Critical Care Students' Perceptions, Satisfaction, and Reflections on Their Clinical Learning Environment: A Step for Quality Improvement

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Abstract

Background: The primary goal of nursing education programs is to provide educational opportunities for nursing students to successfully achieve the competencies leading to initial entry to practice as qualified registered nurses able to provide high-quality and safe patient care. Continuous improvement in the quality of nursing education could be achieved by keeping pace with continuous changes in the clinical learning environment (CLE) through continuous attention to the students' feedback and reflections. **Aim:** To assess nursing students' perceptions, satisfaction, and reflections on their clinical learning environment as a step toward quality improvement. **Methods:** A mixed-research design was used to conduct the current study. A cross-sectional online survey was used to collect quantitative data and focus group discussions were used to collect qualitative data. **Results:** Statistical analysis of the five dimensions of the students' perceptions and satisfaction scale found two findings: On the one hand, the majority of the sample moderately perceived and agreed that the CLE was supportive, conducive to learning, and enhanced their academic success. On the other hand, slightly more than half of the students were moderately satisfied with their CLE, and there was a significant positive correlation between the students' perceptions and satisfaction with ($P < 0.001$ and $r = 0.65$. and $r = 0.65$). Furthermore, analysis of the sub-dimensions of the scale showed that the most common sub-dimensions that threaten the quality of nursing education were problems with clinical teaching, clinical placements, and clinical supervision and these findings were almost identical with the findings of the students' narrations extracted via FGDs. Three challenges emerged: psychological burdens (stress & anxiety), limitations in the clinical placements & lack of guidance, support, and competence of novice clinical supervisors. **Conclusion:** Among the five dimensions of the students' perceptions and satisfaction, the majority of the students moderately perceived that CLE is supporting, conducive to learning, and enhances academic success. Moreover, slightly above half of the study sample were moderately satisfied with the critical care learning environment. **Recommendations:** Partnerships with healthcare institutions should be developed, a module of virtual critical care learning environment using simulation, in particular, high-fidelity simulation, should be considered in the teaching methods, a mentorship program for the suspected/ novice clinical supervisors to prepare them for academic life, and a feedback to the student should be provided clearly and objectively, and should be delivered privately.

Keywords: critical care nurses' perceptions, satisfaction, reflections, clinical learning environment

Introduction

Nursing practice is the center, heart, and essence of any nursing program. It constitutes up to 60% of the credits in any nursing curriculum. Critical care is a demanding nursing specialty in terms of the complexity of the educational content, training environment, technological advancement, and patients with life-threatening conditions. The breadth and depth of nursing knowledge and skills necessary for critical care practice continue to increase rapidly yet the clinical learning environments (CLE) do not. Critical care nursing course provides an opportunity for students to develop basic knowledge and skills in critical care as well as expose them to the role of the critical care nurse **(Akyüz & Ergöl, 2022; Hattingh & Downing, 2020; Kalyani et al., 2019; Mohamed & Ahmed, 2022).** The critical care learning environment is an interactive network of forces within the clinical setting that influences the quality of learning outcomes, this network includes a combination of several physical, psychological, emotional, and organizational factors affecting the student's learning and how they confront the environment. It encourages competence development but also poses challenges for students and teachers. these challenges include the lack of clinical educators/instructors and clinical staff, inadequate

support supervision, shortage of resources that facilitate knowledge and skills acquisition, problems related to student and patient ratio, and imitation of time required to master the skills **(Drateru, 2019; Fernández-García et al., 2021; Jaffe et al., 2019; Kalyani et al., 2019; Liu et al., 2022; Moghaddam et al., 2020; Panda et al., 2021; Vizcaya-Moreno et al., 2018).**

Continuous assessment of the clinical learning environment has long been considered an important indicator of the quality of well-structured nursing education programs. Overall, it helps nursing institutions to adopt and employ new teaching and learning methods and revise the program structure as a whole. In this evaluation, the opinions and satisfaction of nursing students are considered important factors, which motivate possible reforms to optimize quality service activities. An optimal clinical learning environment has a positive effect on the professional development of the student, also, a poor learning environment could negatively affect the student's professional development process. Nursing students become competent when they use their knowledge, skills, and attitudes to make their clinical decisions to solve patient problems and meet their needs. The unpredictability of the clinical learning environment could cause problems for nursing students **(Drateru, 2019; Moghaddam et al., 2020; Panda et al., 2021)**. Student satisfaction and reflection are considered quality indicators of students' clinical training experience. Student satisfaction represents students' subjective perceptions, opinions, and feedback about the quality of the education they receive and how the educational environment supports their academic success. At the same time, student reflection connects to practice and theoretical work through critical thinking and reasoning **(Calma et al., 2022; Putra et al., 2020).**

The Key components of CLE that students should give feedback and reflect on are the content of clinical education, learning and teaching methods, learning support services, how clinical simulation laboratories mimic the real clinical environment, the effective level of expertise and leadership of the clinical supervisor, clinical supervision and how their supervisor's guide and support them in a stressful situation, and how much does the clinical educational content align with what was taught in the classroom (theory) without gaps between the both. The positive clinical experience of students is more likely to be related to how they feel valued and supported than the physical aspects of their training. When students were provided with a person who could ensure that their learning needs were met, and when they were given respect and appreciation as well as being part of the healthcare team, high levels of satisfaction were reported.

Students' positive clinical experiences are more likely related to how students feel valued and supported than to the physical aspects of the practice. High levels of satisfaction were observed when students had someone to ensure that their learning needs were met, and when students were treated with respect and appreciation and included in the health care team members. International researchers agree that seriously collected student feedback in nursing schools contributes to the continuous improvement of the quality of education. Satisfaction with the quality of nursing education is important in training qualified, professional, and innovative nurses **(Dhakal & Thapa, 2020; Kalyani et al., 2019; Sellberg et al., 2021; Woo & Li, 2020).**

Significance of the study?

The nursing education program at Alexandria University has been accredited more than once, and it has a good reputation nationally and internationally. However, in response to the need to increase the number of nurses who enter the healthcare workforce to overcome the nurses' shortage and the strong demand for nursing as an income-generating profession to solve the unemployment problem among non-nursing graduates in Egypt, many private and governmental nursing institutions and programs had been established creating burdens and pressures on the clinical learning environment leading to limitations in human resources (e.g. clinical instructors), and non-human resources (e.g., clinical settings, equipment & supplies, and the time allowed for students to practice and the clinical exposure). limitations in the components of the clinical learning environment are threatening the quality of nursing education that students receive and the quality of nurses entering the healthcare workforce.

The research problem was raised based on the observation of the researcher while supervising the clinical training of the students in the critical care units. To address the observed problem objectively and scientifically and to devise a solution to such a problem, the current study was conducted for such a purpose.

Aim of the study:

To assess nursing students' perceptions, satisfaction, and reflections on their clinical learning environment as a step toward quality improvement through:

- Assessing the critical care nursing students' satisfaction and perceptions toward their clinical learning environment.
- Assessing the critical care nursing students' reflections on challenges that hinder their skills acquisition in the clinical learning environment.

Research Questions

1. What are the undergraduate critical care nursing students' perceptions and satisfaction about the clinical learning environment?
2. What are the challenges that hinder the undergraduate critical care nursing students' skills acquisition during their studies in the critical care nursing course?

Methods

Design: a mixed research design was used.

- To assess the students' perceptions and satisfaction with the components of the clinical learning environment, a quantitative, cross-sectional design using a self-reported closed online scale was used.
- To assess the student's reflections on the critical learning environment, especially the challenges hindering the acquisition of their critical care skills, a qualitative exploratory research design using focus group discussions (FGDs) was used.

PROCEDURE

Participants

1. For quantitative research design: data were collected from all undergraduate critical care nursing students (n= 330) during the first semester of the academic year of 2021 – 2022 (5^{th} semester), who agreed to participate in the study with their opinions.
2. For the qualitative research design, a purposive sampling method was used to recruit the students. Thirty students were selected based on the following criteria: completed the quantitative questionnaire, were active during the semester in providing continuous feedback and comments, and achieved high grades in the continuous summative and formative assessments.

Exclusion Criteria

Students who were unwilling to participate in the study or absent for more than three days (25%) of the total course duration were excluded from the study.

Setting:

The researcher was willing to benefit from the advantages of using online technology, especially after the era of CORONA. Data were collected in the students' places where the internet connection was available, their times were allowed, and the environment was secure allowing for students who were not as assertive to collaborate with classmates through virtual meetings (e.g., homes).

Instruments

Tool One "Students' Perceptions & Satisfaction with the Clinical Learning Environment Scale". It consists of two parts.

Part I: "Demographic and Academic Data of the Students"

This part was developed by the researcher to collect the demographic and academic data of the students. the sociodemographic data includes age and sex, grade point average (GPA), the level of entry to the nursing program, if the nursing profession was a student's interest, the time required to reach the clinical area, working in the private hospital during the education period, the extent that training in the clinical skill labs was helpful, the extent that the training in the real clinical environment (hospital) was helpful, students' views regarding the adequacy of the duration planned for training in the clinical skill laboratories or the hospital.

Part II "Students' Perceptions & Satisfaction with Clinical Learning Environment Scale"

This scale was developed by the researcher after reviewing other validated reliable scales to assess the students' perceptions and level of satisfaction with their clinical learning environment **(Chan, 2002; Elbilgahy et al., 2020; Mikko Saarikoskia, et al., 2011; Newton et al., 2010; Sabah Imran et al., 2019).** It consists of 5 dimensions with 39 sub-dimensions. Dimension I: Clinical Teaching and Tutoring (9 sub-dimension), Dimension II: Clinical Instructor/Tutor/Supervisor (11 sub-dimension), Dimension III: Clinical Learning Physical Atmosphere (8 sub-dimension), Dimension IV: Educational Content & Assessment Methods (9 sub-dimension), and Dimension V: Equipment & Supplies (2 sub-dimension).

Scoring System:

Each positive statement is scored based on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5), and each neutral response scored 3, whilst negative statements were scored in the reverse manner. The students were asked to rate their perception regarding different dimensions' items. the overall score agreement was estimated as the following: Low perception (<50%), Moderate perception (50% - < 75), and High perception (≥75%). Five experts assessed the face and content validity of the scale in the academic and clinical nursing field. Cronbach's alpha coefficient for the scale sub-dimensions ranged from 0.83 to 0.95. For student satisfaction, students were asked to select their level of satisfaction with CLE on a 5-point Likert scale ranging from not at all satisfied (1) to very satisfied (5). The overall score for each dimension was evaluated based on the following criteria: (< 50%) indicating poor satisfaction. (≥ 50% - < 75%) indicating moderate satisfaction. (≥ 75) indicating high satisfaction. Face and content validity were examined by five panels of nursing experts, and reliability was assessed using Cronbach's alpha (0.92).

Ethical Considerations

- Approval to conduct the study was obtained from the Research Ethical Committee of the Faculty of Nursing, Alexandria University (IRB00013620), and the course coordinator.
- Students who chose to click on the link to the online survey and complete the survey confirmed their consent to participate in the study.
- The students were informed that they had the right to withdraw from the study without any penalty.
- The anonymity, confidentiality, and non-discrimination of information provided by the participants were asserted.

Pilot Study:

It was done on 10% of the study subjects to assess the applicability and clarity of the study questionnaires, as well as to estimate the time needed to fill in the study tools. The survey was sent to 30 nursing students and collected at the same time. Because there were no suggested modifications received from the students, the students involved in the pilot study were considered as a part of the study sample and were not excluded from the study.

Data collection

The data collection of the current study was conducted at the end of the first semester of the academic year 2021 – 2022.

For Quantitative Data:

- The layout of the online survey was designed by a researcher using the Microsoft Teams Form.
- A voice message was sent by the researcher to the students through Microsoft Teams Posts to explain the instructions regarding the method of accessing and completing the survey and avoiding double responses.
- Further instructions and clarifications were provided face-to-face via a meeting with the students during the course's office hours.
- The students were instructed to read the items in the survey carefully and to be aware that some items may be written in negative form (dimension three, items 5 & 6) to be aware of when to select between agreement and disagreement.
- The link to the online survey was sent to the students, and they were informed to access it at any time throughout the week, the validity

of the link. Completing an online survey took about 30 - 45 minutes.

- Responses of the students were collected, organized, and statistically analyzed.

For Qualitative Data

- Exploratory four focus group discussions were conducted to determine the lived experiences and challenges that hinder the students' learning from their point of view and using the students' words.
- The meeting was arranged and conducted through Microsoft Teams. The students were asked to open their Cameras, and their responses during the meeting were recorded.
- The researcher started the meeting by welcoming, thanking the students, and reflecting on the study's aims. Each meeting lasted about two hours to complete.
- During the first meeting, all (30) students were asked to attend this introductory meeting to decide on the themes for the next three meetings. A brainstorming open discussion strategy was used to allow the students to think about the challenge(s) that students experienced during their clinical training in the clinical environment that hindered their learning development and to delve deeper into issues previously identified through a quantitative study.
- At the end of the FGDs, the researcher thanked the students and asked them to reflect on what was said in the meetings.

Data analysis:

- To identify and extract challenges faced by the student in their clinical learning environment, a content analysis was used. It focuses on the interpretation of the similarities and differences within different sections of the text. The researcher heard the recorded interview several times to completely understand it and address the challenges encountered by the students. They were isolated in a separate text. Then, similar texts in terms of content and context were coded and three themes were extracted.
- Trustworthiness of the data collected by using the explorative qualitative method such as credibility, transferability, dependability, and confirmability were followed, for example, the students were given the chance to correct the researcher's summaries, and they were allowed to add further information, so the credibility of the data was established.

Results

Part 1: Quantitative Data (Perceptions & Satisfaction)

Table 1 portrays the distribution of students according to their demographic & academic characteristics. Out of 330 students, only 305 nursing students completed the survey (response rate 92.4%). About two–thirds of the students in the study were female (66.9%) and the mean and standard deviation of the student's age and GPA were 20.76 ± 0.82. 10 and 2.96 ± 0.29 respectively. The nursing profession was the choice of interest for the vast majority of the students (97%). About three–quarters of the students were admitted to the faculty of nursing from a secondary school. A vast majority of the students (97.7%) were not working during the study period. The minimum and maximum time required to reach the clinical place was from 10 – 120 minutes with a mean and standard deviation of 70.15 ± 30.12. About two-thirds of the students found the training in the clinical skills laboratories was very useful (63,6 %) compared to 39.7 % of the hospital. However, nearly equal numbers of the students (196 & 188) required more time for training in the clinical skills laboratories and hospitals.

Table 2 highlights the percentage distribution of nursing students' perceptions of the clinical learning environment. The scale consists of 39 sub-dimensions distributed along with 5 dimensions. As regards the first dimension which aimed to evaluate the students' perceptions of the teaching methods that were used to deliver the educational clinical content, it could be predicted that the total percent score ranged from 14-45, with a standard deviation of 28.89±6.21, and Median (IQR) of 29 (8). Among the 9 items, the highest percentage score of students' agreement belonged to item 6 (65.9%) "The clinical teaching methods helped to develop my competence" In contrast, the lowest percent score belonged to item 5 (34.4%) (There are opportunities for students to express opinions in the clinical training sessions).

The second dimension reflects the students' perceptions toward the clinical instructor, it consists of 11 items. The total percent score ranged from 15 – 55, with a standard deviation of 35.30±7.25, and a median (IOR) of 36 (9.5). Among the 11 items, the highest agreement score belonged to item number 6 where 72.8% of the students found the clinical instructors were competent versus 20.6% found they were not. In contrast, the lowest scores belonged to items 4 & 5. Only 29,5 % and 34.4% of the students agreed that the clinical instructor often thinks of interesting & innovative activities for the students and cares to listen to the students during the debriefing sessions without fear or anxiety.

Moreover, the third dimension is concerned with the evaluation of the student's perceptions that relate to the clinical learning physical atmosphere. It consists of 8 items. The total percent score ranged from 14 – 40, with a standard deviation of 25.09±3.61, and a median (IOR) of 25 (4). Among the 8 items, the highest mean score of agreement belonged to item number 4 where 71.2% of the students felt that the teaching environment was comfortable and sociable.

Furthermore, the fourth dimension related to the students' perceptions toward educational content & assessment methods, with a total of 9 items and percent scores ranging from 9 – 45, a standard deviation of 30.89±6.01, and a median (IOR) 32 (7). The highest score of the agreement was given to item 2 in which 80.4% of the students reported that skills taught in the clinical module are aligned with the nursing theory concept. In contrast, the lowest percent score belonged to sub-dimension 9 where 43% of the students agreed that the rubrics of the checklist provided an accurate measure of my skills. Finally, dimension five depends on the student's evaluation of the availability of equipment and supplies required for clinical training. It consists of 2 items with a percent score ranging from 2 – 10, with a standard deviation of 6.68±1.96, and a median (IOR) of 7 (2). It also found that 77% of the students reported that there were sufficient equipment and supplies in the simulation that were used during the nursing skills demonstration and re-demonstration.

In conclusion, table 2 predicted that the total percent scores of agreement categories were 10 (3.3) had low or poor perceptions, 252 (82.6) had moderate perceptions, and 43 (14.1) had high perceptions.

Table 3 reveals the level of students' satisfaction with their learning environment. The scale consists of 5 items. The total percent score ranged from 20-100, with a standard deviation of 57.81±15.92, and a median (IOR) of 56(20). Additionally, the total percentage scores of the overall students' satisfaction were 93(30.5) experienced low satisfaction, 164(53.8) experienced moderate satisfaction, and 48(15.7) experienced high satisfaction.

Table 4 represents the correlation between nursing students' perception and satisfaction with the clinical learning environment. it was noted that a significant positive correlation between perceptions and satisfaction was identified with $P < 0.001$ and $r = 0.65$. Additionally, 43% of the changes in satisfaction level could be explained by their perceptions as $R^2 = 0,43$. Accordingly, further study is required to study the remaining 57% of the changes in the students' satisfaction level.

Part Two: Qualitative Data (Students' Reflections)

Findings of the Focus – Group

Students Profile

Out of the 30 students, 27 students (Response Rate = 90%) attended the focus group discussion. 7 were males and 20 were females. All the students were between the ages of 20 and 22 years old. 3 of the students worked in a private hospital during the study. Additionally, all of them were single, and 22 were admitted to the Nursing Program after secondary school, while 5 of them were admitted bridging their diploma certificates. The three themes perceived by the students as key challenges were: clinical place stress and anxiety, lack of supporting environment, limited time, physical placement allocated for training, and incompetence of novice clinical instructors.

1) Initial clinical stress and anxiety

Stress and anxiety were been recognized as common psychological responses during the first exposure of the students to the critical care learning environment that may negatively affect the cognitive functions of the students leading to

a mental block, lack of concentration, learning impairment, and the student's well-being. This theme emerged from all FGDs where all the students faced these feelings in the beginning, and they reported the following some of the students' experiences:

S4. *"On the first time in the critical care unit (CCU), the instructor asked me to assess the patient; I panicked to the degree that I forgot everything I was taught in the lab. . . I was afraid to do something that would harm the patient.".*

S1. "Oh, yes, I gave medication to the patient with great fear of causing harm to the patient. I hoped that the procedure would be completed quickly." …she stopped talking for a moment and continued *"I was anxious to the degree that, I felt trembling, pale, sweating, cold skin, and fainting."*

S7. *"I like training in the clinical skill laboratory more than the hospital. I felt comfortable dealing with manikins. Although I had some clinical experiences from the emergency care course, I was a bit scared in the beginning, I was worried about the patient's safety."*

S5. *"I was scared to the degree of crying. The instructor told me "We have objectives that should be fulfilled" She was worried about the objectives more than my feelings or suffering."*

S2. *"I agree, but to be fair instructor was busy in the ICU with achieving the objectives. If she paid her attention to the student's feelings, no time would be available to train the students."*

S1. "I will never forget my first experience; I saw dead people on TV. however, it was the first time I saw a real dead patient I was shocked, and I could not breathe."

S13. *"When I went to the unit, a patient was attached with tubes and devices that I had never seen before. I was scared to accidentally remove any of them. My arms and legs were shaking. I couldn't hear or understand what my instructor asked me to do., and I was freezing up in an urgent situation.*

S17. *"Oh, I was pushed by my instructor to deal with the patient."*

S11. "*We think the cause of our fears and anxieties were caused by inadequate knowledge and deficient practical skills. What we learned in the clinical skill labs was not enough to prepare us with adequate competencies and confidence to handle critically ill patients, and we think, we need to spend more time in the labs and be exposed to simulated clinical scenarios imitating the real clinical learning environment."*

S9." *Lack of self–confidence disturbed our abilities to concentrate, communicate, and be involved in the team."*

2) Lack of support and guidance from clinical instructors

Unfortunately, this result is quite disappointing, especially for a program that had been academically accredited more than once. Students perceived their clinical instructors were not supporting them as a result of their physical and psychological exhaustion. The following are some of the students' narrations.

S17.*"Some of the clinical instructors shouted and lost their temper in front of the nurses and patients. some of the instructors lost confidence and mistrusted us."*

The majority of the students expressed their agreement with their colleagues, pitted the emoji of acceptance, and added *"We lose our focus & interest in learning when the clinical instructors come to the clinical area with a passive or aggressive attitude."*

they proceeded." We like to learn in the lab because the instructors are calmer and even if they give negative feedback or criticize us, we accept it without being embarrassed. In the hospital, most of the instructors are always stressed and shouting. I understand that they are afraid students do actions harm the patients, but they should understand that stress hinders learning acquisition.

S25. "*My instructor was aggressive, and she had a poor communication method, I was afraid to express my worries and feelings, and all my colleagues in the group refused to*

express our opinions in the clinical training sessions."

S10. "*The problem was not only concerning our instructor but also extended to the staff nurses working in the CCU*. She mentioned *"In the clinical setting, I was disappointed due to poor communication and uncooperative behaviors. They considered us an overload in the unit and when I complained to my instructor, she told me we have to withstand and rare them to reach our objectives……. I did not agree with this type of rationality and support. My instructor supported the nurse and neglected my feelings as a human being."*

S1*" Although I did not like the way of communication of the nurses working in the ICU, I sometimes gave them an excuse. They were stressed and worried about mistakes that could happen to the patients who are responsible, "She is a person who will be questioned and accused of the mistakes."*

S8. "*Because of the increased numbers of students and decrease in the number of instructors and clinical placement areas, the instructors were pushed to train two students' groups along with two consecutive clinical sessions without break, so most of them looked tired, they did not have the capacity or tolerance to answer the students' questions, so most of the time we preferred not to ask them to avoid their nervousness. Physical exhaustion of the instructors leads to loss of their interest in teaching or guiding students."*

S13.*"One of the common causes of the aggression of my instructor was because she was a novice. She found herself face-to-face with the students without adequate preparation. She was assigned to be responsible for the group due to a limitation in the number of instructors in proportion to the students' number. The instructor was very distressed when the ICU nurses denied both the students and their novice instructors.*

3) Limitations in the clinical placements, inadequate time allowed for student practice, and incompetence of novice clinical instructors.

The three elements that students perceive as challenges or barriers to skill acquisition are important components of CLE. This finding reflects that the quality of nursing education and healthcare services is at great risk for questioning.

S6., *"Training in the clinical skill laboratories was a procedure–based learning, not as holistic patient care and did not mimic the real CCU environment, the problem was when we faced a critically ill patient who was attached to several invasive devices, most of them, we did not have any idea about them, and the instructors ordered us to come in contact with the patient and provide care."*

This narration was supported by all of the students "*There was a disparity between the clinical practice gained in the labs and the reality in clinical practice. In the lab, we must follow the procedure's steps strictly."*

They elaborated *"One other key that limits the acquisition of clinical experience is the time allowed for training. They indicated that there was a 3-hour allocation for each student per day per week. They mentioned that the 3 hours were distributed among 5- 7 students with 15 – 20 minutes for each student per day." …. yes…the number of students in the ICU is very high… we found ourselves with many other nursing students from different nursing institutions. Nurses had a negative attitude toward us, they also found us a burden and the physical space inappropriate for our numbers in the department. Most of the time, we tried to deal with bad nurses' behaviors by neglecting or staying silent to reduce tension and to avoid problems with our instructor."*

Most of the students reported that "the clinical skills laboratory was cleaner and more conducive to learning than the real – environment (hospital). They rationalized their views by saying that the hospital environment needs more arrangements to ensure the patients' privacy and reduce the noise and interruptions that make the environment more stressful and hinder educational growth."

Table 1: Distribution of Students According to Their Demographic & Academic Characteristics.

Sociodemographic / Academic Characteristics (N = 305)	
Sex:	
– Males	101 (33.1)
– Females	204 (66.9)
Age (years):	
– Min-max	18-25
– Mean ± SD.	20.76 ± 0.82
– Median (IQR)	21 (1)
Grade Point Average (GPA):	
– Min-max	2– 3.9
– Mean ± SD.	2.96 ± 0.29
– Median (IQR)	3 (0.30)
Was the nursing profession student's interest:	
– Yes	296 (97.0)
– No	9 (3.0)
Level of entry to the nursing program:	
– Secondary School	237 (77.7)
– Bridge Diploma	68 (22.3)
Time (minutes) required to reach the clinical area:	
– Min-max	10 – 180
– Mean ± SD.	70.15 ± 30.12
– Median (IQR)	60 (45)
Do you work in a private hospital during the education period?	
– Yes	7 (2.30)
– No	298 (97.70)
To what extent the training was useful at:	
– **Clinical Skill Laboratories?**	
– Not useful	15 (4.9)
– Moderately useful	96 (31.5)
– Very useful	194 (63,6)
– **Hospital?**	
– Not useful	24 (7.9)
– Moderately useful	160 (52.5)
– Very useful	121 (39.7)
Do you think more time is required for training at:	
– **Clinical skill laboratories?**	
– Yes	196 (64.3)
– No	109 (35.7)
– **Hospital?**	
– Yes	188 (61.6)
– No	117 (38.4)

Table (2): Percent Distribution of Nursing Students' Perceptions toward the Clinical Learning Environment

Dimension I "Clinical Teaching and Tutoring (9 Items)					
Sub-dimension Items	Disagree/ Strongly Disagree		Neutral	Agree/ Strongly Agree	
	%	%	%	%	%
1. I've been clear about the training objectives of this content.	25.6	0.3	9.2	49.2	15.7
2. Clinical teaching is often stimulating.	24.9	6.9	11.5	44.9	11.8
3. The clinical teaching is producer-centered.	6.6	25.2	10.2	46.2	11.8
4. At clinical training, students have the opportunity to express their opinions.	15.4	31.1	15.4	29.2	8.9
5. Innovation and diversity are characteristic of clinical teaching methods.	7.9	43.0	14.7	26.2	8.2
6. The clinical teaching methods help to develop my competence.	4.9	22.6	6.6	52.1	13.8
7. The clinical teaching methods help to develop my confidence.	1.3	51.1	7.9	25.6	14.1
8. The clinical teaching time is well organized and well used.	10.5	45.2	5.9	29.5	8.9
9. The clinical teaching method encourages me to be an active learner.	7.5	23.3	4.9	53.5	10.8
Sub-Total Scores: Min-max Mean ± SD. Median (IQR)	14-45 28.89±6.21 29 (8)				
Dimension II "Clinical Instructor /Tutor/ Supervisor; (11 Items)					
Sub-dimension Items	**Disagree/ Strongly Disagree**		**Neutral**	**Agree/ Strongly Agree**	
	%	%	%	%	%
1. It's easy to approach the clinical instructor.	13.8	17.0	3.6	48.2	17.4
2. The clinical instructor helps me to build confidence and overcome fear in performing nursing procedures.	7.2	48.2	7.2	24.9	12.5
3. The clinical instructor respects the privacy of the students & treats them individually.	11.1	18.0	5.6	51.5	13.8
4. An interesting and innovative activity for students is often considered by a clinical instructor.	11.1	51.4	7.9	24.6	4.9
5. The clinical instructor cares to listen to the students during the debriefing sessions without fear or anxiety.	12.5	36.1	17.0	24.9	9.5
6. The clinical instructor is competent (knowledgeable & skillful).	7.5	13.1	6.6	56.4	16.4
7. The clinical instructor is strict and over-controlling the training.	20.6	45.8	8.9	20.2	4.5
8. The clinical instructor appears to have effective communication skills with students.	13.5	41.3	11.1	23.9	10.2
9. The clinical instructor provides constructive criticism & feedback.	9.8	25.6	7.2	47.6	9.8
10. The clinical instructor showed a positive attitude toward clinical teaching	9.8	49.9	15.4	16.4	8.5
11. The clinical instructor deals with me as friendly and helpful during teaching.	16.1	33.7	4.3	39.0	6.9
Sub-Total Scores: Min-max Mean ± SD Median (IQR)	**15-55** **35.30±7.25** **36(9.5)**				

Dimension III "Clinical Learning Physical Atmosphere (8 Items)					
Sub-dimension Items	Disagree/ Strongly Disagree		Neutral	Agree/ Strongly Agree	
	%	%	%	%	%
1. The atmosphere is relaxed during clinical teaching & motivates me as a learner.	18.0	31.1	4.9	39.4	6.6
2. This clinical rotation is well-timetabled.	7.2	34.7	1.0	48.2	8.9
3. There are opportunities for me to develop interpersonal skills.	6.9	36.4	4.5	43.0	9.2
4. I feel comfortable in teaching sessions socially.	2.6	21.6	4.6	46.9	24.3
5. I feel able to ask the questions I want.	3.9	31.5	6.9	48.5	9.2
6. The clinical placement (labs) is boring.	10.8	35.4	4.2	28.9	20.7
7. The clinical placement (Hospitals) is stressful for students.	14.1	33.8	3.5	27.9	20.7
8. The clinical placement is disorganized & unsafe	12.8	22.0	9.1	43.0	13.1
Sub-Total Scores: Min-max Mean ± SD. Median (IQR)	14-40 25.09±3.61 25(4)				
Dimension IV "Educational Content & Assessment Methods (9 Items)					
Sub-dimension Items	**Disagree/ Strongly Disagree**		**Neutral**	**Agree/ Strongly Agree**	
	%	%	%	%	%
1. Educational content assists in developing psychomotor skills that I will use in the actual scenario.	6.6	15.7	4.2	59.7	13.8
2. Skills taught in the clinical module are aligned with the nursing theory concept.	5.9	7.2	6.5	71.5	8.9
3. The clinical content is interesting.	5.2	20.7	5.2	58.1	10.8
4. A checklist is clear and easy to understand.	3.6	17.0	3.9	59.8	15.7
5. A checklist is concise, focusing on the needed skills for a specific procedure.	4.9	17.4	3.9	54.8	19.0
6. The checklist accurately measures my nursing skills.	7.5	18.4	6.2	55.1	12.8
7. The checklist is the same as the real scenario in the clinical or hospital setting.	21.3	27.2	4.3	39.3	7.9
8. The rubric of the checklist is clearly stated, and it is fair.	4.6	18.4	21.2	49.2	6.6
9. The rubrics of the checklist provided accurately measure my skills.	5.5	27.2	24.3	35.1	7.9
Sub-Total Scores: Min-max Mean ± SD. Median (IQR)	9-45 30.89±6.01 32 (7)				
Dimension V "Equipment & Supplies (2 Items)					
Sub-dimension Items	Disagree/ Strongly Disagree		Neutral	Agree/ Strongly Agree	
	%	%	%		%
1. Equipment is functioning and ensures learning opportunities.	12.5	37.0	3.6	39.7	7.2
2. There are sufficient equipment and supplies in the simulation that can be used during the nursing skills demonstration and re-demonstration.	7.2	14.1	1.6	49.6	27.5
Sub-Total Scores Min-max Mean ± SD Median (IQR)	2-10 6.68±1.96 7(2)				
Total Percent Scores of Agreement Categories Low (<50%) Moderate (50% - < 75) High (>75%)	10 (3.3) 252 (82.6) 43 (14.1)				
Min-max Mean ± SD. Median (IQR)	34.87 – 98.46 65.05 ± 9.62 64.62 (13.08)				

Table (3): Percent Distribution of Nursing Students' Satisfaction with the Clinical Learning Environment

Sub-dimensions	Not satisfied at all	Slightly satisfied	Moderately satisfied	Very satisfied	Extremely Satisfied
1. Clinical learning teaching /tutoring/ supervision?	8.9	37.4	8.1	31.8	13.8
2. 2-How satisfied were you with the attitude of the clinical instructors towards students & clinical learning?	24.9	19.3	14.5	32.8	8.5
3. How satisfied were you with the clinical learning environment?	17.4	30.2	23.3	22.0	7.2
4. How satisfied were you with the educational content & evaluation method of the clinical learning?	10.5	38.4	3.0	38.4	9.8
5. How satisfied were you with the equipment & supplies used in the clinical placement?	18.0	40.0	3.3	32.1	6.6
Total Percent Scores / Categories: Low (<50%) Moderate (50% -) High (>75%)	93(30.5) 164(53.8) 48(15.7)				
Min-max Mean ± SD. Median (IQR)	20-100 57.81±15.92 56(20)				

Table (4): Correlation Between Nursing Students' Perception and Satisfaction Towards the Clinical Learning Environment

r	0.65
R^2	43%
Constant	-12.64
F	226.71*
P	<0.001

Discussion

For a nursing education program to be accredited, it should have appropriate standardized structures and resources, ie. human, physical, technological, and fiscal. Through its content and delivery method, the nursing education program provides a curriculum that ensures that students receive the theoretical, laboratory, and clinical practical experiences necessary to meet the applicable standards and qualifications, which experienced qualified academic/ teachers/ mentors, supportive, guidance, safe, and a well-prepared educational environment with equipment and with clinical skill laboratories that mimic a real clinical environment, using teaching-learning and assessment models that support students and keep them focused and active learners. The above combinations influence and affect each other.

Student satisfaction represents a subjective perspective on how the educational environment supports students' academic success. This study aimed to determine the students' perceptions, satisfaction, and reflection on the quality of the critical care nursing course as a step toward quality improvement. The discussion of the current study will depend on a comparison of the results depicted from the analysis of the student's perceptions and satisfaction scale (Tables 2 & 3) and the students' narrations extracted from the FGDs that reflect deeply the real feelings and experiences of the students and ties the clinical and academic coursework together through critical thinking and reasoning. The quantitative and qualitative findings indicated that the nursing students faced challenges while they were studying in the critical care nursing course and these challenges are almost congruent, influence and affect each other.

To provide a constructive clear discussion, similar challenges are grouped and categorized into main three themes: limitations in the clinical placements, lack of clinical supervision, guidance, and psychological burdens (stress & anxiety). Clinical placements, including clinical skills laboratories, simulation environments, clinical instructors/ supervisors, and clinical preceptors are integral components of any nursing program. They provide educational opportunities for nursing students to achieve the psychomotor objectives, and outcomes of the courses and the program, as well as to gain the entry-level competencies required to practice as a critical care health professional through the transfer of classroom-based knowledge into practice and the facilitation of transferable skills and socialization into the nursing profession. To achieve these learning goals, so these educational components should be conductive, supportive, and safe **(Cant et al., 2021; Nursing Education Program & Standards, 2023).**

Although the students in the current study found the training in the clinical skills laboratories very useful, they mentioned that it was boring because the instructors used the procedure-based method not a scenario-based one that mimicked the real clinical scenario in the ICU. Additionally, they found the training in the ICU was unsafe and instructors were overwhelmed, distressed, and sometimes incompetent, especially if they were novices. These results are considered disasters that must be resolved immediately because may negatively impact the quality of nurses who will enter the healthcare setting. The current finding could be attributed to many factors. First, due to the urgent need to increase the number of nurses who enter the healthcare workforce to overcome the shortage of ICU nurses. To achieve this goal, collaboration between the Ministry of Health and the Ministry of Higher Education was conducted and several actions were taken, such as. establishing many new private and governmental nursing institutions to accommodate a larger number of students who want to pursue nursing as a profession with a fixed monthly income, developing new entry, fast-paced nursing tracks (e.g. accelerated program aims to the extraction of non-nursing graduates get a second–baccalaureate degree in nursing), lowering the admission grade required from the secondary school students. Although this action helped in increasing the number of students admitted to nursing institutions, it negatively impacted the educational opportunities that support the student's learning and the competencies that are required for initial entry to practice as qualified registered nurses able to provide high-quality and safe patient care. Examples of the negative consequences of increasing the number of students without increasing the number of resources creating more pressures and burdens on the clinical placements, equipment, and supplies required for the demonstration of the clinical procedures, decreasing the number of students' clinical exposure, limiting the time allowed for each student to practice the skills, allowing for the novice, non-competent instructors to clinically teach and train the students, limiting the guidance and support, and mentoring services provided to the students by the instructors. In addition, increasing the students' number that exceeds the number of instructors leads to physical and psychological exhaustion of the instructors and also leads to loss of their temper, interest, and power to do their job, as well the quality of teaching becomes questionable, and students' dissatisfaction with their learning process will be developed. The results of the current study are congruent with other studies finding which concluded that fewer positive experiences are considered a barrier to students' learning and may lead to students' failures and attrition **(Cant et al., 2021; Flott & Linden, 2016; Ford et al., 2016; Papastavrou et al., 2016).** Contrary to the current study results, several studies have been conducted and found that a positive supporting clinical learning environment increases students' satisfaction **(Putra et al., 2020) (Ibrahim et al., 2019) (Musabyimana et al., 2019) (Dhakal & Thapa, 2020) (Alammar et al., 2020).**

In the FGDs, psychological problems were considered by most of the students as challenges. Stress and anxiety were the most experienced psychological problems encountered by the students. These students' feelings could be attributed to the students' lack of emotional experiences. Additionally, the ICU environment differed from the units they'd trained in before. The patients in intensive care units generally differ in their appearance, conditions, and sensitivity. In the meantime, during the first few days of their training, some students experienced fear because they felt incompetent and worried

about doing something wrong and harming the patient in the Intensive Care Unit. (Extracted from students' narrations). Moreover, In the ICU, students become "contact with suffering, pain, disability, and even death". The results of the current study are congruent with many other studies finding done by **(Fernández-García et al., 2021; Liu et al., 2022; Özkaya Sağlam et al., 2021; Yüksel & Altun Uğraş, 2020).**

Conclusions

Based on the integration of the results extracted from the quantitative data (students' perceptions and satisfaction scale), and qualitative data (FGDs), it could be concluded that:

- Among the five dimensions of the students' perceptions and satisfaction, the majority of the students moderately perceived that CLE is supporting, conducive to learning, and enhances academic success. Moreover, slightly above half were moderately satisfied with the critical learning environment, and there was a positive correlation between the students' perceptions and satisfaction.
- Comparing the results extracted from the analysis of sub-dimensions of the quantitative data and qualitative narrations revealed that, there are psychological burdens (stress and anxiety), lack of support and guidance from the clinical instructors, communication problems, clinical training model, limited time, and physical placement allocated for training, and incompetence of novice clinical instructors which are the key challenges that impacted nursing students' learning during their practicum in the CCU.
- Understanding nursing students' perceptions and feedback is important to take appropriate measures to solve problems and overcome challenges that hinder the students' skills acquisition.

Recommendations Relevance to Nursing Education

- Partnerships should be developed between the administrative authorities in the faculty of nursing and healthcare institutions aiming to create a conducive positive clinical learning environment, keep effective communication between the staff nurses, students, and clinical supervisors, and accept the students in the clinical area with a rapport, and trusted relations.
- A module of virtual critical care learning environment using simulation, in particular, high-fidelity simulation, should be considered to mimic what happens in real environments and enable students to be exposed to virtual experiential learning.
- Develop a mentorship program for the suspected/ novice supervisors to prepare them academically, as well as orientation should be provided about the importance of building a rapport trusted, and respected relationships with students, creating a conducive, positive relaxed learning environment, and dealing with different types of students' personalities.
- Provide feedback to the student clearly and objectively, which must be delivered privately. Criticism in front of others (nurses, patients, etc) is viewed as disrespectful and hostile and often results in a trust and communication breakdown.

Recommendations Relevance for Clinical Practice

- It is imperative to develop partnerships and agreements between the administrative authorities in the faculties of nursing and healthcare institutions about the rules and facilities that should be available to create a conductive positive clinical learning environment such as effective communication between the nurses, students, and clinical instructors, acceptance of the students in the clinical area, and rapport, trusted relations.

Recommendation Relevance for Research

- Further research also could be conducted to assess clinical instructors' and clinical staff's opinions regarding the clinical teaching environment.
- Analytical study to explain the causes of the difference between perception and satisfaction through a prospective cohort study.

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