Effects of Structure Debriefing on Procedural Skills and Satisfaction of Nursing Students in Low Fidelity Context: A Pilot Study

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Abstract. Structured debriefing is a critical component of skill-based learning. Effects of structured debriefing on procedural skills and satisfaction of nursing students in low fidelity context. A pilot study was conducted in a private nursing college in Islamabad, Pakistan. Out of 51 approaches, 34 students were selected from the list of participants by a data collector using a simple random sampling technique. Block randomization was applied using Microsoft Excel to create two equivalent (n = 17) groups, i.e., experimental and non-experimental. The experimental group received structured debriefing and nonexperimental group received traditional debriefing. The data was collected using skills checklists, and debriefing reflection subscale of the Satisfaction with Simulation Experience Scale. Learning scores and satisfaction level of students. The overall mean learning scores of both the skills (suctioning skill 50.76 ± 3.17) (sterile dressing skill 60.94 ± 7.34) and satisfaction level (29.76 ± 6.93) were increased after constructive debriefing in comparison to traditional debriefing (suctioning skill 44.17 ± 6.31) (sterile dressing skill 48.7 ± 8.69) (satisfaction level 13.8 ± 3.54). Further, there was a statistically significant difference in both skills (suctioning skill P = 0.002; sterile dressing P = 0.001 (<0.05) and significant improvement in the satisfaction level of students with a significance value of 0.001 (<0.05). Constructive debriefing has significantly affected nursing students' procedural skills development and satisfaction level in a low fidelity context. It allows self-reflection in a safe and conducive learning environment. Educator's preparedness and learner's engagement is essential. Trail registration: NCT04992091.

Keywords: Structure Debriefing · Skills · Satisfaction · Fidelity · Nursing

1 Introduction

Debriefing is considered a critical component in skills development, and useful strategy to bridge the theory-practice gap [1]. It is defined as students' reflection on their performance and educators providing feedback [2]. The educator facilitates a constructive discussion while maintaining a stance of genuine curiosity about learners' concerns in the debriefing process. As a result, an emphatic learner–educator relationship is established which encourages the reflective practice in an interactive manner [2, 3]. The process of self-evaluation and constructive feedback enables the learners to identify areas lacking in their performance.

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Debriefing facilitates learning, improves performance and ultimately improves patient outcomes [4, 5]. It allows students to think and critique their practices, which fosters clinical reasoning and critical thinking [6]. Learners acknowledge the positive impact of debriefing to their skills' development. The improvement in psychomotor skills was evident with the application of the debriefing [1]. In the current study setting debriefing is predominantly done in the large groups during skills sign off and after Objective Structured Clinical Examination. The educators highlight the areas that need improvement but learners usually do not get a chance to engage in the reflective discussion. There is a need to have a structured debriefing method to facilitate the learner at the continuum of skills development [4]. The studies have highlighted the effect of debriefing in high-fidelity simulations [4, 6]. Noteworthy, developing context are challenged regarding the cost of maintaining high-fidelity environments. Therefore, the effectiveness of debriefing in a low-fidelity environment need to be tested. Thus the current study aim was to assess the effectiveness of structured debriefing on nursing students' procedural-skill learning and their satisfaction level compared to traditional debriefing methods in the low fidelity context.

The study's hypothesis was that structured debriefing has no significant effect on procedural skill learning and satisfaction level of students compared to the traditional method of debriefing.

2 Methodology

The pilot study was conducted at a private nursing college in Islamabad, Pakistan, from Oct 2019 to June 2020. Participants were allocated into group with the allocation ratio was 1:1.

2.1 Eligibility Criteria

Students who were enrolled in the Adult Health Nursing-II (AHN-II) course were included in the study while those who were repeating the course and were absent for two or more days during skills demonstration and signing off were excluded.

2.2 Intervention

A three hours' workshop on a structured debriefing was conducted by the primary researcher to the educators who were assigned to the experimental group. The content of the workshop included different models of debriefing, the core principles and stages of debriefing performance, the structural elements in practicing debriefing, the 5 W's of debriefing, the role of a facilitator in the debriefing process, and the factors that affect the effective debriefing [7, 8]. The educators facilitating the non-experimental group, continued with the traditional method of debriefing.

During the skill practice, the educators facilitating the non-experimental groups utilized 20 min to debrief students of their groups with the traditional method. Whereas, the educators in the experimental group used 20-min with each student of their groups for

structured debriefing. Every student in the experimental group was allowed to self-reflect, asked questions related to performance, and given feedback by their educators.

After the demonstration of suctioning skills by the course faculty to the whole class, practice time was given to the non-experimental group, the experimental group was free to use the time for their self-study. During their skill practice time, their assigned faculties implemented traditional debriefing methods on students. In the 11th week of the semester, the non-experimental group was signed off for suctioning skills using a standard checklist. The experimental group was utilizing practice time for suctioning skills. During their practice time, their trained faculty members implemented a structured debriefing on students. Both groups were in separate skills labs. In the 12th week of the semester, the demonstration of sterile dressing skills was done for all students. After the demonstration of the skill, the non-experimental group was given practice time for sterile dressing skills and the experimental group was signing off for suctioning skills using a standard checklist in a separate lab.

In the 13th week of the semester, the non-experimental group signed off for sterile dressing skills while the experimental group was practicing sterile dressing skills. Soon after the signing off, a self-administered debriefing and reflection subscale was distributed to the non-experimental group. In the 14th week of the semester, the non-experimental group was free to use study time, while the experimental group was signed off for sterile dressing skills. Both groups received 12 h for practice and signing off. The reason for giving the chance of practice time and signing off skills to the non-experimental group one week prior to the experimental group was to prevent contamination in the study. In the 15th and 16th weeks of the semester, the non-experimental group and other students of the class were exposed to the same intervention before the final OSCE for fair treatment and benefit to all the students.

The non-experimental group practiced and got signed off one week prior to the experimental group to prevent contamination bias in the study. Additionally, both groups were working in two separate skills labs on different building floors. Once the data collection and preliminary analysis was complete, the non-experimental group and the rest of the students were exposed to the structured debriefing before the final OSCE for the fair treatment considering the benefits of intervention.

2.3 Outcomes Measurement

The primary outcome measure was the difference in the learning scores and the secondary outcome was the satisfaction level of students. These two outcomes were measured after the students were signed off for both skills.

2.4 Sample Size

The sample size was calculated by using an effect size (0.2), power of study 80%, level of significance 0.05, and confidence level 95%. The required sample size for both groups was 17 each ($n = 34$). In this study, a small effect size was used because of the small sample size and homogeneity in the sample. A soft copy of participant's roll numbers was obtained by data collector (educator). A simple random technique was applied using Microsoft Excel to randomly assign students ($n = 17$) into two groups i.e., experimental

and non-experimental. The experimental group was further divided into two groups nine (09) and eight (08) participants consecutively.

2.5 Data Collection Tools

The data was collected using; a demographic sheet, suctioning and sterile dressing skills checklist; and a modified version of the subscale "debriefing and reflection" of Satisfaction Simulation Experience Scale (SSES). The reliability of the debriefing and reflection subscale is 0.94 [8]. The modified version consisted of seven statements. Each statement was scored on a five-point Likert scale (5 = "strongly agree", 1 = "strongly disagree"). The highest score one could achieve was 35 and the minimum was 7.

The suctioning and sterile dressing checklist consisted of 20 and 22 items. The maximum points a student can achieve on suctioning skill was 55, on sterile dressing was 69, and the minimum on both skills was "0". Items were marked between 0–2 ("0" = unsatisfactory performance, "1" = needs improvement, and "2" = performed satisfactorily). Both checklists consisted of a few critical items. The suctioning checklist had 3 and the sterile dressing had 5 critical items. Each critical item carried a score of "5". The critical items are the ones that students must perform for patients' or their own safety. Subject and clinical experts reviewed skills checklists, including the critical items. The inter-rater reliability on the checklists were maintained among faculty members by the percent agreement methods.

2.6 Ethical Consideration

Ethical approval was taken from the institutional ethics committee (IRB# 264-754-2019). Furthermore, permission for using the Satisfaction Simulation Experience Scale was taken from the authors [8]. The participants' autonomy was ensured by using voluntary informed consent. A serial code was assigned on data collection tools. Participants had a right to withdraw from the study at any time they wanted.

2.7 Data Collection Procedure

Data was collected and intervention was applied by faculty members who were the team members of the AHN-II course. An explanation regarding data collection tools was given. The educators were signing off students on both skills by using the checklist and lastly, gave 20 min to students, to fill out the self-administered debriefing and reflection subscale questionnaire and demographic sheet.

3 Result

Data was analyzed using SPSS version 21. Most of the variables did not meet the requirements (Shapiro-Wilks $p > 0.05$) of normality; therefore, the Man-Whitney U test was applied to analyze the data for primary and secondary outcomes. The mean age of the participants was 21.24 ± 1.45. There were 100% female students in the experimental group, whereas 76.4% female and 23.5% male students in the non-experimental group.

Table 1. Overall Mean Scoring of Skills and Satisfaction Level

	Experimental		**Non-experimental**	
	Mean	**S.D**	**Mean**	**S.D**
Suctioning skill	50.76	3.17	44.17	6.31
Sterile dressing skill	60.94	7.35	48.70	8.69
Satisfaction level	29.76	6.93	13.80	3.54
Cohen's *d* for learning scores = 1.23. Cohen's *d* for satisfaction level = 3.04				
*(Ranges of effect size small 0.2, medium 0.5, large 0.8)				

The overall results indicated that the skill base performance scores was improved after structured debriefing. The mean performance scores of students in the suctioning and sterile dressing skills were higher in the experimental group than in non-experimental, as shown in Table 1. The difference in scores was statistically significant (p-value 0.002; 0.001).

There was a statistically significant difference in both groups concerning 10 steps of sterile dressing skill (Table 2). However, an analysis of 18 out of 20 steps of suctioning skill did not show a statistically significant difference except for two steps (Table 3). Among the critical points of both skills only two points in sterile dressing were statistically significant (Table 2).

The results indicated that the satisfaction level was improved after structured debriefing. The mean satisfaction score was higher for the experimental group (29.76 + 6.93) as compared to the non-experimental (13.8 + 3.54) with a (p-value 0.001) (Table 1). In

Table 2. Comparison of sterile dressing scores in experimental and Non-experimental groups by Mann-Whitney Test

S #	**Scoring of sterile dressing**	**Groups**	**Unsatisfactory 0**	**Need Improvement 1**	**Satisfactory 2**	**Core 5**	***P-Value***
1	Maintain Privacy	Experimental	1	0	16	–	0.008*
		Non-experimental	7	1	9	–	
2	Offer Bedpan/urinal If required	Experimental	2	0	15	–	0.500
		Non-experimental	0	4	13	–	
3	Place client in comfortable position in which the wound can be readily expose.	Experimental	0	1	16	–	0.294
		Non-experimental	0	3	14	–	
4	Medicate the patient for pain if indicated	Experimental	2	0	15	–	0.016*
		Non-experimental	7	2	8	–	
5	Switch off fan	Experimental	0	0	17	–	0.002*
		Non-experimental	5	3	9	–	

(*continued*)

Table 2. (*continued*)

S #	Scoring of sterile dressing	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
6	Wash hands (medical hand washing).	Experimental	0	1	16	–	0.294
		Non-experimental	0	3	14	–	
7	Check dressing pack for expiry	Experimental	0	1	16	–	0.187
		Non-experimental	3	3	11	–	
8	[a]Open the sterile set maintaining asepsis and throughout the procedure	Experimental	7	–	–	10	0.889
		Non-experimental	6			10	
9	Add equipment and solution into tray maintaining asepsis. (10–12″ above sterile field).	Experimental	3	4	10	–	0.317
		Non-experimental	0	5	12	–	
10	Cover the tray with sterile towel	Experimental	2	2	13	–	0.348
		Non-experimental	2	5	10	–	
11	Put on disposable (plastic) gloves	Experimental	0	0	17	–	0.036*
		Non-experimental	1	3	13	–	
12	Use wet cotton ball to lose the tape	Experimental	0	0	17	–	0.014*
		Non-experimental	1	5	11	–	
13	Remove tapes by holding down the skin and pull the tape gently toward the wound.	Experimental	0	1	16	–	0.069
		Non-experimental	2	3	12	–	
14	[a]Use sterile forceps to remove under dressing (if there is a deep wound) and discard	Experimental	3	–	–	14	0.251
		Non-experimental	6	–	–	11	
15	Remove top dressing and discard	Experimental	0	0	17	–	0.151
		Non-experimental	0	2	15	–	
16	Use normal saline for dressing that stick to the skin.	Experimental	0	0	17	–	0.002*

(*continued*)

Table 2. (*continued*)

S #	Scoring of sterile dressing	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
		Non-experimental	2	6	9	–	
17	Remove dressing, assess for type and amount of drainage before discarding it.	Experimental	0	0	17	–	0.008*
		Non-experimental	3	3	11	–	
18	Remove gloves	Experimental	2	0	15	–	0.758
		Non-experimental	0	3	14	–	
19	Scrub hands and dry with sterile towel for 3 min. (Don't touch the upper part of towel)	Experimental	0	2	15	–	0.056
		Non-experimental	0	7	10	–	
20	[a]Put on sterile gloves	Experimental	4	–	–	13	0.532
		Non-experimental	7	–	–	10	
21	[a]Place the sterile drape beside the wound to make the field sterile.	Experimental	2	–	–	14	0.030*
		Non-experimental	7	–	–	8	
22	Clean the wound using forceps or hand (forceps is preferable).	Experimental	0	1	16	–	0.037*
		Non-experimental	0	6	11	–	
23	Use a separate swab for each stroke.	Experimental	1	2	14	–	0.242
		Non-experimental	0	5	12	–	
24	[a]Clean the wound from the least to most contaminated area (inner to outer).	Experimental	0	–	–	17	0.001*
		Non-experimental	11	–	–	6	
25	Dry the surrounding skin with dry gauze swab	Experimental	2	3	12	–	0.477
		Non-experimental	3	4	10	–	
26	Apply sufficient dressing to cover the wound	Experimental	0	0	17	–	0.017*
		Non-experimental	1	4	12	–	
27	Secure the dressing by taping the edges.	Experimental	0	0	17	–	0.036*
		Non-experimental	1	3	13	–	
	Total	Experimental				–	0.001*
		Non-experimental					
	[a]Core steps of the skill, [b]Alpha is 0.05, *P-Value < 0.05						

addition, in each statement of the satisfaction section, there was a statistically significant difference found between both the groups (p-value 0.001) (Table 4).

Table 3. Comparison of suctioning scores in experimental and Non-experimental groups by Mann-Whitney Test

S#	Scoring of Suctioning	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
1	Assess the patient	Experimental	0	0	17	–	0.151
		Non-experimental	0	2	15	–	
2	Explain procedure to the patient/family	Experimental	0	0	17	–	0.074
		Non-experimental	0	3	14	–	
3	[a]Check that the suction machine is set to the appropriate level. Recommended suction pressure is 8–20 kPa for adults.	Experimental	3	–	–	14	0.360
		Non-experimental	2	–	–	15	
4	Gather equipment	Experimental	0	2	15	–	0.588
		Non-experimental	1	1	15	–	
5	Wash Hand	Experimental	2	1	14	–	0.603
		Non-experimental	1	2	14	–	
6	Make appropriate position. In conscious client—Semi fowlers For unconscious client—side lying Nasal—hyper extended neck position	Experimental	2	0	13	–	0.306
7		Non-experimental	0	1	10	–	
8	[a] Hyperventilate client by increasing O2 to 10 L/min before suctioning (if not contraindicated)	Experimental	1	–	–	16	0.080
		Non-experimental	5	–	–	12	
9	Towel on chest on client's chest	Experimental	1	3	13	–	0.533
		Non-experimental	4	1	12	–	
10	Select the correct size catheter	Experimental	0	2	15	–	0.136
		Non-experimental	5	0	12	–	
11	Set the gallipot and pour distilled water aseptically.	Experimental	0	1	16	–	0.515
		Non-experimental	1	2	14	–	

(*continued*)

Table 3. (*continued*)

S#	Scoring of Suctioning	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
12	Open the wrapper of catheter from distal end and attach it to suction unit. Keep the rest of the catheter in the sterile packet.	Experimental	0	1	16	–	0.032*
		Non-experimental	3	3	11		
13	Put on gloves aseptically on dominant hand.	Experimental	0	1	16	–	0.069
		Non-experimental	2	3	12	–	
14	Unwrap the catheter without touching it to any non-sterile surface. Use dominant/gloved hand to hold the catheter	Experimental	0	3	14	–	0.085
		Non-experimental	4	3	10	–	
15	Measure the tube for distance of insertion from tip of the nose to the ear lobe	Experimental	0	2	15	–	0.220
		Non-experimental	1	2	7	–	
16	Lubricate and check for the potency of the catheter in sterile water and also check for the pressure of suction machine.	Experimental	0	2	15	–	0.179
		Non-experimental	2	3	12	–	
17	Withdraw the catheter from the wrapper and insert in the tracheal tube to about one third of its length and apply suction by placing the thumb over the suction port control	Experimental	0	1	16	–	0.281
		Non-experimental	1	2	14	–	

(*continued*)

Table 3. (*continued*)

S#	Scoring of Suctioning	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
18	[a]Apply intermittent suction for not more than 5 s. Withdraw the catheter gently with rotating motion. Do not suction the client for more than one breath cycle 10–15 s	Experimental	2	–	–	15	0.380
		Non-experimental	4	–	–	13	
19	Look at the mucus for color, consistency or any other changes	Experimental	0	0	17	–	0.074
		Non-experimental	0	3	14	–	
20	Rinse the catheter by dipping its end into the sterile water and applying suction until the solution has rinsed the tubing through.	Experimental	0	1	16	–	0.006*
		Non-experimental	4	4	9	–	
21	Repeat the suction until the airway is clear.	Experimental	0	4	13	–	0.518
		Non-experimental	3	2	12	–	
22	In the end of the procedure, wrap catheter around gloved hand, then pull back glove over soiled catheter, thus containing catheter in glove, then discard	Experimental	0	2	15	–	0.094
		Non-experimental	2	4	11	–	
23	Readjust the oxygen after few minutes/when client's conditions stabilize (according to doctor's order).	Experimental	1	2	14	–	0.281
		Non-experimental	1	0	16	–	

(*continued*)

Table 3. (*continued*)

S#	Scoring of Suctioning	Groups	Unsatisfactory 0	Need Improvement 1	Satisfactory 2	Core 5	*P-Value*
24	Document in nurses' notes, date, time, client's response, secretion obtained (COCA = color, odor, characteristics and amount) and condition of nose and mouth	Experimental	0	1	16	–	0.317
		Non-experimental	0	0	17	–	
	Total	Experimental	–	–	–	–	0.002*
		Non-experimental	–	–	–	–	
	[a]Core steps of the skill, [b]Alpha is 0.05, *P-Values < 0.05						

4 Discussion

The study findings reject the hypothesis and establish that structured debriefing can significantly improve the skills performance scores and satisfaction in the low fidelity context. The overall performance in skills of the experimental group was significantly higher which is congruent with existing literature [9]. A structured debriefing positively impacted students' psychomotor performances, clinical reasoning, and critical thinking [9]. In addition, the effect of the structured debriefing on the sterile dressing skill revealed a significant difference. This effect may be due to educators' coaching skills, and providing a chance to reflect about their performance [10]. Moreover, the facilitator's guidance to reflect on the critical aspect of students' performance and feedback have a fruitful impact on students' skill-based learning [11].

The satisfaction level of students in the experimental group was significantly higher, similar to the existing study [1]. During debriefing, students got an opportunity to ask questions which allowed clarifying their concepts and when the facilitator asked questions, it stimulated their thinking [1]. Moreover, structured debriefing strengthens the relationship between students and teachers, encouraging students to learn without fear [12]. The students in the experimental groups were able to reflect more which is consistent with the literature [9, 13]. Furthermore, students' recognition of their mistakes through self-reflection and questioning during debriefing may have helped them improve their performance [9]. In addition, self-reflection provides insight to students which improve clinical reasoning and Judgment [13]. Debriefing guided reflection throughout the learning experience improved students' satisfaction.

Table 4. Comparison of Satisfaction Level in Experimental and Non-Experimental Groups

Sr.	Satisfaction level	Groups	Disagree	Unsure	Agree	*P-Value*
1	The facilitator provided constructive criticism during the debriefing	Experimental	2	2	13	0.001*
		Non-experimental	12	3	2	
2	The facilitator summarized important issues during the debriefing	Experimental	1	5	11	0.001*
		Non-experimental	16	1	0	
3	I had the opportunity to reflect on and discuss my performance during the debriefing	Experimental	2	1	14	0.001*
		Non-experimental	14	3	0	
4	The debriefing provided an opportunity to ask questions	Experimental	2	1	14	0.001*
		Non-experimental	12	4	1	
5	The facilitator's questions helped me to learn	Experimental	2	0	15	0.001*
		Non-experimental	12	4	1	
6	I received feedback during the debriefing that helped me to learn	Experimental	1	0	16	0.001*
		Non-experimental	13	4	0	
7	The facilitator made me feel comfortable and at ease during the debriefing	Experimental	1	0	16	0.001*
		Non-experimental	13	1	3	
	Overall	Experimental	1	0	16	0.001*
		Non-experimental	6	11	0	

[b]Alpha is 0.05, *P-Value < 0.05

5 Limitation

This study's results could be generalized cautiously because of its small sample size, the inclusion of only one subject's specific skills, and only one class. Further research is needed to explore the effects of debriefing on different outcomes, such as clinical reasoning and judgment, using a bigger sample size.

6 Conclusion

Structured debriefing has shown to be an effective teaching modality. It encouraged the involvement of students and provided a supportive learning environment. Educators play a pivotal role in implementing structured debriefing in enhancing students' skills performance and confidence. Students' ability to self-reflect and educators' feedback during debriefing also contributes to students' skills learning and satisfaction.

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