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Risk Assessment of Intensive Care Stressors and Coping with it among Critical Care Nurses at Internal Medicine Department Zagazig University Egypt (An Intervention Study)

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ABSTRACT

Background: Nurses play an important role in today's health care system. They constitute the largest health care occupation .The right to work in a safe and healthy environment is a fundamental right for every worker .Nursing is a highly stressful profession. **Objectives:** 1-to inquire about sources of work stress among nurses in critical care work 2-to assess the extent of stress predictors risk among nurses working in critical care work 3- to discover adopted style of coping among those nurses 4- To increase nurses awareness about varieties of coping especially constructive coping through health education intervention. **Subjects and Methods:-** An intervention study was conducted on 80 nurses working in the internal medicine intensive care units (ICU) of Zagazig University Hospitals and included two parts: 1-descriptive part: a pre-constructed questionnaire included: causes, frequency and details of their work, stress predictors in the ICU work, their adopted coping style, data for calculation of nurses work load. and lastly, a pre-test (about their basic knowledge about coping) was distributed followed by the post test three months later. 2- Intervention part: through health education about scientific definitions and concepts of coping strategies and its scales especially adaptive coping. **Results**:- Most of nurses were married females distributed nearly equally between different age groups, majority of them were qualified by technical diploma grade, spending <5 years in emergency departments and 85% of them perceived ICU work as a stressful job. Perception of work stress increases in married females of younger age group <35y, technical diploma nurses of <5 years duration of employment and higher workload (60-69).Risk assessment of ICU work stressors pointed to work load & high nurse /patient ratio as the most risky parameter of stress followed by dealing with critically ill patients. Adopted coping strategies centered in mal-adaptive coping i.e. venting emotions (35%), religion adherence (23.75%) and then problem solving (18.75**%**).After introduction of the health education message, there was an improvement in their knowledge about all parameters of coping strategies, expecting better attitude and performance of coping strategies. **Conclusion and recommendations**: It was concluded that feeling of stress among critical care nurses is precipitated by several work place factors. Work overload and dealing with patients relatives could be prioritized first (according to its risk weights and liability for solving) to be managed at the administrative and individual levels through development of the work policy and application of effective coping approaches.

Key words: Risk assessment- Coping- Workplace stressors- ICU nurses

Introduction

Occupational stress is a well recognized problem in health care workers. Nursing has been identified as an occupation that has high levels of stress (Nasef *et al.,* 2014). Stress is particularly acute among people who work in the 'helping professions' (Isikhan *et al.,* 2004; Gilibert and Daloz, 2008; Siegrist *et al.,* 2010). Stress has devastating effects on healthcare staff and their working environments (Lambert *et al.,* 2003). In an investigation conducted by the National Institute for Occupational Safety and Health in the USA, nurses were found to be one of the occupations that had a higher than expected incidence of stress related health disorders. It was found that job stress brought about hazardous impacts not only on nurses' health but also their abilities to cope with job demands. This will seriously impair the provision of quality care and the efficacy of health services delivery (Lee, 2003).

Emergency Department nurses are in a position that is expected to deal with additional stressors. These include unexpected numbers of patients at any time, unexpected rapid changes in patients' situations, and response to distressing or traumatic incidents such as sudden death, patient violence, inappropriate attendees, and physical or verbal abuse on a daily basis. Emergency nursing is a highly stressful profession. (Gabr and Mohamed, 2011).

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Coping is a strategy that helps people to reduce stress and solve problems. At 80th, Folkman *et al.* (1986) define coping as "the person's cognitive and behavioral efforts to manage the internal and external demands in the person-environment transaction. It was found that job stress brought about hazardous impacts not only on nurses' health but also their abilities to cope with job demands. This will seriously impair the provision of quality care and the efficacy of health services delivery (Lee, 2003). Some researchers described ICU as a stressful environment because of the complex nature of patients and health problems requiring an extensive use of very sophisticated technology (Raja *et al.,* 2007). In an emergency situations, the seconds between arriving, diagnosis and treatment can determine whether a patient lives or dies (Situation Critical, 2007). However, time is not the only factor to consider when measuring nursing workload (Beth and Karen, 2005).

Aim and objectives:

This study aimed to improve coping with sources of work stress among critical care nurses and its objectives were: 1-to inquire about sources of work stress among nurses in critical care work 2-to assess the extent of stress predictors risk among nurses working in critical care work 3- to discover adopted style of coping among those nurses 4- To increase nurses awareness about varieties of coping especially constructive coping through health education intervention.

Subjects and Methods:

The study was conducted in the internal medicine intensive care units (ICU) of Zagazig University Hospitals. Target group: All nurses working in ICU of internal medicine department of Zagazig University Hospitals. The total number of staff nurses on the head of work at ICU unit of internal medicine department during the period of this study was (89). Two of them were in long legal leaves and (5) of them were excluded because of participation in the pilot study, so 82 ICU nurses were asked to participate in this study but actually, two nurses dropped out during the study and 80 nurses completed (response rate about 97,5%).

Study design: An intervention study was conducted on 80 nurses working in the internal medicine intensive care units (ICU) of Zagazig University Hospital. It include two stages: 1-descriptive part: a pre-constructed questionnaire tailored by the researchers and contains many sections was distributed to ICU nurses, it included: causes, frequency and details of their work, stress predictors in the ICU work, their adopted coping style, data for calculation of nurses work load using Nursing Activities Score NAS (Miranda *et al.,* 2003) .lastly, a pre-test (about their basic knowledge about coping) was distributed followed by the post test three months later. 2- Intervention part: through health education message about scientific definitions and concepts of coping strategies and its scales for wider scope of beneficial application including adaptive coping .The massage was introduced after collecting their pre-test feedback.

The scientific material was collected from many sources: i.e Folkman and Lazarus, (1988,1986); Weiten *et al.,* (2008); Shelley, (1998); Snyder *et al.,* (1999) and Brannon and Jess, (2009). Both pre and post-test distribution were facilitated by the help of two cooperative senior head nurses working mainly as nurses administrators of the department. The interview was conducted during nurses available time while they are rotating in their shifts.

Pilot study:

This study design was tried first on 5 nurses who showed good understanding and applicability of study tools.

Scoring, risk rating and statistical analysis:

-The average daily workload was calculated through the product of the average daily demand of patients (n) by the average time of the care spent per patient (Beth and Karen, 2005) and (Lilia *et al.,* 2014) .The Nursing Activities Score (NAS) was used to measure the average time of assistance in the emergency room. NAS checklist contains 23 items which cover the nursing activities undertaken with the patients with weights which represent the percentage of the nursing time dedicated to undertaking the activities (Miranda *et al.,* 2003).

-Risk assessment of stress predictors among ICU nurses was calculated by multiplying a "probable frequency rating" by a standardized risk assessment method according to the Health and Safety Executive (HSE, 2014) approach to risk assessment measurement for each hazard by multiplying a "probable frequency rating" by a "severity rating using Risk Assessment Matrix):

Probability	Consequences		
	Slightly	harmful	Extremely harmful
Highly unlikely (1)	1	2	3
Unlikely (2)	2	4	6
Likely (3)	3	6	9

Where, mean stressors likelihood of occurrence and severity of exposure consequences were expressed by an ascending score from 1 to 3 for each.

Results

Table 1: Socio-demographic characteristics of studied nurses.

Items	Number	% Percent
Sex		
Male	13	16.3
Female	67	83.8
Age		
≤ 35y	42	52.5
> 35y	38	47.5
Martial state		
Married	67	83.8
Unmarried	13	16.3

Table 2: Occupational characteristics of studied nurses.

Items	Number	% Percent
Qualification		
Technical diploma	64	80
Technical institute	14	17.5
B.Sc.	2	2.5
Duration in emergency department		
≤ 5y	54	60.75
>5y	26	39.25
Department		
Emergency of pediatrics	11	13.75
Emergency of gynecology and obstetries	15	18.75
Emergency of internal medicine	54	67.50

Table 3: Perception of stress and risk assessment for its Predictors among Participating ICU Nurses.

Stress perception among studied nurses	N(T=80)	%
	68	85%
Potential predictors of work stress (according to nurses opinion)	Risk assessment of stress predictors	

	Probability (Mean)	Consequences (Mean)	Calculated Risk (Mean)
1-Physical environment (complexity)	2.1	1	2.10
2-Work load and high patient/nurse ratio	2.8	2.9	8.12
3-Dealing with patients suffering (critically ill patients)	2.4	2.1	5.04
4-Dealing with patients relatives and the safety issues	2.2	1.8	3.96
5-Peer conflict and lack of support by administrators	2.1	1.1	2.31
6-Staff shortage during the shift	1.6	2.7	4.32
7-Lack of needed instruments or equipments	1.4	1.9	2.66
8-Work shift and unbalanced work and life responsibilities	2.8	1.6	4.48

Table 4: The relationship between nurses socio-demographic characteristics and stress perception

Sociodemographic characteristics of studied nurses	Perceive stress at work (n=68)		Not perceive stress at work (n=12)		X2	P
	N	%	N	%		
Sex						
Male	5	7.4	8	66.7	26.4	0.000
Female	63	92.6	4	33.3		
Age						
<35	42	61.8	0	0.0	15.6	0.000
>35	26	38.2	12	100.0		
Marital status						
Married	60	88.2	7	58.3	6.7	0.010
Unmarried	8	11.8	5	41.7		

Table 5: The relationship between nurses occupational characteristics and stress perception.

Occupational characteristics of studied nurses	Perceive stress at work (n=68)		Not perceive stress at work (n=12)		X2	P
	N	%	N	%		
Qualification						
Technical diploma	54	79.4	2	16.7		
Technical institute	10	14.7	6	50.0	19.78	0.000
B.Sc.	4	5.9	4	33.3		
Duration in emergency departments						
≤ 5	52	76.5	2	16.7		
>5	16	23.5	10	83.3	16.6	0.000
Mean daily workload/nurse/shift						
49-59	10	14.7	4	33.3		
60-70	58	85.3	8	66.7	17.55	0.000

Table 6: Adopted coping acts used by nurses against stressful work conditions (interpreted to The Cope terminology).

Coping styles adopted by nurses in the ICUI interpreted to the corresponding scientific coping strategy)	N	%
Praying for a time (religion)	19	23.75
Problem solving (active coping)	15	18.75
Refusing the event (denial)	3	3.75
Ventillating feelings with others (venting emotions)	28	35.00
Increase breaks between work(mental disengagement)	3	3.75
Macking joks (humor)	5	6.20
Agreement that the event is a reality (acceptance)	7	8.40

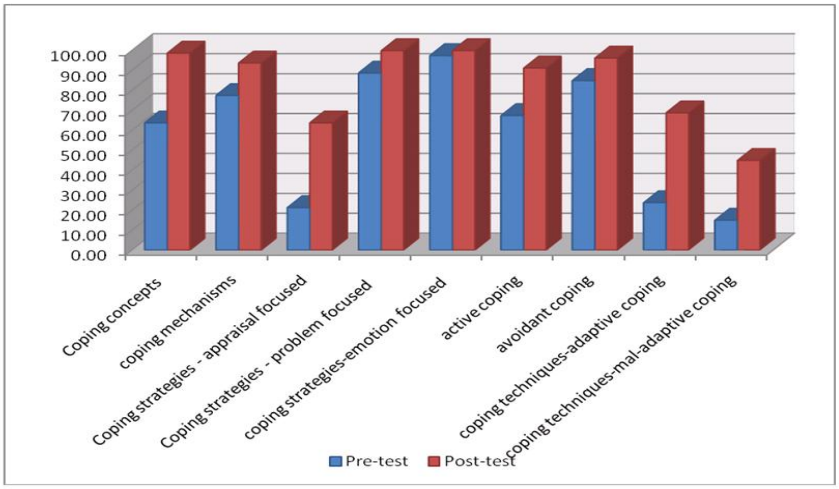

Fig. 1: A Bar chart showed the effect of health education on nurses awareness about coping

Table 7: Significant of health education effect on nurses awareness about coping.

Awareness about coping	Pre-test N=80 n (%)	Post -test N=80 n (%)	P-value
1-Awareness about coping concepts	51 (63.8)	79 (98.8)	0.000*
2- Awareness about coping mechanisms	12 (15.0)	36 (45.0)	0.000*
3- Awareness about coping strategies: appraisal focused	62 (77.5)	75 (93.8)	0.003
4- Awareness about coping strategies: problem focused	17 (21.3)	51 (63.8)	0.000*
5- Awareness about coping strategies: emotion focused	71 (88.8)	80 (100.0)	0.002
6- Awareness about constructive (adaptive) coping	78 (97.5)	80 (100.0)	0.155
7-Awareness about mal-adaptive coping	54 (67.5)	73 (91.3)	0.000*
8-Awareness about active coping	68 (85.0)	77 (96.3)	0.015
9- Awareness avoidant coping	19 (23.8)	55 (68.8)	0.000*

Discussion

Emergency nursing is a highly stressful profession, nurses are in a position that is expected to deal with additional stressors. These include unexpected numbers of patients at any time, unexpected rapid changes inpatients' situations, and response to distressing or traumatic incidents such as sudden death, patient violence, inappropriate attendees, and physical or verbal abuse on a daily basis (Yang *et al.,* 2002).

In this study, Table (1,2) showed that most nurses were female (83.8%).the subjects distributed nearly equally between two age groups (<35y and >35y) , most of them were married (83.8%). of technical diploma qualification (80%) , working at ICU of internal medical department (67.50 %) and more than half of them were working in the ICU for <5y .Table (3, 4) show the relationship between socio-demographic and occupational characteristics of studied nurses and stress perception among them: 85% of ICU nurses were perceiving stress. This is not surprising because other studies indicated that stress symptoms were experienced by 100 % of their staff nurses sample (Raja *et al.,* 2007). Abdolhamid *et al.* (2015) discovered also High levels of occupational stress (83.9%) among ICU nurses.

By using risk assessment matrix for ICU stress predictors, the highest risks in a descending order were: higher workload & nurse/patient ratio (8.12), dealing with patients suffering (5.04) then unbalanced work and home responsibilities (4.48) (Table 3)**.** A quiet similar findings in another study commented that, most common causes of stress reported by nurses were: dealing with patients' pain and suffering, a heavy workload with special concern to presence of the patients' family in the Emergency Department (ED) (Adeb-Saeedi, 2002). Resuscitation of patients who are critically ill was also mentioned in other studies as a major cause of stress

(Laposa *et al.,* 2003, O'Connor and Jeavons,2003).Other researchers clarified that aspects of the work environment as a whole', including poor rostering, workload, overcrowding, traumatic events, shift work, frequency at which doctors rotate, inter-staff conflict, lack of teamwork are the main stressors . Lewis *et al.* (2010) and Tessy and Bhat, (2013) specify unequal allocation of workload as a main and the second main stressor respectively while. in another point of view, Ross-Adjie *et al.* (2007) ranked violence against staff as the top work stressor among ED staff in Australian study. In the same line, Winstanley and Whittington, (2004) commented on the safety issues and reported that more than 30 per cent of assaults in UK hospitals are directed at emergency staff who are slower to report these aggressive incidents as they occur so frequently. Moreover, many researchers as Ross-Adjie *et al.* (2007) and (Jonsson and Halabi, 2006) identified a relationship between a lack of workplace support and work-related traumatic stress. they added other stressors including death or resuscitation of a young person or child, managing patients who were critically ill, sudden or traumatic death, or having to deal with major incidents.

Table (4) showed that married females of <35 y age group were significantly higher in perceiving stress than others during ICU work. Tessy and Bhat, (2013) confirmed this relationship and also with +ve marital status. An explanation for this gender difference by Healy and Tyrrell (2011) is the relatively large proportion of females in the sample plus the conflict in balancing between work and family commitments. Preto and Pedrão (2009) also mentioned that most of stressed ICU nurses were females between 24 and 40 years old, as the younger nurses are the ones who most intensely desire to work in these units to develop their professional skills.

Table (5) clarified that higher workload for less experienced nurses (<5y) and especially those of lower scientific grade (technical diploma) were significantly perceiving stress than others. Ross-Adjie *et al.* (2007) commented on this and claimed that less experienced emergency nurses find caring for high-acuity patients more stressful than do their more experienced colleagues. This is due to that experienced nurses are more likely to care for critically ill patients and so are more confident in doing so. Healy and Tyrrell, (2011) also, commented on that subject stressing that, Nurses with less years of working experience, experienced more stress compared to nurses with many years of working experience (p=0.0001).The condition can be different in relation to children resuscitation because Ross- Adjie, (2007) suggested that nurses with between one and five years' experience of ED working ranked the stress resulting from the death of a child higher than those with less than one year's experience. Because more experienced nurses are likely to be older and more likely to be parents, and therefore find the death of children particularly difficult. Lilia *et al.* (2014) notified that, failure to distribute manpower based on "actual workload" may result in either under-utilization in some hospitals or "overloading" in others and so, nurse patient ratio was identified among nurses to be a significant predictors for stress. They added other parameters for stress like high technology work environment and nursing critically ill patients. (Healy and Tyrrell, 2011) revealed that nurses' grade (described as either clinical nurse manager or staff nurse), showed a significant difference in stress perceiveness that staff nurses did not find particular stress compared to clinical nurse managers.

Table (6) discussed nurses styles in dealing with stressful factors in the ICU and showed great dependence on mal-adaptive coping i.e. venting emotions (35%), religion adherence (23.75%) and then problem solving (18.75%). Liana *et al.* (2014) showed different results in their study: Their nurses frequently employ problem-oriented and emotion-oriented strategies of coping stress, besides that, planful problem solving, self controlling and positive reappraisal are the most often applied ways of coping stress, while confrontive coping and escape/avoidance are less common (nurses use the escape/avoidance and confrontive coping with higher Emotional Exhaustion). Loo See, (2012) revealed quiet different results where Praying (religion) and relaxation methods(mental disengagement) were the commonest coping methods followed by ventilating emotions with others. Loo See, (2012) found that social support is a buffer against dysfunctional consequences of stress emanating from the workplace and advice for establishing network of friends, family, superiors, peers, and colleagues seeking for emotional support on facing job-related stress.

In contrast to this, several studies in other countries had identified "problem solving" as the most frequent coping strategy being used by nurses (Raja *et al.,* 2007).

Our intervention to widen coping scope of respondents (Table 7) and (Figure 1) .by comparison between pre and post-test, this intervention yields significant awareness showed significant improvement especially regarding parameters of coping concept, mechanisms, problem focused strategy, constructive coping and avoidant coping. Raja *et al.* (2007) also recommended for stress inoculation training to be implemented for prevention of total burnout among ICU nurses.

Conclusion and recommendations:

It was concluded that stress among critical care nurses is precipitated by several work place factors. Work overload, high patient/nurse ratio and dealing with patients suffering could be prioritized according to its risk weights to be managed first at the administrative and individual levels through development of the work policy and training for application of effective coping approaches.

Ethical consideration:

After obtaining a consent from the manager of Internal medicine department to proceed in this research, all participant subjects were informed about the study aim and steps with keeping of their confidentiality.

Obstacles:

1-Rotating shift and high work load were the most difficult events during this study while filling the questionnaires and attending the seminar-2-Case drop out during collection of the post test.

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