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ORIGINAL ARTICLE

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The effectiveness of crisis resource management and team debriefing in resuscitation education of nursing students: A randomised controlled trial

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Aims and objectives: The aim of this study was to investigate (i) whether integrating a course on crisis resource management principles and team debriefings in simulation training, increases self-efficacy, team efficacy and technical skills of nursing students in resuscitation settings and (ii) which phases contribute the most to these outcomes.

Background: Crisis resource management principles have been introduced in health care to optimise teamwork. Simulation training offers patient safe training opportunities. There is evidence that simulation training increases self-efficacy and team efficacy but the contribution of the different phases like crisis resource management principles, simulation training and debriefing on self-efficacy, team efficacy and technical skills is not clear.

Design: Randomised controlled trial in a convenience sample (n = 116) in Belgium. Data were collected between February 2015–April 2015.

Methods: Participants in the intervention group (n = 60) completed a course on crisis resource management principles, followed by a simulation training session, a team debriefing and a second simulation training session. Participants in the control group (n = 56) only completed two simulation training sessions. The outcomes self-efficacy, team efficacy and technical skills were assessed after each simulation training. An ancillary analysis of the learning effect was conducted.

Results: The intervention group increased on self-efficacy (2.13%, p = .02) and team efficacy (9.92%, p < .001); the control group only increased significantly on team efficacy (4.5%, p = .001). The intervention group scored significantly higher on team efficacy (8.49%, p < .001) compared to the control group.

Conclusion: Combining crisis resource management principles and team debriefings in simulation training increases self-efficacy and team efficacy. The debriefing phase contributes the most to these effects.

Relevance to clinical practice: By partnering with healthcare settings, it becomes possible to offer interdisciplinary simulation training that can increase patient safety.

KEYWORDS

crisis resource management principles, high fidelity patient simulation, nursing education, nursing students, self-efficacy, team debriefing, team efficacy

1 | INTRODUCTION

Previous studies proved that implementing crisis resource management (CRM) principles reduce the amount of adverse events in health care. Gaba translated aviation's CRM to health care, where they are being used as CRM principles to increase patient (Künzle, Kolb, & Grote, 2010) safety. Künzle et al., 2010 Crisis resource management consists of 15 nontechnical skills like closed loop communication, check and double check, establishing a leader and using resources appropriately. When these principles are applied, team efficacy increases (Rall & Dieckmann, 2005).

Developments in health care lead to more complex care processes which makes CRM principles even more important, especially in life-threatening situations. The application of CRM becomes even more important when team members do not know each other and work together in complex situations such as cardio-pulmonary resuscitation (CPR) (Lewis, Strachan, & Smith, 2012). Earlier studies pointed out that the implementation of CRM in health care can lead to a reduction in mortality and in resuscitations (Ballangrud, Persenius, Hedelin, & Hall-Lord, 2014; Künzle, Kolbe, & Grote, 2010; McCaughey & Traynor, 2010). Nevertheless, during CPR classes in nursing education, the focus is primarily on technical skills and knowledge and CRM principles get little attention (Norris & Lockey, 2012).

Results from previous studies indicated that an education that focuses too much on theory impedes the employability and leads to a lack of self-confidence for newly graduated nurses. Knowledge and technical skills are insufficient to translate theoretical knowledge into real actions; moreover, self-efficacy is a better predictor for taking action than competence (Lauder et al., 2008; Pike & O'Donnell, 2010). Moreover, perceived self-efficacy leads to more effective use of cognitive and metacognitive strategies (Meurling, Hedman, Fellander-Tsai, & Wallin, 2013).

Repeated training opportunities, successful experiences, verbal persuasion and emotions are factors that affect self-efficacy (Cardoza & Hood, 2012; Hart et al., 2014; Kameg, Howard, Clochesy, Mitchell, & Suresky, 2010). Simulation training does not only result in more SE but also stimulates the insights in technical skills that are necessary in complex situations and improves clinical reasoning processes, choosing priorities and teamwork (Garrett, Macphee, & Jackson, 2011; Lewis et al., 2012).

Several studies showed that simulation trainings offer more authentic, realistic learning experiences than classic teaching methods without compromising patient safety and bridge in this way the gap between theory and practice and increases students self-efficacy (Berragan, 2011; Cardoza & Hood, 2012; Garrett et al., 2011; Hart et al., 2014; Kameg et al., 2010; Lammers, 2007; McCaughey & Traynor, 2010; Pike & O'Donnell, 2010; Shinnick, Woo, & Evangelista, 2012).

A specific kind of simulation training is the high fidelity patient simulation (HFPS). High fidelity refers to the high sense of reality of the manikin and the faithful responses to actions of students (Lammers, 2007). The higher the sense of reality, the higher transition of competences to real healthcare settings (Berragan, 2011; Fernandez Castelao, Russo, Riethmuller, & Boos, 2013; Pike & O'Donnell, 2010; Ricketts, 2011; Shinnick et al., 2012). Regarding the available evidence, HFPS is especially useful for training nontechnical skills (Lazzara, Benishek, Dietz, Salas, & Adriansen, 2014; Stocker, Burmester, & Allen, 2014).

What does this paper contribute to the wider global clinical community?

- Combining a course on crisis resource management principles and a team debriefing phase in simulation training sessions increase self-efficacy and team efficacy.
- The debriefing phase contributes the most to the effect on self-efficacy and team efficacy.
- Nursing education can introduce simulation as a complementary teaching method alongside lectures, practical training and internship.

Simulation training sessions usually consist of several phases including a simulation exercise and a reflection phase. Kolb's model (Figure 1) is the most common conceptual framework for simulation training and distinguishes four phases (Stocker et al., 2014):

1. Simulation training session
2. Reflection phase/team debriefing
3. Making assumptions based on the reflections
4. Checking the assumptions in a second simulation training session

Although there is evidence that simulation training increases technical skills and self-efficacy (Garrett et al., 2011), there is no answer to the question what the contribution of the different phases in simulation is. Lammers (2007) and Leonard, Shuhaibar, and Chen (2010) noted that most of the effect can be contributed to the phase of team debriefing. By guiding students to reflect, they gain insight into their learning and discover opportunities for growth

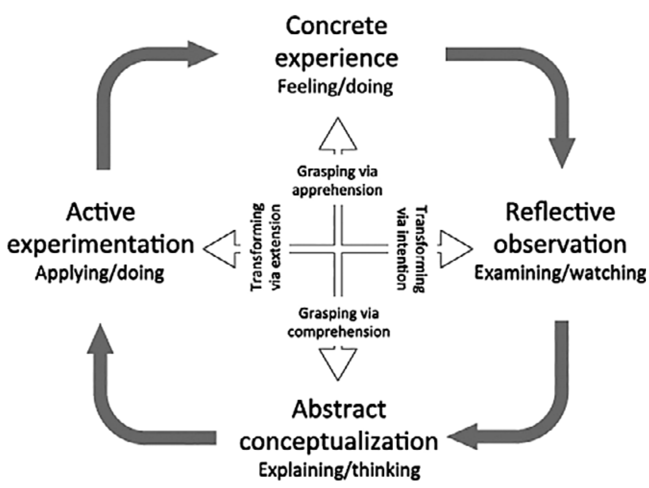

FIGURE 1 Kolb's model (Stocker et al., 2014)

(Jaffrelot, Touffet, Ozier, & Gueret, 2012; Overstreet, 2008; Shinnick et al., 2012; Stocker et al., 2014). Analysing actions and feedback from peers influences the learning performance positively (Jaffrelot et al., 2012). During these reflections, students experience emotional support by getting positive feedback from each other. The second simulation training is important to confirm the successful behaviour (Stocker et al., 2014). As earlier studies pointed out that simulation trainings have an effect on self-efficacy and team efficacy but there is a lack of knowledge about which phase of the simulation training contributes to this effect and there is no evidence that simulation trainings have an effect on technical skills, these questions will be the focus of this study.

2 | METHODS

2.1 | Design

This pilot study, designed as a randomised controlled trial, was set up to answer the research question: "What is the effect of combining CRM principles, guided team reflection and repeated simulation training sessions on the perception of self-efficacy, team efficacy and technical skills for bachelor nursing students?" (Figure 2).

Permission from the ethical commission of Ghent University Hospital was obtained (B670201421658). There were no sources of funding or other support.

2.2 | Participants

All participants were Belgian students bachelor nursing.

The inclusion criteria for this study were the following:

- Being a student of a bachelor's nursing degree.
- Having completed courses in basic life support and advanced life support.
- Being <60 European Credit Transfer System removed of the bachelor's nursing degree.

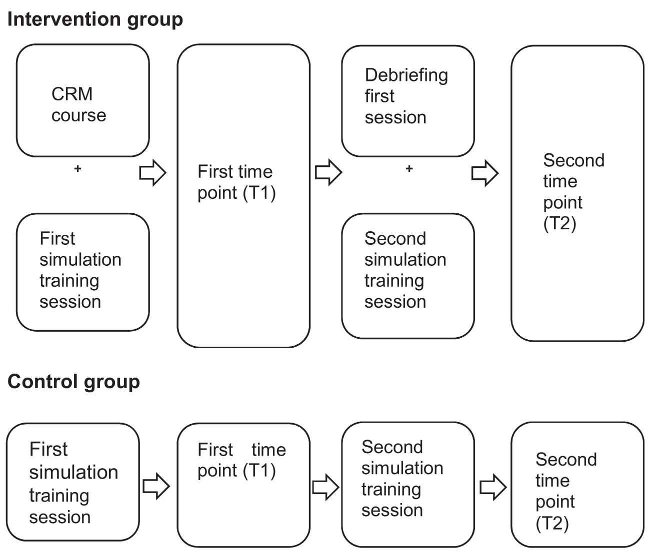

FIGURE 2 Research design

2.3 | Interventions

Both groups, intervention group and control group, received two simulation training sessions using standardised resuscitation scenarios (Figure 2). The simulation room was set up as patient room. The 12 scenarios used for this study were validated by two emergency physicians. Each scenario required a resuscitation and was completed after 15 min.

The intervention group followed a course on 15 CRM principles. During this 30-min course, all 15 CRM principles were explained by using examples and exercises. A simulation training session was followed by a guided team debriefing. During this interactive reflection, the team focused during 45 min on the implementation of CRM principles and not on technical performances. The model of Barbara Steinwachs was used as a framework for the team debriefing (Steinwachs, 1992) (Figure 2).

This model consists of several phases:

- Description of the dominant feeling after the simulation training session
- Reconstruction of the simulation training session
- Reflection on what went well
- Reflection on what did not go well and looking for better alternatives

All simulation training sessions took place in a Simulation Training Centre and were guided by a simulation team. A simulation team existed of two people, a facilitator and an operator. The facilitator observed the students and guided the debriefing phase. The simulation team consisted of two emergency doctors and four teachers from the nursing course. Everyone participated in the operator course of Laerdal; five of them also took the European Simulation Instructors Course. All members of the simulation team who were involved in the study were given a briefing on the study design and alternately took the role of facilitator and instructor. During the simulation training session, they both operated behind a one-way screen to minimise observer bias.

Because the sense of reality is important for simulation training, the HFPS SimMan 3G Laerdal was used for this study. All sessions were videotaped by three cameras.

2.4 | Outcomes

The primary outcomes of this study were the perception of self-efficacy, team-efficacy. The secondary outcome was technical skills. Various validated instruments were used to assess study outcomes.

2.4.1 | Team efficacy

Team efficacy was measured with the University Of Auckland behavioural rating scale. This seven-point Likert scale measures 23 items and can be used as a self-reported measuring scale for team efficacy (TE) in urgent conditions. Construct validity for this scale (Cronbach's $\alpha > .8$) and internal consistency ($r = .57$, $p < .0001$) were conducted (Weller et al., 2013). Two independent individuals translated the scale into a Dutch version; each item was discussed. The score on this scale is a continuous variable with a value between 25–175.

Teamwork was measured by the researcher using the Clinical Teamwork scale (CTS) on the taped training sessions. This is a validated (Kappa .78; interclass correlation .98) scale that measures 14 items about six different domains of clinical teamwork. These domains are overall teamwork, overall communication, situational awareness, decision-making, dividing roles and patient-centredness. For each item, a 10-point Likert scale was scored.

2.4.2 | Self-efficacy

The General Self-Efficacy Scale, designed by Schwarzer (1994), was used as a self-rating scale to measure self-efficacy (SE). This scale measures, in contrast to most other SE scales, the global perception of the individual making use of a four-point Likert scale with 10 items. The Dutch version of this scale was validated (Cronbach's alpha between .76–.90; Luszczynska, Scholz, & Schwarzer, 2005). The continuous variable has a value between 10–40.

2.4.3 | Technical skills

Because technical skills (TECH) are important for a successful resuscitation, TECH were assessed. The assessment consisted of a score for depth and rate of chest compressions, detection shockable rhythm, ventilation efficiency and time spend until the CPR was started. One point could be scored for each item. The sum score is a continuous variable with a value between 0–6. According to the guidelines of the European Resuscitation Counsel of 2010, six items were selected to be scored (Nolan et al., 2010).

Based on the measurements on time point 1 for these outcomes, students were divided into three groups: a strong, an average and a weak group. For all three groups, the learning effect for the primary outcomes was measured as a secondary outcome.

2.5 | Sample size

A convenience sample of 133 Belgian nursing students was invited to participate to this pilot study.

2.6 | Randomisation

All students who volunteered to participate were randomly assigned by means of excel by use of a random number generator to 30 small groups; each consisting of three to five students. These groups were randomly assigned to a control group and an intervention group (Figure 3).

Allocation concealment was used. The researcher had no insight into the allocation of groups and individuals to the research conditions before the analysis of the data.

2.7 | Statistical methods

SPSS version 22 Belgium was used for data analyses. All variables measured were continuous data. For all the variables, skewness and kurtosis were analysed. Based on the results, normally distributed variables were parametrically tested, not normally variables were nonparametrically tested. Descriptive data were presented as means and standard deviations for normally distributed variables, and as medians for the other variables.

Correlation between the different variables within both treatment arms was calculated, making use of Pearson (for normally distributed variables) or Spearman correlation coefficient (for not normally distributed variables). The intervention group was compared with the control group using the independent sample *t* test (for normally distributed variables), or the Mann–Whitney *U*-test (for non-normally distributed variables) for each variable.

The paired sample *t* test (for normally distributed variables) or the Wilcoxon test (for non-normally distributed variables) was carried out to measure whether an effect of simulation training session, CRM or debriefing on their own effectiveness, TE and TECH in the intervention group could be measured.

The ANOVA test (for normally distributed variables) and Kruskal–Wallis test (for non-normally distributed variables) were used to determine the learning effect of the interventions on all the primary outcomes.

To increase the readability, all variables were expressed in percentages. The level for significance used was .05.

3 | RESULTS

3.1 | Recruitment

Data were collected in a 6-week period between February–April in 2015. At two data collection periods, time point 1 (T1) and 2 (T2), following measuring instruments were used:

- Self-reporting scale on SE
- Self-reporting scale on TE
- Team efficacy on team level (CTS)
- Technical skills

Technical skills were assessed by the facilitator. The researcher scored TE on team level making use of the videotapes.

3.2 | Baseline data

From the descriptive statistics, the experimental and the control group seem similar (Table 1).

3.3 | Outcomes and estimation

3.3.1 | Correlations

Both for the intervention group and the control group, correlations of the results on SE and TE within the small teams were analysed.

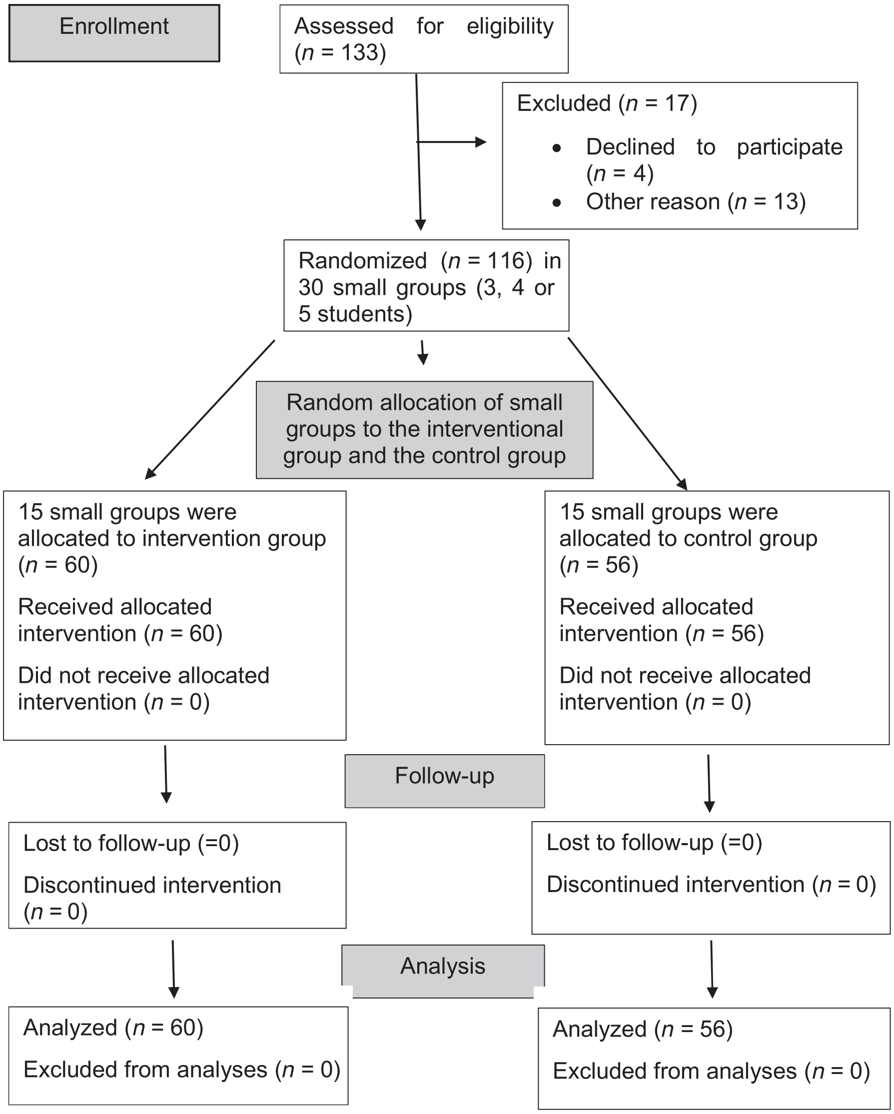

FIGURE 3 Flow diagram

TABLE 1 Description of the sample

	Intervention group	Control group
Gender		
Female	82% (*n* = 49)	73% (*n* = 41)
Male	18% (*n* = 11)	27% (*n* = 15)
Age		
20–21	55% (*n* = 33)	57.1% (*n* = 32)
>21	45% (*n* = 27)	42.9% (*n* = 24)

[a]Mann Whitney *U*-test.

Only for the results on TE significant correlations could be found in the intervention group (T1: $r = .358$; $p = .006$ and T2: $r = .510$; $p < 0.001$) and the control group (T2: $r = -.285$; $p = .03$). No significant correlation between the results of students within a group on SE could be found in the intervention group (T1: $r = .012$; $p = .927$) and T2 ($r = .189$; $p = .156$), nor in the control group (T1: $r = -.076$; $p = .572$ and T2: $r = -.072$; $p = .591$).

There was a significant correlation between the score for TE at T1 and the score on CTS on measuring times for the intervention group (T1: $r = .281$, $p = .03$ and T2: $r = .293$; $p = .023$). There was no significant correlation between the score on TE and the score on CTS at T2 ($r = .239$; $p = .65$).

In contrast to the control group, there was a significant correlation ($p < .05$) found in the intervention group between score on TE and score in all areas of the CTS scale, except for the item decision-making ($s = -0.111$; $p = .398$) on T2. For the control group, there was no significant correlation between the score and the TE score on CTS on both time points ($p > .05$).

3.3.2 | Analyses between groups

At the first time point (T1), the intervention group (61.99%) had a significantly ($p = .011$) higher score than the control group (54.52%) on CTS. There was no significant ($p > .05$) difference measurable between the intervention group and the control group on T1 for the other variables. At the second time point (T2), the intervention group scored significantly higher on the self-reported teamwork scale (67.12%; 58.63%; $p < .001$), CTS (68.74%; 59.80%; $p < .001$) and scale for TECH (70%; 62.22%; $p = .014$) than the control group. For SE, there was no significant ($p = .157$) difference between the intervention group (65.9%) and the control group (63.4%) (Table 2).

3.3.3 | Analyses within groups

In the intervention group, there was a significant increase in SE (T1: 63.75%; T2: 65.88%; $p = .02$), TE (T1:57.2%; T2:67.12%; $p < .001$) and CTS (T1:61.99%;T2:68.74%; $p < .001$) over time. In the control group, there was only a significant increase over time for TE (T1:54.13%; T2:58.63%; $p = .001$) and CTS (T1:54.52%; T2:59.80%; $p < .001$). At both measuring moments, there was no significant ($p = .6$) difference between the intervention group and the control group for SE (Table 2).

3.4 | Ancillary analysis of the learning effect

Based on the score at T1 for each outcome variable, students were divided into three equal groups. The group with the lowest score was named "weak group," the group with an average score is the "average group" and the group with the highest scores are "strong group." The learning effect was determined for each outcome variable by subtracting the score for this outcome variable at T1 from the score for this outcome variable on T2.

TABLE 2 Results for outcome variables at two data collection periods

	Intervention group		Control group		Difference between intervention group and control group
	%	*SD*	%	*SD*	– *p* value
SE					
T1	63.8	7.5	64.0	9.2	0.864[a]
p	0.02[b]		0.6[b]		
T2	65.9	8.0	63.4	0.4	0.157[a]
TE					
T1	57.2	11.5	54.1	0.7	0.139[a]
p	<0.001[b]		0.001[b]		
T2	67.1	1.5	58.6	12.0	<0.001[a]
TECH					
T1	66.7	20.9	56.7	25.0	0.062[a]
p	0.607[b]		0.403[b]		
T2	70.0	12.9	62.2	16.0	0.014[a]
CTS					
T1	62.0	17.8	54.5	12.7	0.011[a]
p	<0.001[b]		<0.001[b]		
T2	68.7	11.5	59.8	14.7	<0.001[a]

t test *SD*, standard deviation; SE, self-efficacy; TE, team efficacy scored with a self-reported scale; TECH, technical skills; CTS, team efficacy scored by the researcher.
[a]Value independent sample *t* test.
[b]Value paired sample.

3.4.1 | Self-efficacy

Neither in the intervention group nor in the control group, the score at T1 for TECH had an influence on the learning effect for SE. In the intervention group, students from the weak group on SE (6.62%, $SD = 6.74$) experienced a greater learning effect on SE than the average group (1.25%, $SD = 7.46$, $p = .039$) or the strongest group (0.17%, $SD = 3.72$; $p = .01$).

3.4.2 | Team efficacy rated by a self-reported scale (TE)

In the intervention group, the weakest SE group (16.79%, $SD = 9.59$) experienced a stronger learning effect ($p = .028$) on TE than the strong SE group (6.32%, $SD = 9.24$). Also in the intervention group, the weak TE group (13.29%, $SD = 8.48$) and the average (14.35%, $SD = 8.78$) experienced a higher learning effect ($p = .002$; $p = .004$) than the strong TE group (3.25%, $SD = 11.12$).

3.4.3 | Team efficacy measured by the researcher (CTS)

In the intervention group, the strongest learning effect on CTS was found in the weak CTS group (16.54%, $SD = 5.65$, $p < .001$). In this group, the weak (13.57%, $SD = 10.67$, $p < .001$) and average technical group (10.11%, $SD = 5.43$, $p < .001$) had a higher learning effect than the strong technical group (−0.47%, $SD = 8.08$). In the control group, the average technical group (7.71%, $SD = 5.36$) experienced a higher learning effect ($p = .04$) than the weak technical group (0.14%, $SD = 6.27$).

3.4.4 | Technical skills

In the intervention group (38.89%, $SD = 8.21$) and the control group (38.33%, $SD = 20.86$), the students with the lowest TECH experienced the highest learning effect on TECH ($p < .001$).

3.5 | Harms

All students who met the inclusion criteria attended an information session and received written information. The students were assured that all data would be anonymised and that participation was not mandatory. Students were given 1 month to register for this study by signing the informed consent and return this to the researcher.

4 | DISCUSSION

4.1 | Limitation and generalisability

A first limitation of this pilot study is the setting in which the results were collected. The results stem from a single-centre study. The generalisability of the results may therefore be limited.

The second limitation is the use of a convenience sample. The results might be affected by the extent to which the participants are familiar with the teachers who accompanied the simulation training. Each simulation training was supervised by two teachers working in different campuses. In this way, an attempt was made to limit the influence of the participants.

A third limitation is the self-reporting measuring scales used to measure the results of SE and TE and the measuring scale used for TECH. In this scale, the six parameters, on which the TECH were assessed, equally weighted in the final score although some of them might have a greater impact on patients' survival.

Simulation training combined with team debriefings increases SE and TE. Most of the effect can be contributed to the phase of debriefing. Simulation training is more useful for training non TECH than for training TECH.

4.2 | Interpretation

4.2.1 | Self-efficacy

As stated in previous research by Cardoza and Hood (2012), Garrett et al. (2011), Hart et al. (2014), Kameg et al. (2010), Pike and O'Donnell (2010) and Radovich (2012), this study confirms that simulation training has a positive effect on SE. The learning effect on SE was the strongest among the students who initially scored the lowest on SE. Students who had already scored highly on SE at the first time point had less space to grow than students who scored lower on the first measurement.

On both measuring moments, there was no significant difference between the intervention group and the control group, but a significant increase was measured within the intervention group. Although the influence of CRM on SE is not clear, CRM might have contributed to the measured result because the guided team debriefing was based on CRM principles. The results indicate that the higher scores for SE are due to the guided team reflection.

This study shows that only repeating training opportunities, formulated as one of the four factors that influence SE, is not enough to increase SE. The guided team debriefing offered an opportunity for participants to reflect on the successful experience, give peer feedback and share emotions that are required to experience greater SE.

4.2.2 | Team efficacy

In both the intervention group and the control group, there was an increase in the TE (TE and CTS) over time. This increase in TE was the greatest for students who scored low and average for TE on T1, for students who scored low on SE and those who performed poorly or moderately TECH T1. We can conclude that repeated simulation training might increase TE. The significant difference in the score on TE between the intervention group and the control group at T2 can be explained by the guided team reflection. These results are consistent with findings from previous studies of Garrett et al. (2011) and Kameg et al. (2010). The findings of Messmer (2008) have also been confirmed in this study, also nursing students experience an increase in TE after each scenario, even if no guided team debriefing follows.

4.2.3 | Technical skills

Neither the intervention group nor the control group showed an improvement of TECH after simulation training. These results confirm that HFPS is especially suitable for the training of nontechnical skills (Lazzara et al., 2014; Stocker et al., 2014). However, the intervention group scored significantly higher on TECH than the control group (T2 intervention: 70%; control: 62.22%; $p = .014$). This might be explained by the focus of the team guided reflection that was placed on CRM and not on technical performance. Maybe students also reflected on their technical performance during the guided team debriefing.

The opinion of Radovich (2012) that simulation training for nurses leads to better understanding of the skills required in complex situations is not consistent with results of this research. It is possible that students have a better understanding, but this understanding does not lead to improved technical performance as this was the case for nurses.

4.2.4 | Overall discussion

Both the CRM presentation, the repeated simulation training sessions and especially the guided team debriefings had a significant effect on the outcome variables. These findings are consistent with the model of Kolb and the results of previous research by Lammers (2007) and Leonard et al. (2010), who highlighted reflection as an important part of the simulation session. However Jaffrelot et al. (2012) found that the reflection on actions and feedback given by peers boosts the learning performance; according to the results of this study, this only appears to be the case for the nontechnical skills.

The differences in reflection methods, interactively or through transmission, and focus, such as knowledge, technical performance and group interaction used in the different studies, can explain the different results of the studies.

Simulation training sessions lead to a higher SE which is a significant predictor of behaviour (Clark, Owen, & Tholcken, 2004; Lauder et al., 2008; Pike & O'Donnell, 2010). We can deduce that simulation education can stimulate active participation in emergency situations. It is therefore appropriate to provide simulation training as a complementary teaching tool alongside traditional methods to teach resuscitation skills (Fernandez Castelao et al., 2013; Lazzara et al., 2014; McCaughey & Traynor, 2010; Shinnick et al., 2012).

Especially students with low SE and students with low TE benefit from simulator training in combination with CRM principles and guided team reflection. For these students, the effects of these trainings justify the high cost of these trainings.

Both the financial factors such as the investment cost for the HFPS, the equipment of the simulation room, as the operating costs and the labour-intensive nature of simulation education are barriers to implement simulation training. Mutual cooperation between university colleges and healthcare settings can both provide realistic scenarios and can help to create possibilities to finance the creation of a simulation centre by offering training for teams from the field. The collaboration between healthcare settings and college can also lead to more efficient teamwork which enhances patient safety.

4.2.5 | Recommendations for healthcare settings and nursing education

Healthcare settings and nursing education can both benefit from a collaboration. By partnering with healthcare settings, it becomes possible to offer interdisciplinary simulation training that can increase patient safety.

4.2.6 | Recommendations for research

Longitudinal research on the long-term effect of simulation training sessions and the transfer of skills to healthcare settings would be useful. Research on the frequency with which sessions simulation training should be embedded in the curriculum of the nursing education and healthcare settings is meaningful.

Further research is useful to investigate whether a higher TE also leads to better employability in clinical settings and whether a higher SE leads to a more optimal active participation in urgent cases.

This study aimed to define combining CRM principles, guided team reflection and repeated simulation training sessions influences the perception of SE, TE and TECH. This study examines which phase of the simulation training sessions contributes the most to these effects. According to the results of this study, the combination of the interventions improves the SE (2.13%, p = .02), TE (10.08%, p < .001) but has no influence on TECH (3.33%, p = .289) for bachelor nursing students. This study revealed that the debriefing phase was responsible for most of the effects.

CONTRIBUTIONS

Study design: IC, SV, DB; Data collection and analysis: IC, DB and manuscript preparation: IC, SV, AVH, DB.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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