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Investigation of Nursing Students' Perceptions Regarding the Educational Atmosphere of Pharmacology Course at Jahrom University of Medical Sciences

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Abstract

Background: Educational atmosphere is a manifestation of the curriculum and represents the spirit and context of schools and the curriculum.
Objectives: The Dundee Ready Education Environment Measure (DREEM) is used as a diagnostic tool for evaluating the effectiveness of changes in education and identifying the difference between real and ideal environments. Accordingly, this study aimed to investigate the nursing students' perceptions regarding the educational atmosphere of the pharmacology course.
Methods: This cross-sectional study was conducted on all undergraduate nursing students who had a course in pharmacology training (N=30) in 2015. To this end, the DREEM modified instrument was applied to examine students' perceptions and data were analyzed by SPSS software using mean, standard deviation, frequency, and percentage for descriptive data.
***Results*:** Overall, the mean score of the nursing students' perceptions regarding the educational atmosphere of the pharmacology course was 98.5± 18.86 out of 172. The educational atmosphere of the pharmacology course was reported as excellent (3.3%), more positive than negative (70%), and plenty of problems (26.7%) from participants' viewpoints, respectively.
Conclusion: In general, the educational atmosphere of the pharmacology course was more positive than negative from the viewpoints of the majority of nursing students, indicating the importance of professors' considerations regarding the principles of the instructional design and creating an appropriate educational environment for better learning in trainings.

Keywords: pharmacology, nursing students, education, atmosphere, universities

Introduction

Nursing is considered as one of the main health professions whose members spend extensive time interacting with patients. In addition, nurses play a crucial role in the pharmacotherapy management of patients in hospitals and society [1]. On average, they spend 40% of their time in the hospital administering medication [2]. Therefore, having enough knowledge in the field of pharmacology is urgency for nurses in order to be able to have a safe and quality administration. Thus, it is required to examine the patients before giving medication, design the goals of care, prescribe medications safely and effectively, and finally, evaluate the effect of prescribed medications. Furthermore, it is necessary to talk

to patients about their medication and cooperate with the physician and pharmacologist at resolving potential problems and setting care purposes [1]. Taylor stresses the importance of skilled medication administration which requires the application of enough knowledge and skill and indicates that any nurse who administers the drug should have basic medication information. This information includes the name of the medication, its products, categorization, adverse effects, and biological factors affecting medication performance [3]. Moreover, Manias considers the nurses' roles in medication management, safe and effective medication prescription, evaluation, and monitoring of the desired or side effects, along with discharge planning and patients' education. Having comprehensive knowledge of pharmacology helps nurses in fulfilling these roles so that knowing about the scientific principles of medications can provide the ability to manage medications with patients' complex and changing needs [4].

Given that nurses have an important responsibility for managing patients' pharmacotherapy in hospitals and society, previous studies demonstrated that common training programs have provided inadequate opportunities for improving pharmacology among nursing students and nurses. For example, the findings of a study in Japan revealed that the most common medical mistakes of newly graduated students were related to the wrong prescription of intravenous medications and the lack of pharmacological knowledge was the most important reason in this regard [5]. The finding of another study indicated the inadequacy of the theoretical knowledge of pharmacology for the strong performance of clinical students [6].

The learning environment alludes to how learners view the atmosphere of an institution [7]. A learning environment includes all situational factors that affect learning, including the quality of instructions given to learners, curriculum structure, resources available for teaching and learning, organizational culture, and the style of institutional leadership [8]. Some studies represented that the quality of the learning environment influences student motivation and learning outcomes, and this can have an effect on graduates' professional competence [9,10].

Additionally, the students' perceptions of the academic atmosphere are influenced by various cultural backgrounds of students, educational facilities available to them, quality of the faculty, curriculum, and student's expectations apart from the other circumstances of the university. The effective management of teaching and learning is supported by understanding the educational environment and incorporating appropriate changes and remedies wherever necessary [11]. Nonetheless, defining the educational environment in a short, easy, and concise way is difficult because of the complexity of the medical sciences educational environment [12].

To make the learning environment measurable, Dundee Ready Education Environment Measure (DREEM) was developed and validated at the center for Medical Education, University of Dundee (1997) by an international Delphi panel of medical educators [13]. The DREEM inventory is a valuable diagnostic tool of the educational environment at the undergraduate health and medical institutes. In addition, it is a generic, non-culturally specific, and multi-dimensional questionnaire which has been used worldwide and translated in over dozens of languages including Arabic, Persian, and the like [14,15]. Further, this diagnostic instrument can demonstrate the perceived weaknesses and strengths in medical sciences schools which can be used as the basis as a remedial and useful plan in comparing the educational environments between different medical schools [16].

Some studies focused on the effect of teaching methods for creating interest and enthusiasm in learning in several studies [10,17] and reported that having adequate resources and facilities, spending enough time to teach students, guiding individual and collective learning, and solving their problems in training were among the effective factors in efficient training. Thus, the approaches to train the required skills for students are effective in students' professional promotions. Based on the literature, the teaching and learning of pharmacology have received little attention, and common educational programs have failed to provide adequate opportunities for improving pharmacological knowledge among students and nurses [5,6]. Accordingly, the pharmacology course was added as a new credit to the syllabus depending on the perceived and reviews

conducted in the syllabus design of undergraduate nursing. Given the trend toward pedagogical, student-centered approaches, especially in the field of medical sciences, a training package tailored to training objectives would be used for the step by step training of the students. Thus, this study sought to evaluate the nursing students' perceptions of the educational atmosphere of the pharmacology course.

Methods

This is a cross-sectional descriptive study. The sampling was conducted through census from all nursing undergraduate students of Jahrom University of Medical Sciences (N= 30) in the pharmacology training center in 2015. The inclusion criteria were being the 2nd semester nursing student and attending the pharmacology course.

In addition, the DREEM modified instrument was used to examine the atmosphere of the learning environment in training the pharmacology course since students' perceptions were removed from their social conditions. Therefore, the aforementioned tool was modified with a 43-item questionnaire in four domains including students' perceptions of their learning (12 items), faculties (11 items), their academic performance (8 items), and the educational environment (12 items) with the graded list (0-4) and scored and used accordingly. Each item was scored on a Likert-type scale ranging from zero to 4 with scores of 0, 1, 2, 3, and 4 that were categorized as strongly disagree, disagree, uncertain, agree, and strongly agree, respectively. It should be noted that 8 questions (i.e,11,12,19,20,21,23,42,&43) were reversely scored since they had negative senses. Further, the questionnaire scoring range was 0-172, which was categorized into four groups of "very poor"(0-43), "plenty of problems"(44-86), "more positive than negative"(87-129), and "excellent" (130-172). An approximate guide for interpreting the subscales is shown in (Table 1) [12,13].

Table: Subscale Interpretive Guide, DREEM Modified Instrument

Students' Perceptions of Learning	0-12 Very poor 13-24 Teaching is viewed negatively 25-36 A more positive perception 37-48 Teaching is highly thought of
Students' Perceptions of Faculties	0-11 Abysmal 12-22 In need of some retraining 23-33 Moving in the right direction 34-44 Model course organizers
Students' Academic Performance	0-8 Feelings of total failure 9-16 Many negative aspects 17-24 Feeling more on the positive side 25-32 Confident
Students' Perception of Educational Environment	0-12 A terrible environment 13-24 The presence of many issues in need of changes 25-36 A more positive attitude 37-48 A good feeling overall

Note. DREEM: Dundee Ready Education Environment Measure

In a study conducted on 350 students at Guilan University of Medical Sciences and the Islamic Azad University of Tonekabon, the test reliability was 0.93 through Cronbach's alpha. Furthermore, the validity of the Kaiser-Meyer-Olkin and Bartlett tests was 0.910 and 60936.37 which was even beyond the level P= 0.001 was statistically significant [14].

At the end of the course, the educational atmosphere questionnaire was given to the students and all 30 questionnaires were completed and delivered to the researcher. Data were analyzed by SPSS software using mean, standard deviation, frequency, and percentage for descriptive data.

Ethical approval

To observe ethical principles, written permission was obtained from the Dean of the Nursing School of Medical University of Jahrom for conducting this study. The authors were not directly involved in data collection. After explaining the purpose of the study and obtaining

written consent, the researcher reminded his commitment to observe all ethical principles in research, including assuring confidentiality, maintaining anonymity, and using pseudonyms for individuals.

Results

Based on the obtained data, from 30 attending students, 16 (53.3%) and 14 (46.7%) cases were females and males with a mean age of 22.34± 1.18, respectively.

The findings of this study demonstrated that the means (standard deviations) of the students' perceptions of their learning, faculties, their academic performance, and the educational environment were 24.95 (±7.57), 24.65 (4.34), 21.08 (5.72), and 28.34 (7.01) and that of the total score of the educational atmosphere was 98.5± 18.86 (Table 2).

Table 2: Descriptive Statistics regarding the Perception of the Educational Atmosphere of Pharmacology Course in Students under Investigation

Educational Atmosphere and Subscales	Items/ Maximum score of the scale	Mean± SD	Percentage of maximum score	Interpretation
Students' perception of their learning	12 (48)	24.95±7.57	51.98	A More Positive Perception
Students' perception of their faculties	11 (44)	24.65± 4.34	56.03	Moving in the Right Direction
Students' perception of their academic performance	8 (32)	21.08± 5.72	65.88	Feeling More on the Positive Side
Students' perception of educational environment	12 (48)	28.34± 7.01	59.04	A More Positive Attitude
Total	43 (172)	98.5± 18.86	57.27	More Positive Than Negative

Note. SD: Standard deviation.

The findings further revealed that the educational atmosphere of the pharmacology course was excellent (3.3%), more positive than negative (70%), and had plenty of problems (26.7%) from the nursing students' viewpoints (Table 3).

Table 3: The frequency of views of the under study students regarding the educational atmosphere of pharmacology course

The levels of educational environment	Score	Frequency (%)
Excellent	130-172	1(3.3)
More positive than negative	87-129	21(70)
Plenty of problem	44-86	8(26.7)
Very poor	0-43	0(0)
Sum		30(100)

Discussion

The undergraduate nursing students' perception of the educational atmosphere of the pharmacology course was evaluated using the DREEM questionnaire.

In this study, the educational atmosphere of the pharmacology course was more positive than negative from the viewpoints of the majority of nursing students. In Subscales the students' perception of their learning was (A More Positive Perception), students' perception of faculties (Moving in the Right Direction), the students' perception of their academic performance (Feeling More on the Positive Side), students' perception of Educational environment (A More Positive Attitude). Based on the findings of the present study, the students' perceptions of their learning were positive. In another study by Arabshahi, the learners' views were evaluated in the clinical learning environment of Iran University of Medical Sciences hospitals using the DREEM instrument. The students' perception of their learning was at a higher level [18]. In Pakistan, the subscale analysis of students' perceptions of their own learning showed more positive perceptions [17].

The findings of one study in Oman demonstrated that the mean score for the perception of the learning subscale among Oman Medical College interns was significantly higher compared to undergraduate students from the same college [19]. In the Medical College of Basrah, the mean score for the students' perception of learning was 23.89± 5.56 [12]. This is in line with the findings of the current study and its value is slightly lower, which could be related to the traditional education system and requires more attention and strategy. These findings are mainly expected in

environments that use the traditional education system.

In the present study, students' perception of faculties was moving in the right direction while it was reported 30.8± 5.14 for interns in the study of Arabshahi [18]. Similarly, a study from the United Arab Emirates conducted among faculty members reported that perceptions regarding the subscale of faculties had the highest mean scores [20]. However, in another study in Pakistan, the subscale analysis was more in the right direction for students' perceptions of faculty [17]. These findings corroborate with those of the present study. In a qualitative study by Khaghanizade et al. regarding educational competence for faculties, the keys to successful teaching included having specialized skills and knowledge, and effective interaction, as well as providing effective and attractive teaching materials with regard to ethical issues in relation to students [21] In addition, considering that training is the main element for expanding nursing knowledge, the role of instructors has been particularly emphasized regarding interacting with students in nursing training plans which aim at building competency and qualification in students [22].

The findings further revealed that the nursing students perceptions' of their academic performance were more on the positive side while Arabshahi reported a mean score of 32.4± 5.13 [18]. In Pakistan, the subscale analysis represented high confidence for student's academic performance [17]. As regards the percentages of the total available score, the findings of the study in Oman demonstrated that the academic performance subscale had the highest mean score percentage for all participants apart from Sultan Qaboos University undergraduate students [19]. However, Zarei et al. reported that the curriculum subscale obtained a mean above the average with the values of 1.91 out of 3, which could be significantly considered as an effective factor in learning pharmaceutical care in clinical training [23], which is in conformity with the findings of the present study. In his study, Mohammadi found that the fourth and eighth term students consider themselves more competent in terms of efficacy which could be attributed to qualitative improvements in clinical skill training in specialized courses [24]. The students' perceptions of the educational environment were more positive. A study conducted at the University of Zambia revealed similar findings [10]. Zare et al. showed that the learning environment had a mean above the average with the values of 2.06 out of 3 and concluded that it can be considered as a significantly effective factor in learning pharmaceutical care in clinical training [23]. Contrarily, the obtained data in the above-mentioned studies represented higher rates in this regard compared to the studies of Askari , Arabshahi, and Gowda [17,18,19]. In his study, Arabshahi showed that despite the acceptable learning environment, more favorable learning conditions can be created with slight changes such as holding workshops, using correct principles of educational designs, and building a friendly relationship with students. Furthermore, consultation on learning in busy clinical environments can create a favorable clinical atmosphere so that students can obtain clinical experiences at peace and the feeling of security [18]. In reviewing students' views regarding ruling environments on the educational atmosphere at Ardabil University of Medical Sciences, Fouladi et al. concluded that none of the students had a good feeling toward the learning environment and evaluated the learning environment unfavorable [25].

In this study, the total score of the educational atmosphere was 98.5± 18.86 (more positive than negative), which is in line with the findings of some other studies [17,18,26]. The total DREEM score observed in the Oman study was high and comparable with the findings from established international medical schools in South Africa and Ireland [27,28] whereas total DREEM score was reported 45% in a study in Kuwait [29].

Similarly, the findings of the study of the University of Zambia demonstrated that the students were marginally satisfied with the learning environments of the programs, which corroborates with reports from other studies that measured the quality of the learning environments of medical schools in developing countries. For example, Mayya and Roff reported a global DREEM score of 107/200 (53.5%) from Kasturba Medical College in India [30], while Zawawi and Elzubier found a global score of 100/200 (50%) from Saudi Arabia [31]. The findings of the present study conform to these reports from

developing countries while sharply contrasting with the reports of other studies in more advanced countries. Further, Zawawi and Elzubeir confirmed this issue and noted that schools operating under a problem-based learning curriculum model often obtain higher DREEM scores compared to their traditional counterparts [31]. Although curriculum models may be an important determinant of learning environment quality, several other factors, which are related to curriculum delivery and instructor behavior, might be significant as well. According to previous research, creating positive experiences for students' learning in clinical sessions is important as a principle. Moreover, providing the opportunity for effective clinical experiences in the real world for nursing students can lead to success in nursing training programs in clinical situations [32]. These findings indicate that double and coordinated efforts are needed to improve the learning environment of medical and nursing students in Jahrom University of Medical Sciences in the field of pharmacology in particular and other courses.

The present study has some limitations. It recruited participants from only one institution, and a nationwide study could have been more appropriate. In addition, only the perceptions of undergraduate nursing students were evaluated thus these findings may not be applicable to students in other undergraduate or postgraduate programs. Accordingly, for a comprehensive understanding of the educational environment of an institution, all programs should be studied at both undergraduate and postgraduate levels and other factors such as academic and support staff should be included as well. Finally, extending the study design to include a qualitative component could provide a more in-depth understanding of the raised issues.

Conclusion

In general, the Dundee Ready Education Environment Measure is internationally used for different purposes and is regarded as a useful tool by the users. However, reporting and analysis differ between publications.

The findings of the present study revealed that the educational atmosphere of the pharmacology course was more positive than negative from the viewpoints of the majority of students, indicating the importance of professors' considerations to the principles of the instructional design and creating an appropriate educational environment for better learning in trainings.

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Conflict of interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

Ethical considerations

The study was approved by the Ethics Committee of Jahrom University of Medical Sciences (IR.JUMS.REC.1394.226).

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