Evaluation Of Educational Environment Based On Dundee Ready Education Environment Measure Inventory In Institute Of Nursing: A Cross-Sectional Study

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Abstract

Objective: To assess the educational environment at the Institute of Nursing using the Dundee Ready Education Environment Measure (DREEM) inventory.

Methods: A descriptive cross-sectional study was conducted at the Institute of Nursing, Wah Medical College from July 2022 to June 2023. All students (n= 216) enrolled in Generic and post-RN programs of BScN of the Institute of Nursing, Wah Medical College were given a DREEM questionnaire. The inventory consists of 50 items. The mean and standard deviation of all the variables were calculated and presented as tables. For each of the five domains, scores were calculated as the cumulative total of individual responses for all of the items in that domain. Data was analysed by SPSS 23.

Results: The total DREEM score was found to be 138.08 ± 18.77 out of a maximum of 200 corresponding to 67.48% of the maximum score (95% CI: 1.08-3.65). Students tend to have a more favourable perception of their educational environment rather than a negative one. The domain with the highest mean score was the Students' Perception of atmosphere for which the mean score was 33.63 ± 6.50. The lowest mean score was for the students' self-perception of performance for which the mean score was 17.29 ± 2.98.

Conclusion: The present study revealed that all groups of nursing students perceived the learning environment highly positively. Nevertheless, the study also revealed areas of the learning environment which can be improved further.

MeSH Keywords: Educational assessment, Nursing students.

1. Introduction

The educational environment is a critical component of the curriculum, influencing the interaction between students, teaching tools, assessment criteria, and educational outcomes.[1] Therefore, monitoring this environment is essential to identify and address problematic areas within an institution. Such monitoring enables the necessary adjustments to achieve the desired educational outcomes.

The foundation for improving patient health and safety starts with the competence of healthcare providers. Nurses, who spend more time with patients than other staff members, must provide a high standard of care.[2] This standard should not be compromised due to gaps in clinical knowledge. Therefore, delivering high-quality learning experiences and motivating nursing students to engage actively in their educational environment are crucial steps to address these gaps.

Nursing education is skill-based, meaning that classroom theoretical knowledge alone is insufficient for developing professional skills. To meet healthcare needs, nursing students need to apply theoretical knowledge in clinical settings.[3] Nearly half of a nursing student's education takes place in clinical wards, underscoring the importance of practical experience. Addressing students' learning requirements under the guidance of instructors is crucial for developing professional competence before graduation.[4]

In this context, nursing education serves as a platform for lifelong learning, where quality improvement methods are essential for reforming the healthcare system.[5] The Institute of Nursing at Wah Medical College offers post-registered Nurse (RN) BSc Nursing and Generic BSc Nursing programs to produce highly skilled, competent, and knowledgeable professional nursing graduates.

The Dundee Ready Education Environment Measure (DREEM) inventory, developed and validated by Roff et al. between 1994 and 1996, is a highly reliable tool

for assessing the educational environment of health professionals and allied institutions.[6] It has been validated in various countries and cultures globally and remains a trusted method for evaluating educational environments in health professions.[6,7]

The Institute of Nursing at Wah Medical College was established in 1975 to provide a three-year General Nursing Diploma Program. In 2016, the institute was upgraded to offer a BSc Nursing Degree Program and began two degree-level programs: the Post Registered Nursing (RN) BSc (a 2-year degree program) and the Generic BSc Nursing (a 4-year degree program). The aim was to develop professionals who would work as integral members of medical teams alongside doctors. The institute is equipped with a qualified faculty and fosters a learning-conducive environment.

To our knowledge, this is the first study assessing the educational environment of the Institute of Nursing using the DREEM inventory. Our study will serve as a starting point for implementing measures toward curricular reform and will provide valuable evidence for comparative studies in this and other nursing institutions in the future.

2. Materials & Methods

A Descriptive cross-sectional study with probability consecutive sampling was conducted at the Institute of Nursing, Wah Medical College from July 2022 to June 2023.

The sample size was calculated using the Raosoft sample size calculator, taking a confidence level of 95%, anticipated population proportion of 84.1% [5] and absolute precision of 5%. The calculated sample size was 216. All students (n= 216) enrolled in the Generic BSN programme and post-RN BSN programme of BScN of the Institute of Nursing, Wah Medical College were included in the study.

The DREEM inventory comprises 50 questions, each scoring 4, thus giving a cumulative maximum individual DREEM score of 200. Students were asked to indicate their perception about the following domains: Students' Perceptions of Learning (SPL) containing 12 items, Students' Perceptions of Teachers (SPT) having 11 items, Students' Academic Self-Perception (SASP) containing 8 items, Students' Perception of Atmosphere (SPA) having 12 items and Students' Social Self-Perceptions (SSSP) having 7 items.[1-7]

The scoring system of the DREEM questionnaire was the one suggested by McAleer and Roff as explained in Table 1. [8] The students respond to each of the 50 statements on a five points Likert scale of 0–4 (4 = strongly agree, 3 = agree, 2 = uncertain, 1 = disagree, and 0 = strongly disagree). Items with a mean score of 3 and above were considered positive and items with a mean score of 2 and below were considered as problem areas and will be identified in the study population. Items with a mean score between 2 and 3 will be considered as aspects of the educational environment that require enhancement.

3. Results

There are 9 negative items (statements no 4,8,9,17,25,35,39,48 and 50) which will be scored in a reverse manner; thus, higher scores indicate disagreement with that item.

After obtaining approval from the Institutional Ethics Board (WMC/ERC/IRB/030), DREEM questionnaires were distributed to all students of BScN present in the class (each session separately) during a routine lecture.

The students were informed regarding the objective of the study and the process of data collection. Participants were ensured that data collected for the study would remain anonymous. Results were summed and statistically analyzed using SPSS 23.0. Internal consistency of the DREEM using Cronbach's alpha for both the total score and subscale scores was validated. The mean and standard deviation of all the variables were calculated and presented in the form of tables. For each of the five domains, scores were calculated as the cumulative total of individual responses for all of the items in that domain. Thus, after conversion, 100 represented the best possible score (complete agreement) and 0 the worst score (complete disagreement). Frequencies with percentages were computed to describe the sociodemographic characteristics of the students.

There were 216 enrolled students in the nursing programme of the Institute of Nursing, Wah Medical College, Wah Cantt. All students completed the questionnaire giving a response rate of 100%. Out of 216 students, 56 (25.93%) were male and 160 (74.07%) were female. In the demographic data of respondents, the highest percentage was related to the group aged 23-30 from post-RN group 41(18.98%) while the highest percentage of respondents was related to the group aged 20-23 from generic group 76 (35.18%).

Table 2 presents the sub-scale statistics for the DREEM instrument. The scale's reliability was assessed at 89.8%, demonstrating excellent internal consistency among student responses. The sub-scales Students Perception of

Learning (SPL) and Students Perception of Teachers (SPT) exhibited notably high reliability, reflecting a more positive approach, as evidenced by their mean values.

Table 1: Guideline to interpret the overall and subscale dreem scores.[8]

Total and individual scores	
Total Score 50 items	**Interpretation**
0-50	Very Poor
51-100	Plenty of Problems
101-150	More Positive than Negative
151-200	Excellent
Individual items	
< 2	Problem areas
2 – 3	Could be enhanced
> 3	Real Positive points
Subscales	
Students' Perception of Learning (SPL) 12 items	
0 - 12	Very poor
12 – 25	Negatively viewed teaching
25 – 37	A more positive perception
37 - 48	Teaching highly regarded
Students' Perception of Teachers (SPT) 11 items	
0 – 11	Very poor
12 – 22	Negatively viewed teaching
23 - 33	A more positive perception
34 - 44	Teaching highly regarded
Students' Academic Self Perception (SASP) 8 items	
0 - 8	The feeling of total failure
9 - 16	Many negative aspects
17 - 24	Feeling more on the positive side
25 - 32	Confident
Students' Perception of Atmosphere (SPA) 12 items	
0 – 12	Very poor environment
13 – 24	Many issues need changing.
25 – 36	A more positive attitude
37 - 48	A good overall feeling
Students' Perception of Self Performance (SPSP) 7	
0 – 7	Miserable
8 – 14	Not a nice place
15 – 21	Not too bad
22 - 28	Very good socially

Similarly, Students' Academic Self Perception (SASP) and Students' Perception of the Atmosphere (SPA) showed strong consistency in responses, with reliability statistics of 72.4% and 80% respectively. However, Cronbach's alpha for the Student's Perception of Self Performance (SPSP) sub-scale was notably low, suggesting significant heterogeneity in student responses to its items.

Table 2: Dream Sub-Scale Statistics (N=216)

	Mean	SD	Sub-scale score interpretation	Cronbach's Alpha
Students Perception of Learning (SPL)	33.71	4.823	A more positive perception	.719
Students Perception of Teachers (SPT)	29.33	5.311	A more positive perception	.660
Students Academic Self Perception (SASP)	24.0	3.657	Feeling more on the positive side	.724
Students Perception of Atmosphere (SPA)	33.63	6.508	A more positive attitude	.800
Students Perception of Self Performance (SPSP)	17.29	2.989	Not too bad	.129
Overall All DREEM Score	138.08	18.77	More positive than negative	.898

The descriptive statistics, including the 95% confidence intervals (CI) for each item in the questionnaire, are presented in Table 3. Higher scores indicate more positive opinions from students towards the environment. We designated an item score greater than 3 as reflecting a "good" opinion. Among the 23 items with a mean score > 3, the item "The teachers are knowledgeable" received the highest mean score (3.62 ± 0.56), signifying a very positive opinion.

However, the other 22 items had mean scores between 2 and 3, indicating areas that need considerable improvement to enhance students' satisfaction. Notably, five items had mean scores below 2.0, highlighting significant problem areas (these items are shown in bold in Table 4). The item "The teachers are authoritarian" received the lowest mean score (1.19 ± 0.983), indicating a particularly negative perception.

Table-3: Item Statistics

Item No.	Statement	MEAN	SD	95% LOWER CI	95% UPPER CI
1	I am encouraged to participate in class	3.38	.678	3.29	3.47
7	The teaching is often stimulating	3.01	.699	2.92	3.11
13	The teaching is student-centred	2.96	.840	2.85	3.08
16	The teaching helps to develop my competence /learning capabilities	3.05	.842	2.94	3.16
20	The teaching is well-focused	3.20	.725	3.11	3.30
22	The teaching helps to develop my confidence	3.19	.833	3.08	3.28
24	The teaching time is put to good use	3.07	.753	2.97	3.17
25	The teaching over-emphasizes factual learning*	1.29	.885	1.17	1.41
38	I am clear about the learning objectives of the course	3.09	.813	2.98	3.20
44	The teaching encourages me to be an active learner	3.01	.798	2.91	3.12
47	Long-term learning is emphasized over short-term learning	2.91	.882	2.79	3.03
48	The teaching is too teacher-centred*	1.53	.964	1.40	1.66
2	The teachers are knowledgeable	3.62	.506	3.55	3.68
6	The teachers espouse a patient-centred approach to consulting	2.70	.888	2.58	2.82
8	The teachers ridicule the students*	1.99	1.116	1.84	2.14
9	The teachers are authoritarian*	1.19	.983	1.06	1.33
18	The teachers have good communication skills with patients	3.03	.957	2.90	3.18
29	The teachers are good at providing feedback to students	3.10	.881	2.98	3.22
32	The teachers provide constructive criticism here	2.50	1.043	2.36	2.64
37	The teachers give clear examples	3.33	.654	3.25	3.42
39	The teachers get angry in teaching sessions	2.05	1.178	1.89	2.21
40	The teachers are well prepared for their teaching sessions	3.36	.668	3.27	3.45
50	The students irritate the teachers	2.56	1.191	2.41	2.72
5	Learning strategies which worked for me before continue to work for me now	2.80	.712	2.70	2.89
10	I am confident about my passing this year	3.35	.712	3.25	3.44
21	I feel I am well-prepared for my profession	3.04	.812	2.93	3.15
26	Last year's work has been a good preparation for this year's work	2.72	.839	2.61	2.83
27	I can memorize all I need	2.94	.810	2.83	3.04
31	I have learnt a lot about empathy in my profession	3.17	.780	3.07	3.28
41	My problem-solving skills are being well developed here	2.91	.796	2.80	3.01
45	Much of what I have to learn seems relevant to a career in healthcare	3.08	.791	2.98	3.19
11	The atmosphere is relaxed during consultation teaching	2.89	.936	2.77	3.00
12	This institute is well timetabled	3.05	.954	2.92	3.17
17	Cheating is a problem in this institute	2.49	1.290	2.32	2.66
23	The atmosphere is relaxed during lectures	2.91	.948	2.78	3.04
30	There are opportunities for me to develop interpersonal skills	2.98	.927	2.85	3.10
33	I feel comfortable in teaching sessions skills	2.89	.906	2.77	3.02
34	The atmosphere is relaxed during teaching sessions	3.08	.746	2.99	3.18
35	I find the experience disappointing	2.25	1.066	2.11	2.39
36	I can concentrate well	3.07	.705	2.98	3.17
42	The enjoyment outweighs the stress of course	2.25	1.198	2.09	2.41
43	The atmosphere motivates me as a learner	2.71	.932	2.58	2.83
49	I feel able to ask the questions I want.	3.06	.869	2.94	3.18
3	There is a good support system for students who get stressed	2.43	1.27	2.26	2.60
4	I am too tired to enjoy studies*	1.57	1.175	1.41	1.73
14	I am rarely bored in this institute	2.15	1.298	1.98	2.33
15	I have good friends in this institute	3.08	.978	2.95	3.21
19	My social life is good	3.05	.856	2.93	3.16
28	I seldom feel lonely	2.11	1.148	1.96	2.27
46	My accommodation is pleasant	2.90	.902	2.78	3.02
	All the DREEM items	138.08	18.77	135.56	140.60

*5 Items in bold have a mean score of < 2.0

22 items have a mean score between 2 and 3.

23 items have a mean score > 3.0

The overall score and the score of each domain of the DREEM questionnaire are tabulated below in Table 4. The highest score was noted in the domain of perception of learning by students and the lowest was observed for students' self-perception of performance.

Table 4: Total results of dreem domains (N= 216)

Domain Dream	Number Of Questions	Maximum Dreem Score	Mean	SD
Students Perception of Learning (SPL)	12	48	33.71	4.823
Students Perception of Teachers (SPT)	11	44	29.33	5.311
Students Academic Self Perception (SASP)	8	32	24.0	3.657
Students Perception of Atmosphere (SPA)	12	48	33.63	6.508
Students Perception of Self Performance (SPSP)	7	28	17.29	2.989
Total DREEM Score	50	200	138.08	18.77

4. Discussion

Nursing education in Pakistan is undergoing the process of evolution as evidenced by the transition from a year's traditional diploma program to a Bachelor of Science in Nursing (BScN) program.[9] Although the nursing training schools were established to meet the challenge of increasing demand for competent and professional nursing staff. Several institutes have started degree programs in recent years; however, limited resources made it difficult to meet the criteria laid down by the Pakistan Nursing Counsel and Higher Education Commission.[10]

Two hundred and sixteen students including 56 males (25.9%) and 160 females (74.0%) were interested in completing the inventory, as evidenced by a 100% response rate. Our data revealed the majority of nursing students were female and day scholars - a fact that is supported by the literature that nursing has been portrayed as a feminine profession.[11]

The questionnaire comprised 50 items, of which 23 have a mean score above 3, reflecting very positive opinions. Meanwhile, 22 items have mean scores between 2 and 3, indicating areas needing considerable improvement to enhance student satisfaction. In contrast, five items have mean scores below 2, highlighting significant problem areas and particularly negative perceptions.

Our total score of DREEM is 134.96 ± 18.2 which shows that the educational environment is favourable for learning. Among all the domains, the student's perception of learning at the Institute of Nursing was greatest with a mean score of 33.71/48, followed by students' perception of atmosphere with a mean score of 33.63/48 which shows a conducive atmosphere for learning. Our finding is comparable to the study reported by Fawzia et al,[12] who perceived a positive perception of atmosphere. However, the result was contradicted by that of Imen et al,[13] which found many issues affecting students' perception of the atmosphere that require change. The differences in studies are the result of cultural background diversity and educational settings. The lowest score in our study was for domain students' self-perception of performance which showed a normal average score. The majority of nursing students belonged to the lower middle socioeconomic class. The feeling of overwhelming academic-related stress and social inequality can reduce intrinsic motivation and impact overall academic performance and achievement.[14] The concurrent situation can be improved by introducing a stress management program and counselling sessions for students. The mentorship program may be exploited and strengthening of social support systems will lead to desired results.[15] The study conducted in the Institute of Nursing CMH, Lahore by Ahmad et al concluded similar results in the context of total DREEM score which was 131.77±12.30.[16] Another study conducted by Shrestha et al in Nepal concluded similar results as compared to our data.[17] Studies with slightly lower

scores (115.67 ±12.4) were reported from nursing schools in Iran.[18] Another study conducted in Iran showed a mean DREEM score of 105.01(22.00) which is more positive than negative, but it is less as compared to our study.[4] A study in Morocco on nursing students showed similar results that are less as compared to our study with a DREEM score of 110.6 ±21.5.[19] The literature search depicted the highest score in nursing school in the United Kingdom which was 142.91.[20] Their result reflects the strategy-based student-centred educational programs and self-sufficiency of material resources.

5. Conclusion

The present study revealed that all groups of nursing students assessed the educational environment very positively. However, it also identified areas for improvement, particularly in the domain of "Students' Perception of Self-Performance." We concluded that there is significant room for enhancement in our institute to further increase student satisfaction. The differences in the socioeconomic and cultural backgrounds of nursing students might have influenced their perceptions of the learning environment. Involving various healthcare institutions in future studies could improve the generalizability of the current data. Providing strong social and academic support, along with student-centred innovative learning strategies, will help students become competent professionals.

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References

1. Challa K, Sayed A, Acharya Y. Modern techniques of teaching and learning in medical education: a descriptive literature review. MedEd Publish. 2021;10(1): 18 http://doi.org/10.15694/mep.2021.000018.1
2. Inayat S, Uttanwalla KS, Sikander S. Perception of Nursing Students about their Educational environment in a college of Nursing Pakistan: A cross sectional study. Isra Med J. 2017;9(3):171-174. https://api.semanticscholar.org/CorpusID:217791652
3. Alammar K, Ahmed M, Almutairi S, Saleem O. Nursing Students perception of the Clinical Learning environment. Open J Nurse. 2020; 14:174-179 http://dx.doi.org/10.2174/1874434602014010174
4. Rokhafrooz D, Alborzi Z, Shustari SSGZ, Heydari M. Nursing S Students perception of the Educational Environment in a Public University in Ahvaz, Iran: A Study Based on DREEM Questionnaire. Nurse Media J Nurs.2022; 12(1): 88-99 https://doi.org/10.14710/nmjn.v12i1.41727
5. Bakhshialiabad, H., Bakhshi, G., Hashemi, Z. Improving students' learning environment by DREEM: an educational experiment in an Iranian medical sciences university (2011–2016). BMC Med Educ. 2019; 19: 397 https://doi.org/10.1186/s12909-019-1839-9
6. Roff S, McAleer S, Harden RM, Al-Qahtani M, Ahmed AU, Deza H, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). Med Teach. 1997; 19:295–299. https://doi.org/10.3109/01421599709034208
7. Huda S, Alisbinati ASA. Nursing Education in Pakistan: Challenges and Trends in Degree Program. International Journal of Nursing Education. 2015; 7(4): 59-62 DOI:10.5958/0974-9357.2015.00194.4
8. McAleer S, Roff S. A practical guide to using the Dundee Ready Education Environment Measure (DREEM)," AMEE Medical Education Guide.2001; 23: 29- 33. https: // www. researchgate.net/publication/288791256_A_practical_guide_to _using_the_Dundee_Ready_Education_Environment_Measure _DREEM
9. Shaheen N, Hamdani U, Roshan R, Shaheen FA, Azam N, Pervaiz F, et al. Nursing Students' Perceptions of Their Educational Environment in An Armed Forces Nursing College - A Cross Sectional Study. Pak Armed Forces Med J. 2019; 69 (Suppl-2): S176-80. Available from: https://pafmj.org/PAFMJ/article/view/285
10. Bibi R, Khan RA, Noreen N. Future Direction of Nursing Education in Pakistani Context. Higher Education Research. 2020; 5 (1): 5-8. doi: 10.11648/j.her.20200501.12.
11. Prosen, M. Nursing students' perception of gender-defined roles in nursing: a qualitative descriptive study. BMC Nurs 21, 104 (2022). https: // doi. org/10.1186/s12912-022- 00876-4
12. Fawzia, Badran MM, Ibrahim FM, Mohamed HR. Nursing Students' Perception of their Educational Environment. Egyptian Journal of Health Care. 2018; 9: 281-296. Doi. 10.21608/ejhc.2018.22788.

13. Imen R, Amal S, Mouna BA, Aziza T, Hichem D. Tunisian DREEM: Nursing Students' Perception of the Learning Environment. Open Journal of Nursing. 2022; 12: 745-757. https://doi.org/10.4236/ojn.2022.1211052

14. Carnoy M, Rosa L, Simões A. Trends in the academic achievement gap between high and low social class children: The case of Brazil. International Journal of Educational Development. 2022; 94:102650 https://doi.org/10.1016/j.ijedudev.2022.102650.

15. Ephraim N. Mentoring in nursing education: An essential element in the retention of new nurse faculty. Journal of Professional Nursing. 2021; 37(2) :306-319. https://doi.org/10.1016/j.profnurs.2020.12.001.

16. Ahmed W, Tufail S , Nawaz H, Sana N, Shamim H. Evaluation of educational environment of nursing undergraduates based on DREEM model in institute of nursing, CMH Lahore Medical College. Pak Armed Forces Med J. 2015 ; 66: 444-448.

17. Shrestha, E., Mehta, R.S., Mandal, G.Perception of the learning environment among the students in a nursing college in Eastern Nepal. BMC Med Educ. 2019; 382. https://doi.org/10.1186/s12909-019-1835-0

18. Badiee Aval Sh, Morovatdar N. Perceptions of Students toward the Educational Environment Based on the DREEM Tool in a New Nursing Scholl in Iran. Journal of Patient Safety and Quality Improvement. 2018; 6(2): 1-6. Doi: 10.22038/PSJ.2018.10571

19. Ikrou A, Guejdad K, Abouqal R, Belayachi J. Nursing students perceptions of educational environment: A Moroccan multicenter study. Journal of Positive School Psychology. 2022; 6 (2): 574 – 586. https://journalppw.com/index.php/jpsp/article/view/1544

20. Edgren G, Haffling AC, Jakobsson U, McAleer S, Danielsen N. Comparing the Educational Environment (as measured by DREEM) at Two Different Stages of Curricular Reform. Medical Teacher. 2010; 32: 233-38. http:// doi.org/10.3109/01421591003706282