affecting student motivation: perception of pre-clinical students in the College of Medicine, King Faisal University, Dammam, Saudi Arabia. Journal of family and community medicine, 2000; 7(1): 55-61.
4. Brissette, A., and Howes, D. Motivation in medical education: A systematic review, 2010.
5. Christiana, O. Influence of motivation on students' academic performance. The social sciences, 2009; 4(1): 30-36.
6. Costa, M. L., Van Rensburg, L., and Rushton, N. Does teaching style matter? A randomised trial of group discussion versus lectures in orthopaedic undergraduate teaching. Medical education, 2007; 41(2), 214-217.
7. Crossley, M. L., and Mubarik, A. A comparative investigation of dental and medical student's motivation towards career choice. British dental journal, 2002; 193(8): 471-473.
8. Dornan, T., Littlewood, S., Margolis, S. A., Scherpbier, A. J. J. A., Spencer, J., and Ypinazar, V.

- How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Medical teacher*, 2006; 28(1): 3-18.
9. Fidishun, D. Andragogy and technology: Integrating adult learning theory as we teach with technology. In Proceedings of the 2000 Mid-South Instructional Technology Conference, April, 2000.
 10. Ford, M. E. *Motivating humans: Goals, emotions, and personal agency beliefs*. Sage, 1992.
 11. Hermans, H. J. A questionnaire measure of achievement motivation. *Journal of Applied Psychology*, 1970; 54(4): 353.
 12. Hirsch, G. *Helping college students succeed: A model for effective intervention*. Routledge, 2013; 85-88.
 13. Knowles, M. *Applying modern principles of adult learning*, 1984.
 14. Kusurkar, R. A., Ten Cate, T. J., Van Asperen, M., and Croiset, G. Motivation as an independent and a dependent variable in medical education: a review of the literature. *Medical teacher*, 2011; 33(5): e242-e262.
 15. Mahler, S. A., Wolcott, C. J., Swoboda, T. K., Wang, H., and Arnold, T. C. Techniques for teaching electrocardiogram interpretation: self-directed learning is less effective than a workshop or lecture. *Medical education*, 2011; 45(4): 347-353.
 16. Mann, K. V. Motivation in medical education: how theory can inform our practice. *Academic Medicine*, 1999; 74(3): 237-239.
 17. McInerney, D. M., Yeung, A. S., and McInerney, V. Cross-cultural validation of the Inventory of School Motivation (ISM): Motivation Orientations of Navajo and Anglo students. *Journal of Applied Measurement*, 2000; 2(2): 135-153.
 18. Mohammadi, Y. S. Motivation and emotion, Rio john marshal, 4th edition, Virayesh Publication, 1st chapter, 2009; 15-21.
 19. Pintrich, P. R., and De Groot, E. V. Motivational and self-regulated learning components of classroom academic performance. *Journal of educational psychology*, 1990; 82(1): 33.
 20. Pintrich, P. R., and Schunk, D. H. *Motivation in education: Theory, research, and applications*. 2nd edition, Upper Saddle River, NJ: Pearson Education. Chap 2. 2002; 145-60.
 21. Pintrich, P. R. A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of educational Psychology*, 2003; 95(4): 667.
 22. Pintrich, P. R. The role of motivation in promoting and sustaining self-regulated learning. *International journal of educational research*, 1999; 31(6): 459-470.
 23. Rust, C., Price, M., and O'donovan, B. Improving students' learning by developing their understanding of assessment criteria and processes. *Assessment and Evaluation in Higher Education*, 2003; 28(2): 147-164.
 24. Ryan, R. M., and Deci, E. L. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 2000; 55(1): 68.
 25. Sobral, D. T. What kind of motivation drives medical students' learning quests?. *Medical education*, 2004; 38(9): 950-957.
 26. Vidic, B., and Weitlauf, H. M. Horizontal and vertical integration of academic disciplines in the medical school curriculum. *Clinical Anatomy*, 2002; 15(3): 233-235.
 27. Yousefy, A., Ghassemi, G., and Firouznia, S. Motivation and academic achievement in medical students. *Journal of education and health promotion*, 2012; 1(1): 4.
 28. Yousefi, A. R., Ghasemi, G. R., Firouznia, S. Relationship between progress, motivation and academic achievement in medical students Isfahan, *Iranian Journal of Medical education*, 2009; 9(1): 79-85.