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Effectiveness of Psychological Adaptation Model of Mental Health Nursing for nurse survivors experiencing post-earthquake disaster post-traumatic stress syndrome

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KEYWORDS
Analysis of self-awareness;
Communication;
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Intrinsic motivation;
Psychological adaptation model

Abstract

Objective: The study to assess the effectiveness of psychological adaptation model of mental health nursing for nurse survivors experiencing post-earthquake post-traumatic stress syndrome (PTSS).

Method: This study used a quasi-experimental pre- post-test without control group method. Respondents amounted to 42 people who have been screened for PTSS. Research took place in a district in West Java. Research instrument consisted of: *1)* questionnaire for respondent's characteristics and the skills of nurses, and *2)* psychological adaptation model of mental health nursing intervention in the form of modules. Data collected was analyzed using bivariate analysis namely the t test dependent.

Results: Nurse survivors experienced increased ability in areas including analysis of self-awareness, communication or interaction, coping mechanisms, and intrinsic motivation after undertaking the PTSS intervention. Women were more likely to experience PTSS than men.

Conclusions: The model can be used for nursing theory development, and as disaster management algorithms. The model is useful for training programs, in the form of certification of nurse expertise, and improve the ability of nurses to help themselves and others.

Introduction

Worldwide, it had been indicated that there were increased incidence of earthquake, Tsunami, hurricanes and floods, resulting in loss of property and lives[1,2]. In Indonesia, earthquakes ranked first as the most frequent natural disasters[3]. Hence, this research focused on earthquake related trauma, due to the direct impact on loss and because they have caused the most deaths (75.36%)[4].

Individuals experience loss in term of ideas and feelings that include precious feelings, capabilities to appeal to others, and satisfaction with themselves. Loss is categorized into the loss of a significant other or something very significant, loss of a loved object, and loss of health. The nature

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of the can vary between happening permanently or temporarily, wholly or partly, dependent on the capabilities and strengths of individuals (nurse survivors) compared to the number of stressors[5].

Prolonged loss can cause grieving, resulting in inability to concentrate, impaired ability to remember, even loss of association skill, that is, the ability to align thoughts with words or actions[6]. This is supported by a study by Mustikasari (conducted in Yogyakarta and Padang) that found that psychological responses to loss and grieving were shock, disbelief, sadness, and helplessness[7]. Completion of loss and grieving requires 1 month to 3 months[8,9]. According to Larsen and Buss, individuals already experiencing chronic stress were unable to make decisions and maintain control of themselves in response to adverse events[6], leading to fatigue and then trauma[10-12].

Prolonged trauma leads to post-traumatic stress syndrome (PTSS)[6,13,14]. PTSS is a continuous response due to an extreme traumatic event[8,15,16]. The main symptoms of PTSS are anxiety, terror, excessive fear, and helplessness[6,15]. PTSS occurs when two of the three main symptoms are found in the span of ≥ 6 months to 2 years after the earthquake catastrophe[17-19]. The cause of PTSS is the individual's inability to cope with a traumatic experience resulting from a disaster, such as an earthquake[19]. Various studies in different countries, including Indonesia, showed that even when 2 years have passed since the time of the earthquake, the trauma caused still predicted the emergence of PTSS[7,20].

Post-earthquake trauma occurs not only in general survivors but also in nurse survivors. Nurse survivors are nurses who experienced the earthquake and managed to escape, but at the same time experienced a loss and an obligation to help others. Nurses are bound to the code of professional conduct, especially the principle of altruism, to always serve the people, and to the principle of beneficence, to make the best decision in favor of the community they serve, while lay person survivors are only focused on saving themselves and those closest to them[21].

A study of the experience of nurse survivors who experienced PTSS in a district of West Java in January 2010, identified changes in emotions, social relations, interaction skills, psychological burden, and coping abilities[7]. Even under disaster situations, nurses tend to neglect their own safety to help others. Hence, nurse survivors who experienced the earthquake also need others to help them and in turn to help the community. This refers to the core principles of nurses caring for nurses so that they can care for people. The parameters for the success of an intervention for nurse survivors with PTSS consist in ways to change the individual's cognitive function through cognitive therapy[22].

Unresolved PTSS may lead to decreased functioning; areas impacted include analysis of self-awareness, communication, coping mechanisms, and intrinsic motivation. If left untreated, subsequent impacts include increasing social burden, work dysfunction, damage to personality, and mental disorders[18]. Therefore, this study was aimed to test the effectiveness of the psychological adaptation model of mental health nursing for nurse survivors, who experienced post-earthquake PTSS by measuring the nurses' level of competence before (pre-test) and after (post-test) interventions were implemented.

Method

This study used a quasi-experimental research design with pre- and post-test, without a control group. This selection of study design was based on the ethics of research, where respondents who experienced PTSS showing anxiety responses, fear, and traumatic experiences were provided an intervention directly without delay (respect for persons) as well as the intervention was performed on all respondents after a screening phase (justice)[23].

The inclusion criteria for participants were as follows: *1)* a nurse present at the time of the earthquake in the disaster area and the survivors of the earthquake; *2)* experienced at least one loss condition, for example damage to their living space (damaged house), possessions, and others, and *3)* experienced PTSS, detected through screening.

The research was conducted for 10 months, in one district in West Java. Sampling was processed following the research ethics that includes the respect of human dignity (respect for persons), beneficence, do no harm (non-maleficence), and justice[24] as well as obtaining informed consent from respondents to participate in the study. Data collection tools used by the researchers were a questionnaire, observation sheets (to measure the skill of PTSS treatment), and an intervention manual in the form of an intervention model and modules. The instruments were tested for validity and reliability with validity values ranging from 0.808-0.944 and reliability of 0.989, which did not deviate too far from the standard of an instrument's validity (0.879-0.979) and reliability (0.898). Prior to implementation, the research received ethical approval and cleared the clinical trials for the ability to provide therapy to respondents.

Data analysis included univariate analysis for demographics data such as age, income, length of employment, analysis of self-awareness, communication, coping mechanisms and intrinsic motivation, and bivariate analysis (dependent t tests)[25] were applied to determine the changes between the before and after the PTSS intervention was given.

Results

This study was aimed to gain an insight of the effectiveness of the psychological adaptation model of mental health nursing for nurse survivors experiencing PTSS after earthquake disaster. The final sample consisted of 42 respondents derived from the selection of respondents (from 642 to 72) and PTSS screening (from 72 to 42).

Demographics description of study respondents can be found in Table 1 as shown below.

The respondents of this study were at the age of 30 years old, the productive age, in average. Income ranged from IDR 0 (to IDR 3,520,000). Those with IDR 0 income what were known as volunteer nurse, employed by government owned health services institutions. Length of employment ranged from 1 year to 30 years at the longest, with the average of 7 years of employment.

Table 2 showed most of the respondents (71.4%) were graduated from vocational nursing schools (Diploma III), followed by graduates from undergraduate nursing program (11.9%) and graduates from specialty high school with nursing course (9.5%). More than half of the respondents were

Table 1 Mean distributions based on age, income, and length of employment (n = 42)

Variable	Mean/median	SD	Min/max	95%CI
1. Age	33.12/30.00	7.91	22/53	30.65-35.58
2. Income (IDR)	995,178.57/0	7.91	0/3,520,000	569,028.98-1,421,328.00
3. Length of Employment	9.97/7.00	8.70	1/30	7.25-12,70

95%CI, 95% confidence interval; IDR, income-driven repayment; SD, standard deviation.

volunteer nurse (59.5%) and female (61.9%). All respondents were Muslim and ethnically Sundanese.

The changes in the ability of analyzing self-awareness in intrapersonal relationship, professional and social circle (family, personal and working environment) are shown in Table 3:

Study results found an increase (7.39) in the analysis of self-awareness means with 5.57 deviation standard. Statistical tests provided the *P* value of .000 ($P < .05$), proving an increase in the ability to analyze self-awareness in respondents after receiving PTSS treatment intervention.

The mean value of communication skill before the intervention was 82.95 with 5.20 deviation standard. The mean value was increased 2.90 to 85.86 with 7.66 deviation standard after the PTSS treatment intervention. *P* value was .018 ($P < .05$), meaning an improvement in communication skill of the respondents after PTSS treatment intervention.

Similar results were found in the respondents' coping mechanisms as well as intrinsic motivation. Statistical test found the *P* value of .001 ($P < .05$) for coping mechanisms and $P = .000$ ($P < .05$) for intrinsic motivation, meaning an increase in respondents' ability in coping mechanism and intrinsic motivation after having received the PTSS treatment intervention.

Discussion

Disaster events, such as the Earthquake disaster, could become a traumatic experience prompting severe psychological shock which leads to Post-Traumatic Stress Syndrome. PTSS when left unresolved PTSS negatively impacted nurses functioning such as the analysis of self-awareness, communication, coping mechanisms, and intrinsic motivation. Decreased functioning may impair the nurse survivors' ability in providing nursing care, the essence of the nursing principle, to help others.

These study respondents consisted of more female respondent (61.9%) than male respondents (38.1%). This was consistent with the estimation of nurses proportion in Indonesia stating that there are 70% female nurses and 30% male nurses. Studies have found there was a correlation between susceptibility to PTSS and gender. Several researches showed females are more at risk to experience PTSS than males[11,15].

This study purpose was to test the effectiveness of the psychological adaptation model of mental health nursing for nurse survivors who experienced post-earthquake PTSS by measuring the changes in areas impacted by PTSS. Study results indicated overall increase in all areas impacted after interventions.

Research by Clukey et al[26] showed that nurse survivors who experienced moderate to severe trauma required intervention in the form of knowledge, non-verbal behavior, nursing care, the intensity of the meeting time, and comfort. In line with that study, analyses of self-awareness were feasible if nurse survivors had the ability to assess themselves including assessing self-identity and understanding their own values[11,27].

The increase in the analytical capability of self-awareness in nurse survivors after the PTSS treatment intervention ($P < .05$) was consistent with the research of Hamid et al (2006) on the influence of psychosocial support for nurse survivors working in Aceh. Both Hamid's study and the current study used the same measurement tool derived from Roy's adaptation theory, namely the cognator in effectors function[28]. The cognator subsystem relates to brain functions such as perception, information processing, judgment and emotion. The current study results showed the application of the psychological adaptation model positively impacted the cognator subsystem, increasing the nurses' ability to analyze self-awareness.

Furthermore, the results of the improvement of analytical skill of self-awareness in this study showed increased knowledge in nurse survivors after receiving training that included treatment of PTSS, interdependence, self-concept, and function and role through supervision. In the skill aspect, however, there was a decline in the methods to manage

Table 2 Distribution of respondents frequencies based on educational background, employment status, and sex (n = 42)

Variable	Number	Percentage
Educational Background		
1. Nursing High School	4	9.5
2. Diploma III in Nursing	30	71.4
3. Bachelor in Nursing	5	11.9
4. Bachelor in Health Science	2	4.8
5. Bachelor in Administration	1	2,4
Employment Status		
1. Civil servant	17	40.5
2. Volunteer	25	59.5
Sex		
1. Male	16	38.1
2. Female	26	61.9

Table 3 Self-awareness, communication, coping mechanisms, and intrinsic motivation means pre- and post-traumatic stress syndrome treatment intervention (n = 42)

Variable	Mean	SD	95%CI	SE	T	*P* value
Analysis of self-awareness						
Before	98.78	7.41	96.47-101.09	1.14	–8.58	.000
After	106.17	7.48	103.83-108.49	1.15		
Difference in means	7.39					
Communication						
Before	82.95	5.20	81.33-84.57	0.80	–2.46	.018
After	85.86	7.12	83.64-88.07	1.10		
Difference in means	2.90					
Coping mechanisms						
Before	85.09	6.86	82.96-87.23	1.06	–3.62	.001
After	89.09	8.39	86.48-91.71	1.29		
Difference in means	4.00					
Intrinsic motivation						
Before	98.19	7.63	95.81-100.57	1.18	–5.01	.000
After	103.19	7.11	98.72-103.66	1.10		
Difference in means	5.00					

95%CI, 95% confidence interval; SD, standard deviation; SE, standard error.

PTSS through group meetings. This was because group meetings introduced new nurses who recounted traumatic experiences that can cause traumatic flashbacks that affected the comfort of nurse survivors.

Other research by Karanci and Acarturk[20] about the experiences of survivors who suffered through the Marmara earthquake, showed that the factors affecting the whether the incidence of trauma led to PTSS were: *1)* the experience of the earthquake; *2)* the location of the earthquake; *3)* how they thought of death at the time of the earthquake; *4)* the response to the earthquake catastrophe, and *5)* fear leading to panic.

According to Ford[29], guilt arises because nurse survivors felt moral responsibility in accordance with their trust in ethical values that affects their decision making. This is supported by the results of Hamid et al[30] and Mustikasari's[7] findings that the earthquake and tsunami caused feelings of guilt for not accepting optimal responsibility, thus creating an ethical dilemma. However, nurses should have knowledge about the impact of a disaster on themselves and others and understand what they are required to do[18,21]. In fact, nurses are individuals who also suffered emotional trauma as much as others, which also requires good handling so that the nurses can help others[31].

The results showed that the variable most affecting self-awareness after receiving PTSS intervention was role function through group meetings. The role function in question was how a nurse survivor provides services or nursing care to patients already covered by their role, function, knowledge, and tasks[32]. An effective group is an effective self-help group, consisting of individuals who experienced the same problem attempting to solve the problem together[28]. The theory is supported by a study by Levi et al[33] that found that self-awareness is an important factor in determining one's ability to develop oneself and interact with the environment.

According to Malaka, an effective environment occurs when the same group working together can help to reduce members' most salient fears[34]. Feelings of being insecure, tense, and anxious could eventually lead to internal conflict in individuals related to negative thoughts about facing one's fear of the earthquake. Dwelling on negative thoughts brings no benefits but instead exacerbates feelings of trauma, resulting in negative outcomes.

Communication in Peplau's theory, refers to nurse survivors' ability to know and explore their own capabilities. Additionally, Hildegard Peplau looked at the relationship of nurses with patients[35]. The communication used by nurse survivors who experience PTSS was assessed to explore the depth of PTSS experienced by nurse survivors[11,36-39]. Study result showed improvements in communication capabilities in nurse survivors, after PTSS treatment intervention ($P < .05$).

The losses that nurse survivors experienced due to the earthquake were distressing events that could affect loss of association, which refers to disconnections between thought, speech, and expressed response due to the absence of a logical mind. The illogical thoughts were displayed in the form of ideas that are inconsistent, irrational, and that contradict perceived feelings, thus affecting the communication quality[35]. This loss of association leads to misunderstandings in communication and often times irrational thoughts inducing fears. According to Townsend[27] and Wilson and Kneisl[40], traumatized nurse survivors fear interpersonal rejection.

Necessary efforts to improve communication after the earthquake catastrophe include intrapersonal communication, occurring within nurse survivors themselves, and interpersonal communication, that refers to communication with

family, friends, and the community[11]. This study's results showed that most respondents performed intrapersonal communication during the earthquake catastrophe. Intrapersonal communication was performed through seeking closeness to God by "istighfar" (the act of seeking forgiveness from God for Muslims) and this resulted in increased serenity. However, some respondents have not managed to perform this intrapersonal communication due to difficulty concentrating during prayer or spiritual practice caused by a deep trauma. Interpersonal communication needs include acceptance, caring, affection, trust, enthusiasm, protection, and support, and these should be provided adequately when facing individuals who have experience trauma or unpleasant experiences. Good communication helps patients freely express their feelings, and view their problems from a new perspective of acceptance of unpleasant experiences[11,41].

The result showed an increase in coping mechanism after the intervention ($P < .05$). This study used Roy's adaptation theory, with the contextual stimulus as input and coping mechanisms as a control process for improving cognator functioning[26]. The measure of coping mechanisms in nurse survivors included their problem-solving skill, adaptation to change, and response to threatening situations[11,42]. A coping mechanism is classified as an adaptive and effective method of coping that, among others, can be studied through its psychosocial aspects[42]. According to Gorman and Sultan[39], individuals engage self-defence mechanisms to protect them against threats, discomfort, and inability to interpret perceived feelings and thoughts.

Factors that heavily influence post-traumatic development are problem solving (optimistic) and coping, whereas in the post-traumatic recovery phase, an influencing factor was supervision in using a variety of coping approaches[20]. Trauma in an individual was due to the inability to use their coping mechanism[20,43,44].

Another impact on traumatized nurse survivors is an imbalance in the interaction between biological, psychological, socio-cultural, and environmental aspects as well as internal conflicts that affect individual adaptation to the environment, which in turn affects their level of health[8,26]. This study's findings showed that the variable that most affects coping mechanisms after interventions for PTSS was PTSS treatment for individuals through supervision by reseachers. According to Folkman and Lazarus in Stuart and Laraia[8], nurses' coping mechanisms after receiving post-earthquake PTSS interventions focused on their emotional status (ego oriented reaction). When achieving certain tasks, human's goal orientation often divided into 2 types, namely task orientation or ego orientation. While task orientation focus more onto task mastery, ego orientation is more focused in the sense perceived when success is achieved. Thus promoting better psychological state necessary to effective method of coping against unpleasant experiences.

The study also found an increase in intrinsic motivation after receiving the PTSS treatment intervention in nurse survivors. Motivation increased after the intervention ($P < .05$) with a mean difference of 5.00 pre- and post-treatment. Nurses increased in their ability to begin reviving from fear, anxiety, and helplessness in response to unpleasant events. The variable that most influenced intrinsic motivation was the method of improving role function through group meetings. According to Tyler[45], one of the factors of individual self-motivation was autonomy, including changes in life choice, way of life, and relationships with others.

Based on Ivancevich[46], aspects that motivated nurse survivors were as follows: *1)* psychological needs for security, appreciation, status, self-esteem, and self-actualization, and *2)* cognitive needs for knowledge, sense of belonging, safety at work, working conditions, and interpersonal relationships. This was supported by the results of this study from in-depth interviews showing the commitment of nurse survivors to change, expectations to fix themselves in a way that allowed them to work for others and perform their role well, not be embarrassed to provide care, be unafraid, and to soothe people who need it, and to helping each other. Results were consistent with the theory that increasing the motivation of individuals produces feelings of happiness, being valued, and accelerates the achievement of objectives[12].

The PTSS Intervention implemented through the Psychological adaptation model significantly increased the ability in self-awareness analysis, communication, coping mechanisms, and intrinsic motivation of nurse survivors. Study results also provided deeper insight towards the role of cultural and spiritual aspects in individuals in the aftermath of disaster occurrence. Hence, the model of psychological adaptation of mental health nursing for nurse survivors could be used incorporated into the training program, continuing education (CPD) as well as career development for nurses in vulnerable area or nurses who specialized in disaster response or disaster relief. This model and modules should be used as a reference for the organization of the nursing profession to formulate standards, an algorithm for disaster management, and a position statement for nurses' protection to the government.

Further research with qualitative methodology (cultural and spiritual aspects) and quantitative (quasi-experimental pre- and post-test with a control group) could provide more data regarding the application of this model as an option of intervention for nurses and other health professional disaster survivors beside nurses or the general society.

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