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Student's opinion about feedback Vs structured debriefing: a randomized controlled trial

Verónica Rita Coutinho[1], José Carlos Martins, PhD, RN[2], Fátima Pereira, PhD, RN[3]

[1]Adjunct Professor, Nursing School of Coimbra, Coimbra, Portugal
[2]Coordinator Professor, Nursing School of Coimbra, Coimbra, Portugal
[3] Assistant Professor with aggregation Faculty of Psychology and Educational Sciences from the University of Porto, Porto

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Abstract: Background: Simulation is a key tool for learning, and the debriefing is a central component in this process.
Aims: To analyse how structured debriefing after simulated practice impacted on the student's evaluation instead of traditional feedback; to analyse the influence of structured debriefing on some outcomes associated with simulated practice.
Design: Randomized control trial post-test only design with control group.
Methods: Developed with 85 graduation´s students (4th year), randomly divided into two groups: a control group(44), who received traditional feedback after the simulated practice, and experimental group(41) that received structured debriefing. The Simulation Debriefing Assessment Scale (EADaS), and a questionnaire of perceived outcomes associated with the simulation were applied. Statistical analysis was performed with SPSS nonparametric tests. Formal and ethical aspects were respected.
Results: The sample is mostly women (92.9%) with a mean age of 21.89±2.81years. Experimental group presented higher averages in all dimensions and in global EADaS, as well as statistically significant differences from the control group. Each of the dimensions evaluated is statistically significant and strongly correlated with the global. Regarding the results associated with simulation perceived by students, the experimental group generally perceived these results as being better in all areas surveyed.
Conclusions: Structured debriefing in association with simulation has a higher impact for students compared to traditional feedback, with clear contributions to learning.

Key Words: debriefing; simulation; students; nursing

INTRODUCTION

Simulation is a key tool for the development of knowledge and skills. It develops manual, auditory, visual and sensory memory from a process of repetition and systematization. Due to its active nature (Jeffries, 2012), it improves the ability to reflect, the learning and practice of psychomotor skills, clinical reasoning, problem solving and teamwork (Martins et al., 2012).

BACKGROUND

Debriefing is a central component in the process of learning by simulation. It starts from the concrete experience and uses reflective observation, abstract conceptualisation and active experimentation (Parker & Myric, 2010).Is a methodical and structured discussion led by a teacher.Where students carry out a self-critical review of their performance during the clinical experience, based on the objectives set and discussed the feelings, actions and decisions of the group members whoparticipated (Reed, 2015).

Realistic simulation combined with properly conducted debriefing contributes to more competent students, since debriefing encourages reflective thinking and it helps improve self-assessment and feedback skills (Martins, et al., 2012; Guhde, 2010).

It is mainly in this focus that the debriefing differs from one-way feedback, in that the teacher's expertise does not have the intention of asserting his/her point of view or giving a theoretical lesson, but helping students discover on their own what they did not do so well and how to improve their performance in future experiences (Kolb, Grande & Spahn 2015; Gardner, 2013), in a challenging, safe and psychologically rigorous environment (Rudolph, 2014).

A safe environment that ensures confidentiality, trust, open communication with focus on help, self-analysis and reflection contributes to the success of the debriefing (Decker, et al., 2013), and to greater comfort, spontaneity, self-critical reflection and identification of one's own needs and weaknesses (Gardner, 2013).

Few studies focus solely on debriefing. Amongst some that have emerged recently, the focus is placed on the students' perception of the usefulness of the debriefing, on the comparison of different methods of debriefing and on its importance for the development of learning in nursing (Reed, 2015; Paige, Arora, Fernadez & Seymour, 2015).

AIMS

The study aims to analyse the impact of structured debriefing in association with simulated practice on the student's evaluation of that debriefing instead of traditional feedback; to analyse the influence of structured debriefing on some outcomes associated with simulated practice (knowledge, skills, structured thinking, decision-making, teamwork).

METHODS

Design and participants:

Randomized control trial post-test only design with control group.Students of the 4th year of the Bachelor's Degree in Nursing from the Nursing School of Coimbra (ESEnfC) participated in the study.

An invitation to participate in the training entitled "Assessment and intervention with a person in critical condition" was sent to the students' personal emails explaining that this training would also involve research. Students who expressed an interest in participating registered for the course on the electronic platform of the school.
After registering on the platform the students were randomly divided into groups.

Data collection:

Training and data collection took place on 7th (control group) and 14th (experimental group) of December 2013.
Each student participated actively in two scenarios and as an observer in six scenarios.

At the beginning of the training, students filled in the questionnaire on sociodemographic characterisation. At the end of training, they responded to the questionnaire on perceived outcomes associated with simulation. At the end of each scenario, students who actively participated in it were asked to respond to the EADaS. Thus, although we had a total of 85 students, 170 assessments with the EADaS were carried out, which we subdivided into evaluation 1 (at the end of the first scenario in which they actively participated) and evaluation 2 (at the end of the second scenario).

The combined response time required for the three surveys was 20 minutes.

Interventions:

All students enrolled in the training received the theoretical support 15 days in advance. The teachers prepared this document, which addressed the assessment and intervention with a patient in critical condition with problems related to airway (A), with breathing (B), with circulation (C) and neurological dysfunction (D).

To further enhance the realism of the scenarios, eight clinical medical records were developed in digital format, available on the computer in each simulation laboratory, where students could look up the clinical diary, the nursing diary, prescribed therapy, diagnostic tests and vital signs.

A trainer's guide was created with the objectives of the training, the program, the distribution and rotation of students by laboratories and scenarios to accomplish. Each scenario was composed of: objectives, problem situation, situation context, critical factor, assessments expected of the students, interventions expected of the students, presence or absence of medical support, development of the scenario, preparation of environment and simulation, necessary materials and equipment and items to focus on during feedback (control group) and to reflect upon during the structured debriefing (experimental group), according to the goal.

The scenarios were targeted at problem situations with a patient in critical condition, with no occurrence of cardiac arrest:
Airway (A1) - Pneumonia with secretions
Airway (A2) - Anaphylactic shock with glottic oedema
Breathing (B1) - Acute pulmonary oedema
Breathing (B2) - Difficulty breathing
Circulation (C1) - Hypovolemic shock
Circulation (C2) - Bradycardia with signs of severity
Neurological dysfunction (D1) - Hypoglycaemia
Neurological dysfunction (D2) - Seizure

The training took place in four laboratories of the ESEnfC Simulation Centre. The environment was prepared to simulate a real hospital setting. Adult Nursing Anne simulators with VitalSim® by Laerdal and iStan® by Meti were used.

There was a 15-minute theoretical lecture on the assessment of a person in critical condition, followed by a guided tour of the simulation laboratories to familiarise the students with the space, materials and equipment. Later, eight scenarios were developed, four in the morning and four in the afternoon, taking place in different spaces and in contact with different teachers.

Each scenario was developed by four participants and observed by the remaining members of the group.

The scenarios for the control group were ended with the teacher pointing out only the aspects to be corrected in future actions, which we called traditional feedback.

For the experimental group the scenarios were ended with structured debriefing (SD).

The training involved six trainers. All the trainers received prior training on the objectives and strategies for the development of this training and the carrying out of traditional feedback and structured debriefing (SD). Although these trainers taught in the "Emergency Nursing" curriculum and were familiar with the strategies and methodologies used in the simulation center, they all received training on structured debriefing. After this, trainers' exercise scenarios were created in order to validate and standardize the strategy and methodologies used.

In this study, the debriefing followed four stages (Coutinho, Martins & Pereira, 2016):

1. Meeting: To enable students to describe what happened and explain their feelings about the simulated clinical experience;
2. Positive reinforcement: To allow observers to make a reflection on the positive aspects regarding the performance of students who participated in simulated clinical experience (non-judgemental) and use it for positive reinforcement particularly focused on objectives;
3. Analysis: To enable structured thinking for the students who participated in the simulated clinical experience and, through critical analysis, help identify the less

positive aspects during the action. These were discussed and corrective strategies for future actions were found (reflection on action and for action);

4. Summary: To strengthen the aspects of learning; clarify the doubts that arose within the group and to present key points (action plan), interconnecting and theoretically substantiating the action.

Compliance with these four phases of SD involved creating a safe environment for the debriefing, which included confidentiality, trust, open communication, self-analysis and reflection.

Since one of the objectives was to focus the research on the process of interaction with students, there was no audio or video recording, thus avoiding the student's assessment being contaminated by the use of this resource.

Instruments:

- Questionnaire for sociodemographic characterisation.
- Questionnaire on perceived outcomes associated with simulation, with six statements, for the student to express his/her opinion on a Likert-type scale, ranging from one to five where one corresponds to "strongly disagree" and five corresponds to "totally agree".
- EADaS (Coutinho, Martins & Pereira 2014), designed to measure the student's perception of debriefing – a scale with 34 items, in which the student expresses his/her opinion on each one, on a Likert-type scale, with five possible answers, from "strongly disagree" to "totally agree". The items of the scale are part of three dimensions: psychosocial dimension (13 items); cognitive dimension (9 items); affective dimension (12 items). The alpha value determined by the authors in the original study of the scale was .899 for the global and .884 for the psychosocial dimension; .859 for the cognitive dimension, and .889 for the affective dimension.

Sample:

Inclusion criterion was being a student of the 4th year of the Bachelor Degree in Nursing. Students who had already participated in the Emergency Nursing course in a previous academic year were excluded.

Bearing in mind what was proposed by some authors (Maroco, 2010), we endeavoured to make groups of more than 30 subjects, with the control group having 44 and the experimental group 41.

Randomization:

Different randomization processes were generated, using the Statistical Package for Social Sciences (SPSS). After the registration of each student in the electronic school platform automatically assigned a serial number that was used to carry the first randomization for the various experimental and control groups. As the training took place in four rooms with the respective rotation groups to determine which of the rooms would start training were randomized.

Finally, each trainer was assigned a random number and they were randomized throughout the rooms, where they remained until the end of training. The entire randomization process was conducted by the lead author.

Ethical Considerations:

The study was approved by the Ethics Committee of the Health SciencesResearch Unit: Nursing (P183-09/2013) and authorized by the President of Nursing School of Coimbra. Participants were informed about the study and gave their consent in written form. Confidentiality was assured. For the pairing of the questionnaires a code automatically generated by the computer system was used, and was provided to each student, written on the back of their ID card. The key to the relationship between the student's name and their code was restricted to the principal researcher and was destroyed after the investigation ended.

Statistical Methods Used:

For the statistical treatment of the data the SPSS® version 23.0 for *Windows* program was used.
In the descriptive analysis the mean, standard deviation, minimum and maximum, and the distribution of frequencies and percentages were used.

The Kolmogorov-Smirnov test found non-normality of the distribution of the dependent variable values, so we used non-parametric tests. The Chi-square test was used to evaluate the association between two nominal variables. The Wilcoxon test was used to assess differences in averages between paired assessment measurements 1 and 2. The Mann-Whitney U test was used to analyse differences in average positions between independent groups. The Spearman correlation test was used to measure the relationship between continuous or ordinal variables.

For the different tests, a value of $p < 0.05$ was considered statistically significant and a value of $p < 0.01$ as highly significant.

RESULTS

The sample consisted of 85 students from the 4th year of the Bachelor's Degree in Nursing, mostly women (92.9%) with an average age of 21.89 years (Standard dev. = 2.81 years) and there were no significant differences between groups.

In the control group the average of the EADaS psychosocial dimension and cognitive dimension fell from the first to the second evaluation, while the average of the affective dimension rose. In the experimental group (structured debriefing) there was an increase in average in all dimensions and the global between the first and second evaluation. Overall, the average obtained in EADaS were higher in the second evaluation than the first in both groups. The Wilcoxon test on EADaS shows that the differences are statistically highly significant ($p < 0.01$).

Comparing the results obtained in both groups (Figure 1.), it can be seen that the averages are always higher for the EADaS global and for each dimension in the experimental group. The Mann-Whitney U test shows that the differences between the groups are always significant ($p > 0.05$) except for the affective dimension in the second evaluation ($p < 0.05$).

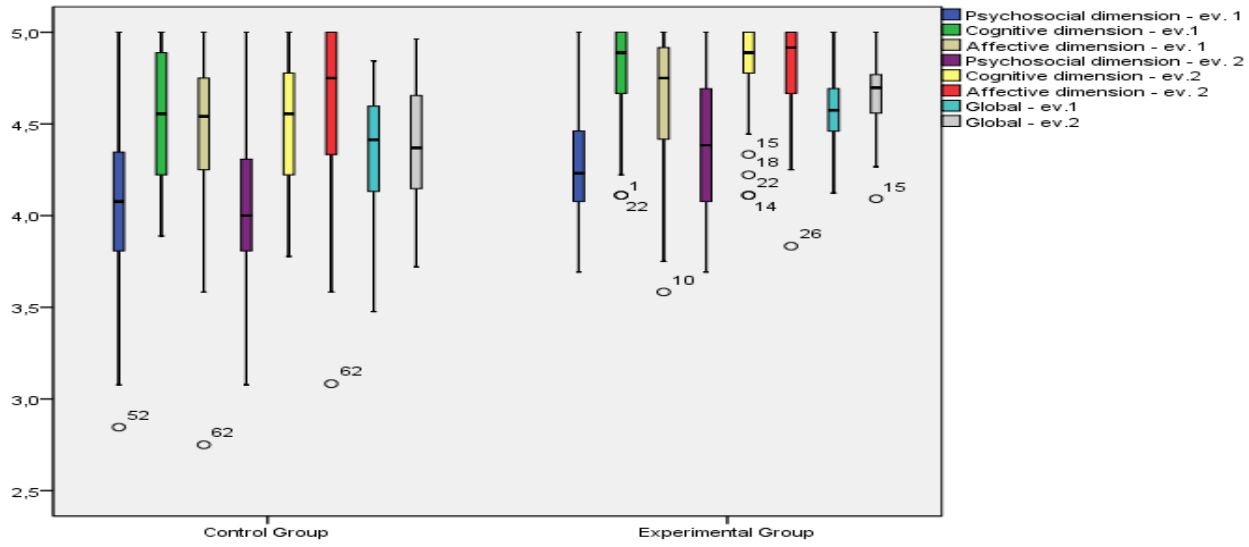

Figure (1) Results obtained in both groups

The Spearman correlation test (Table 1) shows that the EADaS dimensions are strongly correlated with the global, and that these are statistically significant correlations (p < 0.05). Correlations between dimensions tend to be stronger and more significant in the second evaluation.

Table (1) Results of Spearman correlation test between the dimensions and the whole of EADaS (N = 85)

		Psychosocial dimension -e v.1	**Cognitive dimension - ev.1**	**Cognitive dimension - ev.2**	**Affective dimension - ev.2**	**Global ev.1**	**-Global - ev.2**
Psychosocial dimension e v.1	-r_s					,853**	
	Sig					**,000**	
Cognitive dimension ev.1	-r_s	,763**				,841**	
	Sig	**,000**				**,000**	
Affective dimension ev.1	-r_s	,175	,175			,535**	
	Sig	,110	,109			**,000**	
Psychosocial dimension e v.2	-r_s			,731**	,317**		,884**
	Sig			**,000**	**,003**		**,000**
Cognitive dimension ev.2	-r_s				,280**		,829**
	Sig				**,009**		**,000**
Affective dimension ev.2	-r_s						,602**
	Sig						**,000**

* Significantcorrelation p < 0.05; ** Significantcorrelation p < 0.01

Students in the experimental group saw better learning outcomes in all the domains surveyed (Table 2). These differences between groups are statistically significant (p < 0.05) for the results on the level of the ability to work together, setting priorities, and capacity for analysis.

Table (2) Table about the questionnaire with results as perceived by students associated with simulation

Response	**Group**	**Team Work**	**Priorities**	**Goals**	**Analysis**	**Skills**	**Structured Thinking**
3-No opinion	Control	4.5%					
	Experimental	4.9%		2.4%			
4-Contributed	Control	70.5%	43.2%	50%	61.4%	50%	36.8%
	Experimental	29.3%	22%	36.6%	26.8%	31.7%	2.4%
5-Contributed greatly	Control	25%	56.8%	50%	34.1%	50%	61.4%
	Experimental	65.9%	78%	61%	73.2%	68.3%	78%

DISCUSSION

In the evaluation of the results we must also be aware of thelimitation related with the specificity of the sample.
For a discussion of the results some items of the EADaS scale will be used.

Debriefing is identified by students as valuable and positive. Almost all students in the study of Wottonreported that debriefing helped them manage problems related to the patient and the development and validation of actions. It is further stated that debriefing allowed them to reflect on their actions and understand "things" better (Wotton, Davis, Button & Kelton, 2010). This study corroborates those results, and students (78%) report that structured debriefing allowed them to develop the ability to establish priorities in assessment and in nursing care. The same percentage of students also reported that SD after simulation helped them develop the ability to think in a structured way.

Training teachers to do debriefing is therefore urgent and it is imperative that this takes place (Rall, Manser& Howard, 2009). This was a concern in this study, as well as guaranteeing uniformity among teachers in the conduct of feedback and structured debriefing. Students consider structured debriefing as a moment of closer contact between peers and teachers, free from conflict. They feel understood, respected, motivated to participate in more simulations, in that they do not feel ashamed identifying their own mistakes in front of colleagues.

Training based on simulation helps student self-reflection. Debriefing is the critical component in fostering deep learning and promoting the transfer of skills and behaviours into clinical practice (Paige, et al., 2015). In this study, students reported that SD allowed them to develop the ability to analyse their own behaviour and actions (73.2%) as well as develop skills (68.3%), and these results were more obvious with the use of structured debriefing compared to feedback.

Students reported that the environment itself helped them feel calm, be unstressed, not feel humiliated, and made them want intervene in other settings without fear. These ideas are mirrored in the score in the affective dimension, which is in line with that suggested by various authors (Kolb, et al., 2015; Gardner, 2013; Paige, et al., 2015).

The facilitator's role is very important throughout debriefing. He/she should guide the discussion without lecturing, clarify information, provide constructive information, employ active listening and be reliable and respectful. They must be able to promote learning and discussion in an organized and non-threatening manner (Cantrell, 2008).

The study by authors shows that most students are satisfied with their achievement in clinical simulation scenarios, in that it allowed them to increase their clinical reasoning, strengthen their ability to prioritize, increase security in interventions with patients, improve clinical skills and integrate theory with practice (Cantrell, 2008). These results are in line with those of this study: the students reported that SD helped them raise their self-confidence, develop their leadership skills, increase their potential for teamwork, develop a supportive relationship, promote self-awareness, identify difficulties in their performance as well as improving their ability to manage their emotions.

Students prefer to have experiences followed by debriefing, rather than experiences with written debriefing (Reed, 2015). This study also confirms those results.

Debriefing is an opportunity to summarize cognitive and behavioural learning, and moral nature of answers, as we found in this study (Coutinho et al., 2016). This applies to aspects such as structuring thinking, learning, identifying priorities, improved identification of resources to use, focusing on the important aspects of the procedure, developing skills for good decision-making and identifying areas for improvement in future situations, aspects which are depicted in the scores in the cognitive dimension. In the same line of thought (Limoges, 2010), the value of debriefing lies in its potential to help students to transfer their knowledge and skills gained in simulated clinical experience to other clinical settings and situations, as well as in their transition from students to recent graduates.

Bender and Walker (Bender & Walker, 2013)identified some key issues in debriefing which are in line with the results of this study: safe environment, psychological safety, learning also from mistakes, greater learning, exploration of feelings and self-reflection. SD allowed students to feel proud of being able to perform many interventions correctly, which may be related to the fact that observers only address the positive. In this study, students reported that the teacher has a genuine interest in their professional development and felt like the centre of the training process, and were keen to participate in more simulated scenarios, features that are present in the scores of the psychosocial dimension.

One study (Fey, Scrandis, Daniels &Haut, 2014) reviewed group performance before and after simulation with and without debriefing. The experimental group obtained higher scores than the control group. In this study it was also found that structured debriefing produced better outcomes for students. Several studies have been performed comparing different types of debriefing in the last five years. One of them (Grant, Moss, Epps & Watts, 2010), compared the effect of two kinds of debriefing (oral or video-assisted) and found cumulative results. Other study (Boet, et al., 2010), compared student self-debriefing with debriefing led by a teacher and found significant improvements in pre and post test scores for all participants, regardless of the debriefing method. The last one (Savoldelli, et al., 2006), compared debriefing with feedback, video-assisted debriefing and no debriefing. It was found that participants who had debriefing obtained more significant performance scores compared to those with no debriefing.

Finally, comparing this study with those described above, we realise the importance of having structured debriefing associated with the simulation. And it can be stated that this study adds the student's view, showing a clear advantage to structured debriefing, as opposed to traditional feedback.

CONCLUSION

The need for additional research to compare different methods of debriefing is clear. It is becoming increasingly challenging to find innovative teaching methods which captivate students and motivate them to learn.

Nursing programs should invest in physical, material and human resources to make it possible to include simulation, and the teachers should be trained in debriefing techniques.

Debriefing requires a skill set, structure and planning, with a view to structured critical reflection, going far beyond statement of less successful aspects.

Structured debriefing as a facilitator of learning, using reflection both on the action and for action is considered a tool for building excellence. When associated with simulated practice, debriefing has very positive impact on the development nursing students' skills regarding the psychosocial, cognitive and affective dimensions. It also positively influences the results associated with simulated

practice as regards the ability to work as a team, set priorities in nursing assessment and care, establish objectives for the patient, analyse one's own behaviour and actions performed and think in a structured way.The structured debriefing method used in this study reveals interesting results, and can be used in the future as a teaching strategy for different learning contexts, not only in simulation. In order to understand whether students who have DE have acquired more knowledge than those who have traditional feedback, we recommend a new investigation with the evaluation of knowledge and performance before and after. These changes will contribute to more and better learning, better practices and, in the end, more effective nursing care of higher quality and more health gains.

CONFLICTS OF INTEREST

The authors report no conflict of interest.

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