Perception of Students in Faculty of Nursing Science about Clinical Training in Simulation Laboratories and Hospitals, Karari University, Omdurman-Sudan 2022

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Conflict of Interest

Authors declare that they have no conflict of interests regarding the research article.

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Authors' contributions

All authors declared that they contributed to the manuscript until its final shape. Hereby authors` contributions:

- Author Khadiga Mohammed Mousa Ashkoub: developed the research outlines including the perception scale and divided it to five themes.
- Author Siham Ahmed Balla Musa and author Hayat Fadlallah Mukhtar revised total work and adjusted subscales for internal and external validity.
- Author Khadiga Mohammed Mousa Ashkoub designed the manuscript and author Hayat Fadlallah Mukhtar was responsible for references and citation.
- Author Siham Ahmed Balla Musa did the statistical analysis and revised the manuscript for intellectual consistency and editing

Abstract:
Background: Basic nursing education is a practice-based professional career where clinical training is a crucial part in nursing programs. The study was aiming to assess the perception of nursing students about clinical training in simulation laboratories compared to training in hospitals at Karari University in Sudan.
Methods: The research design was a descriptive, cross-sectional institutional based study. The study setting was the faculty of nursing sciences in Karari University Sudan. The sample size was 167 students in grades five, six and eight. Five points` Likert subscales of perception were used for; *General training, Training environment, Supervision, Self-confidence and Training outcomes*. Multivariate analysis was carried out for the mean scores of perception subscales and grade levels. The ethical concern and confidentiality were maintained.

Results: Ninety-two students were in the age group 19 -24 and almost 71 % were females. The nursing students in grade eight perceived clinical training at hospital significantly different from grade five, the mean differences and confidence intervals were as follows: *General training* (0.38; 95 % CI: 0.11, 0.64), *Training environment* (0.53; 95 % CI: 0.17, 0.89),   *Self-confidence* (0.37; 95 % CI: 0.11, 0.63) and *Training outcomes* (0.49; 95 % CI: 0.19, 0.79). The perception of *Training environment* at both simulation laboratories and hospitals was significantly high among students in grade six compared to grade five, (0.32; 95 % CI: 0.03, 0.61) and (0.34; 95 % CI: 0.01, 0.68) respectively. The perception of *supervision* about training at the two settings was statistically insignificant among the three grades.
Conclusion: Perception scores about clinical training at hospitals was significantly high among nursing students in high grade level. More researches needed for perception about clinical training at simulation laboratories
Key words: Perception, Nursing, Hospitals, Simulation Laboratories, Grade.

Introduction

Basic nursing education is a practice-based professional career where clinical training in Simulation laboratories   and hospitals setting is a crucial part in nursing programs. The combination of theoretical and practical learning methods in nursing curriculum is based on quality experiences which has an impact on care delivery at all levels of health system [1, 2]. The key element of the nursing curriculum is the clinical practical experience in Simulation laboratories   and health care settings that aims to provide the upcoming nurses with the adequate knowledge and skills to succeed in their working field [2, 3]. Substantially; the acceptable methods to nursing students for clinical training and education is the supervised blended training approach in order to acquire the maximum knowledge and nursing skills [2, 4].

Simulation laboratories   has a safe forging teaching environment which is a prerequisite education vehicle before application of nursing methods at real working stations. It is a structured guided teaching tool that accompanied by tutors` supervision as a risk-free practice environment [5].   Clinical nursing education in Simulation laboratories   and health institutions such as hospitals and health centers are the cornerstones for teaching nursing methods in real working spaces [6, 7]. It is the vehicle to translate the basic nursing knowledge to practice and assist the nurses to develop their professional skills and attitude [6, 7]. Some studies in Sudan reflected the non-effective nursing teaching by clinical instructors and the need for students` evaluation and their perception about such clinical nursing education to tune the capacity of the tutors and to tailor the curriculum towards improvement and updates [7, 8]. Clinical training of nursing students is a mandatory component in basic education of nurses all over the world, nevertheless; few studies in Sudan are focusing on evaluation of basic clinical training at hospital settings by nursing students [9]. The aim of the study was to assess the perception about clinical training in simulation laboratories compared to training in hospitals settings among nursing students in Karari University in Omdurman locality in Sudan.

Material and methods

The research design was a descriptive, cross-sectional institutional based study. The study setting was the faculty of nursing sciences at Karari University. It is located on 40th street, Banat city west of the Medical Military Hospital at Omdurman locality. The faculty provides certain particular nursing programs as follows:

1. Bachelor of Nursing Science.
2. Diploma of Nursing Science.
3. Diploma of Nursing & Midwifery Science.
4. Diploma of Nursing &Anesthesia Science.

The eligible students were males and females who received training in Simulation laboratories and hospitals. Therefore, nursing students in grades five, six, and eight were the target population

for the study and their total number was 340. The sample size was calculated according to the following formula:

$$n = \frac{N \times P(1-P)}{[(N-1)(d^2/z^2)]P(1-P)}$$ where;

N is the total population = 340 students
z^2 is the deviate value at 95% confidence level = $(1.96)^2$
P was considered as 50% (0.5) to obtain the maximum sample size in the absence of similar and recent literature
d^2 is the desired tolerable error = $(0.05)^2$
Therefore, the calculated sample size was 180 students. The sample size was divided proportionally to the number of nursing students in the three grades. Thereafter; a systemic random sampling was carried out using the serial number in the students` lists and selected every 2nd number.

A structured self-administered questionnaire was created after a thorough review of relevant published and unpublished articles. The questionnaire composed of two sections, the first was about the characteristics of the student in terms of age, sex and grade level. The second section was five points` Likert scale composed of 31 items for both clinical training in Simulation laboratories   and training in the hospitals [Annex A]. The scale was derived from literature [10 -13] and adapted to local context of faculty in the country. It was divided further to into five subscales of perception themes; General training, Training environment, Supervision, Self-confidence and Training outcomes. The scale in general and its subscales were reviewed by experts in the university and by researchers in the faculty. It was tested in 27 students (15% of the sample) and the results was tested for consistency and item analysis. The scale was validated and the number of tested nurses was dropped from the sample.

The response rate was 93% yielded a sample of 167 nursing students. Data was entered in excel sheet, cleaned and exported to SPSS version 27. Frequency statistics was carried out for age, sex and mean score per subscale. Multivariate analysis was carried out at 95% confidence level for the mean scores of perception subscales as dependent variables for training in Simulation laboratories   and hospitals settings and the independent variables were grade`s levels.

Approval was taken from the ethical committee and administration unit in the faculty of nursing sciences in Karai University for permission and ensure compliance with ethical standards. The ethical concern of each student was considered by signed informed consent statement at the top of the questionnaire. Data confidentiality was maintained and not disclosed to any person except the principal researcher.

Results

Most of the nursing students in this study were younger, 92% in the age group 19 -24 years [Fig 1]. Females were the common, almost 71 % [Fig 2]. The means of scores for perception of nursing students regrading Simulation laboratories   subscales were ranged from 3.95 to 4.23 and 4.06 to 4.26 for subscales of clinical training at hospitals [Fig 3]. Multivariate analysis had shown that, the mean perception scores among nursing students in grade eight for clinical training at hospital were significantly different from grade five, the mean differences were as follows: *General training* (0.38; 95 % CI: 0.11, 0.64), *Training environment* (0.53; 95 % CI: 0.17, 0.89),   *Self-confidence* (0.37; 95 % CI: 0.11, 0.63) and *Training outcomes* (0.49; 95 % CI: 0.19, 0.79). The mean perception scores of *Training environment* at both simulation

laboratories   and hospitals were significantly high among students in grade six compared to grade five, (0.32; 95 % CI: 0.03, 0.61) and (0.34; 95 % CI: 0.01, 0.68) respectively [Table 1]. The perception score of *supervision* was statistically insignificant regarding training at the two settings among the students in the three grades.
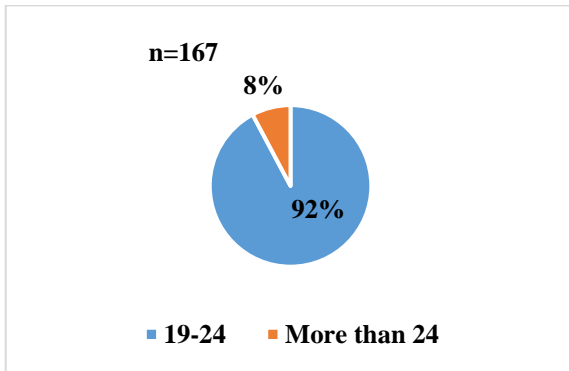

Figure 1: Age Distribution of Nursing Students
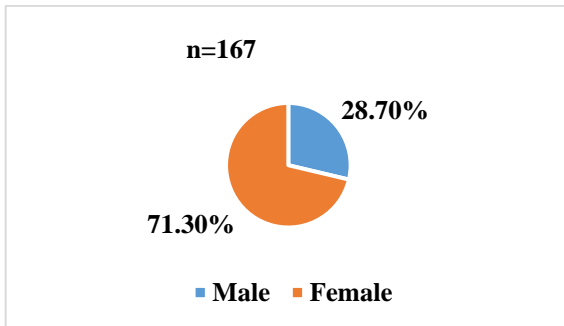
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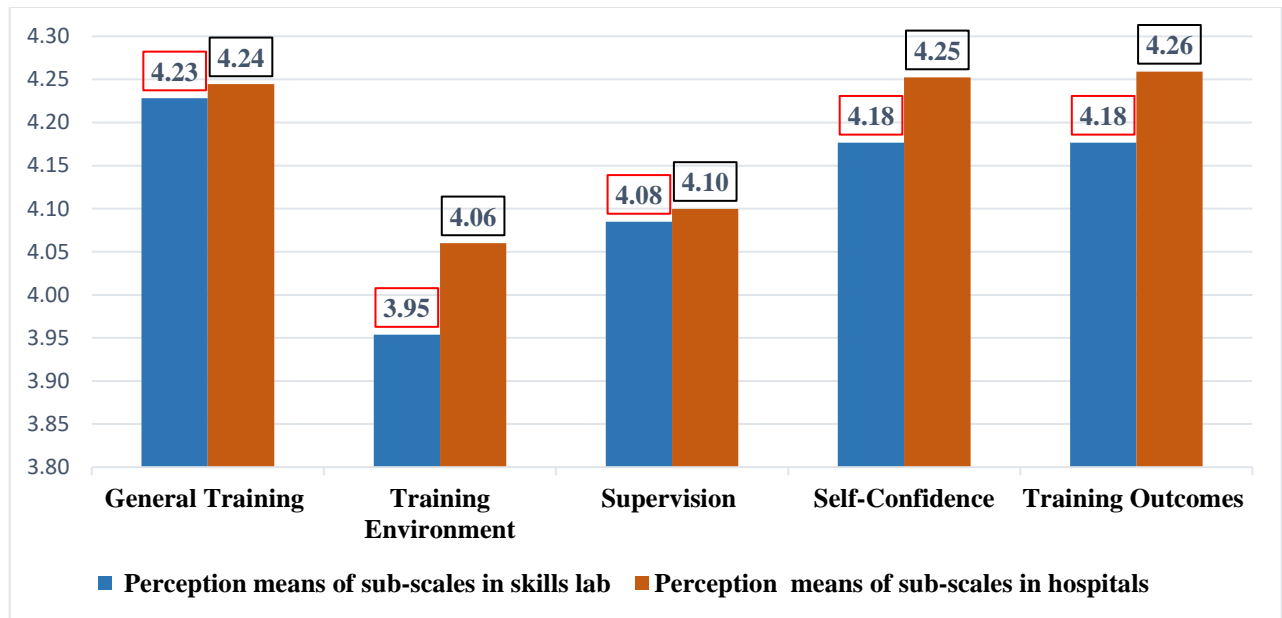

Figure 2: Gender distribution

Fig 3: Means of Scores of Nursing Students Perception Between Training in Simulation laboratories   and Health Institutions Settings - Karari University- Omdurman-Sudan 2022

Table 1: Means Subscales Score of Perception among Nursing Students Between

Subscales of perceptions	Perception scores of students / Grades (semesters)	Mean diff $\pm$ (se)	95% CI of Mean diff	P-Value
General training in hospital training	8 > 5	0.38 (0.10)	0.11, 0.64	0.003
Training environment in hospital training		0.53 (0.20)	0.17, 0.89	0.002
Self-confidence in hospital training		0.37(0.12)	0.11, 0.63	0.002
Training outcomes in hospital training		0.49 (0.13)	0.19, 0.79	0.001
Training environment in simulation laboratories	6 > 5	0.32 (0.12)	0.03, 0.61	0.028
Training environment in hospital training		0.34 (0.14)	0.01, 0.68	0.044

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*Multivariate analysis at level of significance less than 0.05. Dependent variables are grades

Discussion

In this study, nursing students in higher grade level reflected significant and acceptable perception scores for general training at hospitals compared to training in Simulation Laboratories. However; literature supported the augmentation of training at hospitals with Simulation Laboratories by combining one contact hour of clinical training in Simulation

Laboratories and two contact hours at hospitals, this resulted in students` satisfaction compared to traditional teaching at hospitals alone [14]. The nursing curriculum structure for the higher grades in the faculty concentrated on hospital teaching of critical care such as renal dialysis, intensive care, emergency care and specialized care in other health institutions. Usually, the students in higher grades gained cumulative clinical training experience from hospitals and other health care units by assignments and exercise before proceeding to final grade level. Most of students at high grade exert efforts prior to final exam as a preparedness for graduation which increased their confidence to perceive and accept the hospital training.

Most of nursing curricula focused on nursing education in Simulation Laboratories at low grades to produce improvement in retention of knowledge, clinical reasoning and thinking, satisfaction and self-confidence with remarkable increase in learning cognitive knowledge [15, 16]. Clinical training at hospital for nursing students in grade five is minimum compared to much training and demonstrations at simulation laboratories in the faculty before application at hospitals. Exposure to clinical training at hospitals for grade five is not sufficient to produce students` perception and satisfaction.

Although the perception scores of all nurses for training environment were the lowest for clinical training at both settings but nurses in grades eight and six were significantly perceived adequate training environments at hospitals setting as well as in Simulation laboratories more than those in grade five. Students in higher grades usually exposed to extensive clinical at both settings as prerequisite to strengthen their clinical skills as upcoming workforce for health system. Nevertheless; in Africa and low- and middle-income countries, there are insufficient resources for clinical training at simulation laboratories and hospital settings, but this did not mask the students` perception about its environment [1, 17].

The clinical training outcomes at hospital setting was significantly perceived among nursing students in grade eight. The acknowledgment of training outcomes at hospitals by nurses reflected the importance of clinical education component in the curriculum. The practical clinical training in hospital is a crucial element in the curriculum development that proceed learning the knowledge concepts and conceptual frameworks of nursing theories at the faculty [18].

The Self-confidence perception among students in grade eight was significantly high regarding clinical training in hospitals. At this grade level, the extensive clinical training at hospitals as a real setting strengthen the capability of students to produce their competency and gain their self-confidence [19]. Self-confidence is the feeling of real involvement in upcoming nursing practice at hospital setting that lowers the level of anxiety and stress [20].

Perception of students in the three grades about supervision was similar, however; sometimes the students valued the teachers` supervision as regular checkup of the clinical performance and not the supportive guidance[11, 21]. The fact of academic supervision is the clinical guidance and supportive close monitoring of the students' performance [21].

Conclusion
The perception of nursing students at grade eight in Karari faculty of nursing science was significantly high regarding clinical training at hospital settings for the following subscales; *General training*, *Training environment, Self-confidence* and *Training outcomes* , while perception of *Training environment* among nursing students in grade six was significantly high regarding clinical training at both settings compared students in grade five. More researches needed for clinical training at Simulation laboratories.

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