

*Original/Research Paper***Effect of the developed parallel process model on the resilience of spouses of post-traumatic stress disorder veterans: A quasi-experimental study**Akram Rezaei Aghuei <sup>a</sup>  | Nafiseh Hekmati Pour <sup>b\*</sup>  | Hamid Nejat <sup>a</sup>  | Ahmad Akbari <sup>a</sup> 

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Email: [n-hekmatipour@aliabadiau.ac.ir](mailto:n-hekmatipour@aliabadiau.ac.ir)<https://doi.org/10.32598/JNACS.2401.1000>This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial 4.0 License](https://creativecommons.org/licenses/by-nc/4.0/) (CC BY-NC 4.0).

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**Abstract**

The present study aims to determine the effect of the developed parallel process model on the resilience of spouses of post-traumatic stress disorder (PTSD) veterans. This quasi-experimental investigation comprised 30 spouses of veterans diagnosed with PTSD, segregated into two distinct groups during the year 2023: an intervention group, consisting of 15 individuals, and a control group of equal size. To gather data for this study, a demographic questionnaire capturing information on age, veteran percentage, education level, and occupation, alongside the Connor-Davidson Resilience Scale (CD-RISC), was utilized. Preceding the intervention, the intervention group exhibited a mean resilience score of 45.06 (SD=3.82), which increased to 61.13 (SD=4.92) after the intervention, indicating a statistically significant difference as determined by the paired t-test ( $P<0.01$ ). Conversely, in the control group, the resilience rate was 46.53 (SD=5.71) before the intervention and 47.00 (SD=6.20) after the intervention; however, the paired t-test did not reveal a significant difference ( $P=0.7$ ). In sum, the implementation of educational methodologies grounded in theoretical frameworks and cognitive models emerges as a pivotal factor in augmenting the adaptation and resilience levels of spouses of veterans grappling with PTSD.

**Keywords:** Resilience, Veterans, Posttraumatic Stress Disorder, Nursing, Nurses.**1 | Introduction**

Post-traumatic stress disorder (PTSD) represents a profoundly distressing occurrence in an individual's life that surpasses their capacity to endure [1]. It is widely recognized as a consequential outcome of exposure to wartime situations [2]. Manifestations of this disorder encompass mental re-experiencing of the traumatic event, recurrent nightmares, avoidance of recollections related to the event, heightened anxiety, irritability, tinnitus, and impaired social, occupational, and physiological functioning [3]. Notably, PTSD prevalence stands at 18.1% among veterans of the Iran-Iraq war, with 36,354 diagnosed cases, including 1,112 individuals considered at risk for mental health disorders as per data from the Martyrs and Veterans Foundation [4]. The duration of this disorder varies among individuals, and its symptoms and complications may manifest years after the initial trauma [5]. Persistent

PTSD affects approximately 40% of afflicted individuals and more than a third continue to exhibit symptoms a decade following the traumatic incident [6].

The ramifications and symptoms of PTSD are prominently observed among family members, particularly the spouses of veterans [7]. The stress induced by wartime experiences exacerbates individual challenges, amplifying negative experiences and life issues that impact not only the individuals but also those around them, notably their family members [8]. This stress has a detrimental effect on the affected individual's daily physical functions and the overall health of the family unit [9]. Prolonged manifestation of this disorder frequently leads to enduring mental health conditions and diminishes the quality of life for both the individual and their family. The presence of a family member impacted

by the repercussions of war often amplifies the burden of responsibility on the family, particularly the spouse [10, 11]. Spouses of veterans suffering from PTSD are often described as the unseen casualties of war [12], bearing the brunt of immense pressure and stress in their lives [2, 13]. Consequently, their families experience chronic conditions like PTSD, enduring heightened emotional strain and frequently enduring taxing circumstances [9].

Resilience stands as a pivotal factor for spouses of veterans grappling with PTSD when confronting life's challenges. It serves as a mechanism enabling adaptation to pressures and adversities. Within spouses of PTSD-affected veterans, resilience manifests in diminishing levels of depression, anxiety, and feelings of helplessness [3]. Moreover, resilience restores equilibrium in the face of life's stressors and perils [10]. The implementation of educational programs founded on theoretical orientations plays a pivotal role in inducing behavioral changes [14]. Notably, the Extended Parallel Process Model (EPPM) stands as an effective framework utilized in recent years for crafting health messages and mitigating the onset of diseases and high-risk behaviors [15].

The inception of this model in 1992 is credited to Kim White, who amalgamated and refined various fear-provoking models and theories [16]. It revolves around four fundamental constructs encompassing intensity, sensitivity, effectiveness, and self-efficacy [17]. According to this model, individuals perceiving a heightened susceptibility to disease contraction or encountering health risks tend to exhibit increased motivation in addressing these threats. Subsequently, they proceed to assess the efficacy of potential solutions [18]. Employing this model enhances comprehension, and sensitivity, and facilitates improved decision-making in various situations and predicaments [19]. Given its significance in nursing paradigms and theories, this model assumes a crucial role in advancing the quality of nursing care [20]. Nursing education and care interventions significantly contribute to augmenting the quality of life and performance standards among nurses [21]. Consequently, this study was undertaken to investigate the impact of the developed parallel process model on the resilience levels of spouses of veterans afflicted with PTSD.

## 2 | Methods

### 2.1 | Study design

A quasi-experimental study was undertaken at the Islamic Azad University of Mashhad to assess the effects of the implemented parallel process model on the resilience levels of spouses of veterans suffering from PTSD.

### 2.2 | Ethics consideration

This project was approved by the research council of the Islamic Azad University of Mashhad branch, and the code of ethics was obtained from the Bioethics Committee of Mashhad Azad University IR.IAU.MSHD.REC.1402.018. This project was approved by the Iran Clinical Trial Registration Center (IRCT20230608058420N1).

### 2.3 | Participants

This quasi-experimental investigation comprised 30 spouses of veterans diagnosed with PTSD, segregated into two distinct groups during the year 2023: an intervention group, consisting of 15 individuals, and a control group of equal size. The study's inclusion criteria encompassed spouses of PTSD veterans who demonstrated awareness of time and place and did not present any chronic mental illness. Additionally, included participants had spouses comprising over 25% of veterans. Exclusion criteria involved spouses whose husbands were deceased and those who declined participation by not providing consent for involvement in the study.

### 2.4 | Sample size

The sample size for this study was determined following the methodology outlined in Hojjati *et al.*, (2020), using G Power software. With an effect size of 1.1, a significance level set at 0.05, a test power of 80%, and a confidence interval of 95%, a total sample of 30 participants divided into two groups was established [22]. Random allocation of these participants into the intervention and control groups was achieved using a simple random method and a coin toss procedure.

### 2.5 | Intervention

To gather data for this study, a demographic questionnaire capturing information on age, veteran percentage, education level, and occupation, alongside the Connor-Davidson Resilience Scale (CD-RISC), was utilized. The CD-RISC comprises 25 statements rated on a 5-point Likert scale (ranging from "completely false" to "completely true," scored from zero to four), resulting in a total score range of 0 to 100 [23]. Scores exceeding 50 indicate higher resilience levels, with higher scores indicative of greater resilience [18]. The questionnaire's content validity was established by ten university faculty members holding doctoral degrees in nursing, psychology, or psychiatry. Additionally, Dominguez-Cancino *et al.*, (2022) and Hatami & Hojjati (2019) confirmed the questionnaire's validity and reliability, respectively, in prior studies [24, 25].

The development of the parallel process model training in the experimental group consisted of six sessions conducted in three groups of five individuals each, lasting approximately 60 minutes per session. The educational content was structured based on relevant literature and scientific articles encompassing the model's principles (Table 1). Meanwhile, the control group received the Shahid Foundation's routine care and training.

Before the research implementation, the researcher elucidated the study's objectives to both groups, emphasizing participant safety and anonymity. Additionally, all participants were assured of their voluntary participation and the option to withdraw from the study at any stage.

### 2.5 | Statistical analysis

Data analysis was performed using SPSS software (version 21.0, SPSS Inc., Chicago, IL, USA). Descriptive statistics were utilized to present means with standard deviations (SD) for continuous variables and frequencies with percentages for categorical variables. Furthermore, a range of statistical tests including Chi-square, independent t-test, and paired t-test were applied in the study. A significance level of 0.05 was considered.

## 3 | Results

### 3.1 | Participants

In comparing demographic characteristics, the mean age of subjects in the control group was 48.06 (SD=4.12) years, while in the intervention group, it was 51.06 (SD=5.16) years. The average

percentage of veterans in the intervention group was 33% (SD=8.94), and in the control group, it was 29.66% (SD=8.95). No statistically significant differences were observed between the two groups concerning age ( $P>0.05$ ) and the percentage of veterans ( $P>0.05$ ). Additionally, the chi-square test indicated no significant disparities between the groups in terms of education ( $P=0.08$ ) and occupation ( $P=0.06$ ).

### 3.2 | The effect of the developed parallel process model on the resilience of spouses of PTSD veterans

As shown in Table 2, preceding the intervention, the intervention group exhibited a mean resilience score of 45.06 (SD=3.82), which increased to 61.13 (SD=4.92) after the intervention, indicating a statistically significant difference as determined by the paired t-test ( $P<0.01$ ). Conversely, in the control group, the resilience rate was 46.53 (SD=5.71) before the intervention and 47.00 (SD=6.20) after the intervention; however, the paired t-test did not reveal a significant difference ( $P=0.7$ ). The independent t-test between the intervention and control groups did not indicate any significant differences before the intervention ( $P=0.46$ ). Nevertheless, post-intervention, a significant difference emerged ( $P<0.01$ ).

Furthermore, employing the ANCOVA test, while accounting for the pre-test effect, a significant difference was observed ( $\eta^2=0.545$ ,  $P<0.01$ ). This implies that 54% of the variance in post-test scores can be attributed to the intervention.

**Table 1.** The content of training sessions based on the parallel process model developed by Kim White.

| Construct                                             | Aim                                                   | Content                                                                                                  |
|-------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1                                                     | Perceived sensitivity                                 | - Introducing and stating the purpose of the research                                                    |
| Perceived threat assessment                           | - Identify the amount of risks                        | - Identifying underlying causes                                                                          |
|                                                       | - Identify the number of complications                | - Check the needs                                                                                        |
| 2                                                     | Perceived intensity                                   | The level of understanding and sensitivity of the research units should be determined                    |
| (Perceived sensitivity and perceived intensity)       | - Determine the severity of the disorder.             | Determine how to control emotions and stress levels                                                      |
|                                                       | - Determine the importance of the issue               |                                                                                                          |
| 3                                                     | Perceived intensity                                   | Provide the necessary answers while understanding the needs                                              |
| 4                                                     | Perceived self-efficacy                               |                                                                                                          |
| Assessment of perceived efficacy                      | - Familiarize yourself with the self-care process     | The effect of interpersonal relationships and self-control skills training on resilience can be observed |
|                                                       | - Know the role of self-care in improving performance |                                                                                                          |
| 5                                                     | Perceived effectiveness                               | Check the effectiveness of training                                                                      |
| (Perceived self-efficacy and perceived effectiveness) | - Implement crisis intervention methods               |                                                                                                          |
| 6                                                     | Review the contents of previous meetings              |                                                                                                          |

## 4 | Discussion

The findings of this investigation demonstrate that the implemented parallel process model has a positive impact on enhancing resilience in the spouses of veterans. In a study conducted by Nieforth *et al.*, (2023), it was revealed that the resilience levels of

veterans' wives tend to be lower due to the myriad of pressures and stresses they experience. The cumulative effects of enduring stressors over time lead to disruptions in family relationships and overall family functioning [12]. Notably, the burdens associated

with caregiving in spouses escalate distress levels, thereby negatively affecting the quality of life for spouses of veterans [26]. The

exacerbation of these stressors contributes to the deterioration of mental health and well-being [27].

**Table 2.** Resilience before and after intervention (N=30).

|         | Groups          |                     | t     | P-value |
|---------|-----------------|---------------------|-------|---------|
|         | Control (N=15)  | Intervention (N=15) |       |         |
| Before  | 46.53 (SD=5.71) | 45.06 (SD=3.82)     | 0.77  | 0.46*   |
| After   | 47.00 (SD=6.20) | 61.13 (SD=4.92)     | 25.22 | <0.01*  |
| P-value | 0.7**           | <0.01**             |       |         |

Values are given as a mean for continuous variables.

\*P-value was obtained with an independent t-test.

\*\*P-value was obtained with a paired t-test.

A precise comprehension of the extent of stress experienced frequently contributes to heightened self-efficacy in spouses of veterans [28]. The enhancement of mental health and resilience consistently mitigates health-related risks among this demographic. The provision of coping strategies training has been shown to diminish stress levels, alleviate symptoms of depression, and mitigate stress disorders following a war-related incident [29]. A study by Hojjat *et al.*, (2016) investigated the efficacy of stress coping strategies training on the marital satisfaction of spouses of veterans afflicted with PTSD [30].

Heydari *et al.*, (2020) demonstrated that training in spiritual care enhances adaptation and improves the quality of life for spouses of veterans [21]. Wissinger & Stiegler (2019) found that the implemented parallel process model contributes to improved mental health outcomes [31]. In a study by Totzkay *et al.*, (2022), cognitive models, including the parallel process model, were shown to enhance comprehension and foster sensitivity, thereby promoting better understanding [32]. Thapaliya *et al.*, (2022) observed that the developed parallel process patterns instigate healthy behaviors in individuals with heart conditions, consequently aiding in the prevention of disease complications [33]. Furthermore, Parsai *et al.*, (2020) underscored the pivotal role of the parallel process model, conceived as a cognitive theory, in augmenting patient knowledge and understanding to elevate self-efficacy levels [19].

According to the developed parallel process model, individuals who perceive a heightened susceptibility to a disease or health risk tend to cultivate increased sensitivity in addressing such concerns [18]. The utilization of care models has been associated with elevated standards of nursing care and enhancements in overall quality of life [1]. In this context, spouses of veterans benefit from understanding and acknowledging the realities inherent in life, facilitating a confrontational approach toward problems and fostering a comprehensive perspective. This proactive mind-

set, as opposed to succumbing to despair, exaggeration of negative aspects, or avoidance, enables them to critically assess issues, adopt a more positive stance, and actively seek solutions [22].

Moreover, comprehension and recognition of behavior patterns play a crucial role in adaptation and problem-solving among spouses of veterans [34]. Consequently, training in cognitive and behavioral skills serves to fortify commitment and instill a sense of security and well-being in this demographic [35]. Cognitive and behavioral patterns training in veterans' spouses has been shown to enhance life skills, expedite interpersonal relationships, raise awareness, resolve familial conflicts, and establish psychological security within family environments [36]. The application of care models and patterns aids in identifying the needs of veterans and their caregivers, thus contributing to increased consistency and enhanced quality of care provision [1].

#### 4.1 | Limitations

The generalizability of the study's findings to the broader population of spouses of PTSD veterans might be limited due to the potential presence of sample biases or distinctive characteristics within the study cohort.

#### 4.2 | Recommendations for future research

For future research, it is recommended to conduct a longitudinal study with extended follow-up periods to comprehensively capture the sustained effects of the parallel process model on the resilience of spouses of PTSD veterans over time. Additionally, it is advisable to examine contextual factors that may impact the implementation and effectiveness of the parallel process model. This examination should encompass considerations such as cultural nuances, socio-economic status, and access to support services. Furthermore, incorporating qualitative research methods to gather in-depth insights into the subjective experiences and perceptions of spouses participating in the intervention is suggested. Qualitative data can provide a nuanced understanding of the intervention's impact, complementing quantitative findings.

## 5 | Conclusions

The efficacy of the developed parallel process model in bolstering resilience among spouses of veterans implies that the application of this cognitive model enhances the spouses' comprehension and acknowledgment of life's realities. Consequently, individuals are better equipped to confront the truths of problems, scrutinize them from diverse perspectives, and approach challenges with openness and positivity. This stands in contrast to succumbing to despair or magnifying negative aspects, as the cognitive model fosters a constructive perspective and encourages the pursuit of solutions. Hence, the implementation of educational methodologies grounded in theoretical frameworks and cognitive models emerges as a pivotal factor in augmenting the adaptation and resilience levels of spouses of veterans grappling with PTSD.

## Acknowledgements

Not applicable.

## Authors' contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: ARA, NHP, HN, AA; Drafting the work or revising it critically for important intellectual content: ARA, NHP, HN, AA; Final approval of the version to be published: ARA, NHP, HN, AA; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: ARA, NHP, HN, AA.

## Funding

Self-funded.

## Ethics approval and consent to participate

This project was approved by the research council of the Islamic Azad University of Mashhad branch, and the code of ethics was obtained from the Bioethics Committee of Mashhad Azad University IR.IAU.MSHD.REC.1402.018. This project was approved by the Iran Clinical Trial Registration Center (IRCT20230608058420N1).

## Competing interests

We do not have potential conflicts of interest with respect to the research, authorship, and publication of this article.

## Availability of data and materials

The datasets used during the current study are available from the corresponding author on request.

## Using artificial intelligent chatbots

None.

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**How to cite this article:** Rezaei Aghuei A, Hekmati Pour N, Nejat H, Akbari A. Effect of the developed parallel process model on the resilience of spouses of post-traumatic stress disorder veterans: A quasi-experimental study. *J Nurs Adv Clin Sci.* 2024;1(1):10-15. <https://doi.org/10.32598/JNACS.2401.1000>.