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Effect of Mindfulness Training Program on Promoting Mental Well-being Among Emergency Nurses

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Abstract:

Introduction: Mindfulness is one therapeutic modality that emergency nurses use extensively to improve their well-being and decrease stress. The current study aimed to evaluate the effects of training programs built on mindfulness on promoting mental well-being among emergency nurses.

Methods: A quasi experimental design was used on a convenient sample of 70 emergency nurses (35 study group and 35 control group) who participated in the study from the emergency department at Al-Ahrar Hospital in the Zagazig City, Sharkia Governorate, Egypt, which occurred four months from the beginning of February to the start of June 2022.

Tools for Data Collection: Data were collected using socio-demographic data, a mindfulness questionnaire, the Warwick Edinburgh Mental well-being scale, and the Hospital Anxiety and Depression Scale. The researchers designed eight training program sessions. The objectives and content were according to the emergency nurses' needs.

Results: The post-training program for emergency nurses enhanced mindfulness, well-being, and positive emotions (18.12%, 54.03%, and 39.53%, respectively) with a statistically significant improvement. In comparison, negative emotions (45.43%) declined, and there were statistically significant differences between the study and the control group post-program. However, there were no statistically significant differences between the study and control group at preprogram $p>0.05$.

Conclusion: The study revealed that the Mindfulness Training Program was successful in improving mindfulness levels, mental well-being, positive emotion levels, and decreasing negative emotions.

Recommendation: To strengthen the evidence supporting the efficacy of the mindfulness-based stress reduction program for nurses, a study on the impact of mindfulness on nurse work performance and patient outcomes should be conducted.

Keywords: Mindfulness, Mental wellbeing, Nurses, Training program, Socio-demographic data, Hospital Anxiety and Depression Scale.

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1. INTRODUCTION

Healthcare professionals frequently encounter emotionally and physically confronting stimuli when performing their jobs. Since Emergency Medical Service (EMS) personnel are commonly called to witness death, loss, and suffering, they are susceptible to both acute and chronic psychological distress [1]. In the medical setting, nursing staff deal with extreme stress. The main sources of stress for nurses include stressors such as workload, the emotional cost of care, lack of pay and shift rotation, complex interpersonal interactions, and increased requirements for technological skills [2]. Persistently high-stress levels negatively impact nurses' physical and emotional health as well as their capacity to perform their duties. They can also result in burnout, compassion fatigue, low job satisfaction, high staff turnover, and poor quality of care for patients [3].

Mental well-being includes both internal and external aspects of an individual. Flourishing, joy, and high well-being are at one extreme of the spectrum, while elevated depression, anxiety, stress, and low well-being are at the other [4]. Physical well-being entails more than the absence of sickness. However, it also includes a healthy lifestyle, regular exercise, adequate nutrition, and a balanced body, mind, and soul. Since it indicates that people believe their lives are going well, well-being is a positive result that is relevant for many people and sectors of society. Subjective well-being includes cognitive components such as life satisfaction and contentment with certain life domains [4].

According to Kabat-Zinn [5], mindfulness is the consciousness that results from paying attention consciously, in the here and now, and without passing judgment. Mindfulness-Based Stress Reduction is the most well-known structured approach for practicing mind-fulness. The practice of meditation can help cultivate and enhance the attention and awareness skills that makeup mindfulness. There is a lot of confusion surrounding mindfulness because it refers to both a process (*i.e.*, directing attention in Mindful practice) and an outcome (Mindful awareness or a way of being).

Mindful awareness is defined as a means of reacting to all experiences, whether happy, negative, or neutral, in an open, receptive manner, without wishing to change how things are. They presented a Mindful practice approach with three components: intention, attention, and attitude.

These three aspects of mindfulness combine to form an operational definition for mindfulness that includes attentional control (*i.e.*, focusing on the breath or noticing the quality of one's mind), attentional control intention (*i.e.*, motivation for practice that may change over time), and attitudes that are being trained (*i.e.*, an attitude of non-judgment, or to decenter from negative thinking) [6, 7].

Mindfulness-based techniques that enhance present-moment awareness can help nurses become more focused and concentrated. The goal of mindfulness meditation is to help people react to events more thoughtfully than instinctively. The goal of these MBSR-related practices is to promote positive approaches to inner experiences by developing awareness, attention control, and acceptance of feelings, ideas, and states without the urge to control, change, or run away from them. MBIs were developed to reduce stress in high-stress employment and to enhance the well-being of nurses and other healthcare workers. It was found that MBIs had a minor impact on the stress levels of medical personnel, including nurses, doctors, and staff members [8].

Mindfulness-based Stress Reduction (MBSR) has repeatedly demonstrated positive impacts on health and well-being in different populations. According to a previous meta analysis of 11 studies examining the effectiveness of mindfulness-based therapies in reducing symptoms of depression reported significant decreases in depression symptomatology [9]. Specific to the healthcare field, a review on 10 studies of the impact of MBSR on healthcare professionals' health and wellness found that MBSR consistently reduced stress and anxiety and improved positive affect while also decreasing emotional exhaustion [10]. Also, a systematic review concluded that MBSR is an effective intervention that can help improve the psychological functioning of healthcare professionals [11]. A different evaluation of the literature provided evidence that mindfulness training could be a useful intervention to reduce stress, anxiety, and burnout while enhancing mood, focus, empathy, and self-care [12].

The study conducted in the department of Emergency Unit, Critical Care Unit, Medical Unit, Hemodialysis Unit, and Psychiatric Mental Health Unit at Menoufia University Hospital, Egypt, showed that the highest percentage of the studied nurses have moderate levels of psychological distress, which manifests in various symptoms including

anxiety and depression [13]. On the other side, a study conducted at Mansoura University Hospital, Egypt, found that most of the nurses involved in the study were psychologically distressed, with over half of them suffering from severe distress [14].

In parallel, according to a general systematic review, including the results of several meta-analytic studies on the incidence of psychological disorders in nurses, the overall proportion of subjects suffering from both depression and anxiety was 24.94% and 24.83%, respectively [15]. Furthermore, Fernandez *et al*. [16] reported that a systematic review comprising data from ten comparative studies revealed that the prevalence of anxiety and depressive disorders, respectively, was 22.8% and 28.8% among nurses.

Globally, mindfulness is becoming a much more well-liked psychological intervention. There is a substantial body of research that supports the effectiveness of MBIs in enhancing psychological functioning and overall well-being in both clinical and non-clinical groups [17]. Additionally, a study conductedin Menia Governorate, Egypt, found that there was a positive correlation between mindfulness and quality of work life. Moreover, there was a statistically significant difference among the qualities of work-life, emotional regulation, and working in critical departments [18].

2. SIGNIFICANCE OF THE STUDY

Patients and healthcare professionals alike benefit from the real, relieving approach known as Mindfulness-based Stress Reduction (MBSR), which has been shown to improve the well-being of a variety of groups with clinical or non-clinical issues [17]. Many benefits have been observed by MBSR participants, such as decreased stress, anxiety, depression, and psychiatric symptoms; better well-being; improved coping strategies; and enhanced empathy and relaxation, in addition to higher life satisfaction and self-satisfaction [19].

Extensive research on the effectiveness of Mindfulness-based Stress Reduction (MBSR) among Egyptian nurses is still lacking. Additionally, there is a dearth of research on mindfulness programs for emergency nurses, especially in Egypt. The study was conducted to evaluate the effect of training programs based on mindfulness in promoting mental well-being among emergency nurses.

2.1. Aim of the Study

The current study aimed to evaluate the effect of training programs based on mindfulness in promoting mental well-being among emergency nurses.

2.2. Research Hypothesis

Implementing a mindfulness training program would have a positive effect on promoting mental well-being among emergency nurses.

3. MATERIALS AND METHODS

A quasi-experimental design with a pre-post-training program was set in Al-Ahrar Hospital for critical departments such as the ICU, burn unit, operations room, and emergency department in Zagazig City, Sharkia Governorate, Egypt.

3.1. Subjects

A convenience sample of seventy nurses (35 study group and 35 control group) was selected randomly as control and study groups from the previously described context. After obtaining approval through the official channel, the researchers identified the nurses (study and control) who fulfilled the inclusion criteria as follows: (a) be employed as a registered nurse in the critical areas; (b) have at least one year of working in the critical areas; and (c) accept to participate in the study. Employees engaged in administrative tasks were not included in the research.

3.2. Data Collection

The present study included four tools for data collection, namely, the mindfulness questionnaire and the well-being questionnaire. The study tools were composed of the following: -

3.2.1. Tool I: Socio-demographic Data

To ensure content validity, the researchers revised the pertinent literature and consulted experts before designing questionnaires with socio-demographic data. Nurses were asked to provide socio-demographic information, such as age, gender, place of residence, degree of education, marital status, and years of experience.

3.2.2. Tool II: The Mindfulness Questionnaire

It was developed by Baer *et al*. [20] to represent elements of mindfulness as it is currently conceptualized. The 39 items in this tool are broken down into five subscales: for the first 4 subscales (observing, describing, acting with awareness, and non-judging of inner experience), each of them includes 8 items, and seven items for 5th subscale (non-reactivity to inner experience). Additionally, there were reversed items in the categories described (numbers three, four, and five), acting with awareness and non-judging (eight items). The reliability of the Mindfulness questionnaire in the present study was 0.70. The items were scored on a five Likert-rating scale ranging from one (never) to five (always). The mindfulness level is divided into three categories: low (39-91), moderate ('91-143), and high (' 143-195). The scores are determined by following the instructions that come with the scale.

3.2.3. Tool III: Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)

Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) was developed by Tennant *et al*. [21]. Items on positive functioning (*e.g*., energy, clarity of thought, self-acceptance, personal development, mastery, and autonomy), fulfilling interpersonal relationships, and positive feelings (*e.g*., optimism, cheerfulness, and relaxation) are included in this self-report measure, which

only includes positive aspects of mental health. There are fourteen items in this tool. In the current study, WEMWBS's reliability was 0.814. Since the items were scored on a five-point Likert scale, from one (none of the time) to five (all time), respondents indicated their responses. The three categories for WEMWBS level are low (14–32), moderate (´32–51), and high (´ 51–70).

3.2.4. Tool IV: The Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS) was developed by Snaith and Zigmond [22]. A self-report measure including 13 statements that were split into two subscales, positive emotion, which has six items, and negative emotion, which has seven, was created to evaluate the symptomatology of anxiety and depression. In the present study, the reliability of HADS was 0.86 for negative emotions and 0.936 for positive emotions. Two embedded subscales that assessed symptoms of depression and anxiety were part of the HADS. Respondents indicated on a four-point rating scale from one (most of the time) to four (not at all). There are three categories for emotional states: low (6–14), moderate (´14–22), and high (´ 22–30) for positive emotions, and low (7–16), moderate (´ 16–24), and high (´ 24) for negative emotions.

3.3. Content Validity and Reliability

A panel consisting of three nursing experts evaluated the Arabic translation of the tool material to ensure it was clear, complete, understandable, and applicable. Minor adjustments were made to all tools. The reliability of Tools II, III, and IV was evaluated using the internal consistency test of Cronbach's alpha coefficient. They demonstrated a high degree of reliability as follows: The reliability of the Mindfulness questionnaire in the current study was 0.70, WEMWBS's reliability was 0.814, and the reliability of HADS was 0.86 for negative emotions and 0.936 for positive emotions.

3.4. Pilot Study

Seven nurses (10%) of the entire study sample were the subjects of a pilot study. It aimed to evaluate, verify, and ascertain the tools' feasibility, timeliness, application, clarity, and relevance. Nurses who participated in the pilot study were involved in the control group of the study sample.

3.5. Fieldwork

The research was carried out in stages, including assessment, planning, implementation, and evaluation.

3.5.1. Assessment Phase (pre-intervention)

The sample of nurses was first gathered by the researchers based on their eligibility. They began by making an introduction, outlining the goal of the research, and extending an invitation to take part. The researcher explained the tool items to the nurses (studied and control groups) participants. Participant nurses filled in and answered the tool items, and the time spent answering all the questions ranged from 10 to 15 minutes. This phase lasted for one month, from the beginning of February 2022 to the beginning of March 2022.

3.5.2. Planning Phase

The researcher designed the training program sessions. The objectives and content were according to the participants' needs, translated into objectives of the sessions, and included in a booklet. This booklet consisted of eight sessions. The initial session focused on identifying between researchers and nurses, giving them information about the program's aim, content, meeting days, and time. The next six sessions focused on providing knowledge to the studied nurses about mindfulness, stress, and psychological state, training participant nurses to perform different exercises to help relieve stress, improve psychological state, and how to practice mindfulness-based stress reduction. The last session was focused on the revision and termination of the program. Teaching methods, including demonstrations, individual and group discussion, as well as role-play and reinforcements, were optioned frequently during the sessions.

3.5.3. Implementation Phase

The program was implemented in the form of small group sessions. There were six sessions, each lasting about 45-60 minutes. For eight weeks, once/a week, those sessions were provided for the studied nurses. Every session had a unique title and goal based on the material it covered; all the nurses under study (study group) participating in the program were exposed to the same material through using the same teaching strategies, media, discussions, and booklet. From the beginning of March 2022 until the end of April 2022, this phase lasted for two months.

The sessions were assisted by using pictures, posters, and the program booklet. The sessions were as follows:

3.5.3.1. Session One (45-60min)

In the first session, the researcher gave an overview of the program, specified the location for meetings, and laid up a weekly schedule for each study group.

3.5.3.2. Session Two (45-60 min)

The main objectives of this session were to offer nurses knowledge about mindfulness and increase their ability to detect the benefits of mindfulness exercises in reducing stress and practicing.

3.5.3.3. Session Three (45- 60 min)

The main objectives of this session were to provide and help the nurses with knowledge about attention and the effect of meditation exercises on the brain, as well as train nurses about meditation exercises.

3.5.3.4. Session Four (45-60min)

The main objective of this session was to provide the studied nurses with knowledge about the psychological state (anxiety, depression, and well-being) and how to improve well-being and get rid of its negative effects

(anxiety and depression), training operation nurses about rain meditation exercises.

3.5.3.5. Session Five (45-60min)

The main objectives of this session were to provide the nurses with knowledge about the positive effect of communication and its relationship to mindfulness and knowledge about the relationship between mindfulness, compassion, and empathy, training nurses about mountain and sea meditation, meditation concerned with compassion and empathy.

3.5.3.6. Session Six (45-60min)

The main objectives of this session were to help the emergency nurses end the program safely, manage their daily life activities, learn mindfulness and exercise, learn how to get rid of pressures or stress, review the previous exercises and manage all problems in the critical area.

3.5.4. Evaluation Phase

The post-test, which was conducted as soon as the program was over and used the same data collection instruments as the pretest for the study and control groups, was used to assess the efficacy of the educational program. This phase was taken one month from the beginning of May 2022 to the start of June 2022.

3.6. Statistical Analysis

For statistical analysis, SPSS 20.0 for Windows was used to gather, tabulate, and analyze all of the data. In qualitative data, absolute frequency (number) and relative frequency (%) were presented, whereas in quantitative data, the mean, standard deviation, and range were expressed. The Student's t-test was employed to evaluate two groups of normally distributed variables. If there were more than two groups of normally distributed data to compare, the F-test was employed. The chi-square test or, if suitable, the Fisher exact test was used to compare the percentages of categorical variables. The link between the several study variables was evaluated using the Spearman correlation coefficient, and all tests were two-sided. One might classify a p-value as statistically significant (S) if it was less than 0.05 and not statistically significant (NS) if it was greater than 0.05.

4. RESULTS

Table **1** shows that, as regards the study group's emergency nurses, more than half were married, male, and aged thirty or older (51.43%, 51.34%, and 51.42%, respectively). Of them, about three-quarters (57.14%) had less than ten years of experience. Furthermore, 37.14% of the study group's emergency nurses had a bachelor's degree or higher. Regarding emergency nurses in the control group, 34.29% and 37.14 were aged ≥30 years and had bachelor's education, respectively; three-fifths (60.0%) of them were male; less than three-fifths (57.14%) were married and lived in rural areas; and more than two thirds (68.57%) had experienced less than 10 years. Regarding all demographic parameters, no statistically significant differences were found between the study and control groups.

Table 1. Demographic characteristics of the studied emergency nurses in both the study and control group (n=35).

Items	Studied Groups		χ^2	p-value
	Study Group (n=35)	Control Group (n=35		
	No. %	No %		
Age per years ＜30 ≥30 Mean ±SD Median(range)	17 48.57 18 51.43 30.4±7.2 30(20-51).	23 65.71 12 34.29 27.9±6.5 27(18-45)	2.1	0.15
Gender Males Females	18 51.43 17 48.57	21 60.0 14 40.0	0.52	0.47
Residence Rural Urban	22 62.86 13 37.14	20 57.14 15 42.86	0.24	0.63
Marital status Single Married Others	12 34.29 18 51.42 5 14.29	11 31.43 20 57.14 4 11.43	0.26	0.88
Education Diploma Technical institute Bachelors	10 28.57 12 34.29 13 37.14	12 34.29 10 28.57 13 37.14	0.36	0.83
Experience years ＜10 ≥10 Mean ±SD Median(range)	20 57.14 15 42.86 9.5±7.9 8(1-35).	24 68.57 11 31.43 7.3±5.5 6(1-20)	0.98	0.32

Note: χ^2 Chi-square test f=Fisher exact test p<0.05= significant p>0.05= non-significant.

Table 2. Frequency distribution of emergency nurses regarding mental well-being, positive emotions, negative emotions, and total mindfulness levels at pre- and post-training programs in the study and control groups (n= 35).

Study Variables	Study Group (n=35)				Control Group (n=35)				^P-value	
	Pre		Post		Pre		Post		Pre	Post
-	%	No.	%	No.	No.	%	No.	%		
Mental well-being level Low Moderate High	5 30 0	14.3 85.7 0.0	0 4 30	0.0 11.4 88.6	15 9 11	42.9 25.7 31.4	14 7 14	40.0 20.0 40.0	0.92	<0.001
Mental wellbeing score(70)* Mean± SD	39.3±6.04		60.6±7.2		39.1±12.4		41.6±13			
% of improvement **paired t** **p-value**	54.03% 12.2 <0.001				6.39% 1.9 0.061					
Positive emotion level Low Moderate High	6 27 2	17.1 77.2 5.7	0 4 31	0.0 11.4 88.6	7 15 13	20.0 42.9 37.1	7 15 13	20.0 42.9 37.1	0.17	<0.001
Positive emotion score(30)* Mean± SD	16.91±3.83		23.6±2.26		18.4±4.9		18.3±4.8			
% of improvement Paired t **p-value**	39.53% 8.2 <0.001				0.15% 1 0.32					
Negative emotion level Low Moderate High	3 22 10	8.6 62.8 28.6	31 3 1	88.6 8.6 2.8	4 12 19	11.4 34.3 54.3	2 12 21	5.7 34.3 60.0	0.06	<0.001
Negative emotion score (35)* Mean± SD	21.6±4.6		11.8±3.8		23.7±4.7		24.6±3.9			
% of improvement Paired t **p-value**	45.43% 9.2 <0.001				3.8% 1.8 0.08					
Total mindfulness level Low Moderate High	0 35 0	0.0 100.0 0.0	0 29 6	0.0 82.9 17.1	0 35 0	0.0 100.0 0.0	0 35 0	0.0 100.0 0.0	0.82	<0.001
Mindfulness score (195)* Mean± SD	111.5±10.0		131.7±9.2		110.9±10.4		111.4±10.4			
% of improvement Paired t **p-value**	18.12% 7.8 <0.001				0.49% 1.3 0.19					

Note: Paired t-test significant =p<0.001, ^ t test % of improvement= percent of improvement score after intervention.

Table **2** defined that the percentage of improvement post-training program among the study group nurses of mental well-being, positive emotion level, negative emotion level, and total mindfulness were 54.03%, 39.53%, 45.43%, and 18.12%, respectively. These improvements were statistically significant (p<0.001), and there were statistically significant differences between the study and control group post-program. However, there were no statistically significant differences between the study and control group at preprogram p>0.05.

Table **3** shows that preprogram mental well-being scores of the study group's nurses and education had a statistically significant relationship (p<0.05). It was clear that nurses affiliated with technical institutes had elevated mental well-being scores (M±SD=43±5.2). In contrast, there were no statistical relations between the mental well-being scores of study group nurses and all demographic characteristics in the post-training program (p>0.05). Moreover, the positive emotions, negative emotions, and mindfulness scores of study group nurses did not relate to their demographic characteristics in pre or post-training programs (p>0.05).

Table **4** states that there was a statistically significant negative correlation between negative emotions and both mental well-being and positive emotions among emergency nurses in preprogram in the study group (r=-.390 at p=0.021 and r= -.409 at p=0.015 respectively. The same table shows that, among nurses in post-program in the study group, there was a statistically significant positive correlation between mindfulness and both mental well-being and positive emotion (r=0.85 at p=0.0001 and r=0.83 at p=0.0001, respectively). However, it was statistically significantly negatively correlated with negative emotion (r= -0.84 at p= 0.0001). Moreover, the same table reveals that there was a statistically significant negative correlation

between negative emotions and both mental well-being and positive emotions (r=-0.91 at p=0.0001and r=-0.92 at p=0.0001). However, mental well-being was statistically significantly positively correlated with positive emotions (r= 0.92 at p=0.0001).

Table 3. The relation of mindfulness score, mental well-being score, positive emotion score, and negative emotion score among studied emergency nurses at pre-and post-program and their demographic characteristics (n=35).

Demographic Characteristics	Number	Preprogram (Study Group)				Post-program (Study Group)			
		Mindfulness	Wellbeing	Positive Emotion	Negative Emotion	Mindfulness s	Wellbeing	Positive Emotion	Negative Emotion
Age per years <30 ≥30	17 18	1110.9±11.6 112±8.5	38.8±6.3 39.8±5.9	17.4±4.6 16.3±2.9	21.9±5 21.2±4.2	131.3±9.5 132±9.1	60.2±7.7 60.9±6.9	23.4±2.6 23.7±1.9	12.1±3.7 11.4±4
t-test **p-value**	-	0.31 0.76	0.49 0.63	0.83 0.41	0.29 0.46	0.24 0.81	0.28 0.77	0.47 0.64	0.51 0.61
Gender Males Females	18 17	109.2±9 113.8±10.8	40.4±5.4 38.1±6.5	17.1±3.6 16.6±4.1	21.3±4.3 21.8±4.9	131.2±9.4 132.1±9.2	60.7±6.6 60.4±8	23.6±2.4 23.5±2.1	11.8±4.3 11.6±3.4
t-test **p-value**	-	1.39 0.17	1.1 0.27	0.39 0.52	0.31 0.75	0.26 0.79	0.102 0.92	0.03 0.78	0.18 0.86
Residence Rural Urban	22 13	111±9 112. ±11.9	39.3±6.5 39.3±5.4	17±3.9 16.6±3.9	22.1±5.1 20.5±3.3	129.9±10.1 134.6±6.7	60±8.1 61.6±5.4	23.3±2.6 24.1±1.3	12. ±4.2 11.3±3.3
t-test **p-value**	-	0.3 0.77	0.026 0.98	0.26 0.79	1.03 0.3	1.47 0.15	0.63 0.52	1.1 0.27	0.45 0.65
Marital status Single Married Others	12 18 5	112.9±11.7 110.8±10 110.4±5.6	41±8 38.5±5 38.4±3.6	17.5±5.3 17.2±2.9 14.2±1.3	22.1±5.4 21.1±4.5 21.8±2.9	132.1±10.7 130.2±8.7 135.8±7	59.7±9.1 60.4±6.8 63.4±0.89	23.2±2.9 23.5±2 24.8±0.83	12.3±4.3 11.8±4 10±0.7
F-test **p-value**	-	0.18 0.83	0.67 0.51	1.54 0.23	0.191 0.83	0.735 0.48	0.455 0.65	0.921 0.41	0.657 0.52
Education Diploma Technical institute Bachelors	10 12 13	113.5±15.2 111.7±8.4 109.6±6.4	37.1±7.5 43±5.2 37.6±4	16.8±4.2 17.1±4.1 16.7±3.5	77.2±7 77.3±7 76.4±9.6	131.6±9.2 129.6±12.2 133.7±5.4	61.6±4.5 58.8±10.4 61.4±5.3	23.9±1.4 22.7±3.4 24.1±1.1	12.1±5 11.9±3.6 11.3±3.2
F-test **p-value**	-	0.39 0.67	3.9 **0.029(S)**	0.038 0.96	0.04 0.96	0.61 0.55	0.54 0.59	1.3 0.27	0.106 0.9
Experience years <10 ≥10	20 15	110.2±10.9 113.1±8.9	39.1±5.9 39.6±64	17.5±4.3 16±3	21.5±47 21.6±4.5	131.3±8.7 132.2±10	60.6±7.1 60.6±7.5	23.5±2.4 23.7±2.1	11.9±3.4 11.6±4.4
t-test **p-value**	-	0.84 0.41	0.27 0.79	1.14 0.26	0.03 0.97	0.28 0.78	0 1	0.29 0.77	0.23 0.82

Note: Data represented by mean ±SD, t (t-test of significance), F (Anova test of significance), (S) p<0.05 significant.

Table 4. Correlation matrix between mindfulness score, mental wellbeing score, positive emotion score, and negative emotion score for studied emergency nurses at pre-and post-program in the study group: (n=35).

Varaibles	Mindfulness Score		Mental Wellbeing Score		Positive Emotion Score	
	(r)	P	(r)	P	(r)	P
Preprogram(study group) Mental wellbeing score	0.008	0.962				
Positive emotion score	-.223	0.19	0.334	0.05		
Negative emotion score	-.026	0.884	**-.390***	0.021	**-.409***	0.015
Post program (study group) Mental wellbeing score	**.0.85***	0.0001				
Positive emotion score	**0.83***	0.0001	0.92*	0.0001		
Negative emotion score	**-0.84***	0.0001	-0.91*	0.0001	-0.92*	0.0001

Note:(r) Corrélation coefficient, *signifiant p<0.05

Spearman's rank correlation coefficient (r) was calculated to assess the relationship between various study variables. The (+) sign indicates direct correlation & the (-) sign indicates inverse correlation, and also values near to 1 indicate strong correlation & values near 0 indicate weak correlation.

Table 5. Correlation matrix between mindfulness score, mental wellbeing score, positive emotion score, and negative emotion score for studied emergency nurses at pre-and post-program in the control group (n=35).

Variables	Mindfulness score		Mental wellbeing score		Positive emotion score	
	(r)	P	(r)	P	(r)	P
Preprogram(control group) Mental wellbeing score	**0.504***	0.002				
Positive emotion score	.306	0.074	**0.67***	0.0001		
Negative emotion score	-.126	0.47	.041	0.82	0.2	0.24
Post program (control group) Mental wellbeing score	**0.46***	0.005				
Positive emotion score	0.18	0.29	**0.42***	0.012		
Negative emotion score	-0.26	0.13	-0.25	0.15	0.2	0.24

Note: (r) Corrélation coefficient, *signifiant p<0.05
Spearman's rank correlation coefficient (r) was calculated to assess the relationship between various study variables, The (+) sign indicates direct correlation & the (-) sign indicates inverse correlation, and also values near to 1 indicate strong correlation & values near 0 indicate weak correlation.

Table 5 shows that among emergency nurses in the control group, there was a statistically significant positive correlation between mental well-being score, and both mindfulness and positive emotion scores at pre- (r=0.504 at p=0.002 and r=0.67 at p=0.0001 respectively) and post-program (r=0.46 at p=0.005 and r=0.42 at p=0.012 respectively).

5. DISCUSSION

Nursing is often acknowledged as one of the most stressful occupations. Occupational stress can affect nurses' mental and physical health as well as their performance [23, 24]. Over the last few decades, mindfulness programs have grown in popularity. Mindfulness has demonstrated the advantages of these approaches on psychological symptoms, which has increased the importance of scientific studies on mindfulness (*e.g.*, depression, anxiety). Enhance pleasant emotions, empathy, well-being, and compassion, among other characteristics of psychological flourishing. MBIs do increase thriving by improving quality of life and positive affect, establishing social ties, and nurturing character traits like kindness and pro-sociality [25].

Regarding emergency nurses in the study group, more than half were aged ≥30 years. However, in the control group, more than one-third were aged ≥30 years. Additionally, compared to three-fifths of the nurses in the control group, slightly more than half of the research group's nurses were men. Compared to over half of the study group, the majority of the studied nurses in the control group were married. In both the research and control groups, about three-fifths of the nurses were from rural areas. Compared to over two-thirds of nurses in the control group, over three-fifths of nurses in the study group had less than ten years of experience. Furthermore, more than one-third of the emergency nurses in both the study and control groups held a bachelor's degree. Regarding all demographic characteristics, there were no statistically significant differences between the study and control groups.

The Chinese study by Lin *et al*. [26] indicated that the study's subjects were married men and that no statistically significant differences were found in any of the demographic variables between the nonintervention and intervention groups, which is consistent with these findings. Furthermore, El Dalatony *et al*.'s study [27] and Elwey *et al*.'s study [28] in Egypt discovered that a greater proportion of nurses lived in rural than in urban areas and that there was no statistically significant difference in the proportion of nurses living in rural *vs* urban areas.

According to the present study's findings, there was a statistically significant correlation between the study group's mental well-being score and its preprogram education level, indicating a link between mental health and higher education. In a similar vein, Sadeghifar *et al*. [29] study from Iran discovered that psychological well-being differs significantly from demographic data in education level with a P-value of 0.003.

Regarding mindfulness dimension levels among the study and control groups, the implementation of the current study training program led to significant improvement in mindfulness dimension scores in the study group, including observe, describe, act with awareness, non-judgment, non-react, and total mindfulness compared with the control group which confirmed the set of research hypotheses. The success of the present study program was due to the researcher's use of mindfulness exercises, such as body meditation exercises that bring about positive changes to the mind and train the mind to focus and pay attention to difficult tasks, get active and lively, and overcome stress, pain, and annoying events for nurses.

According to the results of a study conducted in the USA by Davis & Hayes [30] stated that mindfulness meditation can help reduce stress, enhance memory and attention span, lessen emotional reactivity, increase cognitive flexibility, improve relationship satisfaction, and lessen fear and anxiety. In a similar line, Goyal *et al*. [31] study from Maryland, USA, found that mindfulness meditation programs enhanced pain, anxiety, and depression in addition to lowering stress and that meditation can help lessen the detrimental effects of psychological stress and mental illness.

According to research conducted by Creswell [32] at Carnegie Mellon University in Pennsylvania, USA, mindfulness-based stress reduction can improve general coping strategies for disability and distress in daily life as well as for major disorders like stress, depression, and anxiety. Mindfulness-based treatment also has an impact on lowering psychological distress and improving wellbeing.

Implementing the current study training program improved the mental well-being and positive emotions scores of the studied nurses while also lowering the negative emotions levels when compared to the control group. These results validated the set of research hypotheses. The success of the current study program is interpreted as the researchers used to improve the mental well-being of the emergency nurses and raise their efficiency. The most prominent methods and suggestions that are represented in maintaining healthy habits are proper nutrition and adequate sleep, using meditation and relaxation exercises related to rain, meditation on mountains, expressing inner feelings and not comparing with others, self-confidence, sense of self, and stimulating positive feelings.

Similar Canadian research by Guillaume *et al*. [2] found that MBIs might be useful in considerably lowering anxiety and depression in nurses. This could include enhancements to personal well-being and better job performance. In other words, the study demonstrated the beneficial effects of mindfulness on psychological well-being and job performance, such as an inner state of calm and fullness, enhanced behavior, and communication in challenging and stressful situations with coworkers and patients.

The current post-program study revealed that there was a statistically significant positive correlation between mindfulness scores and both mental well-being scores and positive emotion scores for the study group. This result may be due to mindfulness-based stress reduction among emergency nurses through mindfulness exercises, which are advanced in mental well-being and psychological symptoms. This result is consistent with the result of Elwey *et al*. [33] in Egypt, who found that when compared to the control group, the mindfulness training Program's execution resulted in a significant improvement in the scores for psychological health characteristics, including mental well-being and levels of both positive and negative emotions among nurses working in operation room. The study conducted by Reb *et al*. [34] at Singapore University in London, supports the findings of the present research by demonstrating the positive relationships between mindfulness and desired outcomes, including the reduction of chronic pain, enhancement of immunity, reduction of anxiety, and stress, and enhancement of psychological well-being and positive affect.

Additionally, practicing mindfulness techniques, such as mindfulness meditation, causes structural alterations in the dorsolateral prefrontal area of the brain, which is linked to positive affect and higher stress tolerance. People who practice mindfulness are better able to recognize and express their emotional states to their partners and control when they become angry.

6. LIMITATIONS OF THE STUDY

Conducting the study at a single hospital with a small sample size limits the generalizability of the findings, as well as without long-term follow-up and measuring of the compliance of nurses with practice sessions effect on evaluating the sustained impact of the mindfulness training program on mental well-being

CONCLUSION

The current study's findings support the notion that training emergency nurses on Mindfulness-based stress reduction has an impact on promoting their mental wellbeing. Compared to the control group, the study group's level of mindfulness, mental well-being, positive emotions, and negative emotions has statistically significant variations post program with increasing levels of mindfulness, mental well-being, and positive emotions and decreasing levels of negative emotions.

RECOMMENDATIONS

The primary study recommendations suggested that, in high-stress environments like critical care units, using mindfulness-based stress reduction as an intervention to ease new graduates' transition to staff nursing would be beneficial. In addition, they should hire liaison nurses to assist and counsel nurses in overcoming stress and anxiety, improving well-being, and practicing mindfulness. More research is required to examine the impact of Mindfulness-Based Stress Reduction (MBSR) on various nurse groups using a randomized control design. To strengthen the evidence supporting the efficacy of the MBSR program for nurses, a study on the impact of mindfulness on nurse work performance and patient outcomes should be conducted.

AUTHORS' CONTRIBUTION

All the authors shared the steps of design, background review, statistical analysis, results representation, and discussion, as Abeer S. Aseeri, Nawal Yahya H Asiri, and Manal Ibrahim Asiri wrote the introduction discussion, and references. Mona M Abd El-Maksoud and Hanem A Ahmed suggested and formulated the research idea, took the ethical approval, collected the data, developed the health education program, implemented the program, and published, Heba A. Al-Metyazidy, Eman Baleegh, and Lizy Sonia wrote the methodology, did the statistics and Shaimaa Hashem Elsalous organized the paper and did the editing. The authors read and approved the final manuscript.

LIST OF ABBREVIATIONS

EMS	=	Emergency Medical Service
MBSR	=	Mindfulness-based Stress Reduction
MBIs	=	Mindfulness Based Interventions
ICU	=	Intensive Care Unit

WEMWBS = Warwick Edinburgh Mental Wellbeing Scale

HADS   = The Hospital Anxiety and Depression Scale

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

To get authorization to conduct the study, the Dean of the Faculty of Nursing wrote a formal letter to the Director of Al-Ahrar Hospital in Zagazig City, and the researchers filed an official document from the Scientific Research Ethics Committee at Zagazig University. REC#:077 is the reference number for the committee.

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

Informed consent was obtained from all participants

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

CONFLICT OF INTEREST

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

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