











Evaluating the Effectiveness of Resilience Training among Nursing Professionals in Saudi Arabia



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Abstract:

Introduction: Nursing is a demanding profession that calls for resilience and stress management. Nevertheless, many nurses do not receive adequate training in these areas. This study aimed to evaluate the impact of resilience training programs on work-related stress and resilience levels among nurses in Saudi Arabia.

Methods: A quasi-experiment intervention study employing pre- and post-test approaches was conducted from January to March, 2024, to assess a resilience training program for nurses in Hail, Saudi Arabia. Fifty nurses from sixteen hospitals were divided into two groups in the stratified random sample: the intervention group (n = 25) and the control group (n = 25). Data was collected using an online survey at baseline and three months post-training, with the Connor-Davidson Resilience Scale and the Expanded Nursing Stress Scale employed for measuring outcomes. The paired samples t-tests for statistical analysis were performed using the IBM SPSS Statistics 29.0.

Results: Significant improvements were noted in the intervention group, with resilience scores improving to 79.50 from 77.12 ($p = 0.015$) and stress levels decreasing to 63.54 from 65.08 ($p = 0.020$). No significant changes were noted in the control group.

Conclusion: Findings indicate that resilience training programs can significantly enhance resilience levels and reduce work-related stress. These results underscore the importance of implementing structured resilience training to better equip nurses for the challenges of their demanding profession.

Keywords: Resilience, Resilience training, Work-related stress, Nurses, Intervention, Statistical analysis.

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1. INTRODUCTION

Nursing stands as one of the most challenging professions, exerting significant pressure on the

psychological health of its practitioners [1]. For this reason, nurses have to be resilient. The concept of resilience in nursing is defined by Cooper *et al.* [2] as the ability to deal with stress in a positive way while still

maintaining high-quality care. Yet, the current healthcare landscape, evident by intense demands and hazardous working conditions, significantly compromises this resilience [1]. The situation is further aggravated by a global rise in occupational stress within the healthcare sector. Stress develops when the demands of a job exceed the needs, resources, or abilities of employees, resulting in negative psychological and physiological effects [3]. Nurses, specifically, face a disproportionate amount of stress caused by elements, such as insufficient organisational support, conflict in the workplace, extended shifts, staff shortages, patient care demands, and high workloads [4, 5]. The consequences of this stress are profound, leading to burnout and reduced productivity, lower job satisfaction, and an increased likelihood of nurses leaving the profession [4, 6].

In Saudi Arabia, nurses face many challenges that have a significant impact on job satisfaction and mental well-being. This is a view acknowledged by Alanazi *et al.* [7], who concluded that job-related stress is prevalent among nurses in Saudi Arabia. Alharbi and Alshehry [8] added that this stress is exacerbated by limited coping strategies. Albougami *et al.* [9] reported that this stress has led many nurses in Saudi Arabia to contemplate leaving the profession. It is within this context that the government in Saudi Arabia is attempting to use the Saudi Vision 2030 to deal with the challenges by improving the status of the nursing profession through better working conditions, training, and education [10].

One approach to addressing this rising issue in the healthcare sector is the introduction of interventions for enhancing resilience. Studies have illustrated that with resilience training initiatives, nurses can become more resilient, consequently improving their job satisfaction, performance, well-being, and mental health while also playing the role of a buffer against burnout, which has positive effects on both the professionals and the institutions in which they work [2, 11-16]. Therefore, establishing a work environment that minimizes stress and strengthens coping strategies is also crucial for nursing professionals. This view is acknowledged by Alanazi and Alharbi [7, 8], who advised that nurse administrators can play a profound role in developing policies that nurture such an environment, while nurse educators can improve awareness among nurses regarding stress coping and reduction skills. Furthermore, offering mental health training at workplaces is an effective way of demonstrating to employees that their psychological well-being is a priority [17]. Training on stress management complements such efforts by providing nurses with practical tools and techniques to mitigate the physiological and psychological impacts of stress [3]. This holistic approach ensures that nurses are not merely surviving but thriving within their roles and able to provide high-quality patient care even in stressful situations.

Numerous worldwide initiatives have been implemented to enhance the resilience of nurses, exhibiting significant positive results. Critical care nurses in Iran participated in five 90-120-minute sessions of resilience

training [5]. Four weekly mindfulness sessions were combined with a one-day workshop as part of Australia's mindful self-care and resilience program [18]. Other programs involved adult high-acuity mental health nurses delivered in two full-day workshops three weeks apart [19] and a one-day self-compassion workshop for paediatric nurses in the United States [17]. Another US-based study involving paediatric intensive care nurses focused on burnout, secondary traumatic stress, and compassion fatigue with a continuous approach rather than a fixed-term program [15]. Blackburn *et al.* [20] reported on an oncology program for nurses that featured an eight-hour retreat and a six-week social media group study. Based in the United Kingdom, forensic nurses received a work-based resilience intervention with six full-day sessions over 12 weeks [21]. In the study by Bonamer and Aquino-Russell [22], participants took part in Transcendental Meditation (TM) twice daily for 20 minutes, attended bi-weekly meetings, and had a hospital location for TM practice before and after shifts.

Qualitative research demonstrated the advantages of resilience interventions, highlighting improvements in emotional control, cognitive clarity, self-care prioritisation, and coping with stress at work [18, 19], in addition to enhancements in nurses' professional interactions and confidence [21]. Furthermore, studies have reported that longer resilience programs, including ones with longer sessions and extended overall duration, are linked to higher efficacy [14]. Notwithstanding the proliferation of studies dealing with programs seeking to increase resilience among nurses from the Western context, an analysis of the major databases demonstrated that there is a dearth of such studies specifically focusing on Saudi Arabia and the Middle East.

Due to the need for specific resilience enhancement interventions within the Saudi nursing field, the present study suggests a comprehensive education program focused on improving resilience and dealing with workplace stress among nurses at the Hail Health Cluster, Saudi Arabia. The success of this program will lead to its integration into regular nursing staff development activities within the Hail Health Cluster, contributing to improved patient care quality, reduced staff burnout, and enhanced professional satisfaction among nurses. Given the absence of prior research, this study stands as the first documented exploration of the effects of resilience training on occupational stress and resilience among nurses in Saudi Arabia.

1.1. Intervention

The Nursing Resilience Training Program, grounded on theories and clinical practice insights, is a 24-hour program conducted over three days (8 hours per day). The program facilitates engagement in activities that build resilience at both the personal and professional levels. It also aims to reduce the levels of anxiety and stress among nurses. The facilitators are trained nursing educators who specialise in both clinical practice and resilience theory, making sure that the learning experience is both comprehensive and robust.

1.2. Theoretical Framework

The intervention program in the present study is based on numerous theories and models. The resilience theory defines resilience as the capability to positively adapt in the face of hardship [23]. Another related theory is the Cognitive Behavioural Theory (CBT), which focuses on modifying dysfunctional thoughts, behaviours, and emotions based on a systematic approach [24]. The Self-Determination Theory (SDT) highlights the significant role of relatedness, competence, and autonomy in nurturing intrinsic motivation [25]. Finally, mindfulness-based stress reduction (MBSR) focuses on methods of reducing stress by improving mindfulness [26].

1.3. Structure and Content

The program consists of three sessions, as presented in Table 1.

1.4. Training Methods

The content in the program is delivered using lectures, group discussions, and questions and answers. Lectures provide the theoretical foundations and practical applications, while group discussions facilitate the sharing of experiences and collective problem-solving. The Q&A sessions help clarify concepts and address individual concerns. In addition to theoretical learning, the program incorporates practical activities that foster resilience. These include mindfulness exercises, such as yoga, meditation, and mindful breathing, along with positive psychology interventions like gratitude journaling, savouring positive experiences, and engaging in fulfilling hobbies. These activities are designed to be easily integrated into both professional and personal life, providing ongoing support for resilience.

2. MATERIALS AND METHODS

2.1. Study Design

This study utilized a quasi-experimental design with pre- and post-test evaluations to assess the impact of a resilience training program. It included both intervention and control groups, featuring two measurement phases: a

baseline assessment before the training and a post-test three months after completion. The research was conducted from January to March, 2024.

This study adhered to the ethical principles outlined in the Declaration of Helsinki, which ensures the rights, safety, and well-being of all participants involved in research. Ethical approval was obtained from the Ethics Committee of Hail Region in November, 2023 (Approval no. 2023-64). Participants were required to review a consent form and an informational document explaining the study's objectives, the confidentiality assurance for the data obtained, and the approximate time needed to complete the survey.

2.2. Sample and Study Setting

Participants were sourced comprehensively from a network of 16 public hospitals within the Hail Health Cluster, Saudi Arabia. Each hospital's nursing office provided a list of eligible nurses. To be eligible for the training program, candidates were required to have at least one year of experience as staff nurses and a willingness to participate. The participants represented a diverse array of professional settings, including in-patient wards, critical care units, emergency rooms, outpatient services, and non-clinical departments. This diversity aimed to capture a comprehensive understanding of resilience across different nursing environments.

From the list, participants were randomly selected using a stratified random sampling technique. Randomization was conducted using a computer-generated random number sequence to assign participants to either the intervention ($n = 25$) or control ($n = 25$) groups. This process ensured the minimization of selection bias. The final sample size determination was informed by pragmatic factors, such as resource availability and time limitations. A priori power analysis, considering an anticipated medium effect size, a standard deviation from previous similar studies (17), and a standard α level of 0.05, indicated that a minimum of 50 participants would provide sufficient power to detect significant differences between groups. Both the intervention and control groups maintained full participation throughout the study period.

Table 1. Components of the program.

Session	Topic	Focus
1	Foundations of resilience	The main focus of this session is establishing a supportive learning environment and introducing foundational concepts. It covers the resilience theory and explore the characteristics of resilient people and the cognitive-behavioural approach to dealing with difficulties.
2	Developing resilience	This session delves into the themes related to nurse resilience, including self-development, nurturing a positive attitude, and developing strategies for dealing with adversity. Some of the main topics related to the SDT include the comprehension of external factors, such as meaningful roles, accountability, and social support, as well as internal elements, like self-esteem and optimism. The session also incorporates the MBSR technique and teaches mindfulness techniques like Beginner's mind, letting go, compassion, gratitude, authenticity, commitment, and trust.
3	Managing professional hardship	This session is linked to the grounded theory of burnout and resilience, which underlines the range from resilience to burnout and makes available strategies for dealing with professional hardship (27). Some of the techniques covered include protection (having self-care routines and boundaries), processing (supervision and reflective practices), decontamination (methods of emotional release and recovery), and distance (management of professional detachment and re-engagement). The session also employs cognitive behavioural methods for improving self-care, self-awareness, self-confidence, hope, determination, stress management, and communication.

2.3. Research Plan for Control and Intervention Groups

2.3.1. Intervention Group

Participants in the intervention group attended a 24-hour Nursing Resilience Training Program delivered over three consecutive days (8 hours per day). The program included theoretical and practical components, such as mindfulness exercises, cognitive-behavioral strategies, and positive psychology techniques.

2.3.2. Control Group

Participants in the control group did not receive any intervention during the study period. They continued their routine clinical work without additional training. However, they were assessed using the same instruments as the intervention group at baseline and three months later to allow for direct comparisons.

2.4. Data Collection

Data collection for the study was conducted using an online survey platform. Nurses were able to participate in the study by scanning a barcode that granted them access to the survey both before the initiation of the resilience training course and three months after completion.

The study analysed a range of demographic factors among the participants, including gender, age, ethnicity, marital status, educational qualifications, years of experience, and their specific areas of work. To assess the impact of the resilience program, baseline evaluation was performed using two principal instruments: the Connor-Davidson Resilience Scale (CD-RISC-25) to measure resilience and the Expanded Nursing Stress Scale (ENSS) to assess stress levels. After the resilience program was completed, the cohort of nurses underwent the same evaluation process three months post-training to monitor the resilience enhancements and the long-term management of stress.

2.5. Instrument

The data collection for the study incorporated two validated scales: The CD-RISC-25, or Connor-Davidson Resilience Scale, is a comprehensive tool designed to assess the resilience levels of individuals. Developed by Connor and Davidson [27], the scale is composed of 25 items that capture a wide range of resilience attributes. Each item on the CD-RISC-25 is rated using a 4-point Likert scale, where participants can indicate the degree to which a statement is true for them, starting from 0 (not true at all) to 4 (true nearly all the time). The scoring for the scale involves summing up the total of all items. This results in a possible range from 0 to 100, where higher scores indicate greater resilience. An example of items included in the scale is: "I am able to adapt when changes occur". The reliability of the scale has been thoroughly evaluated, with a Cronbach's α of 0.89 [27].

The Expanded Nursing Stress Scale (ENSS) is a specialized instrument formulated by French *et al.* [28] to assess the levels of occupational stress experienced by

nursing professionals. The ENSS is thorough, consisting of 57 distinct items that explore various stressors encountered in the nursing field. Each item is scored on a 4-point Likert scale, where respondents indicate the frequency of their stress experiences, starting from 0 (never stressful) to 4 (extremely stressful). The range of items covers multiple dimensions of work-related stress, including workload, patient care, interpersonal relationships, and the organizational environment. The total score, which can vary from 0 to 228, reflects the cumulative stress level, with higher scores denoting more significant stress. Reliability of the ENSS was demonstrated with α coefficients of ≥ 0.95 [28, 29].

2.6. Data Analysis

Paired samples t-tests were used to compare the means of the constructs before and after the intervention. Cronbach's α scores were calculated for construct reliability. All analyses were carried out with a 95 percent confidence interval and considered statistically significant with a p -value < 0.05 .

3. RESULTS

3.1. Demographic Characteristics

The control group consisted of 25 participants: 44.0% men ($n = 11$) and 56.0% women ($n = 14$). Age distribution was 68.0% aged 20-29, 28.0% aged 30-39, and 4.0% aged 40-49. Most participants were Saudi Arabians (72.0%), followed by South Asians (12.0%), Southern Asians (12.0%), and Middle Easterns (4.0%). Their marital status was 68.0% single and 32.0% married/partnered. Educationally, 92.0% held a bachelor's degree, 4.0% a diploma, and 4.0% a master's degree. Professional experience varied, with 60.0% having 0-5 years, 28.0% having 6-10 years, and 12.0% having over 10 years. Areas of work included inpatient care (44.0%), emergency room (20.0%), and critical care (36.0%).

The intervention group also had 25 participants: 32.0% men ($n = 8$) and 68.0% women ($n = 17$). Age distribution was 56.0% aged 20-29 and 44.0% aged 30-39. Most were Saudi Arabians (92.0%), with 8.0% South Asians. Their marital status was 60.0% single and 40.0% married/partnered. Educationally, 76.0% had a bachelor's degree, 20.0% a diploma, and 4.0% a master's degree. Professional experience included 56.0% with 0-5 years, 24% with 6-10 years, and 20.0% with over 10 years. Work areas were inpatient care (24.0%), emergency room (32.0%), critical care (32.0%), outpatient care (8.0%), and non-clinical roles (4.0%) (Table 2).

3.2. Resilience (CD-RISK-25 Scale) and Stress Levels (ENSS Scale)

The results of the study indicated significant changes in the intervention group compared to the control group. For the intervention group, the mean CD-RISK-25 resilience score increased from 77.12 (SD = 12.78) before the intervention to 79.50 (SD = 17.00) after the intervention, with $p = 0.015$ signifying a statistically significant improvement in resilience. Additionally, the

mean ENSS stress score decreased from 65.08 (SD = 35.01) before the intervention to 63.54 (SD = 39.19) after the intervention, with $p = 0.020$ indicating a statistically significant reduction in stress. In contrast, the control group did not exhibit significant changes. The mean CD-RISK-25 resilience score for the control group decreased from 74.96 (SD = 13.00) before the intervention to 67.44 (SD = 17.67) after the intervention, with $p = 0.144$ suggesting that this change is not statistically significant. Similarly, the mean ENSS stress score for the control group decreased slightly from 83.64 (SD = 30.55) before

the intervention to 81.32 (SD = 33.77) after the intervention, with $p = 0.225$ indicating that this change is not statistically significant (Table 3).

3.3. Reliability of Constructs

The reliability of the CD-RISK-25 and ENSS scales was high in both groups. In the control group, the CD-RISK-25 had a Cronbach's α of 0.909, and the ENSS had a Cronbach's α of 0.924. In the intervention group, the CD-RISK-25 had a Cronbach's α of 0.937, and the ENSS had a Cronbach's α of 0.984, indicating excellent internal consistency across all items.

Table 2. Demographic characteristics.

-	Control Group n (%)	Intervention Group n (%)
Gender		
Men	11 (44.0)	8 (32.0)
Women	14 (56.0)	17 (68.0)
Age Group		
20-29	17 (68.0)	14 (56.0)
30-39	7 (28.0)	11 (44.0)
40-49	1 (4.0)	-
Ethnicity		
Middle Eastern	1 (4.0)	-
Saudi Arabian	18 (72.0)	23 (92.0)
South Asian	3 (12.0)	2 (8.0)
Southern Asian	3 (12.0)	-
Marital Status		
Single	17 (68.0)	15 (60.0)
Married/partnered	8 (32.0)	10 (40.0)
Educational Attainment		
Diploma	1 (4.0)	5 (20.0)
Bachelor's degree	23 (92.0)	19 (76.0)
Master's degree	1 (4.0)	1 (4.0)
Years of Experience		
0-5 yrs	15 (60.0)	14 (56.0)
6-10 yrs	7 (28.0)	6 (24.0)
10+ yrs	3 (12.0)	5 (20.0)
Area of Work		
In patient	11 (44.0)	6 (24.0)
ER	5 (20.0)	8 (32.0)
Critical care	9 (36.0)	8 (32.0)
Outpatient	-	2 (8.0)
Non-clinical	-	1 (4.0)

Note: n = number; yrs = years; ER = Emergency Room.

Table 3. CD-RISK-25 and ENSS scores by group.

-	Before Intervention M \pm SD	After Intervention M \pm SD	p-value	t-value
Intervention Group				
CD-RISK-25 Overall Score	77.12 \pm 12.78	79.50 \pm 17.00	.015*	2.51
ENSS Overall Score	65.08 \pm 35.01	63.54 \pm 39.19	.020*	2.42
Control Group				
CD-RISK-25 Score	74.96 \pm 13.00	67.44 \pm 17.67	.144	1.51
ENSS Score	83.64 \pm 30.55	81.32 \pm 33.77	.225	1.23

Note: CD-RISK-25 = Connor-Davidson Resilience Scale; ENSS = Expanded Nursing Stress Scale; M = Mean; SD = Standard Deviation; * = $p < .05$

4. DISCUSSION

The findings of this study demonstrated the effectiveness of the resilience training program in significantly improving resilience and reducing stress among participants in the intervention group. Specifically, the mean CD-RISK-25 resilience score increased significantly from 77.12 to 79.50, and the mean ENSS stress score decreased significantly from 65.08 to 63.54. These results underscored the potential of structured resilience training programs to enhance psychological well-being and stress management in nursing professionals.

The significant increase in resilience scores suggests that the training effectively bolstered participants' ability to cope with adversity and maintain psychological stability. This aligns with existing literature that highlights the role of resilience training in improving adaptive coping mechanisms and overall mental health [2, 11-13]. For example, a study by Babanataj *et al.* [5] reported a significant increase in mean resilience scores among critical care nurses from 67.97 to 81.43 after the intervention. Similar results were also reported in Blackburn *et al.* [20], where baseline scores were 74 and increased to 86 after the intervention among oncology nurses. In a study by Bonamer and Aquino-Russell [22], scores increased from 70.4 to 81.2 post-training. Additionally, Henshall *et al.* [21] found that resilience training in forensic nurses led to significant improvements in resilience and reductions in symptoms of burnout.

Moreover, the significant reduction in stress scores among the intervention group participants indicated that the training also had a positive impact on their perceived stress levels. This finding is particularly relevant for nursing professionals, who often operate in high-stress environments [30]. Similar outcomes were reported in the other studies as well [5, 13, 17, 31], which found that resilience-building programs significantly reduced stress and improved well-being among healthcare providers. By incorporating resilience training into professional development programs, healthcare institutions can better support their staff in managing occupational stress and preventing burnout.

In contrast, the control group did not exhibit significant changes in either resilience or stress scores. The resilience score for the control group decreased from 74.96 to 67.44, and the stress score slightly decreased from 83.64 to 81.32, but neither change was statistically significant. These findings might further validate the effectiveness of the intervention, as the absence of significant improvements in the control group suggests that the observed benefits in the intervention group can be attributed to the resilience training program. However, the decline in resilience score in the control group could also suggest that factors external to the intervention, such as workplace stress or burnout, could have influenced resilience levels over time. Exploring these contextual influences could provide valuable insights into future research.

It is also essential to recognize that resilience is complex and contextual, influenced by both individual and environmental factors [32]. Effective resilience training must address not only personal coping mechanisms but also structural and organizational factors that contribute to stress and burnout. For instance, while our training program focused on individual strategies, additional measures, such as improving staffing ratios, reducing administrative burdens, and enhancing workplace support systems, are crucial for long-term success [33, 34].

One limitation of this study is the relatively short follow-up period of three months. Future research could extend the follow-up duration to assess the long-term sustainability of improvements in resilience and stress reduction. Additionally, the small sample size limits the generalizability of the findings, and larger samples could address this issue.

Another limitation is the inability to perform statistical comparisons of demographic characteristics due to small or zero counts in some categories. The baseline difference in stress scores between groups may reflect unmeasured factors, highlighting a limitation of the study's non-randomized design. Future studies with larger samples or randomized designs could address these issues.

CONCLUSION

In conclusion, this study provides evidence that resilience training programs can significantly improve resilience and reduce stress among nursing professionals. Implementing such programs could be a valuable strategy; however, they should be part of a comprehensive strategy that includes addressing systemic issues and providing continuous support. Implementing these changes can lead to more significant and sustainable improvements in the well-being and performance of the nurses.

AUTHORS' CONTRIBUTION

H.A. and N.A.: Study conception and design; K.G. and F.G.: Data collection; M.J.: Data curation; D.T.: Data analysis or interpretation; M.T.T.: Conceptualization; N.E.: Methodology; W.A.: Visualization; A.A.: Writing the review and editing. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

TM	=	Transcendental Meditation
CBT	=	Cognitive Behavioural Theory
SDT	=	Self Determination Theory
ENSS	=	Expanded Nursing Stress Scale
MBSR	=	Mindfulness-based Stress Reduction

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Ethics Committee of Hail Region Saudi Arabia in November, 2023 (Approval no. 2023-64).

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Participants were required to review a consent form and an informational document explaining the study's objectives, the confidentiality assurance for the data obtained, and the approximate time needed to complete the survey.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIAL

All data generated or analyzed during this study are included in this published article.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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