



Original Article

The effect of anger management program on perceived stress of healthcare professionals: a quasi-experimental studyRami Masa'deh¹, Omayma Mahmoud Masadeh², Aaliyah Momani³, Samiha Jarrah⁴, Samer Hussein Al Shabatat⁵, Ghadeer Ahmad Alshawabkeh⁶, Shaher Hamad Hamaideh⁷¹Department of Psychiatric Mental Health, School of Nursing, Applied Science Private University, Amman, Jordan²Department of Psychological and Educational Counseling, Relief International Institute, Amman, Jordan³Department of Maternal and Child Health, School of Nursing, Applied Science Private University, Amman, Jordan⁴Department of Community Health Nursing, School of Nursing, Applied Science Private University, Amman, Jordan⁵Department of Critical Care, College of Allied Health Professions, Royal Medical Services, Amman, Jordan⁶Department of Special Needs Education, Research Triangle Institute, Amman, Jordan⁷Department of Community and Mental Health, Faculty of Nursing, Hashemite University, Zarqa, Jordan

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ABSTRACT

Background & Aim: Healthcare professionals working in Intensive Care Units and Emergency Rooms are at higher risk of violence from patients and their families compared to healthcare professionals working in other units. Healthcare professionals skilled in anger management may de-escalate the situation and stop violence from happening in the first place. This study aims to determine the effect of an aggression management program on perceived stress levels of physicians and nurses working in Intensive Care Units and Emergency Rooms.**Methods & Materials:** A quasi-experimental design with 158 physicians and 172 nurses recruited from nine hospitals in the three major cities in Jordan was used to assess perceived stress levels with the Arabic Version of Perceived Stress Scale (10-Items). Participants answered the questionnaires twice, before and after attending an aggression management program.**Results:** Results showed that female healthcare professionals had significantly higher stress levels than males ($M=27.33\pm 4.11$, $M=24.20\pm 3.13$; $t(328)=2.11$, $p<0.001$). Furthermore, healthcare professionals working in Emergency Rooms reported significantly higher stress levels than those working in Intensive Care Units ($M=27.93\pm 4.10$, $M=24.94\pm 3.03$; $t(328)=2.04$, $p<0.001$). Additionally, nurses reported significantly higher stress levels compared to physicians ($M=28.17\pm 3.92$, $M=25.20\pm 3.13$; $t(328)=2.09$, $p<0.001$). There was a strong significant positive relationship between increased stress levels and the number of violent attacks ($r=0.73$, $p<0.001$). Most importantly, perceived stress decreased significantly from the pre-intervention level (28.94 ± 3.21) to the post-intervention level (24.20 ± 3.01) ($t(229)=2.03$, $p<0.001$).**Conclusion:** Policymakers may need to consider offering aggression management programs for all healthcare professionals, especially those working in the Emergency Room. This program should decrease their perceived stress levels reflecting improved patient care, outcomes, and satisfaction.**Introduction**

Healthcare professionals (HCPs) have some of the most stressful professions possible (1). Previous studies reported several major causes of stress among HCPs, including (but not limited to) the following: excessive work overload; long working hours; role ambiguity; sleep deprivation; dealing with death and dying patients; exposure to infectious diseases; and

exposure to different types of workplace violence (2, 3). The National Institute for Occupational Safety and Health (NIOSH) defined workplace violence as “violent acts including verbal or physical assaults and threats of assaults directed toward persons at work or on duty” (4). Experiencing workplace violence is a common experience among HCPs. According to the World

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Health Organization (WHO), HCPs experience various types of workplace violence, including physical and verbal workplace violence perpetrated by patients and their families (5).

Workplace violence prevalence ranges between 8-38% worldwide, and a higher percentage of HCPs are exposed to workplace violence (5). Underreporting of such violence is also embedded in such statistics, as reporting workplace violence is voluntary in healthcare settings; one study found that only 30% of HCPs reported incidences of workplace violence they had experienced (6). One reason for the underreporting of workplace violence is the belief of some HCPs that violence is expected and normal when dealing with patients and their families (6). Moreover, the ineffective legal measures in related legislation often fail to prevent any violent attacks toward HCPs (7).

HCPs such as nurses and physicians working in Emergency Rooms (ERs) are at greater risk of experiencing workplace violence while caring for patients in emergency situations (5, 6). This workplace violence was found to affect the levels of perceived stress of HCPs working in such departments. One study conducted in Jordan examined perceived stress among nurses working in various departments and showed that nurses working in ERs and Intensive Care Units (ICUs) had elevated stress levels caused by the aggressive behavior of patients and/or their families (3). This highlights the need to set rules and reactivate legislation concerning workplace violence. Moreover, there is a need to train HCPs on managing/dealing with aggressive individuals in their workplaces.

Several studies in the Arab world showed that HCPs routinely face workplace violence. A study in Saudi Arabia, 738 HCPs (physicians, nurses, dentists, pharmacists, laboratory technicians, radiologists, social workers, and psychologists) found that 57.7% had experienced workplace violence at least once, mostly comprising verbal violence and slaps (8). Furthermore, in ERs, one study

from Egypt showed that 60% of HCPs (mostly nurses and physicians) working in ER in one hospital had experienced workplace violence during the past year, including verbal violence (58%) and physical violence (16%) (9). Moreover, another study conducted in Bahrain including 100 HCPs working in ER showed that 78% of them experienced verbal violence, 11% experienced physical violence, and 3% experienced sexual violence (10).

High rates of workplace violence in ERs are also reported in other non-Arab countries. For example, in Italy, among 323 HCPs working in ER, 78% had experienced work-related violence during the past five years, and over 54% of them had experienced violence more than once (11). Violence in the ER is generally perceived to be related to the nature of the department and unexpected diagnoses and prognoses triggering violent behavior among patients and their families; the endemic, systemic threat of violence increases stress levels among HCPs working in such contexts.

Workplace violence against HCPs is common in ICUs in addition to ERs. One study conducted in India among physicians working in ICU found that of 118 participants, 72% reported that they experienced workplace violence and that verbal violence was the most common type. This experience of violence resulted in these physicians changing their place or pattern of work. Moreover, 98% of the participants thought that violence management should be incorporated into their education at medical school (12). Similarly, a mixed-methods study involving 200 ICU nurses investigating occupational violence found that 99.5% of nurses had experienced violence from the patients and 67.5% from patients' families or friends. Nurses reported that they faced verbal violence more frequently than physical violence (13).

It seems that violent behavior from patients and their families toward health care professionals is common globally, and ER and ICU are units where most HCPs reported exposure to violence, which was

frequently in verbal and physical forms. Nurses and physicians are the HCPs most at risk of such violence.

There are several negative consequences of violence at the workplace against HCPs, including physical and psychological impacts on HCPs' well-being, which leads to absenteeism, low morale and job satisfaction, stress and anxiety, and (consequently) reduced quality of care delivery to patients, entailing poorer patient outcomes and reduced service user satisfaction (4, 5). Controlling and minimizing the risk of violence in healthcare settings may minimize such negative consequences, improving working and clinical conditions for HCPs and patients and increasing healthcare system efficiency.

There are several actions that could be taken to minimize workplace violence against HCPs working in ERs and ICUs (14). The Joint Commission suggested training all HCPs in de-escalation techniques for managing tense encounters with service users (6). Several studies and reviews showed that de-escalating training programs, communication skills interventions, and behavior management training could improve knowledge, attitude, and confidence in coping with aggression in different cultural and organizational contexts worldwide (15, 16). To the best of researchers' knowledge, the effectiveness of delivering anger management programs among HCPs working in ERs and ICUs to decrease their stress levels has not been assessed before in the context of Jordanian culture. Thus, this study aimed to determine the effect of an aggression management program on perceived stress levels of physicians and nurses working in ICUs and ERs.

Methods

Study design

This study implements a quasi-experimental pre-test post-test design.

Sample size

The sample size was calculated using G power software (17). Assuming a power of 80.0%, an α level of 0.05 and medium effect size, a total of 320 participants in both groups was deemed sufficient to detect statistically significant results.

Population, settings, and sampling

The population consisted of physicians and nurses working in ICUs and ERs in Jordan. Nine hospitals located in the three major Jordan cities were randomly selected and included (i.e., from Amman, Zarqa, and Irbid). These cities represent more than 78% of the Jordanian population (18). Inclusion criteria for physicians and nurses were holding at least a bachelor's degree in medicine/nursing allowing them to practice their profession, working in ICU or ER for at least one year, so they had the chance to be exposed to the likelihood of violence, no previous attendance of aggression management training courses, and providing direct care to patients.

A non-random convenience sampling technique was used. Data were collected between June-December 2020. In Jordan, due to the COVID pandemic, the healthcare system divided hospitals into two types: COVID hospitals, which included patients diagnosed with COVID only, and non-COVID hospitals, which accepted all patients except those diagnosed with COVID. The involved hospitals in this study were non-COVID hospitals. This allowed the research team to distribute the questionnaires and recruit participants.

Measures

Characteristics and socio-demographic datasheet

The research team developed an Arabic datasheet which included the following features about the study participants: age, gender, educational level, occupation, working department, weekly working hours, years of experience, marital status, and event

of any aggressive behavior or violence from patients or their relatives.

The Arabic Version of Perceived Stress Scale 10-Items Questionnaire (APSS10)

The perceived stress of HCPs in different situations was measured using the APSS10 questionnaire. The APSS10 uses a five-point Likert rating scale, ranging from 0-4 (i.e., from never to very often, respectively). The total scores of APSS10 range from 0-40, with higher scores representing higher levels of perceived stress. The score ranges of stress levels were as follows: 0-13 indicating low; 14-26 moderate; and 27-40 high perceived stress (19). Previous studies demonstrated the reliability of APSS10, with Cronbach's α ranging between 0.7-0.9 (20). In the current study, the Cronbach α reliability of APSS10 was 0.89, representing excellent reliability.

Aggression management training program

The aggression management training program used in this study was based on the "LOWLINE" method, described by Mike Lowry, Graham Lingard, and Martin Neal in 2016 (21). This method includes both verbal and non-verbal communication techniques that can help de-escalate aggressive behavior toward HCPs. All participating HCPs were taught how to manage aggression using the LOWLINE method, which stands for the following components described below: Listen; Offer; Wait; Look; Incline; Nod; and Express.

Active listening can help in preventing anger eruption. Participating HCPs were taught how to observe the non-verbal signs of anger and listen to paralinguistic communication features such as tone, inflection, and volume, to identify warning signs about angry reactions. Second, participating HCPs were trained how to pick the early signs of anger in order to prevent an escalation by offering choices, alternatives, and solutions when possible. Furthermore, participating HCPs were

taught to communicate in a way that assured patients that their feelings were being taken seriously. Third, participating HCPs were taught why it is important to wait and not to fill the void with words when communicating with service users. Fourth, participating HCPs were trained to look at the patient, maintain eye contact without staring, smiling when appropriate, or maintaining a neutral expression. All of these were found to be helpful in de-escalating anger behavior. Fifth, participating HCPs were instructed how to incline the head to present a non-threatening posture. Sixth, participating HCPs were also instructed on how to use nodding to show continued attention. Lastly, participating HCPs were trained how to express a desire to understand or empathize. All these techniques can help in managing anger toward HCPs in the clinical setting.

The research team discussed the training program's content delivered in this study with three specialists in aggression management. These discussions around the content and the methods of delivering the program continued until an agreement was reached. One of the research team, the most specialist in aggression management and a professor in mental health and communication strategies, taught the LOWLINE method provided to physicians and nurses working in ICU and ER. Physicians and nurses attended a 21-hour-training program over six days.

The first two days concerned communication skills using both verbal and non-verbal techniques, and the importance of respecting personal space was explained in detail. On days three and four of the training, detailed information about applying active listening skills, understanding, offering solutions/ alternatives, and empathy were delivered. On day five, other techniques and strategies to de-escalate aggression were discussed, such as avoiding provocation, being concise, and repeating oneself when delivering information to service users. Day six was a revision session, with practice exercises of de-escalating techniques with patients in the

form of role-playing. There were eight classes, with 35-45 participants per class. There was a schedule of 21 hours for each class, and participants chose classes at their convenience, which fit in with their professional schedules and enabled them to complete the training.

Ethical consideration

Ethical approvals were obtained from the Applied Science Private University Institutional Review Board and the Jordanian Ministry of Health to collect data from all governmental hospitals. Participants' rights, such as voluntary participation, privacy, confidentiality, and the right of withdrawal at any time without giving a reason, were guaranteed and explained to all participating physicians and nurses. Informed consent was signed by participants who agreed to participate in the study. Participants were also informed that collected data was securely stored (i.e., in locked cabinets and password-protected computers), accessible only to the research team.

Data collection procedure

A non-random convenience sampling technique was used to determine potential participants. After gaining the required ethical approvals, potential participants received an envelope including an invitation letter, the participant information sheet, and the questionnaires. In addition, the researchers' contact details were provided on the participant information sheet for those who wanted to participate or who sought more clarification about the study. After signing the informed consent, participants then filled out the socio-demographic data and APSS10 forms in paper format. They returned them to the researcher, and the first-round analysis was done at this point. Then, the program was delivered over six days in a two-week period. There was an agreement on the time and the date of the course, so participants could commit to attending at their convenience.

Subsequently, participants were given three months before the second phase of the data collection process started. Those who attended the training program filled in the APSS10 questionnaire for the second phase of the data collection process. Three months was assumed to be sufficient for HCPs to see the program's effects in their practice.

Data analysis process

Data were analyzed using the SPSS version 25 (22). All numbers in the results section were rounded up to the closest two decimal points. Alpha was set as 0.05; therefore, any p-value below 0.05 was considered significant. Descriptive statistics were used to describe the socio-demographic data. Pearson r product-moment correlation coefficient was used to investigate the relationship between perceived stress levels and the number of violent attacks. An independent t-test was used to check the difference in the perceived stress according to some socio-demographic variables. Moreover, a paired samples t-test was conducted to check any differences in stress levels before and after the training course. In all required cases, the assumptions of normal distribution and homogeneity of variance for the main variables were checked before conducting any of the t-tests, and there was no violation of any of the assumptions.

Results

As presented in table 1, 191 nurses and 178 physicians were invited to participate in this study, of whom 172 nurses and 158 physicians attended the training course and completed the questionnaires (a response rate of approximately 89%). Most participants were married, and most of them held bachelor's degrees in medicine or nursing. The majority of the participants reported exposure to previous aggression from patients or their relatives. The mean age of participants was approximately 33 years, with an average of five years of experience in ICU or ER.

Table 1. Participant characteristics

Variable	N=330 N (%) or Mean ± SD
Marital status	
Single	77 (23.34%)
Married	227 (68.79%)
Widowed	6 (1.81%)
Divorced	20 (6.06%)
Occupation	
Physician	158 (47.88%)
Nurse	172 (52.12%)
Gender	
Male	177 (53.64%)
Female	153 (46.36%)
Educational level	
Bachelor's degree	312 (94.55%)
Master's degree	18 (5.45%)
Working department	
ICU	180 (54.55%)
ER	150 (45.45%)
Faced previous violence/aggression	
Yes	288 (87.27%)
No	42 (12.73%)
Number of violent attacks during previous 6 months	15.12 ± 1.90
Weekly working hours	28 ± 3.11
Age	32.61 ± 3.15
Years of experience	5.01 ± 1.30
Total stress score	
Before intervention	28.94 ± 3.21
After intervention	24.20 ± 3.01

Pearson *r* product-moment correlation coefficient was used to investigate the relationship between perceived stress levels and the number of violent attacks. Results showed that increased stress levels were significantly associated with increased violent attacks ($r=0.73$, $p<0.001$). The coefficient determination of $r^2 = 0.53$ indicates that 53% of the variation of perceived stress accounted for the number of violent attacks. Moreover, as presented in table 2, an independent t-test was conducted to check the differences in stress levels according to the gender of the HCP, working department, and occupation. With regard to gender, results showed that female HCPs had significantly higher stress levels than males ($M=27.33\pm4.11$, $M=24.20\pm3.13$; $t(328) = 2.11$, $p<0.001$). The effect size was calculated (Eta squared=0.01), indicating a moderate effect size. Furthermore, HCPs working in ER reported significantly higher stress levels

than those working in ICU ($M=27.93\pm4.10$, $M=24.94\pm3.03$; $t(328) = 2.04$, $p<0.001$). The effect size was calculated (Eta squared=0.01), indicating a moderate effect size. Additionally, nurses reported significantly higher stress levels compared to physicians ($M=28.17\pm3.92$, $M=25.20\pm3.13$; $t(328) = 2.09$, $p<0.001$). The effect size (Eta squared=0.01) indicated a moderate effect size.

As presented in table 3, a paired-samples t-test was conducted to investigate the difference in perceived stress of all HCPs before and after the aggression management training course. The results showed a statistically significant decrease in the mean total score of perceived stress at time two compared to time one (time one 28.94 ± 3.21 ; time two 24.20 ± 3.01 ; $t(229) = 2.03$, $p<0.001$). The magnitude of the differences in the means (mean difference 4.74, 95% CI: 2.05 to 8.67) was moderate (Eta squared = 0.01).

Table 2. Difference in perceived stress according to gender, working department, and occupation

Variable	N	Mean±SD	T	Df	P-value
Gender					
Male	177	24.20 ± 3.13	2.11	328	<0.001
Female	153	27.33 ± 4.11			
Department					
ICU	180	24.94 ± 3.03	2.04	328	<0.001
ER	150	27.93 ± 4.10			
Occupation					
Physicians	158	25.20 ± 3.13	2.09	328	<0.001
Nurses	172	28.17 ± 3.92			

Table 3. The difference in perceived stress of healthcare professionals before and after the training course

Variable	N	Mean ± SD	T	Df	P-value
Time 1 level of perceived stress	330	28.94 ± 3.21	2.03	229	<0.001
Time 2 level of perceived stress		24.20 ± 3.01			

Discussion

The main aim of the current study was to determine the effect of an aggression management program on the perceived stress levels of physicians and nurses working in ICUs and ERs. A total of 330 HCPs working in ICU and ER in several hospitals covering a wide geographical area in Jordan participated in this study. They answered the APSS10 questionnaire twice (before and after attending an aggression management training program).

The results of the current study showed that female HCPs had significantly higher stress levels than males. In previous literature, the difference in perceived stress was examined thoroughly among gender in different situations (23, 24). Consistently, the majority of these studies reported that females had higher perceived stress than males (24, 25). One cross-sectional study examining gender difference and stress perception reported that females had higher stress perception than males (26). It was suggested that this difference in stress levels between females and males might be explained by the difference in reporting stress and the coping strategies used by females and males; males were found to engage in problem-solving coping, whereas females showed significantly more

emotional coping strategies (26). Another explanation for this difference might be the physical and hormonal difference between females and males, which could be the physiological cause of different stress levels (27). Moreover, females and males differed in their response to the trauma; females were found to have higher levels of exposure to violence and were at higher risk of developing psychological consequences related to trauma (28). This suggests that stress levels vary among gender around the globe.

Perceived stress levels also differed according to HCPs' occupations. The results from the current study showed that nurses had significantly higher stress levels than physicians, consistent with previous studies (29, 30). For example, in a quantitative study that included 232 physicians and 446 nurses working in different hospital departments that examined violent behaviors toward HCPs, it was reported that the HCPs experienced about 700 incidents of passive-aggressive behavior, 680 of verbal violence, and 81 of sexual harassment. Nurses were exposed to violence almost twice as much as physicians, which could be explained by nurses dealing directly with patients and

their relatives with more frequency and duration than physicians (30).

ER healthcare professionals in the current study reported significantly higher stress levels than their counterparts working in ICU. Also, there was a statistically significant strong positive correlation between the number of violent attacks and perceived stress levels. Similarly, other studies showed that HCPs working in ER had the highest risk of violence compared to other departments, associated with higher stress levels (30). A systematic literature review of 27 studies that examined violence toward healthcare professionals showed that workplace violence occurred the most in psychiatric wards and ERs, and less commonly in ICU and other departments (31). Due to the nature of the ER, HCPs working in ER deal with patients and their relatives during highly stressful times, putting them at high risk of violence (32). This may be the reason for high-stress levels reported by HCPs working in ER.

To recapitulate the main findings of the current study, stress levels among females were higher than among males, among nurses than among physicians, and among those working in ER than among those working in ICU; and high stress levels were also connected to the risk of violence toward HCPs. Therefore, the main part of the study focused on applying an aggression management program to HCPs working on ICUs and ERs to get better control of violent patients and their families. After delivering the program, the current study results showed a statistically significant decrease in the levels of perceived stress for all participating HCPs. These findings mirrored the results of a review study that investigated the effect of aggression management and communication skills training programs that focused on the reduction of aggression perpetrated by patients found that such programs improve the confidence of all staff in dealing with aggression, and accordingly decrease their stress levels (33). Similar results were reported by nurses working in mental health care settings in Jordan in a study investigating the effect of an aggression

management training program on perceived stress levels of nurses. It found a significant decrease in the total score of perceived stress of all nurses after attending the training program (34).

Limitations

Although our study covered all healthcare sectors within a wide geographical range of Jordan, these results may not be generalizable to other countries or contexts. Given the role of culture in violence and stress perception, it is suggested that future studies explore the experiences of physicians and nurses in different countries. Moreover, the researchers wanted to collect the largest possible participants to present the three cities and the two groups of healthcare professionals (i.e., physicians and nurses), but it was difficult to get the right control group. However, the researchers acknowledge that this is still a limitation in the study. Therefore, future studies should apply randomized controlled trials to accurately conclude the cause and effect of the intervention.

Implications

Despite the study's limitations, the results showed a decrease in stress levels of physicians and nurses after attending an anger de-escalation technique. Further research is needed to assure healthcare policymakers and organizations dedicate more resources and efforts to multidimensional aggression management programs among physicians and nurses working in ER (as a priority) and ICU (to improve tertiary care working conditions in general). This should reduce the consequences of violence associated with stressful work environments and thereby improve professional satisfaction and the quality of care delivered.

Conclusion

The current study results shed light on the need to design and implement aggression

management courses for all physicians and nurses working in ERs and ICUs (and possibly in other departments). Such training programs can help them effectively de-escalate, manage, and control service users showing aggressive behaviors. This training may help promote good mental health among physicians and nurses, thus increasing job satisfaction and reducing burnout, absenteeism, and turnover, ultimately leading to improved quality of care provided to patients, improved patient satisfaction and outcomes, and a better working environment.

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