

The Effectiveness of Stress Inoculation Training in Reducing Stress on Intensive Care Nurses

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Abstract: Nursing is a highly demanding job with many responsibilities. Intensive care nurses have more complex responsibilities, as they must deliver intensive care for critical patients. This condition puts them at risk of experiencing high stress. This study aims to measure the effectiveness of Stress Inoculation Training (SIT) in reducing stress on intensive care nurses. SIT aims to help individuals to develop personal coping strategies and improve their confidence in facing stressful situations. This is a quasi-experimental study with an experimental one-group pretest/posttest design on 13 subjects. Perceived Stress Scale (PSS-10) is used in this study to see the degree of stress experienced by the subjects. The data analyses are Wilcoxon Signed-Rank Test and effect size by Cohen. The analysis results show that SIT has a medium effect in reducing stress on intensive care nurses. There is a decrease of stress according to mean scores. This research can be developed further to design a stress management program for nurses

1 INTRODUCTION

Clinical nurses who work in various healthcare facilities play a major part in the healthcare system. Nurses have the responsibility to manage a patient's healthcare regimens. In many types of research, nursing is said to be a highly demanding job, especially in the last 25 years (Hersch, et al., 2016).

Nurses have long working hours. They also work in shifts. This issue can be stressful for nurses, especially in understaffed facilities (Edwards et al., 2000; Corley et al., 2005). This issue also makes nurses deal with many patients directly. This means they also deal with unpleasant patients and it can be a stressful experience for them (Edwards, et al., 2000).

On the other hand, there are times when nurses experience a close emotional relationship with their patients. This kind of relationship can be burdening for them when the patient's condition worsens or when they pass away. Nurses must communicate this news to their family, which can also be a stressful experience (Corley et al., 2005; Rai & Tauheed, 2013; Hersch et al., 2016).

Nurses might experience moral distress in several situations. They feel strained psychologically when they are unable to deliver optimal service to

their patients. This issue might be associated with the fact that there are understaffed facilities, therefore giving the nurses less time to care for each patients. This might also happen due to managerial or legal issues (Corley, et al., 2005).

Aside from their professional issues, nurses can also experience stress from daily and personal problems. They might have interpersonal issues with their colleagues or family. They might also experience role conflict, in which their professional roles conflict with their personal roles at home. These issues can also be stressful for nurses (Edwards et al., 2000; Khamisa et al., 2017).

Intensive care nurses are slightly different from general nurses as they have more complex responsibilities. They are responsible for delivering intensive care for critical or terminal patients. This issue might increase the tendency of intensive care nurses to experience more stress (Kristanto, et al., 2009).

It can be concluded that nurses are at risk of experiencing high stress. Stress itself is experienced by individuals by appraising situations around them. They will feel stressed when they perceive the situation as threatening or more than what they can handle (Lazarus & Folkman, 1984).

Stress that is not well-managed can have negative consequences in nurses' lives.

Professionally, stress might reduce their productivity. It might reduce the quality of patients' care. There might also be impaired achievements in nurses' work performance (Fernández-Castro, et al., 2017).

Prolonged stress is associated with burnout in nurses. Burnout may reduce work satisfaction and commitment. Nurses who experience burnout are more likely to feel emotional exhaustion. This might put patients in danger due to lack of attention to work safety. Nurses might also experience depersonalization and difficulty in engaging with patients. Other issues associated with stress are declining health, physical exhaustion, absenteeism, reactivity, and negative attitudes (Fernández-Castro, et al., 2017).

In dealing with stress, nurses need a well-planned strategy. This can be achieved with a good stress management strategy. Researches show that individual stress management interventions with a cognitive-behavioral perspective are effective in increasing the quality of life in the workplace, increasing psychological resources and reducing complaints related to stress (Klink et al., 2001; Flaxman & Bond, 2010).

Cognitive-behavioral-based stress management intervention may reduce the level of cortisol that occurs in stressful situations. The decrease in this endocrinal response is due to change of cognitive appraisal (Gaab, et al., 2003). This change in cognition is also an effective emotional coping method (Kawaharada, et al., 2009). Other physiological responses may also be altered through skills that can possibly be taught in the intervention. For instance, deep breathing as a relaxation method can inhibit and hyperpolarize the nervous system. This can give a relaxed sensation to clients (Jerath, et al., 2006).

Stress Inoculation Training (SIT) is one kind of individual stress management intervention. SIT is a behavioral-cognitive-based training targeted to manage stress. It is designed to make clients experience minor stress during treatment, thus preparing them psychologically to deal with stress in real life. It aims to help clients develop their own personal coping strategies that lead to more resilience and confidence in facing stressful events (Meichenbaum, 2007).

SIT is based on the transactional stress model by Lazarus and Folkman (1984). This model refers to stress as an overload burden from the environment, as perceived by the individual. It focuses on the important role of cognitive-affective processing in the individual and their coping strategies. Hence,

SIT is capable of reducing stress through the change in the clients' cognition. When the clients undergo a cognitive change, their perspective towards situations also changes. This results in new emotions and evaluations towards their environment. They will also develop new coping strategies that are more effective and adaptive (Meichenbaum, 2007).

How SIT works to reduce stress in a workplace setting was compared to Acceptance and Commitment Therapy (ACT) by Flaxman and Bond (2010). Both interventions are cognitive-behavioral-based. It is said that both interventions are effective, but there are some differences in how they work. ACT works by increasing psychological flexibility in the subjects. ACT changes the meaning system of an event. On the other hand, they were unable to establish how SIT essentially works in reducing stress.

In theory, SIT is supposed to change the clients' cognitive processing. However, in the study, it is said that the change does not have a significant effect on the reduction of stress. This might happen due to the limited duration of the intervention, which was done in 2 sessions for 6 hours. In spite of this, it is said that SIT might help clients to distance themselves from their negative thoughts, thus improving their mental health (Flaxman & Bond, 2010).

According to these earlier researches, this study aims to measure the effectiveness of SIT in reducing stress on intensive care nurses. SIT is still inconclusive in reducing stress according to Flaxman and Bond (2010), but it is said that this might be a technical issue due to the duration of sessions. Consequently, SIT in this study will be undertaken for a longer duration in hope of more effective and significant change in the subjects. This study hypothesizes that SIT is effective in reducing stress on intensive care nurses. It is expected that this study can help further development of stress management interventions, particularly for intensive care nurses.

2 METHODS

This study is a quasi-experimental research with a one-group pretest-posttest design. It aims to measure the effectiveness of Stress Inoculation Training (SIT) in reducing stress on intensive care nurses.

2.1 Ethical Consideration

This study has been approved by the ethical committee of the hospital where the study was conducted. It went through ethical assessment by the committee, in which the research proposal and the training module were examined. All participants were given informed consent and information about the training accordingly.

2.2 Participants

The supervisor requested all intensive care nurses who work solely in the Intensive Care Unit (ICU), without managerial duties, to attend this training. In the end, this study was conducted on 13 intensive care nurses who work at a hospital in Surabaya. The group consisted of 3 male and 10 female nurses. They have been working in the ICU within the time range of 2 months – 5 years.

The nurses were assigned in 3 different groups randomly for the intervention. This was due to their different working shifts. The first group consisted of 6 people, the second consisted of 4 people, and the third consisted of 3 people. The group remained the same until the end of treatment. Despite these small groups, the unit analysis in this study is the whole group of 13 nurses.

2.3 Research Variables

This study aims to measure the effectiveness of the independent variable (X) toward the dependent variable (Y). The independent variable in this study is SIT as an intervention. The dependent variable in this study is the stress of the nurses.

2.4 Data Analysis

Data analyses used in this study are Wilcoxon Signed-Rank Test and effect size by Cohen. The data on participants' stress level from both pretest and posttest are analyzed descriptively. The data are compared statistically afterward, examining the significance. This analysis is followed by effect size calculation using the effect size equation.

2.5 Material

The materials used in this study are the Perceived Stress Scale-10 (PSS-10) by Cohen (1994) and Stress Inoculation Training for Intensive Care Nurses module. PSS-10 was used to measure participants' level of stress before and after training.

The scale itself was translated and tested in a study in Surabaya, Indonesia, by Arbi (2017, $r = .846$). It has 10 items with Likert scale (0 = never, 1 = almost never, 2 = sometimes, 3 = often, 4 = very often).

The SIT module for nurses in this study is adapted from *Stress Inoculation Training for Single Mothers in College* by Spencer (2010). The original module has 8 sessions over 8 weeks, one session for each week. The module for this study has been modified to cater to participants' needs and availability.

2.6 Procedure

Stress Inoculation Training (SIT) in this study was conducted in 6 sessions. The first session was done to build a good therapeutic alliance between participants and the trainer. The participants' stress level was also measured by PSS-10 as a pretest.

The participants had a discussion session in the next one. They were to discuss their own stressful situations and coping methods with each other. They also learned more about stress itself and SIT as an intervention. This session also served as a baseline for the participants so that they might have the same starting point.

The next two sessions were skill training sessions. Participants were introduced to deep breathing and cognitive reframing as adaptive coping strategies that they may try to use in the future. They were also trained to do them.

In the fifth session, participants were asked to apply the strategies that they developed before in minor stressful situations. They were asked to imagine a stressful situation and how to deal with it using imagery rehearsal. They were also asked to list possible actions and strategies to use in stressful situations using behavioral rehearsal.

The last session served as a relapse prevention session. The participants discussed stressful events that might happen in the future and what to do about them. Participants were then evaluated by discussing changes they felt after attending this training. Their stress level was also measured using PSS-10 as a posttest.

3 RESULTS

The results show there is a decrease in stress on participants according to mean scores. Despite the difference, the value is not statistically significant. Below are results of statistical analyses of the data:

Table 1: Descriptive Statistics.

	N	Mean	SD	Min	Max
Pretest	13	15.69	5.313	8	27
Posttest	13	13.77	3.516	9	20

Table 2: Wilcoxon Signed-Rank Test.

		N	Mean Rank	Sum of Ranks
Posttest - Pretest	Negative Ranks	6	6.33	38.00
	Positive Ranks	4	4.25	17.00
	Ties	3		
	Total	13		

Table 3: Significance of Wilcoxon Signed-Rank Test ($\alpha = .05$).

	Posttest – Pretest
Z	-1.072
Asymp. Sig. (2-tailed)	.284

The data were also analyzed further to see the effect size. According to the equation, there is a medium effect of the treatment. Below is the equation for effect size in this study:

$$r = \frac{z}{\sqrt{N}} \tag{1}$$

$$r = \frac{1.072}{\sqrt{13}} \tag{2}$$

$$r = 0.297 \approx 0.3 \tag{3}$$

According to the statistical analyses, it can be concluded that the research hypothesis is rejected. SIT is not significantly effective in reducing stress on intensive care nurses.

4 DISCUSSION

According to the statistical analyses, the training is not significant in reducing stress on the participants. One possible explanation for the insignificance is the number of sessions and duration of the training. It is said that SIT needs 3 – 12 months to be evaluated thoroughly, while the training and evaluation in this study were conducted within 1 month (Meichenbaum, 2007). This is because in theory, SIT should have booster and follow-up sessions during the timespan. Participants also need more

time to actually practice what they trained before getting better at managing their stress (Arbi, 2017).

SIT in this study was conducted in 6 sessions within 3 meetings. Each meeting had the duration of 60 – 90 minutes. This can also be an explanation for the insignificance of the training. A SIT training that is too short might be too simple to modify deep cognitive contents (Flaxman & Bond, 2010).

SIT is based on a transactional stress model. This means that stress might come from the individual's environment (Meichenbaum, 2007). In this study, there was no treatment applied to the participants' environments.

SIT in this study was conducted in a group setting. The participation of the subjects was due to the order of their superiority. This can make the participants less motivated to engage in this training (Yalom, 1995, cited in Corey, 2004). It can also create resistance among the participants and this can make the intervention less effective.

Despite the insignificance, SIT still has some effects on the participants. There are 6 subjects who experienced a decrease in stress. This is because of behavioral change due to cognitive-behavioral-based interventions, including SIT. This change appears because of the interaction between inner speech, cognitive structure, and behavior with its own consequences (Meichenbaum, 1997, cited in Corey, 2013).

In this training, participants went through the first phase of this interaction, which is self-observation (Meichenbaum, 1997, cited in Corey, 2013). This was done by self-monitoring and group discussion about stressful situations. Most participants were able to be more aware of their stress in the first meeting. This led to more motivation to develop more adaptive behavior. As the intervention went, the participants also developed a new cognitive structure that allowed them to have new perspectives.

The second phase of this interaction is the creation of new internal dialogue (Meichenbaum, 1997, cited in Corey, 2013). Participants went through this phase when they realized that their previous behaviors were not adaptive. They then tried to find alternative behaviors that are more acceptable. Participants were given new information about stress and this helped them to be more aware of their behaviors.

The third phase of this interaction is the learning of new skills (Meichenbaum, 1997, cited in Corey, 2013). Participants in this study learned about new coping strategies, such as deep breathing and cognitive reframing. These new strategies are more

effective and adaptive in dealing with stress. The experiential use of this kind of skill enhances self-respect and self-efficacy among clients (Meichenbaum, 2007; Kawaharada et al., 2009).

Deep breathing as a relaxation method is effective and easy to use. This is especially so in situations that create emotional or physiological reactions. Deep breathing inhibits and hyperpolarizes the nervous system. This process activates the parasympathetic autonomous nervous system (Jerath, et al., 2006). This causes a relaxed sensation in subjects when dealing with stress.

Cognitive reframing is also a skill that is effective and easy to use. This is especially so in situations that need quick responses. The participants tend to use this strategy in situations in which they are unable to unwind using deep breathing strategy. Cognitive reframing helps subjects to think more positively and this is said to be an effective emotional coping method (Kawaharada, et al., 2009). This perspective change leads to a decrease in cortisol response due to stress (Gaab, et al., 2003).

SIT as a stress management intervention works by influencing cognitive and affective processing in subjects. They become better at appraising stressful situations (Herman & Cullinan, 1997, cited in Gaab et al., 2003). Experiential exercise in this training is also an effective mediator to reduce stress (Gaab, et al., 2003). Therefore, it can be concluded that SIT works by changing subjects' emotion, cognition and behavior in dealing with stress, which leads to a decrease in stress.

Recommendations for future research and application are based on the limitations of this study. One limitation of this study is that the duration is too short, therefore making the evaluation incomplete. The number of sessions might also be insufficient for SIT to work properly. Longer duration of the study and additional sessions in the training might give better results in evaluating and explaining the effectiveness of SIT on intensive care nurses.

5 CONCLUSION

SIT is an effective intervention to reduce stress on intensive care nurses. It has an effect size of 0.3 which means this intervention has a medium effect. This is due to the change in cognitive processing of the subjects in appraising stressful situations. This change prompts new emotions and evaluations toward their environment. This also initiates the

subjects to develop new behaviors that are more effective and adaptive.

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