

Effect of Resilience Training Program on Perceived Stress among Acute Care Nurses

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Abstract: Background: perceived stress in the workplace is a growing concern globally, particularly in high-stress professions such as nursing. The effects of workplace stress on nurses and healthcare organizations can indeed be significant, including illness, absenteeism, and reduced work performance.

Purpose: was to examine the effect of resilience training program on perceived stress among acute care nurses. **Design:** Quasi-experimental two groups' research design was used. **Setting:** it was conducted in the acute care units at Beni-Suef University Hospital. **Sample:** Simple random sampling technique was used to recruit 160 nurses from acute care units. **Instruments:** The Modified Connor-Davidson Resilience Scale and perceived stress scale were used. **Results:** Study group had very high resilience level after implementation of the program (60%). Nearly half of the study group had a very low perceived stress level after implementation of the program (56.3%). **Conclusion:** Resilience training is an effective method that helps nurses to better handle stressful situations in their workplace. **Recommendations:** Nurse Leaders should continue to promote resiliency to nursing staff by reinforcing protective factors such as good time management, problem solving and decision making, effective communication and supportive professional relationships. Build positive and supportive work culture through monthly meetings, conferences to voice their problems, opinions, and needs.

Keywords: Acute care units, Nurses, Perceived stress, Resilience, Training program.

Introduction

The working environment in all health care settings provides massive demands for workers. Nurses account for the largest percentage of health-

care workers specifically in the acute care setting. Acute care units, such as intensive care units (ICUs) or emergency departments, can be

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particularly demanding and stressful environments for healthcare workers, including nurses. Several factors contribute to the complexity and difficulty of these workplace including demanding routines, sophisticated and noisy equipment, lack of natural light and high chances of death and pain (Andersson, et al., 2022).

These acute care settings are psychologically demanding as nurses working in it deal with high-stake life events and most acutely ill patients. And whilst there is some argument to be made for systemic changes to decrease these demands, this will not be achieved in the near future. So, being able to equip these workers with the needed resources to cope with their demands can decrease the risk of losing these experienced, highly skilled employees from the profession completely (Peter et al., 2020) .

Building resilience among nurses has been considered an important approach to support and retain them in the nursing profession. Resilience is “the process of effectively negotiating, adapting and managing significant sources of stress or trauma”. It involves an individual's capacity to bounce back or recover from stressors by adapting to challenging circumstances, maintaining their well-being despite adversity, and functioning at a high level despite difficult circumstances or hardships. (Mealer et al 2020).

In other word, resilience is a crucial characteristic that enables nurses to cope effectively with their work environment and maintain healthy psychological well-being, even in the face of excessive stressors. Highly resilient nurses are less likely to develop post-traumatic stress disorder (PTSD) compared to those with lower levels of resilience. Resilience acts as a protective factor against the negative

effects of stress and helps nurses better manage work-related stressors (Cooper et al., 2021).

The stressors in the workplace of nurses include working relationships with other nurses and other health care provider, communications with patients and their family, complicated and noisy equipment, high levels of knowledge and skill required to handle complex patient conditions, heavy workloads, quick response to emergencies and critical situation, and the heavy burden of patients' care (Badu et al., 2020) .

The high level of stress experienced by nurses in the workplace can have several negative consequences, both for the nurses themselves and for the quality of patient care. High turnover among nurses, conflicts with colleagues, job dissatisfaction, perception of being unable to meet expectations, burnout, being more prone to taking sick leave or being absent from work, and poor quality of nursing care are potential outcomes associated with workplace stress. Moreover, because of their stressful work environment, ACN are at great risk of developing psychological disorders such as burnout syndrome, anxiety, depression and posttraumatic stress disorder (Ogińska-Bulik and Michalska, 2020).

While stress related to workplace cannot be eliminated, nurses can learn different techniques that help them to build resilience, alleviate stress, and decrease fatigue. Resilience has emerged globally as a valuable approach to cope with workplace stress and prevent burnout (Badu et al., 2020).

Significance of the study

Studies indicate that stress is very prevalent among nurses as around 74% of nurses experience severe stress,

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which makes nurses more prone to substance abuse, depression, insomnia, burnout, and higher rates of suicide. Severe stress may also lead to unhealthy coping strategies among nurses including smoking and maladaptive behaviors (Alkhalaf, et al., 2020). Resilience can be defined as the capacity to bounce back, adapt, and recover from adversity or distress. (Chen, et al., 2022). Therefore, identifying effective methods to enhance resilience is crucial. To date, little is known about the efficacy of these interventions among nurses (Kunzler, et al., 2022).

Purpose:

The purpose of the study was to examine the effect of resilience training program on perceived stress among acute care nurses.

Research hypothesis:

Acute care nurses who receive resilience training program are expected to have a lower level of perceived stress than nurses who do not receive the training program.

Methods

Research Design:

Quasi-experimental two groups design was utilized to fulfill the purpose of the study.

Research Settings:

The study was conducted at Beni-Suef University acute care units.

Sampling:

A simple random sampling technique was used to recruit the study's sample from acute care units. 160 nurses were recruited proportionately from different acute care units. Nurses who have at least one year of experience and are involved in the direct care of patients and accepted to participate in

the study constituted both study and control groups. Then, the study sample was divided into 80 for the study group and 80 for control group. Sample size was calculated by using G Power Software, with a power of 0.80, 0 alpha of 0.05, and a medium effect size. The minimum sample size required for multiple regression analysis was 150 nurses. The total sample size of the current study was increased to 160 nurses to avoid the negative impact of attrition.
$$\text{Sample size } n = \frac{[DEFF * Np(1-p)]}{[(d^2 / Z^2 * 1 - \alpha / 2 * (N - 1) + p * (1 - p))]}$$

Instruments: -

Two instruments were used to gather the data.

Instrument one: The Modified Connor-Davidson Resilience Scale (CD-RISC):-

Part 1: Characteristics of nurse's Personal characteristics of studied nurses included age, gender, marital status, level of education and years of experience, and having previous training programs on resilience were collected too.

Part 2: It was developed by Dong, et al. (2013) to assess resilience. It consists of 27-items categorized into 4 dimensions: one's flexibility to cope with change and support (4 items), spiritual support (3 items), having a goal-oriented life (10 items). Instrument uses a 5-point Likert scale (1= strongly disagree to 5= strongly agree). The total mean score of resilience ranges from (27-135); A score of 27-49 indicates very low level of innovative behavior, a score of 50-71 indicates low level of resilience, a score of 72-93 indicates average level of resilience, a score of 94-114 indicates high level of resilience, and a score of 114-135 indicates very high level of resilience.

**Instrument two: Perceived Stress
Scale-10 Items (PSS-10)**

It was developed by Cohen, et al. (1983). It is one of the most widely used psychological instruments for measuring the perception of stress for individuals. It consists of 10 multiple choice questions which include choices on a 5-point Likert scale (0= never to 4= very often). Items number 4, 5, 7, and 8 have reverse score coding. Total score of the scale is divided into five levels ranges from 0 to 40. A score of 0-7 indicates very low stress level, a score of 8-11 indicates low stress level, a score of 12-15 indicates average stress level, a score of 16-20 indicates high level of stress, and a score of 21 and above indicates very high level of stress (Higazee, Rayan & Khalil, 2016).

Validity:

The instruments were tested for face validity by jury of seven expert's members in speciality of nursing administration from different faculties of nursing. Comments were taken into consideration and some items were re-phrased

Reliability:

For the current study the reliability was done by Cronbach's Alpha Coefficient test for modified CD-RISC (Connor-Davidson Resilience Scale) was (0.94) while, the original Cronbach alpha was (a =0.92) and Perceived Stress Scale-10 Items (PSS-10) was (0.78) while the original Cronbach alpha of the scale was (a =0.95).

Ethical Consideration:

Before data collection, an approval for the study's ethical conduct was obtained from the Ethical Research Committee at the Faculty of Nursing, Menoufia University.

Participation in the study was voluntary, participants were assured that they had the right to accept or refuse to participate in the current study. Withdrawing from the study at any time was assured too. A written consent was obtained from all participants who agreed to be part of the study. Participants were assured that there were no anticipated risks from the study. Confidentiality of participants' information was totally assured by preserving the anonymity of their personal data and keeping their collected data in closed closets.

Pilot study

The pilot study was conducted on 16 nurses who represented (10%) of the subjects' number. Based on the results of the pilot study, there were no modifications needed. Participants needed 20-30 minutes to complete the questionnaire. The sample of the pilot study wasn't included in the study sample. Pilot study sample was taken from other settings which had similar characteristics of the sample and setting of the study sample.

Procedure:

A letter was submitted from the Dean of the Faculty of Nursing, Beni Suf University to the director of Beni Suf University hospital explaining the purpose and methods of data collection. Data was collected using self-administered questionnaires. All questionnaires were distributed, completed, and collected from acute care nurses. The purpose of the current study and the instructions to fill in the questionnaire were provided to the entire study sample in a cover page. The nurses completed the questionnaires during working hours. Data collection lasted for six months; February till July 2022. During the month of February, both study and control group were assessed for

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resilience (independent variable; IV) to identify training needs for study group and determine the level of resilience for both groups. Additionally, both groups were assessed for perceived stress (dependent variable; DV). The purpose of assessing the DV for study group was to examine the effect of the training program in the post and follow-up phases of the program. While the change in the DV for control group was assessed to compare the outcomes of program implementation between both groups throughout the program phases.

Development and validation of the program included five phases:

Training needs analysis, instructional design, validation, implementation, and evaluation of the program.

Phase (I): Training needs analysis

This phase aimed to identify acute care nurses' theoretical and practical training needs related to resilience. During this phase, levels of resilience, perceived stress of both study and control groups were assessed using the two questionnaires. The questionnaire sheets were distributed and collected on the same day from nurses.

Based on the results of this phase (pretest) the following learning needs were identified:

The nurses had insufficient knowledge and skills related to coping with change and challenges, social and familial support, spiritual support, and goal-oriented life.

Phase (II): Instructional design

ADDIE model which consisted of five steps (Analysis, Design, Development, Implementation, and evaluation) was used. The program was designed based on the identified training needs and demands of acute care nurses gathered from phase I (pretest phase).

Each participant from both groups was given a specific code for the post and follow up questionnaires, this code was located on the demographic sheet of each participant.

▪ **Analysis (Formulation of the instructional objectives)**

The training program aimed to enhance acute care nurses' resilience level, decrease the level of perceived stress. To achieve this aim after determining the training needs of study sample, instructional objectives were formulated. Instructional objectives cover knowledge and understanding, practical skills and professional skills and were related to the following administrative concept change management, stress management, effective communication, time management, and problem solving and decision making.

▪ **Design (Selection and organization of content)**

Based on the identified training needs and established instructional objectives, the following contents were prepared for each concept.

Regarding coping with change and challenge' content included change management and stress management such as: concept, causes, and importance of change, relation between change and innovation and change management using Lewin's model. In addition, concept, causes, symptoms of stress, spiritual practices and relaxation techniques.

In relation to social and familial support content included: effective communication concept, elements of communication, and modes of communication, effective communication skills, and successful conflict management as an effective communicator.

Lastly, regarding having a goal-oriented life content included time

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management and problem-solving and decision-making skills such as: time management concept, principles of time management, steps of time management, steps of effective planning and time log application. In addition, the concept of problem solving and decision making, types of problems, steps of problem solving, ways of problem-solving, decision-making skills included as well.

▪ Development, implementation and evaluation

The teaching methods, teaching aids and evaluation methods were determined too. Different evaluation methods were selected based on knowledge and skills being acquired by nurses.

Phase (III): Validation of the program:

After completion of the content of training program a panel of expertise that included five professors in nursing administration from different faculties of nursing were invited to conduct the content and face validity for the program content. Minor rewording was made based on panel suggestions.

Phase (IV): Implementation of the program:

The program sessions were conducted in the auditorium of the University Hospital, Beni-Suef governorate. The study group was divided into almost equal three subgroups. Each subgroup attended 5 sessions. Each session lasted for two hours. Each session started at 10:00 am to 12 pm. Based on the nursing director's agreement to conduct the program participated acute care nurses assigned work was covered by another nurses during sessions .

The first session started by ice breaking to facilitate acquisition of knowledge and skills, then each

session started by providing a summary for the previous session and ended by thanking nurses for their attendance. Also, verbal positive reinforcements were provided in the form of saying well done for appropriate performance. Additionally, program was presented in clear and concise form and focused on the point of learning using different teaching methods including lectures, brainstorming, role play, case study, group discussion, and demonstration. In addition, teaching aids used to help for the attainment of the program objectives were handouts, pen and papers, data show, power point presentation, video and group's activities.

Phase (V): Evaluation :

Two types of evaluation were used to emphasize the acquisition of determined knowledge and skills, attitude.

Formative evaluation was used to assure that specific objectives of each session were achieved. Formative evaluation methods used e.g., questions and answers during session and group activities. While summative evaluation was used immediately after program completion to confirm the effect of the program. A follow up evaluation phase was conducted three months after program implementation to measure the retention of knowledge among study group.

Statistical analysis:

Data was coded and transformed into a specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using

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student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means.

Qualitative data were presented in the form of frequency distribution tables, number, and percentage. It was analyzed by chi-square (χ^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used (if the table was 4 cells), or Likelihood Ratio (LR) test (if the table was more than 4 cells). The level of significance was set as P value <0.05 for all significant tests.

Results

Table 1: illustrated Distribution of the acute care nurses according to their personal characteristics. It showed that, majority of study group's nurses (71.3%) aged > 25 years with mean of 24.2 ± 2.6 years, while 80% of control group are aged > 25 years, and the mean age of control group is 24.0 ± 2.8 years, and the difference was not significant statistically ($p > 0.05$ for each). Also, the table revealed that majority of acute care nurses in both study and control group were female (55% and 57.5% respectively), Single (61.3% and 57.5% respectively), experience > 5 years (90% and 92.5% respectively) and have Tech. Institute education or a technical diploma (77.5% and 76.3% respectively), however, the difference was not significant statistically ($p > 0.05$ for each). Unfortunately, all studied nurses don't have any previous training program on resilience (0% for study and control group).

Figure (1): Revealed distribution of acute care nurses according to place of work. The figure showed that nearly three fifths (58.2%) of nurses were working at specialized intensive care unit (SICU). While the lowest percent

(6.2%) of them were working at dialysis unit.

Table 2: illustrated mean and standard deviation of resilience dimensions throughout program phases among study group. This table declared that there was an improvement among study group throughout three phases of the program. Also, the table showed that there was a highly significant statistical difference ($P=0.000$) among resilience dimensions between pre and post phase of the program with a higher mean for one's flexibility to cope with change and challenge dimension in the post program phase (40.6 ± 4.8). In addition, there was a highly significant statistical difference ($P= 0.000$) among resilience dimensions pre and follow up phases of the program with a higher mean score for having a goal-oriented life dimension in the follow up phase of the program (35.5 ± 3.7). While there was a highly significant statistical difference among resilience dimensions post and follow up phases of the program with a higher mean score for one's flexibility to cope with change and challenge dimension in the post program phase (40.6 ± 4.8). Moreover, there was significant statistical decline in the follow up program mean score than post program except spiritual support dimension that shows no significant statistical difference post and follow up phases of the program.

Table 3: illustrated resilience levels throughout program phases for acute care nurses. This table revealed that nearly half of ACN (48.8%) of both study and control groups demonstrated low level of resilience before intervention. The same pattern was observed among control group either post intervention or follow up (50% in both groups)

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However, among the study group, the table highlighted the effectiveness of resilience training program for each item of resilience. Among study group, post-intervention program reveals a highly significant improvement ($p < 0.0001$) in the different items of resilience. The post program' high and very high-level resilience increased from 3.8% to 22.5%, and from 0% to 60% respectively, and the difference was highly significant statistically ($P = < 0.0001$). Moreover, in the follow up phase more than two thirds (72.5%) of study group had high level of resilience and there was a highly statistically significant difference between study group and control group regarding resilience levels ($P = < 0.0001$).

Figure 2: illustrated resilience levels throughout program phases among study group. It is clear from this figure that slightly less than half (48.8%) of the study group had low level of resilience before intervention, while three fifths (60%) of study group had very high level of resilience post intervention. Moreover, more than two thirds (72.5%) of study group had high level of resilience in the follow up phase of intervention.

Figure 3: Showed overall mean score of resilience throughout program phases among acute care nurses. As shown in the figure, the overall mean score of resilience among study group significantly increased immediately post and three months after resilience training program implementation (111.71 & 99.27 respectively) as compared to preprogram (73.27). While control group at baseline resilience through program phases (72.77, 71.7 & 71.76) during pre, post and follow up intervention respectively. The figure ascertained the effectiveness of the training program in

enhancing resilience level among study group.

Table 4: illustrated mean and standard deviation of perceived stress throughout program phases among study group. This table declared that there was remarkable decrease in stress level among study group throughout three phases of the program. Also, the table showed that there was a highly significant statistical difference at ($P = 0.000$) between perceived stress pre and post phase of the program. In addition, there is a highly significant statistical difference at ($P = 0.000$) between perceived stress pre and follow up phase of the program. While there was a highly significant statistical difference between perceived stress post and follow up phase of the program due to elevation of stress level among study group.

Table 5: illustrated perceived stress levels throughout the program phases among acute care nurses. This table revealed that the majority of studied nurses (90% & 91.2%) of both study and control groups demonstrated very high level of perceived stress before intervention. The same pattern was observed among control group either post intervention or follow up (88.7% & 90%) respectively.

However, among the study group, the table highlighted the effectiveness of resilience training program for each item of perceived stress. Among study group, post-intervention program revealed a highly significant improvement ($P = 0.000$) in the different items of perceived stress. The post program' very high-level perceived stress decreased from 90% to 1.3%, while the very low level of perceived stress increased from 0% to 56.3%, and the difference is highly significant statistically ($P = < 0.000$). Moreover, two fifths (40%) of study group had average level of perceived

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stress follow up intervention and there was high statistically significant difference between study and control group regarding perceived stress follow up intervention ($P= <0.000$). This result approved the current study hypothesis which states “Acute care nurses who receive resilience training program will have a lower level of perceived stress than nurses who do not receive the training program”.

Figure 4: illustrated perceived stress levels throughout the program phases among study group. It is clear from this figure that majority (90%) of the study group had V. high level of perceived stress before intervention, while more than half (56.3%) of study group had v. low level of perceived stress post intervention. Moreover, two fifths (40%) of study group had moderate level of perceived stress follow up intervention.

Figure 5: illustrated overall mean of perceived stress throughout program phases among staff nurses. As shown in this figure, the overall mean score of perceived stress among study group significantly decreased immediately post and three months after resilience training program implementation (9.4 & 14.0 respectively) as compared to preprogram (27.5). while control group at baseline perceived stress through

program phases (27.8, 27.7 & 27.8) during pre, post and follow up intervention respectively.

Table 6: presented the relation between post intervention resilience and perceived stress among study group of nurses. The table showed that there was a high significant negative association between resilience and perceived stress among studied nurses ($p<0.000$). The majority of nurses had an average level of resilience and showed a high level of perceived stress (85.5%). Less than half of nurses who had high level of resilience showed average level of perceived stress (44.5%). In addition, the majority of nurses had a V. high level of resilience show V. low level of perceived stress (85.4%).

Table 7: illustrated correlation coefficient between post intervention resilience and perceived stress among nurses of study group. This table showed that there was a high significant negative strong correlation between resilience and perceived stress ($r=-0.95$, $p<0.000$).

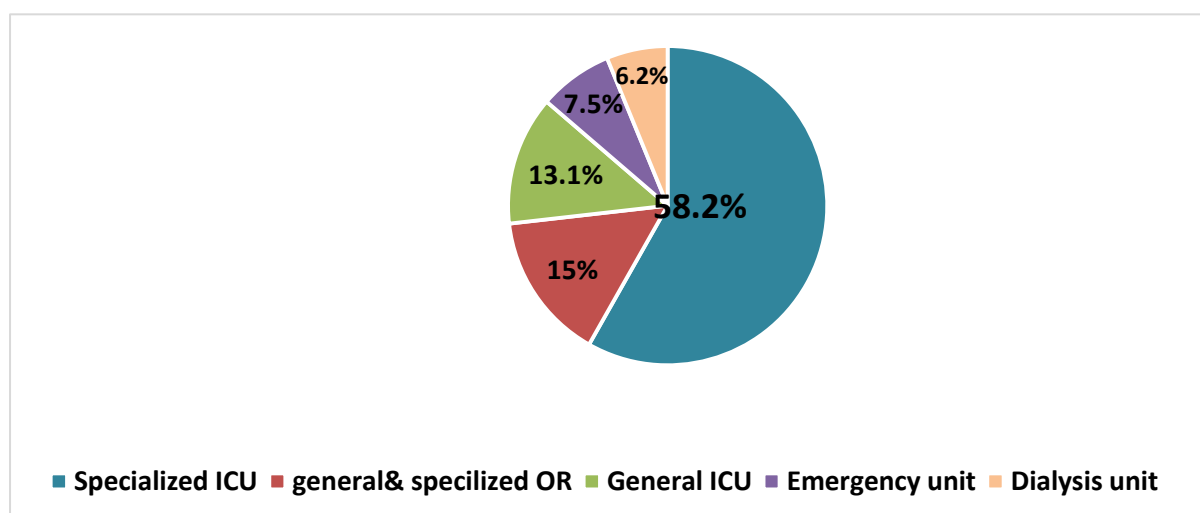
Table 8 & figure 6: summarized the regression analysis for the effect of resilience (independent variable) on stress (dependent variable). The ANOVA model was significant ($F=3303.3$, $P=0.000$).

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Table (1) Distribution of the acute care nurses according to their personal characteristics (N = 160).

PERSONAL CHARACTERISTICS	STUDY GROUP.		CONTROL GROUP		χ^2 / LR	P
	N0.	%	N0.	%		
Age groups:	57	71.3	64	80		
< 25 years	22	27.5	15	18.8	1.73	0.42
25<30 years						
30 years and more	1	1.2	1	1.2		
Mean ± SD Years	24.2± 2.6		24.0± 2.8		t= 0.54	0.58
Experience:	72	90	74	92.5		
< 5 years					1.72	0.42
5< 10 years	13	16.3	12	15		
10 years and more	0	0	1	1.2		
Mean ± SD Years	2.8 ± 1.2 Y		2.6± 1.4 Y		t= 0.01	0.98
Gender:						
Male	36	45	34	42.5	0.10	0.75
Female	44	55	46	57.5		
Marital status:						
Single	49	61.3	46	57.5		
Married	29	36.2	32	40	1.9	0.57
Divorced/ Widow	2	2.5	2	2.5		
Education:						
Diploma	2	2.5	3	3.8		
Tech. Institute	62	77.5	61	76.3	3.1	0.37
Bachelor& postgraduate	16	20	16	20		
Previous training:						
Yes	0	0	0	0		
No	80	100	80	100		
Total	80	100	80	100		

Figure 1: Distribution of acute care nurses according to place of work(N=160)



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Table (2): Mean and standard deviation of resilience dimensions throughout program phases among study group (n=80).

Dimensions	S. G			T1	P1	T2	P2	T3	P3
	Pre	Post	Follow						
	Mean ± SD								
1. One's flexibility to cope with change and challenge	23.0±4.8	40.6±5.8	35.4±3.2	34.3	0.000**	27.4	0.000**	13.8	0.000**
2. Social and familial support	10.5±2.6	16.9±2.2	14.5±1.6	22.7	0.000**	15.0	0.000**	12.9	0.000**
3. Spiritual support	12.5±1.1	13.6±1.8	13.7±1.2	7.4	0.000**	7.6	0.000**	1.5	0.133
4. Having a goal-oriented life	27.3±5.9	40.5±5.4	35.5±3.7	21.8	0.000**	14.8	0.000**	15.4	0.000**
Total	73.3±12.6	111.7±13.2	99.27±8.23	31.7	0.000**	23.3	0.000**	18.1	0.000**

P1: between pre and post

P2: between pre and follow up

P3: between post and follow up **: Statistically significant at P<0.01

Table 3: Resilience levels throughout program phases for acute care nurses (N=160).

Resilience levels	Pre				Post				Follow up				LR/P1	LR/P2	LR/P3
	S. G		C. G		S. G		C. G		S. G		C. G				
	N	%	N	%	N	%	N	%	N	%	N	%			
Very low	0	0	0	0	0	0	0	0	0	0	0	0	0.21 0.89	115.0 0.0001**	103.2 0.0001**
Low level	39	48.8	39	48.8	0	0	40	50	0	0	40	50			
Average	38	47.4	39	48.8	14	17.5	39	48.8	22	27.5	40	50			
High level	3	3.8	2	2.4	18	22.5	1	1.3	58	72.5	0	0			
Very high	0	0	0	0	48	60	0	0	0	0	0	0			
Total	80	100	80	100	80	100	80	100	80	100	80	100			

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Fig. 2: Resilience levels throughout program phases among study group (N=80)

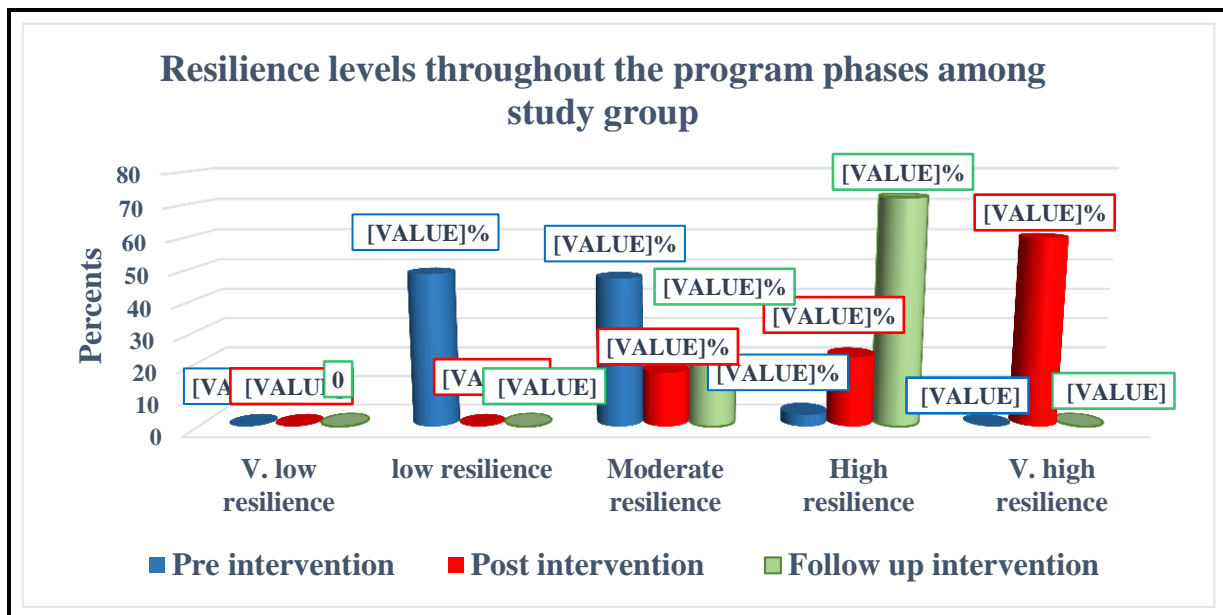
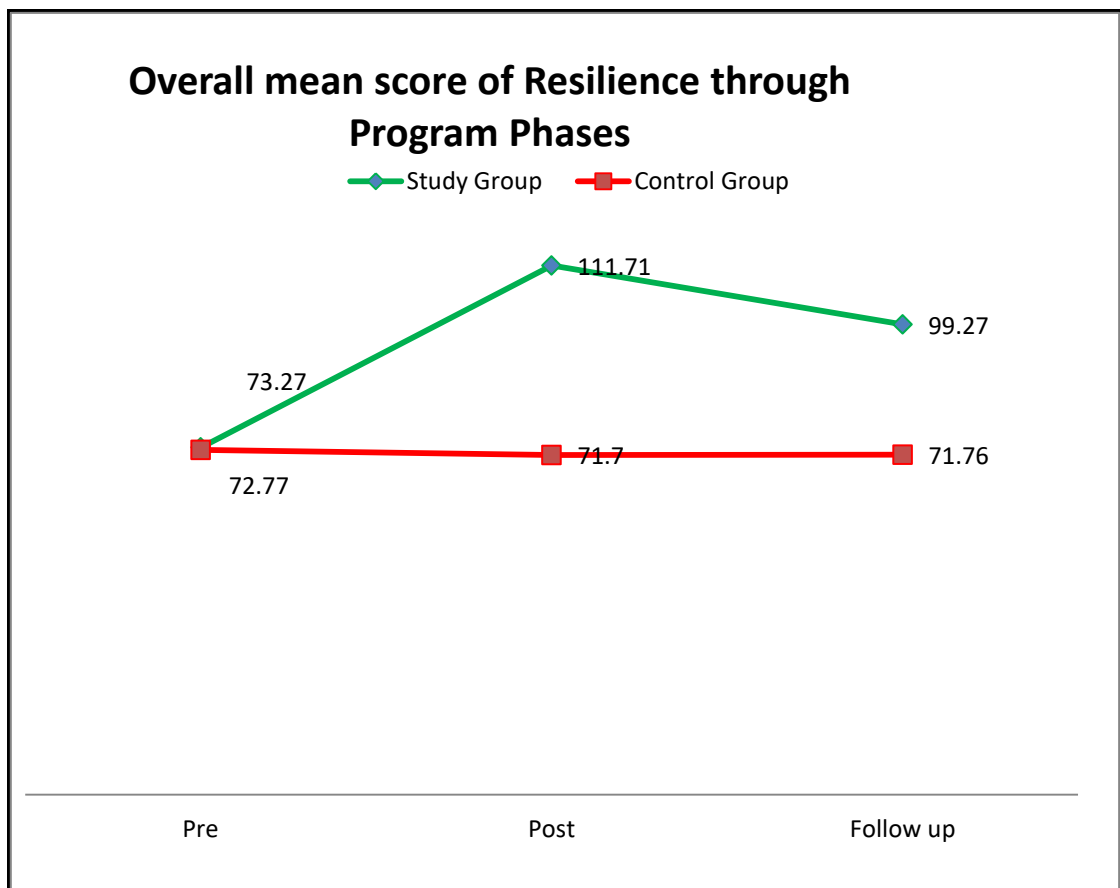


Fig. 3: Overall mean score of resilience throughout program phases among acute care nurses (N=80 for each).



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Table 4: Mean and standard deviation of perceived stress throughout program phases among study group (n=80)

Items	S. G			T1	P1	T2	P2	T3	P3
	Pre	Post	Follow						
	Mean ± SD								
Perceived stress	27.5±6.1	9.4±6.3	14.0±3.4	31.0	0.000**	23.1	0.000**	9.5	0.000**

P1: between pre and post

P2: between pre and follow up.

P3: between post and follow up.

** : Statistically significant at P<0.01

Table 5: Perceived stress levels throughout the program phases among acute care nurses (N=160).

Perceived stress levels	Pre				Post				Follow up				χ ² /P1	χ ² /P2	χ ² /P3
	S. G		C. G		S. G		C. G		S. G		C. G				
	N	%	N	%	N	%	N	%	N	%	N	%			
Very low	0	0	0	0	45	56.3	0	0	2	2.5	0	0	0.074	132.5	121.1
Low	0	0	0	0	7	8.6	0	0	19	23.7	0	0			
Average	0	0	0	0	10	12.5	0	0	32	40	0	0			
High	8	10	7	8.8	17	21.3	9	11.3	23	28.8	8	10			
Very high	72	90	73	91.2	1	1.3	71	88.7	4	5	72	90			
Total	80	100	80	100	80	100	80	100	80	100	80	100			

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Fig. 4: Perceived stress levels throughout the program phases among study group (N=80)

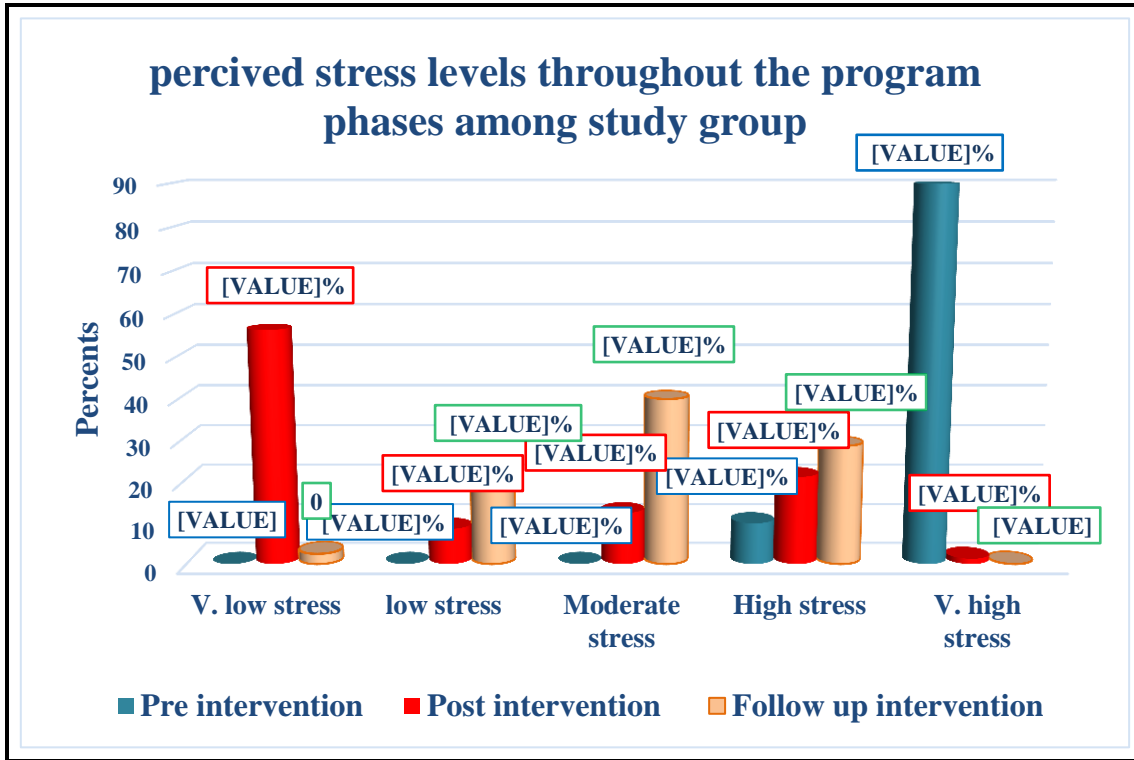
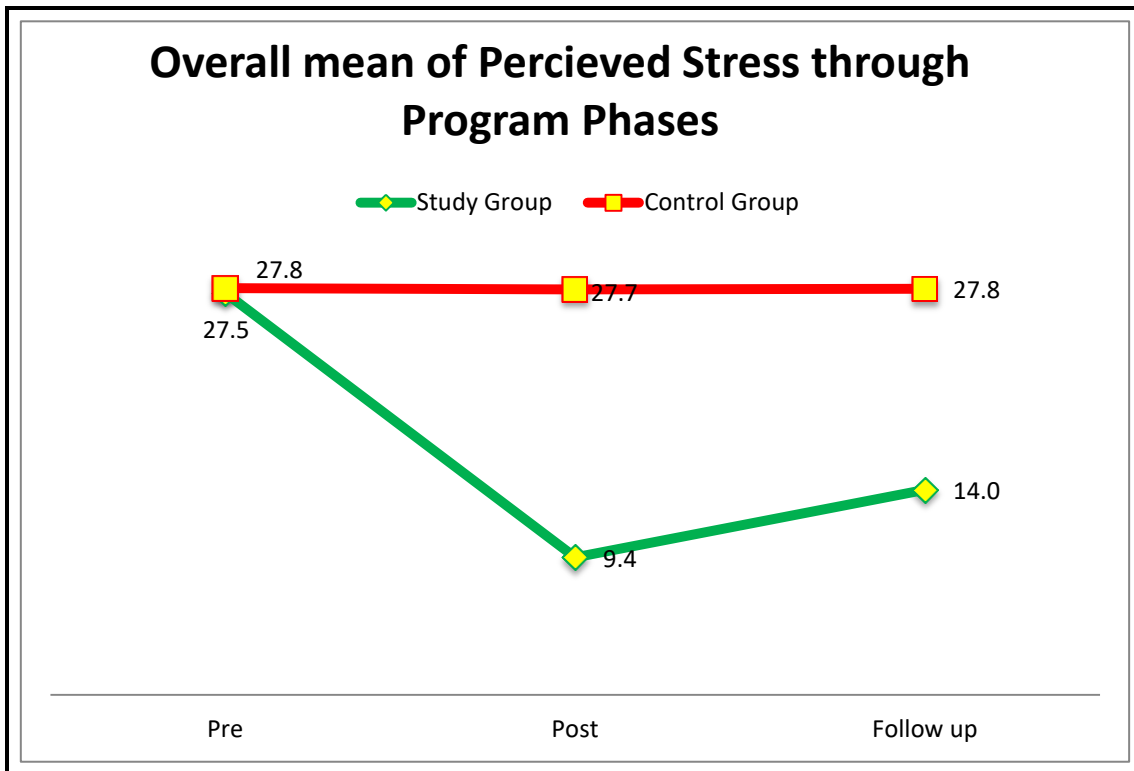


Fig. 5: Overall mean of perceived stress throughout program phases among acute care nurses (N=160)



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Table 6: Relation between post intervention resilience and perceived stress among study group (N=80).

Total resilience levels	Total perceived stress										Total	LR	P	
	Very low		Low		Average (12-15)		High (16-20)		Very high (≥ 21)					
	N	%	N	%	N	%	N	%	N	%				
Average (72 - 93)	0	0	0	0	1	7.1	12	85.8	1	7.1	14	100	77.78	0.000**
High (94-114)	4	22.2	2	11.1	8	44.5	4	22.2	0	0	18	100		
Very high (115-135)	41	85.4	5	10.4	1	2.1	1	2.1	0	0	48	100		
Total	45	56.3	7	8.8	10	12.5	17	21.2	1	1.2	80	100		

Table 7: Correlation coefficient between post intervention resilience and perceived stress of study group (N=80).

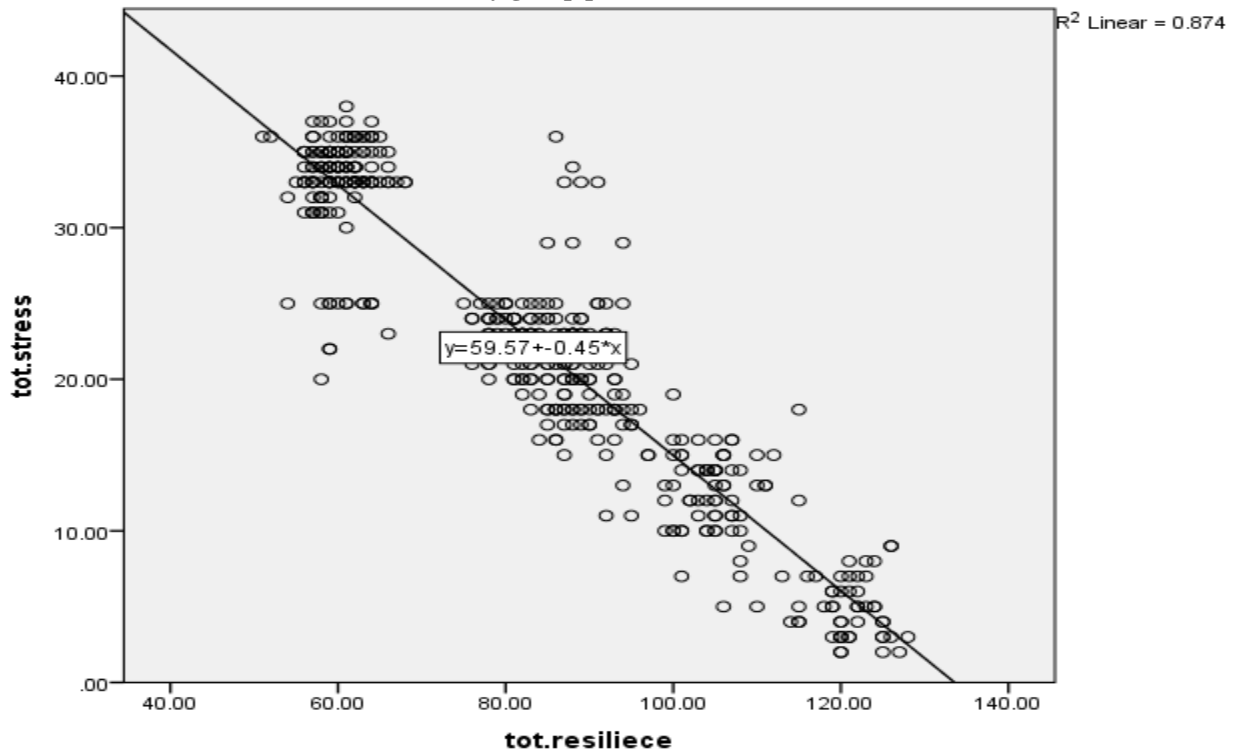
	Perceived stress	
	R	P
Resilience	- 0.94	<0.000**

Table (8): Regression Coefficients of Simple Linear Regression for the effect of resilience on perceived stress (n= 80)

Predictors	Unstandardized Coefficients		Standardized Coefficients	T	P
	B	Std. Error			
Constant	59.757	0.666	-	89.474	0.000**
Resilience	-0.446	0.008	-0.935	-57.475	0.000**
Model AOVA: F=3303.3, P= 0.000**			R2 = 0.874, Adjusted R2 =0.873		

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Fig6: Correlation coefficient with regression line between grand total resilience and total perceived stress among nurses of study group post intervention (n= 80).



Discussion

Traditional research on acute care nurses has predominantly focused on the negative psychological impacts of working in highly stressful clinical settings. However, recently there is a growing recognition of the importance of positive psychological factors and how they can contribute to nurses' well-being and thriving in these challenging environments. Increasing resilience among acute care nurses has shown promise in promoting psychological well-being, reducing secondary traumatic stress, and supporting ACN retention (Blackburn, et al., 2020)

Therefore, the purpose of the current study was to examine the effect of resilience training program on perceived stress among acute care nurses.

Regarding studied nurses' resilience level the results show that control and study groups have low level of resilience in the pre phase of the training program. In addition, in the post phase of the training program, results indicate that the control group still has a low level of resilience, whereas the majority of study group show remarkable elevation of resilience level to very high level. In the follow up phase of the training program, the control group still has a low level of resilience, but the study group shows a slight decline to a high level .

Also, there is a highly statistical significant difference among resilience dimensions between pre and post phase of the program with a higher mean score for one's flexibility to cope with

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change and challenge dimension in post program.

In addition, there is a highly significant statistical difference among resilience dimensions pre and follow up phase of the program with a higher mean score for having a goal-oriented life dimension in the follow up phase of the program. While there is a highly significant statistical difference among resilience dimensions post and follow up phase of the program with a higher mean score for one's flexibility to cope with change and challenge dimension in the post program phase. Moreover, there is a significant statistical decline in the follow -up program mean score than post program. This finding reflected the positive effect of the resilience training program.

From the investigator's point of view, there are few interpretations for these results. The low level of resilience before the program may be attributed to the fact that married individuals may have higher resilience compared to unmarried individuals due to the additional layer of social connection provided by marriage individuals. Therefore, in the present study, most of studied nurses were unmarried and don't have effective social support and this may have accounted for the lower levels of resilience among acute care nurses .

In addition, the very high level of resilience post program could be attributed to the changes of nurses' knowledge about resilience which affect their performance on resilience after implementation of the training program. As nurses learned and gained knowledge from all programs content

of resilience as well as the essential skills and how to implement these skills during stressful and challenging conditions .

On the other hand, a slight decrease in the level of the resilience at follow up phase for study group, can be rationalized as the follow -up phase was conducted after a period of three months, and most of studies that conducted in the follow up phase after three months shows decline in the taught variables regardless the phenomena being studied as not all knowledge reserved in the long term memory as a biological fact and needed to be periodically refreshed and updated.

However, when the level of resilience is low among nurses, the ability to manage stress effectively diminished, leading to negative consequences such as burnout and increased turnover intent. Also, low resilience among nurses can significantly decrease their sense of worth and positive attitude toward their job, and work performance (Dordunoo, et al., 2021) . In experimental group increased during post-assessment and further increased during follow-up. In addition, there was also significant difference in the resilience scores of participants assigned to.

In the same line , Zhai, et al., (2021) who conducted a study to analyze the effect of resilience training in nurses. His study revealed that resilience training improves the resilience scores of the participants immediately post intervention and there was highly statistically significant difference between pre and posttest among study

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group, whereas there was no improvement in the resilience scores of nurses who did not participate in resilience training.

Also, the result of current study was congruent with Elsayed & Abdelraof (2020), who conducted a study on promoting resilience in nurses caring for patients with psychiatric disorders. This study indicated an improvement in the total mean score of resilience among nurses in post and follow up phases of the program. Also, it was found that improvement of total mean score of studied psychiatric nurses' resilience post education program than preprogram and the difference of resilience score, was statistically significant.

In contrast, Roberts, et al. (2021), who conducted a study to explore levels of resilience, anxiety and depression in nurses working in respiratory clinical areas during the COVID pandemic. This study's finding revealed that nearly two thirds of studied nurses have a moderate or moderately high resilience score.

In the same vein, these results were dissimilar to Salem, et al (2022), who conducted a study to investigate the effect of emotional intelligence and transformational leadership training program on resilience and coping strategies among nursing managers. This study revealed that the majority of control group have moderate resilience level throughout phases of the program. Whereas most of study group have moderate resilience level pre and follow up and have high resilience level post implementation of the program.

On top of this, the current study results were inconsistent with Pakenham, et al. (2018) who conducted a study to evaluate of a resilience training program for people with multiple sclerosis. This study revealed that regarding resilience level there is no significant change from pre- to post-intervention and a significant increase from post-intervention to follow-up indicating a delayed improvement .

For studied nurses' perception of stress level: results of the current study indicated that majority of control and study group have very high level of perceived stress before resilience training program. In addition, in post phase of the training program, results indicated that the control group still has very high level of perceived stress, whereas the majority of study group show remarkable decrease of perceived stress level to very low level. In follow up phase of the training program, control group still have very high level of perceived stress, but the study group shows elevation to average level. Also, there is a high statistically significant difference between study group and control group regarding total levels and mean score of perceived stress at post and follow up phases of the program.

From the investigator's point of view, it could be related to, very high level of stress before the program may be attributed to the fact that at beginning of a nursing career, young, newly hired nurses are exposed to a variety of new stressors, and they haven't acquired many knowledge and skills in nursing that might help them to able to deal more effectively with their perceived stress. Therefore, in the present study

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that the majority of studied nurses in were > 5 years of experience might be attributed to their very high level of stress.

Also the complex nature of working in acute care units, as nurses in the ACUs encounter more ethical dilemmas than general ward nurses. Nurses form bonds with patients and family members and develop a sense of being responsible for patients' outcomes.

On the other hand, the remarkable decrease in perceived stress level between pre and post phases of the program, this finding may be due to resilience and having positive emotions support psychological adjustment, broaden intentional focus and behaviors, and thus build resources and protect against harmful effects of stress (Zueger, et al., 2022).

In addition, the ability to cope with stressful situations as challenges can help a nurse to learn and grow from these challenges. Therefore, stress management, change management, and developing skills related to effective communication and conflict management, time management and problem solving taught to nurses within the current training program helped them to look ahead optimistically, build and use their own resources in coping with the stressful situation .

Whereas the slight stress level elevation in follow up phase of the program was rationalized for two reasons: the first reason could be work overload that did not allow nurses to practice relaxation, and other stress management techniques that nurses have learned within the resilience

training program. The second reason could be rationalized that in most quasi-experimental research design that there always negative impact in the follow up scores regardless of the phenomena being studied (Higazee et al.,2016). And the second reason could be interpreted for two reasons either the follow up phase should be conducted before three months or the inability of the quasi-experimental research designs to control all factors that affect the phenomena being studied.

In this respect, high levels of stress among acute care nurses have a negative impact on their health and productivity. Workplace anxiety, depression, and burnout have all been related to excessive stress (defined as emotional exhaustion, cynicism, and inefficacy). These issues might exacerbate the ongoing problem of frequent nurses' turnover in acute care units. In addition, Stress can directly contribute to absenteeism, decreased work performance, and burnout. Nurses facing ongoing stress are more likely to eat poorly, smoke, and abusing of alcohol and drugs. Also, stress can create mental problems, such as insomnia, and feelings of inadequacy (Ageel, & Shbeer, 2022).

This study results were in harmony with Heydari, et al. (2022), who conducted a study to evaluate the effectiveness of resilience training on anxiety, depression, psychological well-being, and life expectancy of women with breast cancer. He reported that resilience training reduces stress in experimental group in the posttest stage and there is a highly statistically

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significant difference between pre and posttest among study group. Also, the total level of stress decreases from a very high level before program implementation to a low level immediately after implementation. However, there is no significant improvement in the stress scores of control group.

Similarly, accordance with Zhai, et al., (2021), who conducted a study to analyze the effect of resilience training on nurses. This study revealed that stress scores of the participants are also decreased after resilience training among study group while there is no improvement among control group.

In contrast to the result of current study Arbuzia, et al. (2019), who conducted a study to determine the effect of resilience training on quality of work life (QoWL) and job stress of nurses. He reported that there is no statistically significant difference between the intervention and control groups after the intervention in terms of job stress .

Similarly, these finding were disagreed with those of a study carried out by Blood, (2021), who revealed on his study on Doctor of Physical Therapy Students that there is no statistically significant difference for total perceived stress score between study groups and that the intervention group does not demonstrate a significant decrease in stress following the intervention.

In relation to the correlation between resilience and perceived stress. The majority of nurses who had an average level of resilience showed a high level of perceived stress. Less than half of nurses who have a high level of

resilience show an average level of perceived stress. In addition, the majority of nurses have a very high level of resilience show very low level of perceived stress. However, 88% of the variance in nurses' decreased stress was due to the improvement of their resilience level.

From the investigator's point of view it could be due to the fact that the important thing about stress is how you respond to it, which can play a vital role in a nurse's adjustment. Resilience is defined as "a person's confidence in his or her ability to cope with stress, self-esteem, emotional stability, and personal characteristics that increase social support from others" (Salehian, et al., 2021). In addition, people who are resilient often develop positive emotions and can deal with stressors and challenges in a positive way so that they can return to normal state or even achieve more progress than pre adversity .

Therefore, resilience training in current study makes acute care nurses to be optimistic and confident in the face of stressful events they face in everyday work, and able to use problem-solving, stress coping techniques, conflict management, and time management skills that make them aware of their inner abilities to manage various stressors.

In this regard, these results were congruent with Kiani, et al., (2022), who conducted a study to investigate the effectiveness of resilience training on psychological well-being and perceived stress of volleyball coaches. This study revealed that resilience training has a significant effect on

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perceived stress and about 41% of the changes in the post-test scores of perceived stresses are related to resilience training.

Similarly, these findings were in harmony with Lara-Cabrera, et al., (2021), who conducted a study to investigate the mediating role of Resilience in the relationship between perceived stress and mental health. He found resilience to be significantly negatively correlated with the reported levels of perceived stress. In addition, the mediating analysis revealed that resilience plays a protective role against stress.

In the other hand some studies that were not congruent with this result as these findings of a study conducted by Kannappan, & Veigas, (2022), to assess and find the relationship between perceived stress and resilience among nurses working in a selected hospital. This study showed that there is a moderate level of stress with intermediate resilience among the nurses and noted a non-significant weak correlation between perceived stress and resilience .

In the same vein, the results of the current study opposed by a study conducted by Chakradhar, et al., (2022), who examined the relationship between spirituality, resilience, and perceived stress among social work students. Chakradhar's study revealed an inverse weak correlation between resilience and perceived stress.

Limitation of the study

Nurses in the control group may have worked closely with nurses in the intervention group, and that association

led to crossover of the intervention to the control group which was reflected in the obtained results of control group in the post and follow up stages of the program.

Conclusion

The study group showed high significant statistical difference between the pre and post phases of the study for all variables. There was a highly statistically significant difference between resilience as an independent variable and perceived stress as dependent variable between pre and post phase of the program. Also, there was a highly significant statistical difference for total resilience between post and follow up phases of the program consequently; nurses who had high resilience were less in their perceived stress than nurses who had low resilience.

Recommendations

The following suggestions can be made based on the findings of the present study. Nurse leaders should continue to promote resiliency to nursing staff by reinforcing protective factors such as good time management, problem solving and decision making, effective communication and supportive professional relationships that will lead to positive nursing outcomes. Also, she should collaborate with nurse educators to use these results to design specific professional development programs to reinforce the benefits of implementing an effective resilience training program. Build positive and supportive work culture through monthly meetings, conferences to voice their problems, opinions, and

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needs through open communication. Publishing posters containing tips are required for resilience and its effect on stress level among nurses displayed in each department. The concept of resilience must be incorporated in the curriculum of undergraduate nursing courses to improve key skills of resilience.

Future research should take patients' contributions into consideration and focus on patient outcomes in the light of improving nurse's resilience and perceived stress. Factors that affect nurses' resilient skills acquisition should be investigated, and perceived stress in the clinical setting.

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