

Research Article

Tutors: The Valuable Resource to Enhance Medical Students' Motivation

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Abstract

Background: Students' academic performance is largely affected by their motivation. Moreover, health professions' education needs motivated students who are keen to tolerate the burden of clinical work along with the academic excellence to graduate competently. This study assessed the effect of tutors on students' motivation.

Method: A cross-sectional, institution-based study of the first-year medical students at University of Khartoum, Sudan was conducted. A self-administered questionnaire was used comprising a modified Motivated Strategies for Learning Questionnaire (MSLQ) with students' evaluation of their tutors after semester one community medicine course. A total of 237 out of 324 students responded. Pearson product-moment correlation coefficient was used to test the relationship between motivation and evaluation. Hierarchical multiple regression model tested the ability of evaluation factors to predict motivation score. **Results:** There was a significant association between tutor's characteristics regarding creativity in conducting the sessions, igniting discussion, and adequacy of knowledge about the course contents and the motivation score (p -value = 0.001). There was a strong, positive correlation between the perceived evaluation score and perceived motivation score ($r = 0.505$, $n = 206$, $p < 0.0005$). After controlling age, gender, paternal educational levels, and scores of Sudanese certificate upon entry, R squared change = 0.28, F change (9.181) = 8.416, $p < 0.001$. In the final model, the content of the course was statistically significant, standardized Beta = 0.285, indicating that content uniquely explains 5.7% of the variance in total perceived motivation score. **Conclusion:** The evaluation score explained 28% of the variance in student motivation. Students' motivation is significantly associated with tutor's teaching skills concerning knowledge, creativity, students' involvement, and attractiveness in conducting the tutorials. Improving course content can enhance students' motivation toward community medicine.

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1. Introduction

Tutors vary essentially from teachers who lead lecture-based teaching session, as they teach students how to learn and hence prepare them for life-long learning [1]. The effectiveness of tutors in terms of their inherent interest in teaching, subject-matter expertise, and clear communication with student is well-known to enhance a medical student's achievements [2]. There has been trends of research on tutors, which has included their effect on students' achievement, process variables, and the relationship between tutors' characteristics and differential contextual circumstances [3]. Nevertheless, none of the studies have addressed their role in students' motivation.

Motivation has several theoretical perspectives that focus on the basis of the level of motivation, except for the Self-Determination Theory (SDT) that focuses on the quality of motivation [4]. The SDT emphasizes on the fact that different attributes of motivation in a spectrum has different educational outcomes, which are bounded at one end by intrinsic motivation and by extrinsic motivation at the other, regardless of the motivation level [5, 6].

In recent years, there has been an increase in interest and research into student motivation in medical education, after the light has been shed to the enhancing effect of intrinsic motivation on student learning [7, 8]. The academic performance of medical students is seriously affected by their motivation [9], motivated students can achieve mastery of their field and be academically accomplished [10]. Motivation plays a crucial role among medical students, given the different learning settings; from didactic lecture halls to bedside sessions, and the great demand of study and practice on students [9]. Motivation is also affected by several factors, some studies have highlighted the effect of parent support, teacher support, problem-based learning curriculum, and types of assessment [11–13].

This study addressed motivation as a dependent variable. It aimed at identifying the effect of tutors on student motivation during the community medicine course among the first-year medical students.

2. Methods

2.1. Study area

This was a descriptive cross-sectional, institution-based study among the first-year medical students at the Faculty of Medicine, University of Khartoum, Sudan.

This faculty is located in Khartoum city (the capital of the country, Sudan). It is the oldest, and number one-ranked medical school in the country. The school admits almost a class of more than 300 students each year. It offers the student upon graduation the bachelor of medicine and bachelor of surgery (MBBS). It has its tertiary hospital, many clinics, and health facilities. The school's curriculum was updated in the last five years. Community medicine became a longitudinal course after this update, which is now spread throughout different study years.

2.2. Study population

First-year medical students at the Faculty of Medicine, University of Khartoum, were targeted in this study. Data were collected immediately after the students finished their first semester. The class size was 324, and the authors covered them completely. Informed consent was taken before enrollment in the study. Both male and female students were included. The students' community is highly diverse, with many of them coming from different parts of the country with different backgrounds. The common thing between them is that they are all the top students in the country in their high school certification exam.

2.3. Data management and statistical analysis

Data were collected through a self-administrated semi-structured questionnaire that consisted of three sections; the first contained the demographic data, parents' educational levels, reading hours per week and the secondary school certificate score. The second section was a pretested modified version of Motivated Strategies for Learning Questionnaire (MSLQ) that was used to measure students' motivation [14], with internal consistency (Cronbach alpha = 0.699), it was constructed with nine questions for both intrinsic and extrinsic motivation, in a form of 7-point Likert's scale (1 = not at all true of me, 7 = very true of me). The motivation Likert's scale points were cumulatively summed to generate the motivation score out of maximum 63 points and then converted into percentages. The motivation score has been furthermore categorized as follows: less than 25% (no motivation), 25-75% (moderate motivation), and more than 75% (high motivation).

The questionnaire assessed motivational beliefs including self-efficacy, an individual's belief in his/her ability for success, and intrinsic value, the degree to which one studies material for the purpose of mastery [15, 16], it also measures the evaluation

score. The evaluation score was the sum of students' ratings for their tutor's knowledge, caring about discussion, and creativity and attractiveness in tutorials in addition to the content of the course and venue (on the 7-point Likert's scale), adopted from the department of community medicine students' feedback questionnaire.

Data were managed through Social Package of Social Sciences (SPSS), version 25, the associations between variable were tested using one-way Analysis of Variants test (ANOVA), the relationship between perceived evaluation score, perceived motivation was investigated using Pearson product-moment correlation coefficient, and Hierarchical multiple regression was used to assess the ability of nine evaluation factors to predict levels of motivation.

3. Results

Out of 237 students, females represented 73.2% of it. The mean age of the respondents \pm SD was 19 ± 0.75 years. Their mean score of the secondary school certificate was 93.1% ($n = 213$).

Regarding the educational level of parents, 61.1% of students' mothers were educated to university level and more, 31.2% educated to the secondary school level, 3.8% to primary schools, and only 1.3% were illiterate. Regarding fathers, 74.3% of students' fathers were educated to university level and more, 19.8% educated to secondary school level, and only one student's father (0.4%) was illiterate (Table 1). There is a significant association between the fathers' educational level and Motivation score 0.006, but not of the mothers' educational level ($p = 0.50$).

TABLE 1: Educational level of first-year medical students' parents at the University of Khartoum ($n = 237$).

Educational Level	Mother	Father
Illiterate	1.3%	0.4%
Khalwa	2.1%	1.3%
Primary	3.8%	4.2%
Secondary	31.4%	19.8%
University and above	61.4%	74.3%

Only 6% of students were highly motivated, 56.7% of students were moderately motivated with more internal motivation, 34.6% were moderately motivated with more external motivation, and 2.7% were amotivated (Figure 1).

The mean score of students' satisfaction with their tutors' ability to conduct a creative and attractive tutorial \pm SD was 4.28 ± 2.38 out of 7, for their satisfaction with tutors' care for discussions in tutorial sessions, the mean score \pm SD was 4.86 ± 2.20

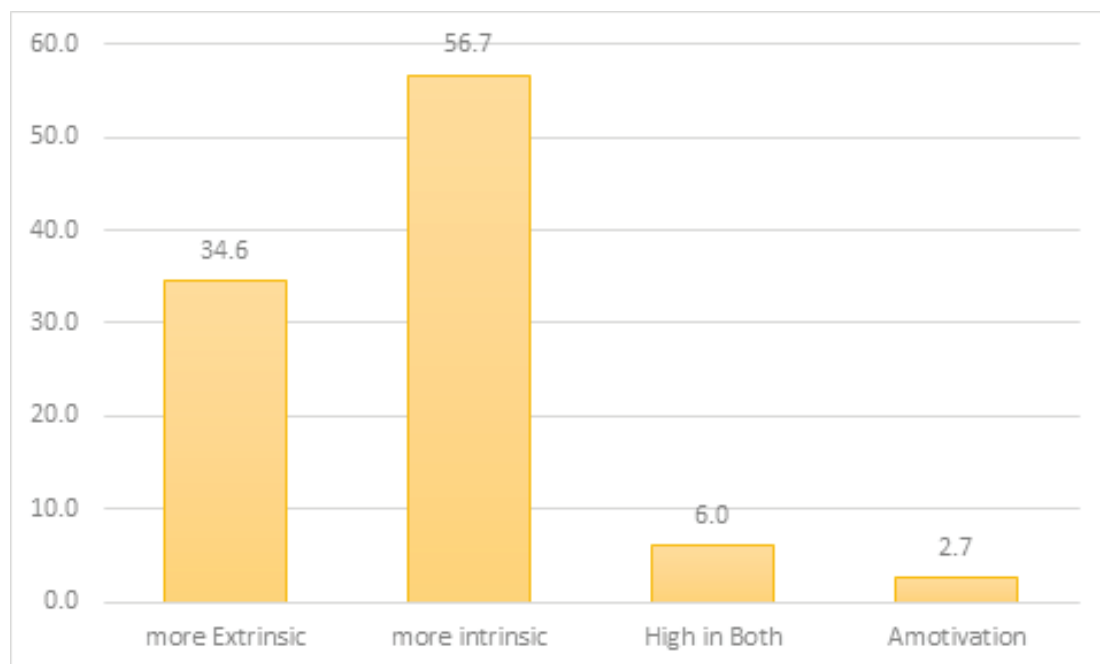


Figure 1: Quality of motivation in first-year medical students of the University of Khartoum toward community medicine course.

out of 7, and for their satisfaction with the adequacy of tutor's knowledge about the content of Community Health course in semester one that helped in understanding difficulties, the mean score \pm SD was 5.09 ± 2.06 out of 7. There was a significant association between the motivation score and the tutors' characteristics in terms of creativity in conducting the sessions, igniting discussion, and adequacy of knowledge about the course contents (p -value = 0.001).

The relationship between perceived evaluation score and perceived motivation was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity (Figure 2).

There was a strong, positive correlation between the two variables, $r = 0.505$, $n = 206$, $p < 0.0005$, with high levels of perceived evaluation score associated with higher levels of perceived motivation score (Figure 3).

Hierarchical multiple regression was used to assess the ability of nine evaluation factors to predict levels of motivation after controlling the influence of age, gender, paternal education level, and scores of Sudanese certificate upon entry. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Age, gender, paternal education level, and scores of Sudanese certificate upon entry were entered at step 1, explaining 4% of the variance in perceived motivation. After the entry of the evaluation factors at step

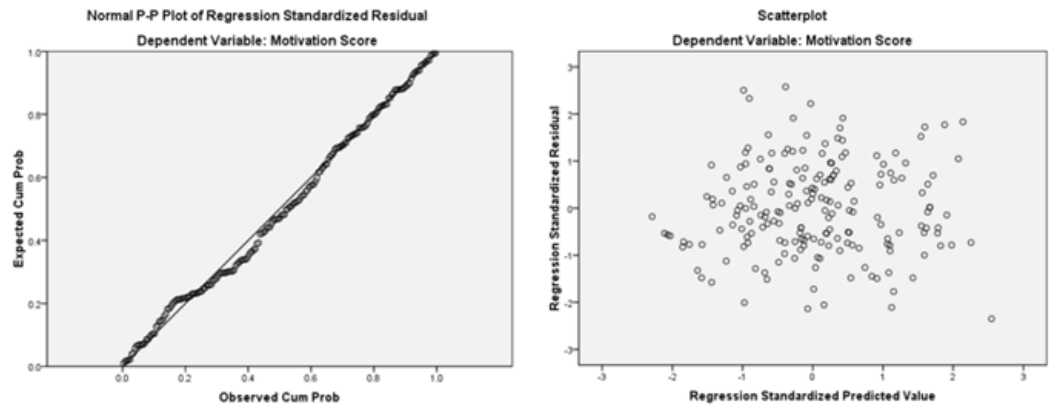


Figure 2: Normal probability plot (P-P) of the regression standardized residuals (left) and the scatter plot (right).

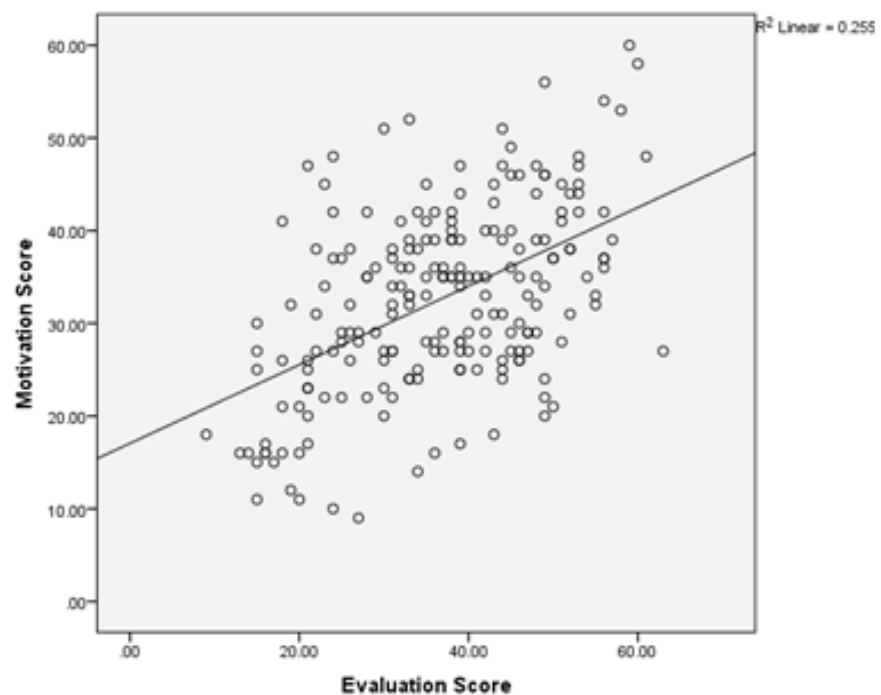


Figure 3: Scatter plot showing the effect of Evaluation score (independent variable) on Motivational score (dependent variable), $R^2 = 0.255$.

2, the total variance explained by the model as a whole was 32.6%, $F(14,181) = 6.25$, $P < 0.001$. The nine evaluation factors explained an additional 28% of the variance in motivation, after controlling for age, gender, paternal education level, and scores of Sudanese certificate upon entry, $R^2 \text{ change} = 0.28$, $F \text{ change}(9,181) = 8.416$, $p < 0.001$. In the final model, only one evaluating factor regarding the content was statistically significant, standardized Beta = 0.285.

The content in the evaluation score has a part correlation coefficient of 0.239, indicating that content alone uniquely explains 5.7% of the variance in total perceived motivation score.

4. Discussion

Most of the students were below 20-year entrants; the motivation quality did not significantly vary in accordance with age ($P = 0.08$). Relevant literature found only a difference in the motivation between mature-age- and normal-age entrants [17].

Domination of females among the study sample reflects the current situation of the dramatic expansion of female students enrolled in medical schools in Sudan [18]. In this study, the quality of motivation showed no difference with regard to gender ($P = 0.058$) that is comparable to findings of studies that investigated motivational elements such as scientific nature of medicine and intellectual challenge, where males and females were similar [19–21]. In contrast to other studies that showed significant variation between females and males in terms of motivation [22], females tend to show more intrinsic motivation, like their desire to help people [19]. Males are found to have more extrinsic motivation, such as looking for financial security, social status, and prestige [23]. Among tutorial groups, the motivation of female students was also found to be significantly higher than the male students [22].

Respondents in this study were descendants of academic families (61.1% and 74.3 of students' mothers and fathers were educated to university level or more, respectively), and the educational level of fathers had significant association with the students' motivation (P -value = 0.006), this implies that the role of father's education is greater in motivating their children. McHarg highlighted the role of parents in motivating their children in his study conducted in the United Kingdom among the first and second years' medical students [11].

A large proportion of semester-one students was intrinsically motivated toward the course (66%), this might be attributed to the interestingness of the course material, aim of excellence, and their curiosity. On the other hand, very few of them were extrinsically motivated (29.5%), and this may be linked to seeking good results in exams, attractiveness of teaching methods, and the ease and understandability of the materials.

In this study, tutors have highly significant influence in the summative scores of motivations of their students ($P = 0.001$), by possessing certain characteristics, such as creativity, elaborating discussion of concepts during the session, and having a firm

grasp of course contents. A study by Hommes investigated the motivational influences by the tutor on the tutorial group function, where students considered lack of motivation as an important inhibitor of the learning process, and they expected the tutor to do something about it [24].

The Beta value obtained in this analysis can also be used for other more practical purposes than the theoretical model testing shown here. If we could increase the content by one standard deviation (which is 1.87), the perceived motivation score would be likely to increase by 0.285 standard deviation units. This figure should be taken into account when designing a specific intervention to increase the overall perceived motivation score among the students. Modifying the content of the course to make it more interesting, understandable, linked it to other courses in medicine, and clarifying that it's useful in practicing medicine and for population health can significantly change the motivation score.

5. Conclusion

Semester-one medical students of the University of Khartoum are internally motivated toward the course of community medicine. Their ages and gender had no significant influence on their motivation score. The impact of fathers' educational level is more profound than the mothers' on their children's motivation. The perception of the first-year medical students of the University of Khartoum of their tutor's performance in terms of teaching skills and knowledge had a strong association with the summative motivation score. Further studies with larger sample size and the original version of MSLQ are recommended. Intervention to increase the motivation toward community medicine can be designed with specific consideration drawn to the content of the course with the predicted outcome. This will further facilitate the monitoring and evaluation process of these interventions used in a specified duration by comparing the change to the motivation score, to what is predicted beforehand using this model.

Conflict of Interests

The authors declare that they have no conflict of interest.

Ethical Clearance

Ethical approval was obtained from the Department of Community Medicine, University of Khartoum. The rights and purpose and the study were explained to first-year medical students. Assurance of voluntary participation and confidentiality was affirmed before the researcher distributed the questionnaire among them. Informed written consent was obtained from those who agreed to participate.

Availability of Data and Materials

The datasets generated and/or analyzed during the current study are not publicly available at this time as they are in use for answering further research questions. The data will be available afterward through the first author of the manuscript on reasonable request.

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Author Contributions

All authors had significant contribution to the study concept, designing, and/or data collection and entry. MNE, MM, and NM performed the statistical analyses. All authors contributed in drafting the manuscript and all of them read and approved the final manuscript.

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