Evaluation of Satisfaction and Self-confidence among Technical Diploma Nursing Students through a Simulated-based Learning Placement.

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Abstract

Background: Simulation-based learning is an innovative educational methodology that creates a new learning environment and represents clinical real-world situations that construct satisfaction and self-confidence for nursing students. **Aim**: to evaluate satisfaction and self-confidence among Technical Diploma-level nursing students through a simulated-based learning placement and explore the perceived factors of simulated learning that influenced their development of self-confidence in caring for real-life patients in clinical practice. **Subjects and methods: - Research design**: A sequential explanatory approach of mixed methods research design was conducted in the current study. **Sample**: A convenience sample of (n=39) students participated in Phase One, and then sequentially 11 volunteer students were recruited in Phase Two. **Setting**: The study was conducted at Gouna Technical Nursing Institute a non-profit institute in southeast Egypt. **Tools**: Two tools were used. Tool One: Student Satisfaction and Self-Confidence in Learning in Phase One: The survey, students were surveyed at the end of the semester using Tool Two: A structured focus group using a Nominal Group Technique of eleven volunteer students who responded to the survey were invited to participate in Phase Two. **Results**: The majority of studied participants had high satisfaction levels and self-confidence during the simulation experience. The produced themes are 1) patient-centered high-quality care, 2) Fidelity simulation & Supportive clinical environment, 3) Critical thinking & decision-making skills, and 4) Feedback and evaluation. **Conclusion and recommendations**: High satisfaction levels and self-confidence were reported among nursing students during the medical-surgical simulation experience. The study suggested fully integrating simulated-based learning in the curriculum of medical-surgical nursing.

Keywords: Satisfaction; Self-confidence; Simulated-based learning; Nursing students

Introduction

Several research studies have investigated the impact of simulation-based learning (SBL) in the education of nursing, which reported positive academic outcomes regarding students' knowledge, and practice when applied to simulation in nursing education (Abdalla Jarelnape & Idris Sagiron 2023).

A qualitative systematic review was conducted on eight studies from Tanzania, Madagascar, Australia, Spain, USA, Canada, UK, Italy, and Qatar relating to simulated placements that were published between 2015 and 2021 and found that simulated placements are a useful method for improving clinical education in nursing (Stevens et al., 2023).

SBL is one of the educational methodologies that creates a new learning environment that is helpful and purposed to represent real-world events that could be experienced closely.

Simulation enables nursing students to carry out clinical procedures in an environment like a hospital, which assists them in acquiring nursing experiences in real situations, even before they start working as professional nurses. It also improves students' competence, satisfaction, self-confidence, clinical performance, and theoretical knowledge (Salam et al., 2024).

Simulation is a valuable educational tool in nursing in the Middle East and North Africa region. The traditional method of teaching depending only on one-way student teaching which has long been used to learn clinical skills is no longer supportive in current teaching for students of nursing (Rashawn et al., 2022 & Moore et al., 2023).

Simulation is an innovative teaching method that constructs satisfaction and self-confidence for students before engaging in hospital experiences (Cura et al., 2020 & Kaliyaperumal et al., 2021).

The acquired satisfaction of nursing students during academic learning reinforces them to sustain more satisfaction after graduation, this is remarkable exposure for improving self-confidence and refers to an effective learning experience.

Relevant studies revealed positive links between simulation, self-confidence improvement in education, and high-quality nursing care. Students who experience clinical skills and apply critical thinking in situations will achieve higher self-efficacy (Guerrero et al., 2022).

Satisfaction is the state of students' well-being. Also, their emotional state and opinions about the experience of learning, self-confidence, and the learning program and faculty. Student confidence is highly correlated with satisfaction. Simulation enables the students to connect concepts and reinforces their interaction and engagement.

(Guerrero et al., 2022 & Rashawn et al., 2022 & Leynes-Ignacio 2023).

The concept of self-confidence is trust in an individual's abilities, capacities, and judgmental decisions. It indicates the belief in a person's capability to successfully meet the planned outcomes and finish tasks, and overcome challenges (Rashwan, Z et al., 2023).

Satisfaction and self-confidence are highly interrelated (Kaliyaperumal et al., 2021). Several research have highlighted that clinical simulation is a cornerstone in raising students' self-confidence and satisfaction (Guerrero, et al., 2022).

The fundamental objective of clinical simulation is student engagement in using the knowledge, clinical skills activities, and behaviors for more learning, more practice preventing errors, and reinforcing student's competence to save patients' lives (Somerville et al., 2023).

Simulation may vary in how realistic it is, also known as simulation fidelity. High, medium, or low fidelity describes to which extent the simulation is like the reality in life situations in simulated tasks (Ainsworth, J., et al., 2024).

Simulations create a more real and interactive learning environment and support hours of clinical practice. It provides a structured and organized environment and provides focused learning experiences. Simulation-based education exhibits secure learning without harming hospitalized patients, fosters students to train without stress, and bridges theoretical and practical gaps.

Nursing students can obtain and develop their self-confidence by decreasing their fear level when dealing with a simulated environment or making errors and capable of providing feedback, reflection, and self-correction until they reach practical competency through consistent experiences through the clinical scenario and enhance the abilities of clinical reasoning (Basak et al., 2016 & Hwang et al., 2022).

Significance of the study:

SBL is urgently needed in nursing education because of the shortage of hospital places for clinical training and at the same time there is a high ratio of nursing students. Simulated-based placements have been used to facilitate reaching the required clinical setting capacity. Lasater (2007) reported that around 25% of standardized clinical placement provisions can be substituted by simulated placements with maintaining the same quality of student performance (Stevens et al., 2023).

Evidence shows that healthcare providers, involving nursing staff, may have inadequate preparation to meet society's needs, particularly in developing countries (Hamdi et al 2019). Nursing in Egypt has progressed over the recent decades. The vision has become directed toward a competency-based curriculum (Brownie et al., 2018).

Technical Diploma-level nurses play a significant part in the Egyptian nursing workforce. Limited studies have highlighted the impact of simulation on nursing students in Egypt (Hamdi et al 2019).

Moreover, there is a lack of research into how SBL impacts nursing students' satisfaction and self-confidence in Egypt. Studying this research problem adds value to the existing literature. Therefore, this study was carried out to evaluate satisfaction and self-confidence among Technical Diploma-level nursing students through a simulated-based learning placement and explore the perceived factors of simulated learning that influenced their development of self-confidence in caring for real-life patients in clinical practice.

Operational definition:

Simulation-based learning (SBL) in this study was the application of designed clinical scenarios like real-world situations, allowing medical-surgical nursing students to experience and respond to situations as they would in actual practice through low-fidelity level simulation.

Aim of the research:

This research study aimed to evaluate satisfaction and self-confidence among Technical Diploma-level Nursing Students through a simulated-based learning placement and explore the perceived factors of simulated learning that influenced their development of self-confidence in caring for real-life patients in clinical practice.

The research questions were:

1. What are Technical Diploma nursing students' perceived levels of satisfaction and self-confidence in learning after completing a simulated-based placement?

2. What are the perceived factors of a simulated-based learning placement that influenced Technical Diploma nursing students' development of self-confidence in caring for real-life patients in clinical practice?

Subjects and methods

Research design:

A sequential explanatory approach of mixed methods research design was conducted in this study which integrates both qualitative and quantitative data within the same research. The researcher

selected this design methodology that was appropriate for providing a holistic evaluation and detailed exploration to describe complex phenomena and provide an integrated deep and comprehensive understanding of the research topic (Yoong et al 2023) & (Mullen et al., 2021).

Data collection and analysis were conducted sequentially using a nested sample through two phases for logical flow and congruence, and in line with the complementarity of the purpose of mixed-methods research to enrich and add interesting viewpoints. In Phase One, a survey was used to quantitatively evaluate satisfaction and self-confidence among Technical Diploma-level nursing students through a simulated-based learning placement then followed by Phase Two, a Nominal Group Technique (NGT) was applied to qualitatively explore the perceived factors of simulated learning that influenced their development of self-confidence in caring for real-life patients in clinical practice.

Setting:

The study was conducted at Gouna Technical Nursing Institute a non-profit technical institute of nursing in the southeast of Egypt. This setting was selected as a scientific mission cooperation between the Faculty of Nursing at Alexandria University and Gouna Technical Nursing Institute which applied simulation-based learning in the medical-surgical nursing specialty since 2016. In Egypt, simulation learning has been successfully utilized in different nursing specialties such as critical care nursing, maternity nursing, pediatric nursing, and psychiatric nursing. It has not been frequently employed as an adjunct to medical-surgical undergraduate nursing students. For those reasons, the setting was selected (Abu El Soud et al .,2023),(Shattla et al .,2022),(Ahmed Abdou et al., 2021),& (AE et al., 2018).

Sample:

A convenience sample (n=39) of nursing students from the host institute of nursing who were enrolled in the Technical Diploma nursing program and who had completed a simulated-based placement as part of a second medical-surgical semester were invited to participate. Because of the small number of students in the medical-surgical simulation, all available nursing students in the second-semester medical-surgical course were involved in the sample.

As a standardized criteria and benchmark for nursing simulation, recent literature reported that fewer than six students in the same simulation scenario could be more effective in cultivating skills and knowledge among undergraduate nursing students (Au et al., 2023) which matched the student ratio in the simulation experiences in this study. The simulation rotation contents consisted of five medical-surgical simulation topics or scenarios which were chronic obstructive pulmonary disease, fluid and electrolytes, immobility, medication administration, and preoperative scenario. The duration of the simulation rotation was three weeks in terms of two clinical days per week. The applied fidelity level inside the institute in this clinical simulation rotation was low fidelity.

The recruitment and sampling strategy involved an invitation to participate in the research by e-mail sent to the students for two phases of the research using a third party. This role was done by the administrative assistant of the nursing department. Also, the researcher wasn't involved in the previous simulation rotation process.

As the sample size was small, the convenience sampling technique was used in Phase One (Hung et al., 2021;) & (Kaliyaperumal et al., 2021). In Phase Two sample size was matched with the characteristics for NGT of the research data collection, (Carter et al 2023), (Cariñanos-Ayala et al., 2023) and (Humphrey-Murto et al., 2017).

The researcher set two sequential meeting dates for data collection, one meeting date for each phase, and contacted all study participants a week before those dates to clarify the process and the time for data collection.

Inclusion criteria included:

- Provide voluntary informed written consent. Nursing students who are enrolled in a Technical Diploma-level nursing program and who have completed a simulated-based placement as part of a second-semester medical-surgical course.
- Provide voluntary informed written consent.
- Able to independently practice English without a translator. The English language was used in this study with the students in the same context of nursing curriculum language and justified by their ability to competently speak English.

Tools for data collection:

The two tools: Student Satisfaction and Self-Confidence in Learning (SSSCL) and a structured focus group using a Nominal Group Technique

(NGT) were used for data collection. The following paragraph discusses the tool and method in detail: -

Phase One: Tool I: Student Satisfaction and Self-Confidence in Learning (SSSCL): **Validity of the tool**: It has been validated internationally and was adopted from the National League of Nursing (NLN 2020). The original version of the scale was validated and was a reliable measurement tool. So far, the SSSCL scale has been adopted and validated in many countries such as the USA, Spain, Turkey, Portugal, Norway, and Hong Kong, and has many translated versions (Studnicka, et al 2023).

The student satisfaction and self-confidence in learning questionnaire consists of students' demographic data (gender and age) and 13 items that were designed in origin to evaluate students' satisfaction and self-confidence with simulation clinical activities. It consisted of two parts or subscales.

The questionnaire includes five items for satisfaction with current learning and eight items for self-confidence in learning. The subscale measuring satisfaction during the process of learning for the students is related to the educational technique used during the simulation sessions or the method of delivering the content. Furthermore, the second subscale, evaluates the confidence of students during the process of learning, in addition to the knowledge required through the clinical simulation, mastering simulation content effectively by students, and getting help to develop skills and abilities in practical situations.

In SSSCL, the score for each item was according to a five-point Likert scale. Strongly disagree was scored (1), disagree was scored (2), undecided was scored (3), agree was scored (4), and strongly agree was scored (5). The total score ranged from (5 to 25). The higher score reflects the higher level of satisfaction. **The tool reliability** was tested using Cronbach's alpha of the American questionnaire which was (0.94 for the satisfaction subscale) and (0.87 for the self-confidence subscale) indicating strong reliability (Reierson et al 2020).

The SSSCL scale was used to evaluate nursing students' satisfaction and confidence with their learning process. The researcher used this tool which was easy to use by nursing students to evaluate important aspects of SBL (Reierson et al 2020).

Phase Two: A structured focus group using a Nominal Group Technique (NGT): For Phase Two: Tool Two: a structured focus group (NGT): **Validity of the tool**: It has been validated in lots of international literature and it was originally designed by (Van de Ven and Delbecq (1972). The NGT protocol for this study was adopted from Cariñanos-Ayala et al. (2023), Mullen et al. (2021), and Gorman et al. (2018).

Students who responded to the survey participated in Phase Two by inviting them to a structured focus group using a Nominal Group Technique to explore the perceived factors of simulated learning that influenced their development of self-confidence in hands-on clinical settings.

The main components or contents of 2nd tool consisted of "open-ended questions" and the four classic stages of the Nominal Group technique as follows: -

1- The open-ended question *"Was there anything from simulation clinical rotation that helped to develop your self-confidence to care for real-life patients when in the hospital setting?"*

2- The four classic stages of NGT: -

Stage one was ideas silent generation, stage two was round robin, stage three was discussion of the list of ideas, and stage four was voting and ranking.

Pilot Study

A pilot study was conducted on 10% of the study sample in both phase one and phase two to test the clarity, applicability, and feasibility of the tools and identify any problems that might be faced in the data collection process. According to the pilot study results, minor modifications were made related to rephrasing some statements to ensure clarification and easily understood by the participants but not in the content itself. Also, an increased estimated time is needed for Phase Two. Those participants were excluded from the original study sample.

Ethical Considerations:

Before data collection, Official written approval was obtained from the Ethical Research Committee, at the Faculty of Nursing, Alexandria University. As well official permission was obtained from Gouna Technical Nursing Institute.

Informed written consent from participants was obtained after an explanation of the study's aim. Confidentiality and anonymity were assured. Privacy was respected and assured.

Participants' right to withdraw at any time from the study. To avoid coercion, the researcher did not participate in the simulation rotation teaching for this semester.

Fieldwork:

Data collection and analysis were conducted sequentially through two phases. Data collection took place in March 2024 for Phase One and in May 2024 for Phase Two.

Phase One: the survey and Phase Two the structured focus group using a Nominal Group Technique: -

In Phase One of data collection: the survey, students were surveyed at the semester's end. Students who are enrolled in the medical surgical course and completed the simulation rotation were sent the survey. The electronic questionnaire platform Survey Monkey was used as it gave immediate results in one process rather than the manual work of a written questionnaire and minimized errors.

In Phase Two data collection: a structured focus group using a Nominal Group Technique (NGT) was used at the semester end, the students were asked in an open question *"Was there anything from simulation clinical rotation that helped to develop your self-confidence to care for real-life patients when in the hospital setting?"*

In this study, the researcher used NGT for many reasons, because NGT is a method of consensus used to provide topics agreement (Waggoner et al., 2016).

NGT is a very structured meeting. It provides an opportunity for creating tangible and meaningful outcomes relatively quickly which considers the time and an equal opportunity to explore and create a shared space to identify, enrich, and provide attention to major areas of inquiry and understanding of a problem. Sharing ideas in terms of each member's voice being heard as concepts are individually voted on by each participant's views not as the group's collective views was also another advantage (Mullen et al., 2021).

Nursing students who completed the simulation rotation were met and generated ideas, and debate topics to answer the previously mentioned question.

In Phase Two of data collection: Nominal Group Technique implementation: (Cariñanos-Ayala et al., 2023) & (Mullen et al., 2021) & (Gorman et al., 2018).

A Nominal Group Technique was conducted involving a 4-hour meeting. The meeting room was a large classroom that was comfortable for all participants, the facilitator, and the notetaker. The facilitator was the first author, and the note-taker was the second author, Also, the seating for meetings was designed U-shaped which included a big-sized whiteboard that allowed a full view for all participants. There was a folder for each participant containing (a participant worksheet, rank order voting card, personal; priority sheet, sheet for the question of NGT, nominal group technique timesheet, and participant ID). Also, an explanatory PowerPoint for the process of NGT, all required supplies a flip chart, different colored marker pens, and an audio recorder were prepared for use.

Participants have previously been informed of this via email. A break for refreshment was given for one hour after the voting stage to permit the facilitator to calculate and estimate the voting frequency numbers and recognize the priority of the top ten items generated by participants.

Stages of NGT:

Stage (1) Ideas silent generation "Brainstorming": Participants requested to document all their ideas silently and independently on their worksheet in brief sentences regarding the study question.

Stage (2) Round robin: The facilitator made around the table and recorded the generated ideas from each student who shared a single idea at a time in the fashion of a round robin and documentation of items on the flip chart. This process continued until no new ideas were forwarded. The group put into consideration avoiding the repetition of ideas. All ideas were listed verbatim or in their own words with little to no paraphrasing on a flip chart by the facilitator. Ideas discussion is not permitted in this step.

Stage (3) Discussion of the list of ideas: The facilitator asked students to clarify their ideas in a time of two minutes for each item listed. Grouping similar ideas in agreement within the group after the removal of duplicated items and generating an agreed list of items.

Stage (4) Voting and ranking: It was the voting for the selection of the most integral ideas and ranking of the top ten items considered the most important by the group.

The approved top ten items from the group were then put in priority rank order. The discussion stage from the NGT was transcribed verbatim. Immersion in the transcripts was done by the researcher through detailed reading of the scripts, listening to the audio recording many times, and manually writing numerous drafts for coding and the generated themes process in a Microsoft Word document for more validation based on the researcher's background and reading of existing literature.

All similar listed items are sorted, categorized, and distributed to assigned codes. Codes as a preliminary set of narrow concepts were developed

and then converted to produce themes that were clusters of similar ideas. The notetaker reviewed the framework of coding and categorization of themes. The final themes were developed and compared to their existence in the literature to confirm and validate the findings. All evidence and material for the process of data collection was maintained (Bajwa et al., 2024;)& (Carter et al., 2023;)& (Cariñanos-Ayala et al., 2023;)& (Mullen et al., 2021;) & (Gorman et al., 2018;), & (Vaismoradi et al., 2013).

Statistical analysis:

Descriptive analysis was used for Phase One and content analysis for Phase Two. In Phase One Analysis: The collected data were organized, categorized, tabulated, and analyzed using a personal computer. Data were presented using descriptive statistics in the form of frequencies and percentages, means. The researcher used Survey Monkey to gather students' feedback using prepackaged questionnaires (Costa et al 2012).

In Phase Two Analysis: A structured focus group using a Nominal Group Technique (NGT): To interpret the NGT findings, qualitative content analysis was used as a framework to develop themes from generated data created by the group in Phase Two.

The researcher immersed himself in the data by accurately and completely reading and listening for the audio recording many times, analyzing the transcript separately by the first researcher, and then meeting with the second researcher for double checks, suggestions, and the agreement also to resolve any conflicts in the development of themes (Bajwa et al., 2024;)& (Carter et al., 2023;)& (Cariñanos-Ayala et al., 2023;)& (Mullen et al., 2021;) & (Gorman et al., 2018;), &(Vaismoradi et al., 2013).

Methods of rigor: The detailed revision of transcriptions was done by the researcher, and multiple checks of written & audio records, votes, and rankings supported the enhancement of the criteria of trustworthiness, transferability, credibility, confirmability, and dependability of results and maintained the study's overall rigor.

Results

1-Phase One results: Out of a total of (39) eligible students, 38 (97.43%) completed the survey.

Table (1) reveals the demographic data of the studied students. Regarding gender, (55.26%) of studied students were females. As regards age, it was noted that (55.26%) of students were within the age group that fluctuated from 18 to less than 19 years, (39.47%) of student's age fluctuated from more than 19 years to less than 20 years, while only (5.26%) of students' ages fluctuated from more than 20 years to less than 21 years.

Table (2) demonstrates frequencies, percentages, mean scores, and standard division for the quantitative survey items related to satisfaction with current learning.

The majority of studied students (92.10%) agreed and strongly agreed that it was a helpful and effective strategy. The result showed that (97.36%) of participants agreed and strongly agreed that the simulation rotation provided a variety of learning materials and activities to promote learning in the medical-surgical nursing course. A total of (84.21%) of students agreed and strongly agreed they enjoyed how the instructor taught simulation rotation. (84.21%) of participants agreed and strongly agreed that the teaching materials were motivating and helpful. (84.21%) responded that they agreed and strongly agreed that the simulation rotation was suitable for the way they learn.

Figure (1) illustrates that the item "The simulation provided me with a variety of learning materials and activities to promote my learning in the medical-surgical nursing course" received the highest score (mean=4.47; SD = 0.64). The item "The way my instructor taught the simulation rotation was suitable to the way I learn." received the lowest score (mean=3.97; SD = 0.9). The mean score (weighted average) of the respondents' perceived satisfaction with current learning was 4.198.

Table (3) & figure (2) showed that the majority of studied students (94.73%) had agreed and strongly agreed and were confident in mastering the content of the simulation activities. It showed that the majority of studied students (89.47%) had agreed and strongly agreed and were confident the simulation rotation covered critical content necessary for the mastery of the medical-surgical nursing course.

(84.21%) of students agreed and strongly agreed were confident in developing the skills and obtained the required knowledge from the simulation rotation to perform necessary tasks in a clinical hospital setting. (86.84 %) of students agreed and strongly agreed indicating helpful resources were used to teach the simulation. The majority of studied participants of participants (94.73 %) agreed and strongly agreed that it was their responsibility to learn what is needed to know from the simulation rotation.

(84.21%) of students agreed and strongly agreed that they knew how to get help when they did not understand the concepts covered in the simulation rotation. (86.84 %) of participants agreed and strongly agreed that they knew how to use simulation activities to learn critical aspects of skills. (84.21%) of participants agreed and strongly agreed responded it was the instructor's responsibility to tell me what they needed to learn of the simulation rotation content.

Figure (2) illustrates that the item "It was my responsibility as a student to learn what I needed to know from the simulation rotation." received the highest score (mean=4.34; SD = 0.74). while the item "I knew how to use the simulation activities to learn critical aspects of skills." received the lowest score (mean= 4; SD =1.05). The mean score (weighted average) of the respondents' perceived self-confidence in learning was 4.18625.

2-Phase Two results:

Table (4): The recruitment and participation were done of 11 students out of 38 students (28.94) in the Nominal Group Technique sessions regarding medical-surgical simulation rotation. By using NGT lots of items were generated. A total of 64 items were identified.

Theme analysis is presented in Table (5) involving 64 items generated which includes the top 10 items. Here in table 4 focuses on the ranking of prioritized top ten items with corresponding themes. The four themes were revealed: 1) patient-centered high-quality care, 2) Fidelity simulation & Supportive clinical environment, 3) Critical thinking & decision-making skills, and 4) Feedback and evaluation.

After participants vote and rank and select the most important ten statements in the group's list that confirm a degree of consensus from the group. The researcher gathers a total score for each of the items to recognize the top ten items that are most highly rated by the group. The higher the priority confronted higher scores. This table shows the top ten items according to their importance and priority regarding group ranking.

Concerning simulation rotation that developed the decision-making in different situations, it was the highest score and highly rated items and ranked as the first items of the top ten. The lowest score according to the group ranking, which was the last item from the top ten items, was the simulation rotation helping develop culturally competent nurses.

Regarding the first theme, patient-centered high-quality care half of the generated items were categorized under this theme. Near to a quarter of the generated items were categorized under the second theme which was fidelity simulation & supportive clinical educational environment, Concerning the third theme (17.18%) of the generated items were found under of critical thinking & decision-making skills theme, while only (9.37%) of generated items were classified under feedback and evaluation which is the fourth them.

The items distribution and categories under these themes were based on the researcher's description of these themes which follow their existence in the literature.

Table (1): Percentage distribution of the studied patients according to demographic data (n=38)

Demographic Data	No.	%
Gender		
Male	17	44.74%
Female	21	55.26%
Age (years)		
18 <19	2	5.26%
19 <20	21	55.26%
20 <21	15	39.47%

Table (2): Survey frequencies, percentages, and mean scores (n=38)

Survey items	(1) Strongly Agree	(2) Disagree	(3) Undecided (Neither agree nor disagree)	(4) Agree	(5) Strongly Disagree	Mean	SD
The teaching methods used in the simulation rotation were helpful and effective.	1 2.63%	2 5.26%	0 0.00%	21 55.26%	14 36.84%	4.18	0.88
The simulation provided me with a variety of learning materials and activities to promote my learning in the medical-surgical Adult Nursing Practice Course.	0 0.00%	1 2.63%	0 0.00%	17 44.74%	20 52.63%	4.47	0.64
I enjoyed how my instructor taught the simulation rotation.	1 2.63%	2 5.26%	3 7.89%	12 31.58%	20 52.63%	4.26	0.99
The teaching materials used in the simulation rotation were motivating and helped me to learn.	1 2.63%	3 7.89%	2 5.26%	17 44.74%	15 39.47%	4.11	0.99
The way my instructor taught the simulation rotation was suitable to the way I learned.	0 0.00%	5 13.16%	1 2.63%	22 57.89%	10 26.32%	3.97	0.9
Mean	0.6	2.6	1.2	17.8	15.8	4.198	-
SD	0.55	1.52	1.30	3.96	4.27	-	-

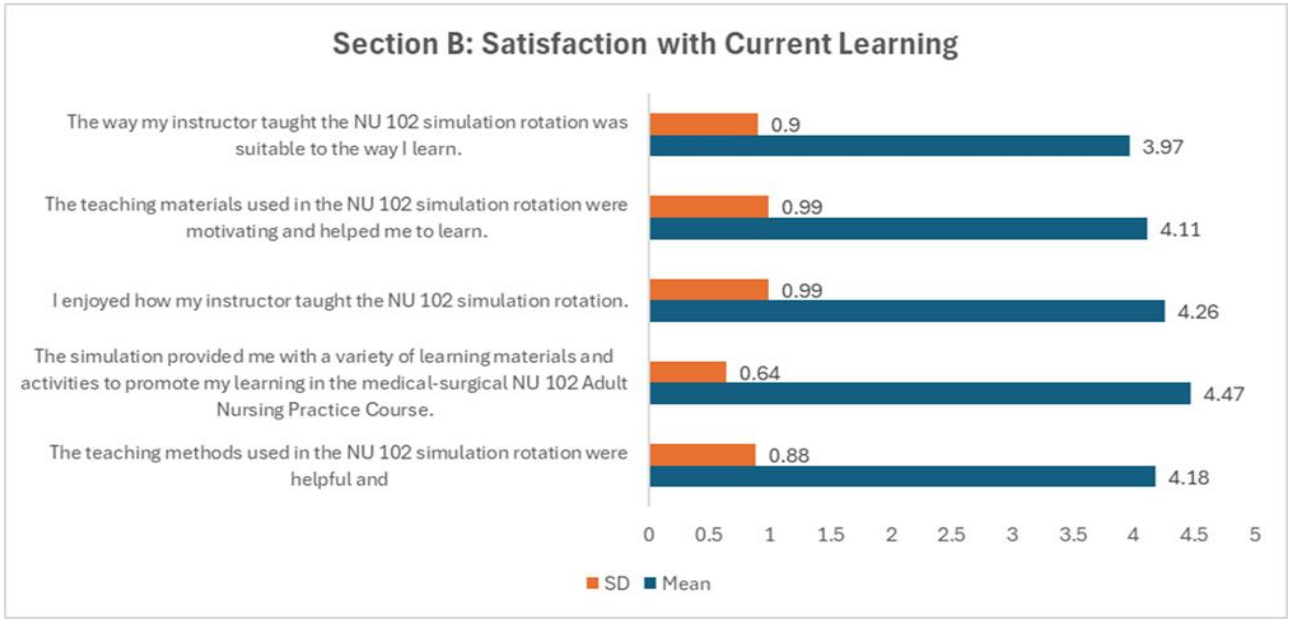

Figure 1. Section B: Satisfaction with Current Learning (mean score)

Table (3): Survey frequencies, percentages, and mean scores (n=38)

Survey items	(1) Strongly Agree	(2) Disagree	(3) Undecided (Neither agree nor disagree)	(4) Agree	(5) Strongly Disagree	Mean	SD
I am confident that I mastered (understood) the content of the simulation activities that my instructor presented to me.	1 2.63%	1 2.63%	0 0.00%	20 52.63%	16 42.11%	4.29	0.82
I am confident that the simulation rotation covered critical content necessary for the mastery (deep understanding) of the medical-surgical Adult Nursing Practice Course.	1 2.63%	3 7.89%	0 0.00%	20 52.63%	14 36.84%	4.13	0.95
I am confident that I developed the skills and obtained the required knowledge from simulation rotation to perform necessary tasks in a clinical hospital setting.	1 2.63%	5 13.16%	0 0.00%	14 36.84%	18 47.37%	4.13	1.1
My instructor used helpful resources to teach the simulation.	0 0.00%	3 7.89%	2 5.26%	15 39.47%	18 47.37%	4.26	0.88
It was my responsibility as a student to learn what I needed to know from the simulation rotation.	0 0.00%	2 5.26%	0 0.00%	19 50.00%	17 44.74%	4.34	0.74
I knew how to get help when I did not understand the concepts covered in the simulation rotation.	0 0.00%	5 13.16%	1 2.63%	15 39.47%	17 44.74%	4.16	0.99
I knew how to use the simulation activities to learn critical aspects of skills.	2 5.26%	3 7.89%	0 0.00%	21 55.26%	12 31.58%	4	1.05
It was the instructor's responsibility to tell me what I needed to learn about the simulation rotation content.	0 0.00%	3 7.89%	3 7.89%	16 42.11%	16 42.11%	4.18	0.88
Mean	0.625	3.125	0.75	17.5	16	4.18625	-
SD	0.744023809	1.356202682	1.164964745	2.777460299	2.070196678	-	-

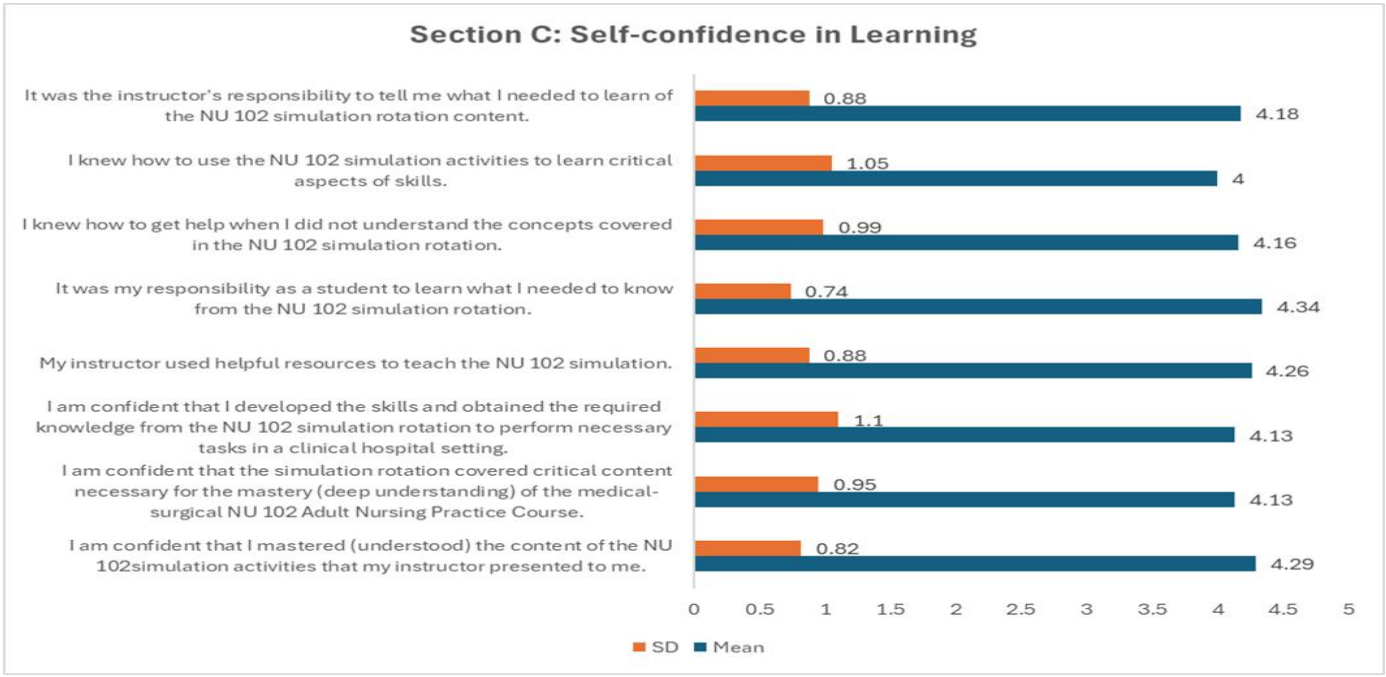

Figure 2. Section C: Self-confidence in Learning (mean score)

Table (4): Group's top of ten items

Corresponding theme	Items Description	Voting Frequency	Ranks	Sum of rank	Ranking of Group
Critical thinking & decision-making skills	Develop decision-making in different situations	9	6,7,7,7,9,9,8,10,10	73	1
Fidelity simulation & Supportive clinical educational environment	Adapting to stressful situations	7	3,4,6,6 ,8,8,9	44	2
Critical thinking & decision-making skills	Develop critical thinking skills	6	5,6,7, 7,8,9	42	3
Fidelity simulation & Supportive clinical educational environment	Safe environment practice to prevent mistakes in real situations	6	2, 5,6,9,10,10	42	4
Fidelity simulation & Supportive clinical educational environment	Enhancing time management	7	2,4,4,5,6, 7,10	38	5
Patient-centered high-quality care	Learning how to use different communication techniques when dealing with patients and families	5	2,5,6,8,10	31	6
Fidelity simulation & Supportive clinical educational environment	A scenario similar to a real-life situation	3	3,8,10	21	7
Patient-centered high-quality care	Prioritizing patient care	2	8,10	18	8
Critical thinking & decision-making skills	Organize thinking while facing emergencies	2	7,9	16	9
Patient-centered high-quality care	Helping to develop culture-competent nurse	5	1,3,3,3,4	14	10

Table (5): Themes

Themes	Items Generated (Total Number)	Themes Description	Supportive Quotes
1-Patient-centered high-quality care	32	Focus on dealing with patients as a holistic approach considering patients as biophysical, psychosocial, and cultural units. Covering all aspects of patient health in terms of physical, cultural, social, and psychological well-being. By focusing care on the needs of patients following the priorities to meet these needs during patient care and applying a nursing care plan. The patient is the top priority in the health care system and considering their families. Caring for patients with dignity and respect through the application of medicolegal issues and the code of ethics and involving patients in all decisions about their health conditions. High-quality nursing care refers to the provision of safe, effective, efficient, and equitable care on time to achieve standardized patient-centered care in terms of zero errors in patient care, accurate documentation, professional communication, and following evidence-based practice and guidelines for any piece of knowledge or practice.	"After patient assessment help to complete systemic & comprehensive way for holistic patient care": Participant 5. "In the simulation, we can consider the patient's cultural background and help us to be a culturally competent nurse": Participant 4. "Improving patient quality of care by reducing errors in the practice". Participant 11. "By using guidelines from clinical key and Elsevier can improve self-confidence in health teaching." Participant 8.
2-Fidelity simulation & Supportive clinical educational environment	15	Refer to the level of realism in a simulated educational or training experience or to the extent to which the degree or level of the simulation is like the reality in life situations in the hospital. Not only does it include physical fidelity elements such as instruments, supplies, equipped clinical places, required materials, and the environment of simulation itself but it also, considers psychological elements in terms of the emotional side of the learner and how to deal with complex stressful situations. The simulation environment represents the usage of organizational structure, assigning roles, time management, students' preparations, leadership, and teamwork skills under supervision and support from teachers. all the previous make simulation real, safe, controlled, organized, and structured environment.	"It teaches us how to deal with real-life situations and practice this situation as facing patient complications and communication help our self-confidence when we will be in the hospital" Participant 2. "Using similar material as real in the hospital such materials as blood, and fluids used in a simulation like in real situations': Participant 3. "Pre-simulation preparations helped to increase knowledge and understanding": Participant 1.
3-Critical thinking & decision-making skills	11	Critical thinking in simulation refers to applying theory content into practice and reducing gaps between them through the integration of data by linking the previous knowledge, and skills, and this improves the clinical reasoning skills and their abilities to judge and make the right decision based on scientific evidence and rational this leading to more success in clinical work and answer any inquiry will facing them in further situations or conditions.	"Develop our critical thinking skills by identifying the tricks designed in the scenario to think critically when we will be in the hospital and transfer theory content and its objectives in the practice": Participant 1. "During simulation, we can make a decision and make me self-confident": Participant 6.
4-Feedback and evaluation.	6	It refers to after completing simulation scenarios, feedback was given to students by the teacher and through peer evaluation. Feedback is an appreciated method for evaluation. Students can learn through self-reflection and self-evaluation and specific feedback will increase learning efficacy. The teacher and peers were then able to discuss the clinical strengths areas and areas that needed improvement for the students that reflect the performance of students. Evaluation and self-reflection about the simulation experience focus on knowledge and clinical performance.	"After simulation rotation, we receive feedback to identify strengths and weaknesses": Participant 4.

Discussion

Simulated-based learning now plays an integral part in the education and teaching of nursing students. SBL is an educational methodology that represents highly matched with real clinical situations instead of hospital training experiences to make students learn in a secure placement (Guerrero et al., 2022).

Students of nursing who had undergone clinical simulation training exhibited positive experiences related to satisfaction level and self-confidence. Alternative nursing teaching strategies must be developed and updated to follow the recent challenges in education and practice. Practical training for nursing students is a vital element of nursing training and education. However, traditional training of nursing students does not always adequately prepare nursing students to meet the required competency leading to weak clinical skills in nursing students, or a theory-practice gap.

Simulated-based learning is an innovative strategy for clinical training that gives nursing students great chances to acquire and securely apply what they learn in nursing care. Furthermore, it improves their competence, self-confidence, performance, and satisfaction. In addition, there is an increased need to use simulation to improve the quality of training, which is the core for developing competent nurses (Salam et al., 2024). The current study aimed to evaluate satisfaction and self-confidence among technical diploma nursing students through a simulated-based learning placement. The study findings are discussed in the following sequences: Satisfaction with current learning, self-confidence in learning, and NGT.

The first part was (section B) concerning satisfaction with current learning, concerning the teaching methods used in the simulation rotation most students agreed and strongly agreed that it was a helpful and effective strategy. This is in accord with (Kaliyaperumal et al. (2021) who found that the curriculum of nursing which contains clinical simulation has become a valuable approach to leading the competency of students.

The majority of studied participants agreed and strongly agreed regarding the following items of satisfaction “Students enjoyed how the instructor taught simulation rotation”, “the teaching materials were motivating and helpful” and “the simulation rotation was suitable to the way they learn”. This may be because simulation-based learning provides students with a process of understanding theory content and related clinical concepts in ways that have helped students by more engagement and enhance their satisfaction level.

Similarly, and consistent with several studies illustrated that satisfaction is a subjective result of undergoing clinical simulation programs. In accord with (Olaussen et al., (2022) who reported students who used simulated-based placement reinforced their knowledge regarding their educational demands.

The findings showed that the majority of studied participants agreed and strongly agreed with the items “The simulation provided me with a variety of learning materials and activities to promote my learning in the medical-surgical nursing” with the highest mean score of 4.47. This may be because students of this generation are often more receptive to diverse and active learning approaches. This finding contrasts with the results of previous studies (Pence, 2022).

The overall mean score of satisfaction with current learning was noted as high, which reflected a higher satisfaction level with learning with simulation clinical rotation. Along the same line, several studies concluded a high level of student satisfaction in the practice and performance following clinical simulation (Kaliyaperumal et al.,2021 & Guerrero et al., 2022).

The results revealed that the overall mean score was (4.198) in satisfaction of nursing students with medical-surgical simulation rotation which indicated high satisfaction levels for nursing students this could be because in simulation learning the students interact as the center and protagonist these learning activities compared to the roles of teacher as facilitator and coordinator this process also reflects the urgent need to join and introduce medical-surgical nursing simulation in the undergraduate curriculum as soon as possible to move into competency learning for nursing students.

This finding is in accord with several studies that found simulation strategies shown more satisfactory than traditional methods (Kaliyaperumal et al., 2021 & Guerrero et al., 2022).

The second part was (section C) concerning self-confidence in learning the majority of studied students agreed and strongly agreed with the following items of self-confidence “I am confident that I mastered (understood) the content of the simulation activities that my instructor presented to me”, “I am confident that the simulation rotation covered critical content necessary for the mastery (deep understanding) of the medical-surgical course” and “I am confident that I developed the skills and obtained the required knowledge from the simulation rotation to perform necessary tasks in a clinical hospital setting”. This may be due to the

simulation scenario covering all of the session objectives.

Simulation-based learning enhances cognitive achievement, learning styles, and collaborative and skilled learning. This is supported by Saad et al. (2022) who found that there were differences in acquired knowledge between before and after simulation applications.

Concerning items under the satisfaction dimension the majority of participants agreed and strongly agreed regarding the statement "It was my responsibility as a student to learn what I needed to know from the simulation rotation" and "I knew how to get help when I did not understand the concepts covered in the simulation rotation". This could be because students who were trained using simulation became more self-directed in learning. Similarly, (Hustad et al., (2019) reported that simulation experience raises self-confidence and improves students' practical and judgmental abilities in the clinical hospital setting.

Concerning items under the satisfaction dimension as "My instructor used helpful resources to teach the simulation" and "It was the instructor's responsibility to tell me what I needed to learn of the simulation rotation content" the majority of participants agreed and strongly agreed regarding this the items. This could be because the simulation instructor met the students and provided needed commonalities in scenario topic content, in which instructors have reinforced a positive attitude toward students through available resources and materials in the simulation rotation and related content. This agrees with Doyle et al. (2017) who found a relationship between students' satisfaction and supervisory and educational atmosphere.

Concerning the item "I knew how to use the simulation activities to learn critical aspects of skills" the majority of participants agreed and strongly agreed regarding this item. This could be because of the positive effects of using integrated concepts in the same skill.

This finding agrees with Saad et al. (2021) who reported that more than three-quarters of the nursing students had a high confidence level in the simulation. Along the same line, Aloush (2019) found that there is an improvement in the majority of items in his study post using simulation training and reported that the simulation approach is widely recognized to improve practical abilities compared to theoretical knowledge.

The overall self-confidence mean score was noted as high, which reflected that the students became more confident with simulated clinical learning. These findings are reinforced by several studies that illustrated higher self-confidence in students' practice and performance after clinical simulation (Kaliyaperumal, 2021 & Guerrero et al., 2022). The present study illustrated that the overall self-confidence in learning mean score was (4.186) for undergraduate medical-surgical nursing students in their medical-surgical clinical simulation rotation.

A possible explanation for gaining more self-confidence with simulation strategy could be knowledge acquisition from theory for the same topics in terms of knowledge is power in addition to multiple simulation experiences performed during the semester around five times for different topics.

The third part was the NGT discussion. As regards the first theme of patient-centered and high-quality care the study findings showed that half of the participants' items and comments were focused on that theme This may be due to the designed simulation acting as an integrated and comprehensive scenario in terms of patient-oriented that deals with patient holistically considering all aspect of health and well-being by tricks involved in the scenario example consider feeling, cultures of patient and families.

In this respect could be interpreted as the simulation differs from traditional teaching by letting the learners use both their senses and their emotions not only as task-oriented for patient care but also representing the approach of patient-oriented care.

Another reason for developing this theme could be that nursing programs used concept-based curricula that ensured student's acquisition of concepts and their application from theory to clinical practice. This agrees with Bussard et al. (2023) who found the high efficacy of simulation related to person-centered care.

Concerning the second theme which is fidelity simulation & supportive clinical educational environment, most of the study participants mentioned positive items and comments toward that theme.

This may be because highly structured, organized controlled, realistic, and preplanned environment by good preparation for the setting design, maintaining components of fidelity as in physical fidelity materials and supplies were used to make the simulation similar to the hospital setting and psychological fidelity by providing good simulation atmosphere through clear assigning of roles, student preparations and teacher support for the students during the practice to achieve the desired goals.

One possible explanation for this standard structured environmental preparation and real complex clinical situations could improve their ability to cope with such situations without stress in addition to reducing their fears, especially with no

real-world risks for them or the patients that strengthen their competence and confidence during clinical practice. This is supported by Watts et al. (2021) who reported that SBL should be prepared to achieve recognized goals and the expected outcomes, considering the psychological, conceptual, and physical aspects of fidelity to keep a realistic simulation design environment. This is in accord with the findings of Lockertsen et al. (2023).

The third theme is critical thinking and decision-making skills. The findings revealed that a high percentage of items generated reflect this theme. This could be because the teaching methodology used in the simulation aimed to improve the development of clinical reasoning and abilities to act as decision-makers in clinical situations through identifying cues, analysis, interpretation, investigation, and integration and matching the relevant data in the simulation scenario to create significant information and achieve simulation rotation outcomes.

This strategy enhanced their active participation since students did not simply assimilate what they received or became dependent recipients; simulation rotation encouraged their interaction and brainstorming, such as students' concept maps in simulation and tricks in the scenario. Another possible explanation for developing this theme was following the clinical judgmental model as a framework in simulated scenarios which helped students identify cues, analyze cues, have positive data integration, prioritize hypotheses, generate solutions, and evaluate the outcomes (Campbell et al., 2024).

Also, the curriculum and the technical institute were concept-based which ensured the transfer of the theoretical knowledge to be applied in the practice such as when dealing with emergencies for all of the previously mentioned reasons that constructed the skills of clinical reasoning and the ability to make decisions. This is in accord with Bussard et al. (2023) and Zengin et al. (2021) revealed that nursing students could enhance their clinical abilities such as critical thinking and making decisions.

The fourth theme is feedback and evaluation. The study findings revealed a minority of generated items under this theme. This could be due to shifting control of traditional feedback from a teacher-centered approach to students via peer feedback which could be a useful solution as an integrated part of the simulation evaluation. In terms of student's reflection after the simulation session by watching the videos about their performance and how it contributed to self-evaluation and peer evaluation on the student–patient interactions during the scenarios debriefing.

Also, continuous and repeated feedback immediately after the practical experiences could reinforce the student's clinical achievement. These findings in agreement with Yoong et al. (2023) and Lee et al. (2020) revealed that simulation debriefing is purposed to enhance learners' performance, correct their clinical errors, and improve their clinical reasoning skills. Through feedback and student reflection, teachers match between learning and experience. Given the previous four themes, upgrading students' knowledge, skills, and attitudes in this approach increases their satisfaction, and self-confidence, and have been explored the perceived factors of simulated-based placement.

Conclusion

This research study seeks to evaluate satisfaction and self-confidence among Technical Diploma nursing students through a simulated-based learning placement and explore the perceived factors of simulated learning that influenced nursing students' development of self-confidence in caring for real-life patients in clinical practice.

Based on the research results, it can be concluded that the majority of studied participants reported high levels of satisfaction and self-confidence with clinical medical-surgical simulation rotation experience. Simulated-based learning is also a useful educational strategy for preparing undergraduate students for real practice in hospitals. Clinical simulation supports medical-surgical nursing education to maintain high patient-quality care, as well as providing teaching in realistic and supportive clinical educational environments that enhance critical thinking and abilities to make decision and motivate students through peer feedback and evaluation. Hence, simulated-based placement serves as a basis for promoting innovation in nursing education.

Recommendations

In light of the findings of this study, simulation-based learning is recommended to be used more in educational nursing institutions for its valuable implications in nursing education.

Simulation-based learning is suggested to be integrated and incorporated into the nursing curricula as an innovative teaching methodology to overcome difficulties and shortage of traditional learning and teaching for optimal effectiveness. Low-fidelity simulation was used in this study, and it was easily applied with low cost compared with high educational outcomes efficacy. Resources are required for this methodology such as appropriate learning spaces, well-trained teachers, designed scenarios, time for preparation, and simple equipment and supplies. Also, when the simulation fidelity level increases that reinforces and services

the degree of realism in clinical educational situations.

Recommendations for further research related to the impact of clinical simulation on nursing students' academic achievement in different specialties in nursing.

Limitations of the study

The limitation of this study was that it involved a relatively small sample size from one institution. However, the study is robust and provided rich data that added to the existing literature on the impact of simulated-based placement on students' satisfaction and self-confidence.

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