The academic environment and approach to learning effects on academic performance among Sudanese medical students

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**Abstract**

**Background:** Academic environment and approach to learning play a significant role in academic achievement. In this study, we aimed to assess the educational environment and approach to learning in the clinical phase medical students.

**Subjects and Methods:** This comparative cross-sectional study conducted among 59 medical students in Omdurman Islamic University from June to August 2016. Participants signed a written informed consent then responded to a structured questionnaire to collect demographic data, the DREEM, and the two process study questionnaire. The local ethical committee approved the research, and the Statistical Package for Social Sciences was for data analysis.

**Results:** They were 59 medical students, 40.5% were males with a mean age of 22.62±1.84 years, the students perceived the learning environment as more positive than negative (114.61±20.30 out of 200), 31.4% and 31.4% had concerns about the atmosphere and social environment respectively. The participants used an in-depth approach more than superficial (29.49±6.39 vs. 22.81±6.94), the females had a more positive perception of the academic environment than males and used the superficial approach less with significant statistical difference (P-value < 0.05).

**Conclusion:** Medical students perceived the academic environment as more positive and deep approach to learning more with room for more improvement.

**Keywords:** Education environment, Curriculum, Teaching & Learning, Sudan
Introduction

The comfortable educational environment is crucial for both the medical students and the broader community as the expertise achieved by the students during their university years is reflected in the community health and quality of life, the importance of the educational environment on academic performance has been emphasized by the World Federation for Medical Education (Xu et al. 2016).

The university environment can be defined as instructional, organization, interpersonal dimensions, in addition to the milieu in which the educational institution exists (atmosphere, culture, resources, values, and culture) (Hammond et al. 2012).

There is an increasing awareness about the need to evaluate the academic environment in medical schools due to the development of innovation in the medical curricula and the diversity of medical students in various courses. Evaluation is a continuous process that throws light on the current position and provides a base for future assessment and improvement to take place (Miles et al. 2011).

The other item that could affect the educational objective is related to the student approach to learning (the study process). The study process can be divided into the deep approach in which is more dynamic, the student play an effort to understand the meaning, clarify the evidence and draw a conclusion with the intention to comprehend, in contrast to superficial approach in which the effort is to memorize unrelated information and fact to fulfill the course requirements (Al-Qahtani et al. 2015).

The students approach learning could affect the academic achievement emphasizing the importance of the study process; there are many theories to elucidate student learning styles with no supremacy of one over another (Bonham 1988).

The Medical education in Sudan began in the year 1924; it passed through different stages with numerous difficulties and constraints along the way (Fahal 2007). Many new medical schools joined the field of Medical Education since 1990. To our best of knowledge this the first research to study the academic environment and the education process among Medical Colleges in Sudan, in this study we aimed to assess the school environment and the study process in the Medical College in Omdurman Islamic University.

Subject and Method

This cross-sectional descriptive study conducted among 150 clinical phase Medical students in Omdurman Islamic University, Sudan during July & August 2016. Participants were approached in a ratio of 1:1 to select 75 students. The students were invited to sign a written informed consent, then the Arabic version of the revised study process and the English text of the DREEM questionnaire for the academic environment were filled. An orientation meeting was held with the participants to explain the purpose of the study and how to fill the questionnaire, facilitators were also present during the filling of the questionnaires to solve any difficulties. Fifty-nine students returned the survey (response rate 80%). The DREEM questionnaire consisted of fifty items in a five Likert scale ranging from strongly agree to strongly disagree with a global score of 200. (Xu et al. 2016) The questionnaire is further divided into five subscales as follows:

- Students perception of learning/teaching (twelve questions with a total score of 48). The interpretation is: 0-12 very poor, 13-24 teaching is viewed negatively, 25-36 teaching is perceived more positive, and 37-48 a
highly thought of teaching.

- The student's perception of the course organizers and teachers (eleven questions with a maximum score of 44). With the following interpretation: 0-11 abysmal, 12-22 some retraining needed, 23-33 moving in the right direction, and 34-44 model course organizers

  - Academic self-perception (eight questions, maximum score of 32) with the following interpretation: 0-8 feeling of total failure, 9-16 many negative features present, 17-24 more on the positive, and 25-32 confident.

  - Perception of the atmosphere (twelve questions with a maximum score of 48) in which a score of 0-12 is viewed as terrible, 31-24 many issues need change, 25-36 a more positive attitude, and 37-48 an overall good feeling.

  - Social self-perception (six questions with a total score of 24) with 0-7 regarded as miserable, 8-14 not a beautiful place, 15-21, and 22-28 not too bad and socially very good respectively.

The overall score is interpreted as follows:

- Zero-50 very poor
- 51-100 plenty of problems
- 101-150 more positive than negative
- 150-200 excellent

The DREEM questionnaire was developed by the University of Dundee and is well-validated globally as a measure of the educational environment (Roff 2005).

The way of studying was measured using the Arabic version of the Revised Study Process Questionnaire a well-validated tool that consists of twenty items each with a scale from 1=Never or Rarely true of me to 5= Always or almost always true of me. The questionnaire is further divided into: deep approach (deep strategy (questions 2, 6, 10, 14, and 18) + deep motive (questions 3, 5, 9, 13, and 17), and superficial approach (superficial motive (questions 3, 7, 11, 15, and 19) + superficial strategy (questions 4, 8, 12, 16, and 20) (Munshi et al. 2012).

The Statistical Package for Social Sciences (SPSS) was used data analysis, the Chi-square was used to compare categorical data, data were presented as means± sd unless otherwise specified. A P-value of < 0.05 was considered significant. The ethical committee of Omdurman Islamic University approved the research.

The authors obtained formal ethical approval from the University Ethical Committee.

**Result**

Out of fifty-nine clinical phase medical students their ages ranged from 20-25 years with a mean of 22.62±1.84 years, 41.5% were males, 64.2% were fifth-year medical students, and 35.8% were in the 4th year class, 35.1% scored an (Excellent) in the last semester, while 64.9% scored C (Pass). Table No (1).

Table No (2) depicted the total score of the academic environment and the study process in which: The deep motive score was 14.79±3.91, deep strategy score was 14.70±3.20, and the deep approach of the students scored 29.49±6.39 vs. 22.81±6.94 for the superficial approach. The total score of the medical student's perception of the
academic environment was $114.61\pm20.30$.

In the present study, the females adopted the superficial approach of learning less than the males $20.40\pm7.08$ vs. $26.05\pm5.98$ with significant statistical difference P-value 0.005, the deep approach learning score was higher among women $30.36\pm7.54$ vs. $28.59\pm5.22$ with no significant statistical difference P-value 0.362. The females perception of the academic environment was positive than the males $124.21\pm23.72$ vs. $106.29\pm12.31$ with significant statistical difference P-value 0.003. Table No (3).

The current data showed that the fifth class medical students adopted the deep approach to learning more than the fourth medical students $30.34\pm6.76$ vs. $27.83\pm5.37$, they take less superficial approach less $21.74\pm6.62$ vs. $24.89\pm7.27$ with no significant statistical difference P-values 0.178 and 0.119 respectively. The fifth class medical students also perceived the academic environment as more positive than the fourth medical students with no significant statistical difference $117.12\pm23.07$ vs. $110.00\pm13.25$ P-value 0.235. Table No (4).

In the current study, the students with the excellent score (A) score more in deep learning approach and the perception of academic environment but not reaching statistical significance $34.50\pm6.45$ vs. $28.45\pm6.99$ and $119.00\pm5.29$ vs. $115.48\pm23.62$ P-values 0.122 and 0.803 respectively Table No (5).

Figure No (1) illustrated the registrars perception of learning in which: 74.5% perceived the learning as positive, 19.6% had negative attitude of learning, 2% perceived the learning as very negative, while 3.9% perceived the learning as highly thought of.

In the current study, 21.6% of medical students viewed the course organizers as in need of some retraining, 64.7% as moving in the right direction, while 13.7% as model course organizers Figure No (2).

Figure No (3) showed the registrars academic self-perception in which 27.5% of the medical students reported many negative aspects, 64.7% felt more on the positive side, while 7.8% were confident.

The registrar perception of the atmosphere was depicted in figure No (4) in which: 2% perceived the atmosphere as terrible, 31.4% as an atmosphere in which many issues need changing, 60.8% had a more positive attitude towards the atmosphere, while 5.9% had a good feeling overall.

Figure No (5) illustrated the registrar social self-perception in which 31.4% thought that it is not a nice place, 60.8% no too bad, and 7.8% exquisite socially.

### Table No (1): General characteristics of the study group

| Character | No%          |
|-----------|--------------|
| Sex       |              |
| Males     | 22 (41.5%)   |
| Female    | 31 (58.5%)   |
| Grades    |              |
| A         | 35.1%        |
| C         | 64.9%        |
Table No (2): The components of the academic environment and the study process among the study group

| Character           | Mean±sd   |
|---------------------|-----------|
| Deep motive         | 14.79±3.91|
| Deep strategy       | 14.70±3.20|
| Deep approach       | 29.49±6.39|
| Superficial motive  | 10.42±3.62|
| Superficial strategy| 10.40±3.89|
| Superficial approach| 22.81±6.94|
| Academic Environment total score | 114.61±20.30 |

Table No (3): The comparison of academic environment and study process regarding sex

| Character           | Deep approach | Superficial approach | Academic environment |
|---------------------|---------------|----------------------|----------------------|
| Sex                 |               |                      |                      |
| Males               | 28.59±5.22    | 26.05±5.98           | 106.29±12.31         |
| Females             | 30.36±7.54    | 20.40±7.08           | 124.21±23.72         |
| P-value              | 0.362         | 0.005                | 0.003                |

Table No (4): The comparison of academic environment and study process regarding grades

| Character | Deep approach | Superficial approach | Academic environment |
|-----------|---------------|----------------------|----------------------|
| Class     |               |                      |                      |
| Forth     | 27.83±5.37    | 24.89±7.27           | 110.00±13.25         |
| Fifth     | 30.34±6.76    | 21.74±6.62           | 117.12±23.07         |
| P-value   | 0.178         | 0.119                | 0.235                |

Table No (5): The comparison of academic environment and study process regarding class
| Character         | Deep approach       | Superficial approach | Academic environment |
|------------------|---------------------|----------------------|----------------------|
| Grades           |                     |                      |                      |
| C                | 28.45±6.99          | 23.82±7.68           | 115.48±23.62         |
| A                | 34.50±6.45          | 23.75±10.56          | 119.00±5.29          |
| P-value          | 0.122               | 0.988                | 0.803                |

**Discussion**

In the present study, the medical students scored 114.61±20.30 on the DREEM scale (within the range 101-150) which is considered more positive than negative; the current data are in line with previous studies from Nigeria, Saudi Arabia, Kuwait, China, and the University of British Columbia Medical School (Veerapen et al 2010;Lai et al. 2009).

Few studies have confirmed a higher DREEM score than the present study: A series of the United Kingdom (Edgren et al 2010) school environment studies (142.91), and studies conducted by Monash University in Australia ( Brown et al. 2011) (137.3). The schools adopting innovative, students-centered curricula scored higher on the DREEM score than those applying the traditional learning ( Hammond et al.2012).

The current data showed that the 74.5% of the students viewed the learning environment as positive, the perception of teachers was moving in the right direction, 64.7% of the students thought that the academic environment was positive, while 60.4% perceived the atmosphere as positive and the social self-perception was not too bad. The current data are in accordance with (Bakhshialiabad et al.2015) who conducted a study in seven medical sciences courses and concluded similar results. These students results indicated a high need for improvement in all the DREEM domains in this school. A significant statistical difference was evident between women and men in the overall DREEM score with the females scored higher than males this information were in line with previous studies from Australia ( Brown et al.2012) and Nigeria ( Roff et al. 2001), other researchers from the Middle East (Bouhaimedet al.2009) concluded different results. A plausible explanation is that: females perception of the curriculum, goals, and structure are more positive than their males counterparts.

Previous literature (Mohd Said et al. 2009) reported a trend towards lower DREEM score by the senior students that could be due the fact that they believe the academic environment is deteriorating and they are looking forwards to leave the students life, this difference was not found in the current study because we studied the fourth and fifth students and not the clinical and preclinical students. A study conducted in the Philippines  (Barcelo 2016) concluded no difference in the DREEM score in different classes.

In the present study, no significant statistical difference was observed between students with the Excellent (A) score and those with the average rating (C) regarding the DREEM score in similarity to (Al-Ansari et al. 2015) who reported no association between GPA and the DREEM score at baseline. One explanation of the result is that the perception of the environment may ultimately differ at the time of the survey and the time of the examination whose GPA was reported by the students. The academic environment perception is different in a changing environment like curriculum reforms, so the DREEM score can be used as a measure in a dynamic environment and not be used as a constant construct by relating it to CGPA accumulated over more than one semester.

The students in this study prefer the deep approach of learning instead of the superficial approach similar to (Mirghani et al.2014) who concluded that the final year's medical students were more likely to adopt a deep approach to learning. The current data showed that the fifth year medical students score more than the fourth
students in line with the previous observation.

The deep approach to learning is associated with better academic performance (Ward 2011), in the present study, no significant statistical difference was observed among medical students with excellent and average performance this can be partly explained by the small size of our study.

The present data showed that females prefer the deep approach to learning with a significant statistical difference in contradiction to (Wickramasinghe et al. 2011) who found no difference between males and women, our results were similar to (Cumplido-Hernández et al. 2006) who concluded that females prefer the deep approach in greater proportion than men.

Conclusion

The clinical phase medical students perceived the academic environment more positive than negative special women, the students used the deep approach learning. Women used the superficial approach less than men; larger multi-center longitudinal studies are needed.

The study limitations are the small size of the study sample, the reliance on a self-administered questionnaire, and the study was conducted in a single faculty.

Take Home Messages

- The clinical phase medical students in the Faculty of Medicine, Omdurman Islamic University, hold positive perception towards their academic environment.
- Near one-third of medical students had a negative attitude, more effort in needed to provide a better educational environment.
- The deep approach to learning was commoner than the superficial among the students.
- The women at the Faculty of Medicine, Omdurman Islamic University, adopted the superficial approach less than men with a significant statistical difference.
- No significant differences were evident between the students with the excellent (A) and average (C) grades regarding the environment perception and approach to learning.

Notes On Contributors

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Appendices

Figure No [1] Registrar perception of learning
Figure No [2] Registrar perception of course organizers
Figure No [3] Registrar academic self-perception
Figure No [4] Registrar perception of atmosphere
Declarations

The author has declared that there are no conflicts of interest.

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