

Full Length Research Paper

Learning environment in medical schools adopting different educational strategies

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Faculty of Medicine, King Fahad Medical City (KFMC) has adopted the problem based learning (PBL) curriculum. This study investigates the educational environment in the school, it also compares the educational environment prevailing in problem based learning curriculum with that of conventional and outcome based curricula. A cross sectional study included one hundred and thirty seven males and females medical students (years 1, 2 and 3). The students completed The Dundee Ready Educational Environment Measure (DREEM) inventory questionnaire at the end of the second semester. The data were compared between the studied groups and also with the similar data from conventional and outcome based curricula. Parametric and nonparametric tests were used to compare between different groups and curricula. There were no significant differences in the scores of DREEM questionnaire between the studied groups (years 1, 2 and 3) within the Faculty of Medicine, KFMC. However, there were significant differences between the scores among the medical schools adopting PBL, conventional and outcome based curricula. DREEM scores of Faculty of Medicine at KFMC were significantly higher than the medical schools adopting conventional learning system in Saudi Arabia but were significantly lower than Medical School of Dundee University which adopts the outcome based learning. Educational strategy could be one of the factors that affect the educational environment. Problem based learning could be a better educational environment compared to conventional curriculum. However, the educational environment is not as good as that in schools adopting more innovative strategies of teaching such as that of the outcome based learning.

Key words: Problem based learning, curriculum, educational environment, DREEM inventory.

INTRODUCTION

Learning depends on several factors but a crucial step is the engagement of the learner. This is affected by their motivation and perception of relevance. These, in turn, can be affected by learners' previous experiences and preferred learning styles and by the context and environment in which the learning is taking place. In adult learning theories, teaching is as much about setting the context or climate for learning as it is about imparting knowledge or sharing expertise (Hutchinson, 2003). The educational environment makes an impact on students' learning experiences and outcomes (Roff et al., 2001). Educational environment influences how, why and what students learn. Educational environment is crucial in

success of the curriculum. Various methodologies were designed to investigate the educational environments such as qualitative approaches (Seabrook, 2004) using questionnaires (Audin et al., 2003; Roff et al., 1997; Sobral, 2004). Dundee Ready Educational Environment Measure (DREEM) questionnaire (Roff et al., 1997) is the most specific tool for investigation of the unique environment experienced by students on medical and healthcare-related courses.

The curriculum and students' perception towards it may affect the quality of learning. The student's feedback in such system is a pivotal for the success of the educational climate. Although there may be cultural and other determinants of how individuals view different qualitative aspects of a given educational environment, perceived ratings precisely report those perceptions.

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adopt problem based learning system with an integrated program offering a mixture of problem based small group learning with appropriate lecture and laboratory teaching. The emphasis throughout is on self-directed learning with PBL being the organizing feature of each week. The curriculum is composed of three phases; Basic Medical Sciences (Years 1, 2 and 3) and Clinical Sciences (years 4, 5, and 6). Students are encouraged to take more responsibility for their own learning as they progress through the curriculum.

This study aimed to investigate the perceptions of preclinical (years 1, 2 and 3) students' towards the educational environment of learning in the school which is crucial for success of the curriculum, it also compares the educational environment prevailing in problem based learning curriculum with that of conventional, in which the teaching depends mainly on information gathering, with the teacher as the main source of information, and outcome based curricula in which teaching and learning occur in three interlocking phases. The educational strategies adopted include elements of problem based and community-based approaches to teaching and learning (El-Hazimi et al., 2004).

MATERIALS AND METHODS

Study design

A cross-sectional study design was implemented.

Population and samples

All males and females medical students of years 1, 2 and 3 of the Faculty of Medicine, KFMC were invited to participate in the study. At the time of the study, there was only one batch of female students (year 1). The demographic characteristics and educational background of entire students were similar.

Instrument for data collection

DREEM is a valid tool in referring the deficient areas in learning process and it was developed by an international Delphi panel. This inventory was developed using input from 80 international medical educators who visited Dundee from 1995 - 1997. It is intended to be universal and cultural free inventory (Roff, 2005).

DREEM was tested in Europe, Africa, Asia, Australia and America (Roff et al., 2001). It consists of five subscales namely students' perceptions of learning, students' perceptions of teachers, students' academic self-perceptions, students' perception of atmosphere and student's social perceptions (Bassaw et al., 2003). Dundee Ready Education Environment Measure (DREEM) was used for collection of data. DREEM questionnaire was translated to Arabic language and the translated version was tested for face validity. The Arabic version of DREEM piloted on small group of students before the operational phase of the study.

DREEM contains 50 statements relating to a range of topics directly relevant to education climate. Items scored as following: 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Uncertain (U) and 1 for Disagree (D) and 0 for Strongly Disagree (SD). However, 9 of the 50 items (number 4, 8, 9, 17, 25, 35, 39, 48 and 50) were negatively phrased statement and scored 0 for SA, 1 for A, 2 for U,

3 for D and 4 for SD. The 50-item DREEM has a maximum score of 200 indicating the ideal educational environment.

Data collection

The Arabic version of DREEM was self administered to first, second and third medical students who accepted to participate in the study at the end of the second semester. The importance and confidentiality of data were explained and emphasized for the students before data collection.

Data management and analyses

Questionnaires were revised and checked for completeness and consistency immediately after their collection. Data entry and analysis were conducted using SPSS-9 (Chicago, USA) Software. The mean score for each item was calculated and compared between different groups. The percentage agreement's score was calculated aggregating the response "Strongly agree and "Agree" as agreement scores. Similarly, "Disagree" and "Strongly Disagree" aggregated to form disagreement scores. Comparisons were made between different academic years and according to sex in the school.

The results of the current study were compared to previous studies conducted in schools adopting conventional curriculum (Medical School in King Abdul Aziz University and Umm Al-Qura University, Saudi Arabia) and outcome based curriculum which was adopted by Dundee Medical School (El-Hazimi et al., 2004).

The Saudi students who were compared to our students were almost equivalent. They were similar in age, cultural background, expectations and learning background as the admission criteria for faculties of medicine were similar in Saudi Arabia. However, they are not equivalent to Dundee's students. One-way ANOVA test was used to compare the overall's domains. The Kruskal-Wallis test was used to compare the individual items of the different studied groups and to compare other national and international studies.

RESULTS

Comparison between the studied groups in different academic years in Faculty of Medicine, KFMC

The questionnaire was completed by 137 students (a response rate of 79.7%). The study included 20.4% females and the remaining of the studied groups were males. The studied group included, 81 (59%) in the first year, 30 (21.8%) in the second year, 26 (18.9%) in the third year. There were no statistically significant differences in the entire DREEM's domains between the studied groups. The overall mean DREEM score was found to be 119/200 in the female students. The scores of the male students were 116.1/200, 118.9/200 and 119.2 for the first, second and third years respectively (Table 1).

The students perception of learning, the total subscale was 29/48, this score mean that the teaching environment is confident in this domain. There was no significantly differences between the females (29.6), males of the first (29.16), second (29.6) and third (27.5) year students. For individual items, item 1 (I am encouraged to participate in teaching sessions) had the highest score

(3.1). On the other hand, items 25 (The teaching overemphasizes factual learning) and 48 (The teaching is too teacher centered) had the lowest scores (1.95, 1.75) respectively. There is no statistically significant difference (p value = 0.2) between the overall average of the individual items of this domain between the studied groups (Table 2).

Concerning student's perception of teachers, it had a total scored of 25.3/44. No statistically significant difference was found between the females (25.35), males of first (24.3), second (26.1) and third (25.6) year students ($p > 0.05$). The lowest items scores were item 8 (The course organizers ridicule their registrars) (1.7) and 9 (The course organizers are authoritarian) (1.55) and the highest (2.9) was item 29 (The course organizers are good at providing feedback to registrars). There is no statistically significant difference (p value = 0.36) between the overall averages of the individual items of this domain between the studied groups (Table 3).

Total students' academic self perception scored was (19.97/32). The differences between the scores were not statistically significant for the females (19.9), first (19.3), second (20.1) and third (20.6) year students. All items scored more than 2, moreover, item 41 (My problem solving skills are being well developed here) was the highest (2.8). There is no statistically significant difference (p value = 0.8) between the overall averages of the individual items of this domain between the studied groups (Table 4).

Students' perception of atmosphere scored (27.3/48). Although third year scored the highest (28.2) compared to the first (Females and Males; 27.7 and 26.8) and second (27) years students but it didn't reach to a significant value. Scores for individual items was highest (2.6) for item 33 (I feel comfortable in teaching sessions socially) and lowest (1.8) for item 35 (I find the experience disappointing). There is no statistically significant difference (p value = 0.53) between the overall average of the individual items of this domain between the studied groups (Table 5).

Students' social self perception scores ranged from 16.1 for the second year to 17.3 for the third year's students. The total mean score was 16.6/28. The individual items scores ranged from 1.5 for item 3 (There is a good support system for students who get stressed) to 3.0 for item 15 (I have good friends in this course). There is no statistically significant difference (p value = 0.9) between the overall averages of the individual items of this domain in the studied groups (Table 6).

Comparison of DREEM scores between PBL curriculum and other curricula.

The current study which was carried out in problem based learning system was compared to other learning strategies such as conventional (Medical School in King Abdul Aziz University, KAU, Umm Al-Qura University,

OAU) and outcome based (Dundee Medical School ; DU) curricula. There are statistically significant differences in the overall scores of the different domains between our learning style and others (p value < 0.05). Our learning style scored higher than other national styles but lower than the Dundee style in all of the studied domains (Table 7).

DISCUSSION

The opinion and feedback of the students are essential in succeeding the learning process. There is growing body of evidence that recognition of the importance of educational climate/environment is effective in student learning. Students' perception of the environment has a significant impact on their behaviour, academic progress and sense of well-being (Genn, 2001, Pimparyon et al., 2000, Audin et al., 2003).

The DREEM inventory allows areas of concern to be highlighted. According to its guidelines (Genn, 2001), the score less than 2 means that this area (item) should be deeply investigated. This type of study could allow changes in the curriculum to meet the expectations of the students. The DREEM overall, its domains and individual questions scores in the current study were similar in years 1, 2 and 3; also there were no significant differences between the studied groups according to the students' sex. This reflects the consistency of the educational environment in our medical schools. These results also might validate the students' responses to the questionnaire's items. The total average score was 118.44/200 which means that the teaching environment in our institute was more positive than negative.

Regarding the individual questions responses in the first domain (students' perception of learning), the total average of this subscale was 29/48 and that means our approach is more positive. The average of most of the items scored more than 2, however, the negative items (No. 25 and 48) scored less than 2. This proves the concept of the PBL is over-emphasized on factual learning and not a teacher centered approach.

All the individual questions of the second domain (Students perception of teachers) scored more than 2 except the negative items (No. 8 and 9) which reflected the importance of teachers' understanding of PBL system. The total average score of this domain was 25.3/44 which means that this subscale is moving in the right direction.

The students' feeling was more on positive side in the third domain (Students' academic self perception) as it scored 19.97/32. Regarding the fifth domain (Students social self-perception), although the average score (16.6/28) was not too bad, we believe that there is a defect in the supporting system for students who get stressed. This area is very important to be investigated and to be solved. The knowledge regarding sources of supporting system in the school must be available to the students

throughout their study. Comparing educational environments in other medical schools (El-Hazimi et al., 2004), there are higher significant differences between the PBL, conventional and outcome based curricular environments in the overall and each domain scores. Many factors might explain this difference. First, the educational strategy themselves as these results reflect that the PBL educational environment was superior to the conventional educational environment but lower than the outcome based learning strategy. The students in PBL are often having good judge towards their knowledge and skills (El-Hazimi et al., 2004). Introduction of PBL and outcome based learning require students to develop the skills necessary to become independent learners and consequently achieved higher scores than the conventional based learning. Second, the Inter school comparison between students' results in PBL, conventional medical schools and outcome based learning environment from different countries is confounded by the variation in students' admission criteria to medical schools and students' expectations. Finally, the variations between the scores in the PBL and outcome based learning educational environments could be due to the cultural difference between students.

In conclusion, this study tried to highlight some issues related to the educational environment. It was not free from limitations. One of which is the sample size. Educational leaders must take care of the educational climate and ensure the satisfaction of students with their learning atmosphere. Further studies are required to confirm the relationship between the educational strategies and the learning environment.

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