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Effect of Debriefing Learning Strategy on Nursing Students' Knowledge and Performance

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Abstract:
Introduction: *Nurse Educators are constantly challenged to develop new teaching strategies to educate and train students to care for a diverse patient population in a rapidly changing health care environment [7].Simulation is an important teaching and learning strategy used in undergraduate and postgraduate nursing programs. It consists of three phases; briefing where the facilitator explains how the simulation session will be conducted, discuses intended objectives and assigns students roles; the scenario, where students have experiential or observational experience with real cases; and debriefing, which is defined as a two – way communication process between the trainee and the trainer [10]. In debriefing a retrospective assessment and discussion of student's performance take place. Little is known regarding the effectiveness of debriefing strategy and its potential for nursing education has not been fully recognized.* ***Aim of the study:*** *to determine the effect of debriefing strategy on retained knowledge and performance of nursing students.* ***Research design:*** *a non-randomized controlled clinical trial.* ***Setting****: The obstetric and gynecologic skill lab at the Faculty of Nursing, Damanhur University.* ***Subjects****: 160 nursing students representing all those who registered in Obstetric and Gynecologic Nursing course in the 2nd semester of the 3rd academic year 2018-2019.* ***Tools:*** *Five tools were used to collect the necessary data.* ***Results:*** *knowledge and clinical performance regarding breast and abdominal examination during pregnancy revealed highly significant differences between the study and the control groups in the post-test (P=0.000), where the former group obtained better total score than the latter group.Additionally, the study group was more likely to achieve high total score of satisfaction about debriefing and high total score of DASH.* ***Conclusion:****debriefing strategy is effective in enhancing student clinical knowledge andperformance regarding breast and abdominal examination during pregnancy.*

Keywords: *Debriefing learning strategy, knowledge and performance, Simulation.*

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I. Introduction:

Midwifery is a science that is much an art in its nature and its profession is involved in clinical judgments that have direct effect on mother's and fetal health. Therefore, development of psychomotor technical skills is critical for safe midwifery practice. Thus, it is necessary for midwifery students to be skillful at the highest level before entering into the health care system. Studies showed that most newly graduated health professionals do not have the required skills to perform psychomotor procedures. This can be due to difficulty in finding a safe clinical environment to provide good clinical experiences for students during the limited time of education [1-3].

In practice-based health care education, like midwifery and nursing, methods of teaching and learning should focus on enabling students to assimilate clinical knowledge and skills as well as integrate theoretical knowledge from books into practical knowledge in real-life situations. Methods of teaching and learning should also help students develop their problem-solving skills as well as maintain a high level of competency and clinical judgment to detect early changes in the patient's status that indicates the need for timely and appropriate intervention [4, 5]. Moreover, they should focus on delivering highly qualified professional nurses, who are armed with the autonomous attributes, as well as are capable to provide decisions in practice and appropriate care in accordance with clinical situations on the basis of scientific nursing knowledge [6].

Nurse educators are constantly challenged to develop new teaching strategies to educate and train students to care for a diverse patient population in a rapidly changing health care environment [7]. Simulation is an important teaching and learning strategy used in undergraduate and postgraduate nursing programs. It helps students enhance critical thinking, develop clinical skills and knowledge, as well as manage priorities, make decisions, improve performance, lean to work in a team; and correct mistakes without adverse effects on the patient; in addition to strengthen technical, relational and ethical skills [4,8] .

In fact, simulation may be an educational strategy for achievement of learning outcomes, since it uses active learning. Simulation may also be an effective method of learning because it implicates four key facets of education in Midwifery and Nursing. These key facets are developing technical proficiency through practice of psychomotor skills and repetition; as well as assistance of experts, which is tailored to students' needs; situated learning within context; and incorporation of the affective (emotional) component of learning [9].

Simulation-based learning consists of three phases; briefing where the facilitator explains how the simulation session will be conducted, discuses intended objectives and assigns students roles; the scenario, where students have experiential or observational experience with real cases; and debriefing, which is defined as a two – way communication process between the trainee and the trainer [10]. In debriefing a retrospective assessment and discussion of student's performance take place. It is also an assessment method based on reflective, and verbal responses elicited from revisiting the clinical encounter. Debriefing is emerging as the most important of simulation within an active learning environment [11]. It contributes to a more intense experience of clinical situations as well as improved use of cognitive, affective and psychomotor skills [8].

Debriefing is the key moment for learning approaches to clinical education, which adequately prepare students for clinical practice because of a need to combine core knowledge with clinical skill. It is a common form of retrospective analysis of critical incidents in nursing and the health professions [8, 12]. Debriefing is also a practice whereby students and teachers positively assess the clinical situation and stimulate the development of critical judgment through reflective learning, which provides an opportunity to engage one's thinking to experiences and to learn from these experiences. In addition, it is an opportunity for students to reflect on their performance during the simulation and determine how they might perform differently in future practices. Moreover, debriefing offers students a reality check or a way to see themselves through the eyes of the teacher or their peers [4].

Furthermore, debriefing is a moment of reflection that takes place after the simulation with the purpose of enhancing learning through an experimental exercise [8]. Therefore, the primary purpose of debriefing is to consolidate learning objectives and provide feedback on student performance to facilitate the realization of learning goals [13]. Its other purposes are to discuss the actions and thought processes involved in a particular patient care situation; encourage reflection on those actions and thought processes, as well as incorporate improvement into future performance [10]. Debriefing is conducted by a facilitator and focused on the simulation learning goals. However, the facilitator's role of creating a safe environment for the students to learn and of structuring a seemingly unstructured learning event is paramount to the effectiveness of the debriefing session [4].

All forms of debriefing have a shared structure that involves setting the stage followed by three phases including the initial description or reactions phase; the analysis phase; and the application or summary phase [8]. In setting the stage, effective debriefing must be conducted in a manner that supports learning. Thus, the purpose is not to identify error and assign blame, but to understand why actions and decisions made sense to clinicians in the moment. Such a focus increases the probability that positive performance can be reinforced, and new options can be generated for changing performance that was incorrect or otherwise below the desired standard. This requires establishment of psychological safety for participants regardless of the type of debriefing conducted [10].

During the initial description or reactions phase, the leader generally elicits perspectives from team members about how events unfolded in the clinical situation or simulation scenario and asks them to describe their reactions. Participants should be requested to identify the important issues to address, and the sequence of events should be clarified. In the analysis phase, the leader should co-develop the priorities for discussion with the participants. The goal of this phase is to explore clinicians' rationales for observed behaviors; identify and close performance gaps by discussing pros and cons of chosen actions; as well as determine any modifiable systems issues that may have interfered with performance. During this phase, team members must be able to be direct with each other as well as leaders may need to actively facilitate team members sharing what they were thinking and how they were affected by the actions of others. The application or summery phase of debriefing is designed to identify and summarize the main learning points and consider how they can be incorporated into future practice. Explicitly summarizing lessons learned from the scenario or clinical event may help team members recall and apply these lessons in the future [10].

Debriefing is based on honesty, positive reinforcement, and mutual help, which has the greatest impact on student learning and achievement [8, 14]. It also enables participants to review key concepts; evaluate rationales and responses to interventions ;as well as gain a more in-depth understanding and appreciation of knowledge ; in addition to retain knowledge and skills for future application. However, a successful debriefing is one in which the participants do most of the talking [4].

Moreover, debriefing makes students feel comfortable to express their feelings and needs as well as reflect on possible errors [8].However, it identifies aspects of team performance that went well, and those that did not to determine opportunities for improvement at the individual, team, and system level. Therefore,

debriefing is an important strategy for learning from defects and for improving performance [10].Thus ,without identifying mistakes and having the chance to correct them, students may transfer their poor performance and knowledge to the clinical setting [15].Furthermore, debriefing allows students to be engaged in their learning through examination of the scenario as well as gives a verbal description of proposed actions and rationale [4,16].However, the use of debriefing immediately after simulation leads to a renewal of experience in the students 'mind, content integration, and better learning [17] . Using small groups for debriefing may also contribute to a more frequently and repeated training, which is considered important for achieving simulation competency [18].

Kolb's learning styles model in 1984 worked on two levels: a four-stage cycle of learning and four separate learning. This model implies that learning is the process whereby knowledge is created through the transformation of experience (Kolb, 1984). According to this model, different authors have emphasized that debriefing integrates the stages of the learning process, namely concrete experience, reflective observation, abstract conceptualization, and active experimentation. [8]

Little is known regarding the effectiveness of debriefing strategy and its potential for nursing education has not been fully recognized. Therefore, evaluation of debriefing is critical to ensure learning outcomes and students' transfer of learning. Such evaluation is needed to direct efforts at improving knowledge and practice as well as create new insight for further research. Thus, this study aimed to explore the effect of debriefing versus traditional learning strategy on nursing students' knowledge and performance

Operational definitions:
Retained knowledge in this study refers to capturing knowledge in the organization so that it can be used later in a previous section on organizational memory.

Performance of nursing students in this study refers to the ability of students to cope with their studies as well as how various tasks assigned to them by their instructors are accomplished

Aim of the study
This study aimed to determine the effect of debriefing strategy on retained knowledge and performance of nursing students.

Research Hypotheses:
Nursing students who received debriefing strategy will have more retained knowledge than those who received traditional learning strategy.

Nursing students who received debriefing strategy will have better performance than those who received traditional learning strategy.

II. Materials And Method

MATERIALS
Research design:
This is a non-randomized controlled clinical trial research design, where the effect of one independent variable (debriefing strategy) on two dependent variables (retained knowledge and performance of nursing students) was investigated.

Settings:
The study was carried out in the obstetric and gynecologic skill lab at the Faculty of Nursing, Damanhur University.

Subjects:
The study comprised 160 nursing students representing all those who registered in Obstetric and Gynecologic Nursing course in the 2nd semester of the 3rd academic year 2018-2019. They were randomly and equally assigned to either one of two groups: the study group who received debriefing teaching strategy, and the control group who received traditional teaching strategy.

Data collection tools:
Five tools were used to collect the necessary data.

Tool one: Socio-demographic characteristics, which was developed by the researchers and included age, gender and current residence as well as academic degree and achievement.

Tool two: Knowledge about breast and abdominal examination, which was constructed by the researchers and involved:

– Knowledge about breast examination, which comprised 8 statements. Total score of knowledge ranged between 0-16 and classified into week (0-5), fair (6-10) and good (11-16)**.**
– Knowledge about abdominal examination, which comprised 10 statements. Total score of knowledge ranged between 0-20 and classified into week (0-6), fair (7-13) and good (14-20)**.**

Tool three: performance of breast and abdominal examination during pregnancy, which was prepared by the staff of Obstetric and Gynecologic Nursing Department, Faculty of Nursing, Damanhur University. It encompassed 14 items for breast examination and 24 items for abdominal examination. Each performance item was given a score; correctly and completely done (3), correctly & incompletely done (2), and incorrectly or not done (1).

The total score of breast examination ranged from 14-42 and classified as follows:
– Poor (14-< 20)
– Satisfactory (20 -< 26)
– Good (26 -< 32)
– Very good (32 -< 38)
– Excellent (38-42)

The total score of abdominal examination ranged from 24-72 and classified as follows:
– Poor (24-< 34)
– Satisfactory (34 -< 44)
– Good (44 -< 54)
– Very Good (54 -< 64)
– Excellent (64-72)

Tool four: Study group's satisfaction about debriefing, which was developed by the researches and enclosed 10 items rated on a 5-point Likert scale as follows: strongly disagree (1), disagree (2), not sure (3), agree (4) and strongly agree (5). The total score of satisfaction ranged from 10 to 50 and classified as follows: low satisfaction (10-23), moderate satisfaction (24-37) and high satisfaction (38-50).

Tool five: Debriefing assessment for simulation in health care (DASH)
DASH is a 6-element, un-weighted, criterion- referenced behaviorally anchored rating scale. Six elements comprising a debriefing are defined, and raters are asked to compare observed performance to the defined elements. It assesses the instructor behaviors that facilitate learning and change in experiential contexts [19]. The DASH6-elements are:
1. Establishes an engaging learning environment
2. Maintains an engaging learning environment
3. Structures debriefing in an organized way
4. Provokes engaging discussions
5. Identifies and explores performance gaps
6. Helps trainees achieve or sustain good future performance.

DASH comprised 20-items on a 7-point Likert scale with responses ranging from extremely ineffective (1) to extremely effective (7). The total score of DASH ranged from 20 to 140, and classified as follows: low (20-60), moderate (61-101) and high (102-140)

METHOD
1. An official approval was obtained from the responsible authorities after explaining the purpose of the study.
2. Tools one and two were constructed by the researchers based on extensive review of recent and relevant literature.
3. Tools three and four were translated to Arabic to suit the Egyptian nursing students
4. Content validity of the tools was tested by a jury of 5 experts in the related field
5. Tools reliability was checked by Cronbach's Alpha test and the result indicated accepted reliability (0.94).

6. Pilot study was conducted by the researchers to test the clarity and applicability of the tools on 16 nursing students (excluded from the sample) to test the feasibility of the study. Following the pilot study, the tool was revised, reconstructed and made ready for use.
7. The students were engaged in two simulation sessions; breast and abdominal examination. Following each session, a debriefing session was conducted. The debriefing questions for the three debriefing steps were based on the 3D Model of Debriefing: Defusing, Discovery, and Deepening. This model is based on Kolb's experiential learning theory, adult learning principles, and the learning outcome model. (8)
8. Statistical analysis was done by the researchers with the help of statistical specialist as follows: the collected data were categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 23 program. Statistical measures were used such as simple frequency tables to describe and summarize categorical variables. Cross tabulation was also used to explore relationships between variables. A descriptive and analytical statistics were used such as percentages. Chi-square-test and Fisher Exact-test were also used to find out the difference in the results at 0.05 level of significance.

Ethical consideration:
For each recruited subject the following issues were considered: securing the subjects' written informed consent, keeping their privacy and right to withdraw at any time as well as assuring confidentiality of their data.

Theoretical framework:

The 3D Model of Debriefing, based on Kolb's (1984) principles in experiential learning, adult learning principles, and the Learning Outcome Model served as the study's theoretical framework. It incorporates common phases prevalent in the debriefing literature, including description of and reactions to the experience, analysis of behaviors, and application or synthesis of new knowledge into clinical practice. It can be used to enhance learning after real or simulated events. Conceptual definitions of defusing, discovery, and deepening informed the debrief question guide. The model supports a psychologically safe environment to move the learner from expressing their feelings regarding the experience of reflecting on the experience and making connections from the experience that can be applied to future clinical practice environments. **Defusing** is the first phase of the 3D Model. It involves discussions of how the simulation impacted learners emotionally and recaps how events unfolded. **Discovering**, the second phase of the 3D Model, involves learners' observation and analysis of their performance, with the identification of mental models and rationales for their behaviors during simulation. **Deepening**, the third phase of the 3D Model highlights the cognitive learning that occurs as students begin to connect new mental models of learning to their future clinical practice.

III. Results

Table (I) presents the number and percent distribution of the students according to their socio-demographic characteristics. It was observed that one-half and slightly more (50% & 51.2 %) of the control and the study groups respectively aged 21 years. Meanwhile, the vast majority of the control and the study groups (92.5%) were females. In addition, a sizeable proportion of the two groups (71.2%, 66.25%) respectively were rural residents. Moreover, almost three-fifths and more (61.25% &65%) of the study and the control groups had secondary educational background. Whereas, more than one-third (35% & 37.5%) of the latter and former groups respectively had technical nursing educational background. Finally, last semester academic achievement among the study and the control groups was excellent (45% & 36.25%) very good (22.5% & 33.75%) and good (32.5% & 26.25%) respectively. However, no significance differences between the two groups were found in relation to their socio-demographic characteristics.

Table (I): Number and percent distribution of the students according to their socio-demographic characteristics

Socio-demographic characteristics	Study (80)		Control (80)		F / χ^2 (P)
	N	%	N	%	
Age:					
20	9	11.25	12	15.00	2.217 (0.529)
21	41	51.25	40	50.00	
22	28	35.00	23	28.75	
23	2	02.50	5	06.25	
Sex:					
- Female	74	92.50	74	92.50	0.000 (1.000)
- Male	6	07.50	6	07.50	

Current Residence:					
- Rural	53	66.25	57	71.25	0.465
- Urban	27	33.75	23	28.75	(0.495)
Academic degree:					
- Secondary	49	61.25	52	65.00	0.242
- Technical Nursing Institute	31	37.50	28	35.00	(0.623)
Last semester academic achievement:					
- Excellent					
- Very good	36	45.00	29	36.25	6.086
- Good	18	22.50	27	33.75	(0.107)
- Weak	26	32.50	21	26.25	
	0	00.00	3	03.75	

χ^2 (P): Chi-Square Test & P forχ^2Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (II) shows the number and percent distribution of the students according to their total score of knowledge about breast examination. It was observed that the relationship between the pre- and post-test was highly significant among the study group (P=0.000), while it was significant among the control group (P=0.018). The relationship was also highly significant between the two groups in the post-test (P=0.000), where a sizeable proportion (73.75%) of the study group obtained good total score, compared to only (30%) of the control group.

Table (II): Number and percent distribution of the students according to their total score of knowledge about breast examination during pregnancy

Total score of Knowledge about breast examination during pregnancy	**Study (80)**				**Control (80)**				**F / χ^2 (P)**
	Pre-Test		**Post-Test**		**Pre-Test**		**Post-Test**		
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Good (11-16)	18	22.50	59	73.75	11	13.75	24	30.00	**Pre -Test** 2.408 (0.300)
Fair (6-10)	46	57.50	21	26.25	48	60.00	45	56.25	
Weak (0-5)	16	20.00	0	00.00	21	26.25	11	13.75	**Post-Test** 34.486 (0.000)**
F / χ^2 (P)	47.16 (0.000)**				8.05 (0.018)*				

χ^2 (P): Chi-Square Test & P forχ^2Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (III) portrays the number and percent distribution of the students according to their total score of clinical performance of breast examination during pregnancy. Although the relationship between the pre- and post-test was highly significant among the study and the control groups (P=0.000), it was significant between the two groups in the pre-test (P=0.028), and highly significant in the post-test (P=0.000), where 42.5% &46.25% of the study group obtained excellent and very good total score respectively, while the control group obtained 6.25% & 8.75% respectively.

Table (III): Number and percent distribution of the students according to their total score of clinical performance of breast examination during pregnancy

Total score of clinical performance of breast examination during pregnancy	Study (80)				Control (80)				F / χ^2 (P)
	Pre-Test		Post-Test		Pre-Test		Post-Test		
	N	%	N	%	N	%	N	%	
Excellent (38-42)	0	00.00	34	42.50	0	00.00	5	06.25	**Pre-Test** 9.101 (0.028)* **Post-Test** 88.205 (0.000) **
Very Good (32-<38)	3	03.75	37	46.25	0	00.00	7	08.75	
Good (26 -<32)	17	21.25	8	10.00	10	12.50	43	53.75	
Satisfactory (20-<26)	48	60.00	1	01.25	64	80.00	23	28.75	
Poor (<20)	12	15.00	0	00.00	6	07.50	2	02.50	
F / χ^2 (P)	123.222 (0.000)**				53.869 (0.000)**				

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (IV) demonstrates the number and percent distribution of the students according to their total score of knowledge about abdominal examination during pregnancy. Although highly significant differences were found between the pre- and post-test among the study and the control groups (P=0.000), highly significant difference was observed between the two groups in the pos-test (P=0.000), where 75% of the study group gained good total score, compared to 23.75% of the control group.

Table (IV): Number and percent distribution of the students according to their total score of knowledge about abdominal examination during pregnancy

Total score of Knowledge about abdominal examination during pregnancy	Study (80)				Control (80)				F / χ^2 (P)
	Pre-Test		Post-Test		Pre-Test		Post-Test		
	N	%	N	%	N	%	N	%	
Good (11-16)	6	07.50	60	75.00	8	10.00	19	23.75	**Pre-Test** 2.297 (0.317) **Post-Test** 43.058 (0.000) **
Fair (6-10)	42	52.50	20	25.00	49	61.25	57	71.25	
Weak (0-5)	32	40.00	0	00.00	23	28.75	4	05.00	
F / χ^2 (P)	83.988 (0.000)**				18.456 (0.000)**				

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (V) displays the number and percent distribution of the student according to their clinical performance of abdominal examination during pregnancy. Although highly significant differences were found between the pre- and post-test among the study and the control groups (P=0.000), highly significant difference was observed between the two groups in the pos-test (P=0.000), where 56.25% of the study group attained very good total score, compared to 6.25% of the control group.

Table (V): Number and percent distribution of the student according to their clinical performance of abdominal examination during pregnancy

Clinical performance of abdominal examination during pregnancy	Study (80)				Control (80)				F / χ^2 (P)
	Pre-Test		Post-Test		Pre-Test		Post-Test		
	N	%	N	%	N	%	N	%	
Excellent (64-72)	0	00.00	23	28.75	0	00.00	5	06.25	**Pre-Test**
Very Good (54-<64)	5	06.25	45	56.25	3	03.75	5	06.25	1.111 (0.574)
Good (44-<54)	70	87.50	11	13.75	74	92.50	34	42.50	**Post-Test**
Satisfactory (34-<44)	5	06.25	1	01.25	3	03.75	36	45.00	88.435 (0.000) **
F / χ^2 (P)	100.642 (0.000)**				48.238 (0.000)**				

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Figure (1) shows the percent distribution of the study group according to their total score of satisfaction about debriefing. It was noticed that more than three-fifths (65 %) of them achieved high total score, while less than two-fifths (35%) achieved moderate total score.

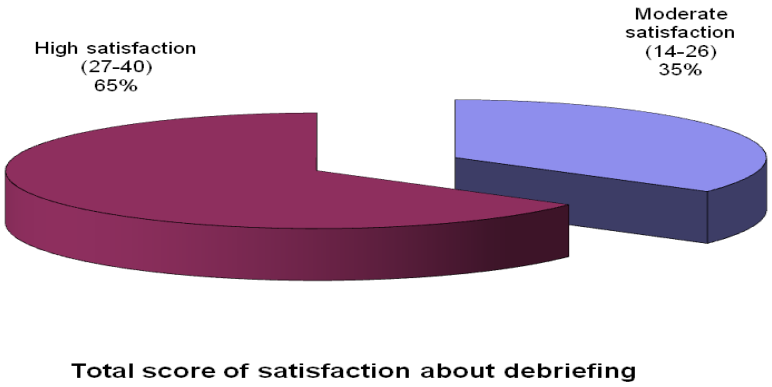

Figure (1): Percent distribution of the study group according to their total score of satisfaction about debriefing

Figure (2) indicates the percent distribution of the study group according to their total score of Debriefing Assessment for Simulation in Healthcare (DASH). It was revealed that the majority ofthem (85%) acquired high total score, while a minority (15%) acquired moderate total score.

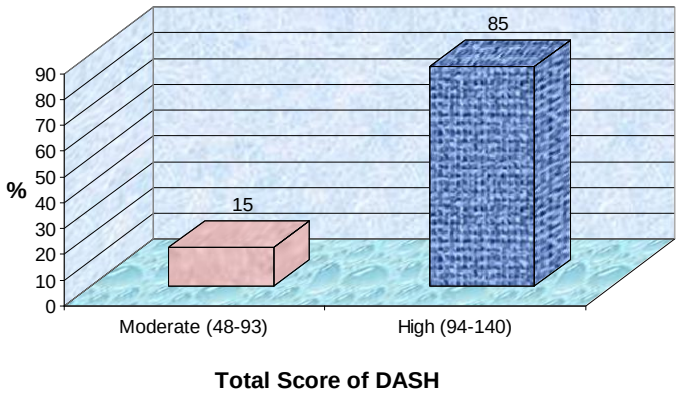

Figure (2): Percent distribution of the study group according to their total score of Debriefing Assessment for Simulation in Healthcare (DASH)

IV. Discussion

At the beginning of the 21st century, simulation and debriefing have been gaining ground as active teaching/learning strategies with a successful impact on students' thinking and lifelong learning[20]. Debriefing is a form of ''reflective practice'', which provides a means of reflection-on-action in the process of continuous learning. This reflection-on action is a key tenet of the experiential learning theory of Kolb who describes how experience provides a primary source of learning and development. Central to the ideas of both reflective practice and experiential learning is the belief that experience alone doesn't lead to learning, but rather the deliberate reflection on that experience [21].

Although there are several models of techniques, debriefing is generally considered a time for the participant to reflect on the event, discuss it with others, learn and modify behavior as a result. During the briefing session, the trainer must act as facilitator, whose ability to assess the trainees' skill is fundamental for the learning process [22]. However, debriefing is useful to encourage the students to reflect on their own clinical performance by providing an opportunity to clarify and explain the rationale of each action in the simulation session [8].

The current study investigates the effect of debriefing strategy on retained knowledge and performance of nursing students. The 3D model of Debriefing (defusing, discovering and deepening), which based on Kolb's theory of experiential learning, was selected in the planning and implementation of the study. Experiential learning is used in the clinical setting with real patients and is recently used for simulation training in a controlled laboratory atmosphere. The simulation experience often involves several students, a clinical instructor at the bedside (mimicking a real clinical situation) and a simulation trained educator at the controls of the simulator. During this experience, certain tasks are expected from the students, as identified by objectives, and critical thinking is anticipated for the particular scenario. Debriefing takes place immediately after the session utilizing guided reflection, in which the instructor allows time for the learner to explore outcomes in relation to objectives and optional patient outcomes as well as critical decision-making choices [23].

On investigating knowledge about breast and abdominal examination, the results of the present study showed that the study group obtained highly significant total score in the post-test, compared to the control one (Table II, IV). This finding suggests that debriefing strategy is effective in enhancing student clinical knowledge. The current finding is in line with the study of **Coutinho et al (2016)** in Coimbra, Portugal, where they reported that through structured debriefing, sharing of knowledge between students increases as well as the critical-reflective and self-reflection skills are developed in a relaxed atmosphere [8]. It is also consistent with PHD dissertation of **Loomis (2018)** in Colorado, USA, where she reported that the use of debriefing positively affected knowledge acquisition, knowledge retention, and knowledge application among baccalaureate nursing students. She also suggested that the use of debriefing will facilitate the development of reflective practitioners [7].

In addition, the present finding is partially similar to the study of **Verkuyl et al (2018)** in Toronto, Canada, where they found significant knowledge and self-efficacy and high debriefing experience rate within all groups. But no significant differences in outcomes were found between groups [24].On the other hand, the present finding is relatively incongruent with the study of **Ha & Lim (2018)** in Seoul, Korea, where they found no significant differences in the total knowledge score between Peer-Led Written Debriefing and Instructor-Led Oral Debriefing [25]. This disparity may be due to different research approaches or methodology.

In this context**Mitchall et al (2018)** stated that debriefing is essential for learner to gain maximum knowledge and skills from activity, which can be further used with reflection or commitment to change [26]. The relative agreement between the current study and previously mentioned studies could shed light upon the efficacy of debriefing strategy on students' knowledge.

On assessing clinical performance of breast and abdominal examination, the results of the current study revealed that the study group obtained highly significant total score in the post-test, compared to the control one (Table III, V). This finding suggests that debriefing strategy is effective in enhancing student clinical performance. The present finding matches the literature review of **Cant&Cooper (2011)** who concluded that formative debriefing and feedback processes enhance experiential learning and are an essential component of simulation training. However, skills are essential in accordance with best practice to improve learning facilitator [12].

The current finding is also in accordance with the study of **Ali et al (2015)** in Islamabad-Pakistan, where they found that the debriefing session at the end of modular teaching Objectively Structured Clinical Examination is a useful learning tool; it not only provides immediate feedback about the performance but also gives students opportunity to discuss own performance with the instructor in order to develop habit of lifelong self-directed adult learner[27]. In addition, it relatively corresponds with the study of **Ostovar et al (2018)** in Tabriz, Iran, where they concluded that both oral debriefing (OD) and video assisted debriefing (VAD) have significantly positive impact on simulation outcomes and can increase preparedness of nursing students before entering the clinical settings. [17].

However, **Billettet al (2019)** stated that the purpose of debriefing is to enhance students' clinical skills through reflection on action to increase understanding of actions behavior and experience as well as improve students' theoretical knowledge and decision making [28]. The relative agreement between the present study and previously mentioned studies could bring to light the efficacy of debriefing strategy on students' clinical performance.

The results of the present study also detected that the study group was more likely to obtain high total score of satisfaction about debriefing (Figure 1). This finding is relatively and partially in harmony with the study of **Ostovar et al (2018)** who found that both oral debriefing (OD) and video assisted debriefing (VAD) methods improve the psychomotor skills, self-confidence, and satisfaction of students after simulation, with no evidence of superiority of one to another [17].

On the other hand, the present finding is relatively dissimilar to the study of **Ha & Lim (2018)** who found no significant differences in the total score of satisfaction with multimode simulation, or satisfaction on debriefing between Peer-Led Written Debriefing and Instructor-Led Oral Debriefing [25]. This dissimilarity may be due to different research approaches or methodology as mentioned before.

In addition, the results of the current study revealed that the study group was more tended to acquire high total score of Debriefing Assessment for Simulation in Healthcare (DASH) (Figure 2). This finding conforms to the guide of **Cheng et al (2015)** who reported that the DASH scores showed evidence of good reliability and preliminary evidence of validity [29]. The same finding is also congruent with the book of **Chinara (2019)**, in which it was indicated that the DASH is used to evaluate debriefing by learners, peers, and educators themselves. Therefore, DASH is important for the quality of training that satisfaction be high in this type of evaluation [19]. On the other hand, the present finding disagrees with the doctoral dissertation of **Shea (2015)** in San Francisco, California, USA, where she found that the DASH scores demonstrated no difference in DASH scores between the two participant groups. This may be due to consistent debriefing after each scenario, which provided by the researcher [30].

So, debriefing is the cornerstone of effective simulation-based education. While the evidence-based gold standard debriefing technique is yet to be determined, the majority of these debriefing techniques are likely effective if utilized appropriately by educators and facilitators.

V. Conclusion

Based on the finding of the current study it can be concluded that the educators could use the debriefing strategy to improve nursing students' knowledge and increase skill performance in the nursing classroom.

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