

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/311454945>

Stress among Nurses Working in the Intensive Care Environment: A Study in Two Different Egyptian Governorates

Article · August 2014

CITATIONS

0

READS

265

2 authors:



Sahar Younes

faculty of nursing

4 PUBLICATIONS 0 CITATIONS

[SEE PROFILE](#)



Samah Shalaby

Alexandria University

10 PUBLICATIONS 7 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Novel education strategies [View project](#)



Priorities of critical care nursing research and assessing self directed learning [View project](#)

Stress among Nurses Working in the Intensive Care Environment: A Study in Two Different Egyptian Governorates

Sahar Younes Othman⁽¹⁾ & Samah Anwar Shalaby⁽²⁾

⁽¹⁾ Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing, Damanhour University,

⁽²⁾ Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing, Alexandria University

Abstract:

Background: The nature of the work in an intensive care unit (ICU) imposes tremendous tension and stress on nurses. The ICU nurses are confronted not only by the increasing demand for quality care by patient, patient's family and the organization, but also by the demand for technological excellence. **Aim:** the aim of this study is to identify factors causing stress among nurses working in the intensive care environment in two different Egyptian governorates. **Subjects & Methods:** A descriptive exploratory design was used in this study. **Setting:** It was carried out at six adult ICUs of four different hospitals at Alexandria and Damanhour cities. **Subjects:** A convenience sample of 150 nurses was utilized in this study. **Tools:** The data was collected through distribution of self-administered questionnaire of ICU nurses' work related stresses which included Expanded Nursing Stress Scale (ENSS). **Results:** ICU nurses were stressed, with the greatest perceived sources of stress being "workload" (mean=3.09±0.81), followed by death or expecting death (mean=3.01±0.70), problems relating to supervisors (mean=2.86±0.81), and dealing with patients and their families (mean=2.74±0.82). Experiencing discrimination was the least stressful event perceived by the ICU nurses with a mean score of 1.08±1.21. The study findings revealed that socio-demographic and occupational determinants of participants (age, marital status, years of experience, education level and work schedule) significantly affected their perception of stress at work. **Conclusion:** Job-related stress among ICU nurses reaches values that are considered seriously high. Only one factor associated with high levels of job stress appears to be modifiable and that factor was work status. **Recommendations:** This study indicates the importance of adopting coping strategies that might help in reducing the amount of stress experiencing by the ICU nurses.

Key words: job related stress; intensive care unit; nursing stress scale.

Introduction:

According to the U.S. National Institute of Occupational Safety and Health, job stress is the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the employee.⁽¹⁻³⁾

It has been identified more frequently in jobs low in autonomy but high physically and psychologically demanding. Nursing has been shown to be a strenuous profession, and nurses are more exposed to stress-provoking factors than other healthcare workers.⁽¹⁾

The intensive care unit (ICU) has been described as an extremely stressful environment for nursing staff.⁽⁴⁾ It is a specialized section of a

hospital that provides comprehensive and continuous care for critically ill patients. Moreover, it is highly technological area in which nurses are required to make rapid time sensitive decisions.⁽⁵⁾ For example, the patient's fight for life appears to be an endless battle for the nurses working in an ICU.⁽⁶⁾ Stress is recognized as an inherent feature of the work life of ICU nurses and they may experience many forms of stress, including physical, psychological, and moral stress or distress.⁽⁷⁾ Potential sources of work-related stress for ICU nurses includes providing care to dying patients, lifting of heavy unresponsive or emaciated patients, fear of making mistakes, high workloads /task overload, interpersonal

conflict, lack of collaboration, lack of support from administration, enclosed atmosphere, time pressures, excessive noise, unpleasant sights and sounds, and standing for long hours.^(5,6,8) Moreover, nurses working in ICUs assume an ever-increasing responsibility for the management of patient care. In this expanding role, the ICU nurses are confronted not only by the impending crises of patients and families, but also by the demand for technologic excellence.⁽⁴⁾

Stress can adversely affect the quality of nursing care delivery, as well as having an economic cost to the community.⁽⁹⁾ Stress may also contribute to fatigue; muscle, back and joint pain; migraine; hypertension; irritable bowel syndrome; duodenal ulcer formation; immune disorders; obesity and all-cause mortality.^(5,10-12) Occupational stress and its consequences on nurses' behavior can create anxiety, depression, insomnia, feelings of inadequacy, reduction of attention span, inability to concentrate, and impaired decision-making.⁽¹³⁾ Work related stress has been implicated in job dissatisfaction, absenteeism, rapid turnover, and burnout among nurses. Job stress impacts nurses' health abilities to cope with job demands with subsequent reduction in the quality and efficacy of health service delivery.⁽¹⁴⁻¹⁶⁾

Conversely, the ICU environment is also the source of teamwork, collaboration, and high control over patient care, with an assignment of 1-2 patients common, compared to 4-10 patients in settings like the emergency department or medical-surgical floor. ICU nurses are sometimes viewed as more assertive than nurses in other settings, resulting in a level of engagement at work that may mitigate stress by supporting each other in caring for difficult patients or dealing with difficult situations.^(5,6) We

determined that there was a need to understand whether today's ICU nurses perceived their job as a source of stress and what factors contributed to stress.

Significance of study:

Despite research conducted internationally about job-related stress in nurses, little has been studied about stress among ICU nurses in Egypt. Understanding the stress perceptions of nurses working in the ICU environment is a first step in determining whether stress reduction need to be considered by hospital and health care administrators.^(4,15) Thus the findings are intended to inform nurse educators, nurse managers, and nurse administrators regarding the level and types of stressors among ICU nurses.

Aim of the study:

The aim of this study is to identify factors causing stress among nurses working in intensive care environment in two different Egyptian governorates.

Research Questions:

The following research questions are addressed:

1. What are the factors causing stress among nurses working in the intensive care environment?
2. What are the most and least perceived sources of stress that commonly faced by ICU nurses?
3. Are there differences in nurses' stressors in the two different Egyptian governorates?
4. Is there relation between level of stress and ICU nurses' socio-demographic and occupational characteristics?

Subjects & Methods:

Research design:

A descriptive exploratory design was used in this study. This study used a survey to collect prospective data at a single point in time.

Settings:

This study was conducted in the adult ICUs of four hospitals in two Egyptian governorates. Two hospitals were in Alexandria: Alexandria Main University hospital (the casualty care unit "unit I", General ICU "unit III"), and Gamal Abd-Elnasser hospital (General ICU). Two hospitals in Damanshour were also settings for this study: Damanshour National Institute Hospital including: (General ICU, Coronary ICU), and Damanshour Chest Hospital: (Chest ICU).

Subjects:

A convenience sample of nurses providing direct patient care was recruited. All nurses were eligible to participate in this study regardless of their qualification in nursing if they had at least 6 months of working experience in the ICU setting.

Tools:

The tool used in this study was "ICU Nurses' Work Related Stresses Questionnaire". It is adopted and modified from French et al.⁽¹⁷⁾ and consisted of three parts:

- **Part (1):** Elicited socio-demographic and occupational information about the ICU nurses such as " gender; age; years of experience in the ICU; qualification; current position; work schedule; residence; and mean of transportation to the work place".
- **Part (2): Expanded Nursing Stress Scale (ENSS):** was self-report questionnaire and used to measure source and frequency of stress perceived by the ICU nurses.⁽¹⁷⁾ The ENSS contained 57 items in nine subscales which include: death and dying (7 items), conflict with physicians (5 items), inadequate preparation (4 items), problems with peers (6 items), problems with supervisors (7 items), workload (9 items), uncertainty concerning

treatment (8 items), patients and their families (8 items), and discrimination (3 items).

Scoring system of ENSS:

The 57 items were arranged in a 5 point Likert type scale. The offered response options were: does not apply (0), never stressful (1), occasionally stressful (2), frequently stressful (3) and extremely stressful (4). The response "does not apply" (0) indicated that the respondent had never faced the situation described by the item, and therefore the calculation of the average value was performed excluding zero values. A total and sub-scale mean score can be derived from this instrument. The total score provides an overall levels of stress and ranges from (0- 228) was obtained by adding all the scores on 57 items together. There are no specific cut scores or published average or "normal" scores for ENSS to determine level of stress. However, higher scores indicate higher levels of stress.

- **Part (3): Environmental Stressors:** was an investigator-developed questionnaire to obtain data related to environmental stressors (8 statements) arranged in a 5 point Likert scale and its scoring system was the same as calculating the total ENSS score.

Content validity and reliability:

The study questionnaires were translated into Arabic before use with Egyptian nurses. The tools were circulated to 6 experts in the field of critical care nursing to test its content validity and ascertain that the tools were relevant, understood, and applicable. Modifications after this content review included. Internal consistency of the subscales of ENSS was assessed by the researcher using Cronbach's alpha for the ENSS, using the entire sample. The study tool showed high reliability ($\alpha=0.93$).

Pilot study:

A pilot study was conducted on 10% of the study sample (15 nurses) who were selected randomly and excluded from the total sample. The pilot study was performed after the development of the tool and before starting data collection. The aim of the pilot study was to determine the applicability of the designed tool, the time consumed for filling the sheet and also to test clarity of the language. Accordingly, minor modifications were done to improve clarity. No new items were added.

Fieldwork:

The field work started at the beginning of May 2013 and was completed by the end of August 2013.

Data collection:

Data were collected through meeting with ICU nurses who met the inclusion criteria at their office during break time. First they completed the demographic information using "part I" of the study tool. Then nurses completed the ENSS "part II" of the study tool; they were asked to rate their perceptions to a list of stressful situations using a five-point Likert-type scale. Finally the nurses were asked to rate their perceptions to a list of environmental ICU stressors using "part III". Explanations about the purpose of the study or how to complete the section were repeated whenever participants requested them. Completing the questionnaires took approximately 15-20 min.

Administrative and ethical considerations:

Approval was obtained from the Ethics Committee of the Faculty of Nursing at the University of Alexandria. Permission to conduct the study was provided by the hospital authorities after explanation of the aim of the study. Nurses were recruited via a verbal request that included the

purpose and nature of the study and information that individual responses would be confidential and not shared with anyone in the workplace. The explanation noted that participation was voluntary. Researchers ensured that names would be protected. The nurses were able to stop participation and withdraw from the study at any time during data collection.

Statistical analysis:

Collected data were tabulated and statistically analyzed using the Statistical Package for Social Science (SPSS) version 20. Descriptive statistics were used to summarize the stressful factors. Factors with the highest and lowest scores were then identified (categorical variables were expressed as number and percentage while continuous variables were expressed as mean \pm standard deviation). Differences in stressors between the two governorates were determined with independent T-tests. Chi-square test used to determine the level of significance for qualitative variables. Finally, relationships between stress scores and ICU nurse characteristics were assessed by One-way ANOVA test. P-Values, which were less than 0.05, were considered as statistically significant, and, less than <0.001, were considered as very highly statistically significant.

Results:

Table (1): Summarized the characteristics of the ICU nurse participants. One hundred fifty nurses were participated in this study (100 nurses from Alexandria and 50 from Damanhour). The highest percent of them at Alexandria and Damanhour were between 20 year to 39 year. Forty seven percent of them in Alexandria nurses were between 20 year to 29 year, while 46% of Damanhour nurses were between 30 year to 39 year. Most of studied nurses working in either

Alexandria or Damanhour were females (75% and 78% respectively), married (55% and 72% respectively), and had working experience ranging from 2 to 5 years (50% and 64% respectively). In Alexandria, more than half (52%) of nurses in the intended ICUs had Bachelor of Science in nursing while 62% of ICU nurses in Damanhour had secondary technical nursing school diploma. Most of studied nurses in Alexandria (65%) were working in general ICUs while the majority of studied nurses in Damanhour were working in general and specialized ICU (48% and 34% respectively). It was found that most of studied nurses working in either Alexandria and Damanhour were rotating among shifts (79% and 80% respectively), live away from hospital (66% and 72% respectively) and had no available mean of transportation (71% and 78% respectively). It can be noted from the same table that the distributions of demographic and occupational characteristics among studied nurses working in the intended ICUs in Alexandria and Damanhour were comparable and there were no significant differences between the nurses in Alexandria and the Damanhour governorates ($p > 0.05$) were noted except for educational level and type of ICU (general versus specialized) as noted in Table (1).

Table (2): Illustrates comparison of mean scores for intensity of all stress situation categories as perceived by ICU nurses in Alexandria and Damanhour. It also lists averaged scores separately for each governorate. Independent t-tests yielded significant differences in nurses' stress situation-specific stress scores, comparing the two study settings. Note also that highly stressful work situations were different in the two study settings. Nurses at all ICUs in Alexandria rated "death or expecting death" as the most

stressful situation with mean score of 2.82 ± 0.69 compared to 3.41 ± 0.51 in Damanhour and the differences were statistically significant $p=0.00$. It can be noted that the intensity of this stress situation in Damanhour is higher than its level in Alexandria. However, in Damanhour ICU nurses rated situations related to working environments as the most stressful ones with high mean score of 3.95 ± 0.09 compared to 2.42 ± 0.72 in Alexandria and also the differences were statistically significant $p=0.00$. On the other hand, the least stressful event rated by the ICU nurses in both (Alexandria and Damanhour) was discrimination with mean scores of 1.46 ± 1.28 and 0.31 ± 0.44 respectively.

Table (3): Indicates rating of stress associated with death and dying and inadequate emotional preparation. On average, nurses' responses to items in the death and dying subscale were rated as the second stressful event occurring in the studied ICUs with relatively high total mean score (3.01 ± 0.70). The death of a patient with whom ICU nurses developed a close relationship was rated as an extremely stressful situation among the majority (74.7%) of participants with mean score of (3.52 ± 0.96). It was found that feeling inadequately prepared to help with the emotional needs of a patient was rated as frequently to extremely stressful event among more than half of studied ICU nurses with a mean score of 2.493 ± 1.16 .

Table (4): Illustrates rating of stress associated with conflict with physicians and problems with peers. About 38% of nurses indicated that criticism by a physician was extremely stressful with mean score of 2.96 ± 1.04 . This score was followed by conflict with a physician and having to organize doctors' work with mean scores of 2.66 ± 1.26 and 2.18 ± 1.27

respectively. Concerning problems with peers, 46% of the ICU nurse participants revealed lack of opportunity to share experiences and feelings with other personnel in the work setting was a frequently occurring stressful situation.

Table (5): Demonstrates rating of stress associated with problems relating to supervisors and workload. The ICU nurses' responses revealed that being held accountable for things over which they have no control was considered extremely stressful situation among the majority (60.7%) of them with a relatively high mean score (3.22 ± 1.14). It was found that workload was perceived by the studied ICU nurses as the first stressful events with a relatively high mean score (3.09 ± 0.81). Having to make decisions under pressure and having to work through breaks were extremely stressful events as perceived by more than half of ICU nurses. In this subscale not enough staff to adequately cover the unit and unpredictable staffing and scheduling were also rated as extremely stressful events occurring in the work place among (48.7%) and (48.0%) of ICU nurses respectively.

Table (6): Represents rating of stress associated with uncertainty concerning treatment and dealing with patients and their families. Regarding uncertainty concerning treatment, nurses' responses indicate that the majority of items in this subscale were frequently to extremely stressful to them. In particular fear of making a mistake in treating a patient was rated as extremely stressful situation to (56.0%) of nurses worked in the intended ICUs with a mean score of (3.15 ± 1.14). Also a physician not being present in a medical emergency was rated as an extremely stressful event by (50.0%) of nurses in the whole study sample. In relation to dealing with patients and their families,

items within this subscale were rated as the fifth stressful events occurring to studied nurses. Patient making unreasonable demands was rated as frequently to extremely stressful event by (57.4%) of nurses. Being blamed for anything that goes wrong was ranked as next most stressful event followed by being the one that has to deal with patients' families with mean scores of 2.90 ± 1.17 and 2.87 ± 1.18 respectively.

Table (7): Represents rating of stress associated with discrimination and ICU environment. Studied nurses responses indicate situations of being discriminated were ranked as the least stressful event with a mean score of (1.08 ± 1.21). In particular experiencing discrimination on the basis of sex was the most frequently occurring stressful event in the workplace. The least occurring stressful event rated by the CCNs was being sexually harassed with a mean score of (0.88 ± 1.28). Regarding ICU environment, nurses' responses indicate ICU environment as the third stressful experience with a total mean score of (2.91 ± 0.95). In particular, noise exposure "beeping and buzzing sounds of machines", insufficient equipment and enclosed atmosphere were rated as the most frequently occurring stressful conditions with high mean scores of (3.11 ± 1.15 , 3.01 ± 1.12 and 3.00 ± 1.20 respectively). While, irritant gases exposure was the least stressful experience mentioned by the studied nurses although this still had a high mean score (2.75 ± 1.37) on the scale ranging from 0-4.

Table (8): Shows relation between ICU nurses' socio-demographic and occupational characteristics and total mean of ENSS. Regarding socio-demographic characteristics, the results of the current study revealed that ICU nurses in the age less than 30 years had the highest score on ENSS

(157.01±32.59). On the other hand, nurses in the age group 40 years to less than 50 years had the lower score on ENSS scale (135.68±33.79). The differences between nurses' age and stress were statistically significant ($F=3.887$, $P=0.010$). The displayed findings also reveal that female nurses had the highest ENSS mean score (152.72±28.00) as compared to male nurses (144.29±36.10), but the differences were not statistically significant ($t=1.402$, $P=0.163$).

It can be noted from the same table that single nurses had lower ENSS mean score (141.06±39.32) than married nurses (157.97±19.84) and the differences were highly statistically significant ($t=3.371$, $P=0.001$). In addition, nurses who had children had higher ENSS mean score (155.45±18.65) than those who had not (145.78±39.52) and the differences were statistically significant ($t=1.984$, $P=0.049$). The findings of the present study revealed that there was a statistically significant relation between ENSS mean scores and nurses' level of education ($F=6.062$, $P=0.003$). The ICU nurses who had diploma degree had higher ENSS mean score (158.59±21.35) than nurses who had bachelor (146.55±33.20). The displayed findings also revealed that nurses with less experience have the highest stress mean score (157.18±35.19) than those who have experience more than 5 years (138.54±32.38). There is a statistically significant relation between nurse's stress and working experience ($F=4.644$, $P=0.011$).

Concerning ICU nurses' occupational characteristics; it can be noted from the same table (Table 8) that there is a statistical significant difference between the type of hospital and ICU nurses' stress ($F=3.134$, $P=0.027$). The results points out that ICU nurses' stress increased among

nurses working in the university hospitals (157.54±31.62) than nurses working in ministry of health and health insurance hospitals (157.10±08.26 and 147.75±36.89 respectively). The study findings revealed that there was a statistical significant difference between the type of ICUs and nurses' stress level ($F=7.349$, $P=0.000$). It was observed that nurses working in the CCU had the lower ENSS mean score (130.25±41.63) than those working in SICU, GICU and specialized ICU (147.00±26.21, 156.64±25.16 and 158.76±3.50 respectively). It can be observed that ENSS mean score increased among nurses who were staying away from the workplace (152.06±28.78) than nurses staying near to workplace (147.42±33.58) but the differences are not statistically significant. The findings of the current study also revealed that ENSS mean score was increased among nurses who had not a mean of transportation to workplace (151.61±29.35) than nurses who had (149.81±29.35) but the differences were not statistically significant. The displayed findings also revealed that nurses who were working in the rotating shifts had the highest ENSS mean score (153.09±29.78) than those working only in morning shift (139.30±28.50). There was a statistically significant relation between nurse's stress and working schedule ($t=2.056$, $P=0.042$).

Discussion:

The complex environment of an intensive care unit is associated with a considerable amount of stress. High levels of stress among ICU nurses have been documented in numerous studies. (18-20) The current study revealed that ICU nurses in the two Egyptian governorates have been frequently, and in some case, excessively exposed to stressful situations as a part of their

daily work. The most intense stressors for nurses worked in both Alexandria and Damanhour ICUs were related to workload followed by, emotional issues related to death and dying, problems relating to supervisors and dealing with patients and their families. These factors were reported previously.^(21,22)

The results of the current study revealed that workload was the first most common source of nursing stress as perceived by the ICU nurses. This may be attributed to the fact that Egypt as many other countries, suffers from a shortage of nurses, which increases the workload for nurses. Also, ICU nurses burdened with extra responsibilities such as having too many non-nursing tasks and having to work through breaks. It was found during the present study that the nurse to patient's ratio in Damanhour ICUs was 1:2 for the morning shift, 1:3 for both afternoon and night shifts. Nursing shortage in Damanhour ICUs was more than its level in Alexandria ICUs. Many nurses in Damanhour ICUs reported that there was not enough staff to get the work done, and that this resulted in not having enough time to provide emotional support to the patient and to respond to patient's needs. Many also believed that they could deliver much better care if they had more enough time with each patient. The current shortages of nurses will thus continue to challenge the ability of nurses to meet the needs of their patients, thereby potentially providing a situation where level of work stress increases and work satisfaction decreases.

The present study agrees with the findings obtained by Gillespie⁽²³⁾ and Astbury⁽²⁴⁾ who reported that the most ICU stressors were resulting from inadequate staffing. Another study that was carried out in Saudi Arabia on 148

nurses found that lack of enough staff was the most stressful event perceived by staff nurses.⁽²⁵⁾ Similarly, in a study carried out in a Chinese intensive care unit, excessive workload was the most frequently cited sources of workplace stress; this was a result of the nursing shortage with fewer nurses to care for more patients.⁽²⁶⁾ It is documented that excessive nursing workloads adversely affect the safety of patients. Montgomery⁽²⁷⁾ has demonstrated that excessive workloads will have a significant effect on the incidence of medical errors that compromise the safety and even the lives of patient. Furthermore heavy nursing workload increases the incidence of burnout and its related disorders in nurses and their private and professional lives.⁽²⁸⁾

Regarding issues related to death and dying, the results of the current study revealed that death and dying was the second most common source of stress the ICU nurses face in their work. This may be attributed to the increased workload, nurses may not have enough time to support each other's emotions in general and those emotions related to death and dying in particular. Also, it may be due to the fact that nurses traditionally had not received sufficient education about dealing with death/dying so they do not know how to express their emotions when encountering the death or the dying of a patient. This idea supported by Mallory⁽²⁹⁾ and Mok et al.⁽³⁰⁾ who indicated that nurses' attitudes toward care of dying were improved after the implementation of educational programs in palliative care. Nurses have benefited from the programs in the areas of change in attitudes, increased self-awareness, having a positive attitude towards death and dying and acquiring the knowledge and psychosocial skills in providing culturally sensitive care for dying patients.

The finding of the current study is in parallel with the previous studies in the Arab world that have been carried out to investigate stress in the nursing profession. Umro⁽²²⁾ studied stress and coping mechanism among nurses in Palestinian hospitals and found that death and dying the most reported source of stress in nursing. Also Muhammad⁽³¹⁾ and Hamaideh et al.⁽³²⁾ reported that nurses working in ICUs in Egypt and Jordan perceived death or expecting death situations as the highest source of stress they face in their work. Several other studies in Asia and Europe investigated stress among nurses and have found similar findings with regard to sources of stress. A study examined work stressors and ways of coping among hospitals from Japan, South Korea, Thailand and the United States (Hawaii) suggested that nurses in all four countries ranked workload and dealing with death and dying to be the highest of all workplace stressors.⁽³³⁾ On the contrary, the present study findings did not agree with another study done by Hays et al.⁽³⁴⁾ who found that the studied nurses reported minimum to no stress most frequently with exposure to death and dying.

Concerning ICU environment as a stress factor, the current study revealed that the most stressful items related to ICU environment reported by the studied nurses were exposure to noise, insufficient functional equipment, enclosed atmosphere, and exposure to radiation. Exposure to noise may be attributed to absence of regular maintenance of ICU machines which leads to inappropriate beeping and buzzing sounds of machines or may be due to nurse's delay in response to machines alarms. Exposure to radiation was frequent stressor in the studied ICUs. This may be related to the fact, that inadequate safety measures such as inadequately shielded nurses when

holding patient in proper position for radiation make them liable to have radiation hazards. In addition, the present study found that lack of sufficient or malfunctioning equipment was common stressor. The results of the present study are consistent with the finding obtained by Mohamed et al.⁽³⁵⁾ who studied nurses' stresses in pediatric ICU and found insufficient functional equipment, exposure to radiation and exposure to noise generated during the use of medical equipment were the most common environmental stressor reported by staff nurses. Similarly, Al Omar⁽³⁶⁾ reported that the first cause of work stress in nursing was the insufficient technical facilities.

Not surprisingly, the lack of support by nursing administration was perceived as stressful situation by the ICU nurses in the present study with a relatively high mean score. This may be attributed to culturally; Egyptian nurses look to supervisors highly. One's supervisor is considered in a position of authority and therefore able to help in problem solving. When such help is unavailable or perceived as inadequate, the level of stress may be perceived higher. This is in agreement with Andal⁽³⁷⁾ who reported that a problem with supervisors was perceived as most stressful to studied nurses.

Issues of dealing with patients and their families, also commonly provided a sources of stress to ICU nurses. The present findings indicated that "patient making unreasonable demands and being blamed for anything that goes wrong" was rated as frequently to extremely stressful events by ICU nurses. This could be attributed to the fact that working with patients, families and visitors seem to cause excessive workload because nurses must provide psychological support and/or respond to their dissatisfaction

or complaints which increased pressures on the daily routine of care. Assigning "Blame" to the nurse is counterproductive but is the usual practice in many patient care units. Nursing managers should be particularly astute to look at causes of problems to solve them rather than "assigning blame". This finding is consistent with Andal⁽³⁷⁾ and Damit⁽³⁸⁾ who found that patient and family stressors were perceived as most stressful events perceived by the staff nurses.

In relation to uncertainty about treatment associated with nurse's performance, it was reported to be among the highest stressors by nurses in the current study. The findings of the present study illustrated that fear of making a mistake in treating a patient was among the most extremely stressful situation to nurses working in the studied ICUs. This might be due to inadequate preparation of ICU nurses to deal with critically ill patients. Also, it might be related to inadequate information from a physician regarding patient's medical condition. In Damanhour ICUs the nurses had reported that they did not receive any in-service training or adequately prepared to deal with critically ill patients. Their lack of knowledge frustrated them, as they felt they were not able to provide efficient care and give patients correct information. Also inadequate training on what they have to do give the feeling of insecurity. This is supported by Alnems et al.⁽³⁹⁾ who reported that the most stressful subscale for staff nurses was the uncertainty concerning treatment. Likewise, Muhammad⁽³¹⁾ also reported uncertainty about treatment associated with nurse's performance as one of the highest stressors by ICU nurses. The present study is inconsistent with Payne⁽⁴⁰⁾ who found that the least

frequently problematic stressor was uncertainty concerning treatment.

In relation to inadequate emotional preparation, more than half of studied nurses rated "feeling inadequately prepared to help with the emotional needs of a patient" as frequently to extremely stressful event. This may be attributed to the totality of a patient care delivery system; there is a tremendous importance on the completion of routine procedures in an almost mechanistic fashion. Also, setting nursing objectives as physical objectives and avoid the emotional objectives in their job and that's opposing the philosophy of holistic care in nursing and converting the nurses into machines regarding the performance of their work. So, it is indeed time of care for ICU nurses and the time to look for the main stressors and reducing it to achieve the concept of holistic care in nursing (the physical, emotional, social and spiritual aspect of care). The finding of the current study is in parallel with Milutinović et al.⁽⁴¹⁾ study who documented that there is a focus on compliance with policies and procedures rather than emotional aspect of care.

In relation to conflict with physician, the present study revealed that criticism by a physician was the frequently stressful situation for the studied ICU nurses. Negative perception of one's work or how the staff nurse interacts with the physician in the work setting is an important variable in stress level rating. It can only be surmised that in a situation where a physician is unavailable, the nurse is forced to make a prudent decision, then a criticism results from such action resulting in a no-win situation. A nurse has to work under such circumstances and maintain professional composure. Such

scenarios occurring repeatedly could possibly influence a nurse's decision to leave the source of stress, in this case may be request transfer to a different unit to avoid the physician in question. Some may chose to leave the hospital altogether. This is in agreement with other studies done by Umro⁽²²⁾ and Milutinović et al.⁽⁴¹⁾ who studied stress among ICU nurses in Palestinian hospitals and Serbia.

The study findings revealed that socio-demographic and occupational determinants of participants (age, marital status, years of experience, education level and work schedule) significantly affect their perception of stress at work. It was found that the younger nurses with less than 2 years' experience were more stressed than other the older nurses with more than 5 years' experience. This may be attributed to once the nurse has the knowledge and skill acquired; the degree of stress is reduced. Other explanations for the high stress level: most of participants in this study were women. Generally, women are found to have more psychological strains and depression⁽⁴²⁾, experience greater sadness and anxiety⁽⁴³⁾, and women might be more vulnerable to repeated stress exposures⁽⁴⁴⁾. Also, in Egypt society the majority of young women do not view nursing as socially-appropriate career choice. So, prevailing negative images and perceived low status of nursing have contributed to the high stress level of ICU nurses.

Many studies have shown that an individual nurse may behave quite differently in stress perceiving according to their gender, age, marital status, working experience and educational level. Raja⁽⁴⁵⁾ reported that there was a significant relation between nurses' experience and level of stress. Similarly, Milutinović et al.⁽⁴¹⁾ underlined that; socio-demographic determinants of participants

significantly affect their perception of stress at work. Contrary to the results of the current study, Alnems et al.⁽³⁹⁾ and Al Hosis et al.⁽⁴⁶⁾ found that there were no statistically significant relations among total mean of working stress, gender, age, shift rotation, educational level and work place. In the same line Saudi study conducted by Al-Omar⁽³⁶⁾ revealed that work stress was not influenced by the educational level, the gender, the marital status, the language of the employee.

Conclusion:

The current study documents reported stress by ICU nurses was high enough to be considered serious. The most intense and frequently reported sources of stress perceived by ICU nurses was workload followed by emotional issues related to death and dying, problems relating to supervisors and dealing with patients and their families. The least frequently reported stressful event was discrimination. The present study also revealed that socio-demographic and occupational determinants of participants (age, marital status, years of experience, education level and work schedule) significantly affected work-related stress.

Recommendations:

The following recommendations are suggested;

- ICU nurses need to be trained through a stress-management program to equip them with advances in knowledge, as well as required skills, which helping nurses to cope with stress at work.
- Creating opportunities for ICU nurses to attend in-service education as well as enhancing continuing education. This will update them about new diagnostic and treatment modalities; handling modern

equipment; and the optimal use of supplies.

- The results provide evidence to support the integration of palliative care in undergraduate critical care nursing practice to increase positive attitudes toward care for the dying.
- Moreover, researchers recommend to foster cooperation, social interaction concepts, and effective coping mechanism among undergraduate critical care nursing students for future behaviors. Students who learn the importance of cooperation and social integration during their education might better understand the significance of coworker support in the work place.
- Psychological counseling after stressful events (i.e. debriefing sessions) should be an integral service to help supporting ICU nurses experiencing high levels of stress
- Policies that reduce stress from shift work should be developed. These could include reducing the number of hours of the night shift, increasing rest time between shifts, providing adequate meal times, and providing a fair distribution of weekend and holiday work.

Acknowledgment:

The authors express their gratitude and great thanks for all nurses who agreed to participate in this study and we would like to acknowledge the full cooperation of the directors and head of nursing departments in all the hospitals where the study was performed

Conflict of interest: None declared

Table (1): Percent distribution of ICU nurses according to their socio-demographic and occupational characteristics in Alexandria and Damanhour (N=150)

Socio-demographic characteristics	Alexandria N=100		Damanhour N=50		Test P value
	n	(%)	n	(%)	
Age :					
▪ 20-29	47	(47)	16	(32)	$\chi^2= 4.065$ P= .255
▪ 30-39	33	(33)	23	(46)	
▪ 40-49	17	(17)	8	(16)	
▪ 40-≤60	3	(0.3)	3	(0.6)	
Sex:					$\chi^2= 0.164$ P= 0.685
▪ Female	75	(75)	39	(78)	
▪ Male	25	(25)	11	(22)	
Marital Status:					$\chi^2= 5.772$ P= 0.123
▪ Single	39	(39)	10	(20)	
▪ Married	55	(55)	36	(72)	
▪ Divorced	2	(0.2)	2	(0.4)	
▪ Widow	4	(0.4)	2	(0.4)	
Years of experience:					$\chi^2= 3.042$ P= 0.218
▪ Less than 2 years	9	(9)	2	(0.4)	
▪ 2-5 years	50	(50)	32	(64)	
▪ More than 5 years	41	(41)	16	(32)	
Level of education:	38	(38)	31	(62)	$\chi^2= 10.554$ P= 0.014*
▪ STNS Diploma ¹					
▪ THI Diploma ²	10	(10)	0	(0.0)	
▪ BSc Nursing ³	52	(52)	19	(38)	
Work place:					$\chi^2= 42.774$ P= 0.000*
▪ GICU	65	(65)	24	(48)	
▪ CCU	21	(21)	9	(18)	
▪ SICU	14	(14)	0	(0.0)	
▪ Specialized ICU	0	(0.0)	17	(34)	
Work schedule:	21	(21)	10	(20)	$\chi^2= 0.020$ P= 0.887
▪ Morning					
▪ Rotating	79	(79)	40	(80)	
Residence:	66	(66)	36	(72)	$\chi^2= 0.551$ P= 0.458
▪ Away from work					
▪ Near to work	34	(34)	14	(28)	
Transportation:					$\chi^2= 0.835$ P= 0.361
▪ Available	29	(29)	11	(22)	
▪ Not available	71	(71)	39	(78)	

STNS Diploma¹: Secondary Technical Nursing School Diploma,

THI Diploma²: Technical Health Institute Diploma,

BSc Nursing³: Bachelor of Science in Nursing.

Table (2): Comparison of mean scores for intensity of all stress situation categories as perceived by ICU nurses in Alexandria and Damanhour

Stress Situation Categories	Alexandria Mean± SD	Damanhour Mean± SD	t. test (p value)
ENSS¹ subscales:			
▪ Death and dying (7 items)	2.82±0.69	3.41± 0.51	5.36 (0.00)
▪ Conflict with physicians (5 items)	2.49±0.85	1.89±0.87	4.00 (0.00)
▪ Inadequate preparation (4 items)	2.51±0.85	2.11± 0.53	3.06 (0.00)
▪ Problems with peers (6 items)	2.45±0.73	1.82±0.58	5.21 (0.00)
▪ Problems with supervisors (7 items)	2.68±0.91	3.22±0.34	4.03 (0.00)
▪ Workload (9 items)	2.72±0.71	3.85±0.32	10.64 (0.00)
▪ Uncertainty concerning treatment (8 items)	2.68±0.94	2.85±0.43	1.22 (0.22)
▪ Patients and their families (8 items)	2.71±0.90	2.82±0.60	0.79 (0.430)
▪ Discrimination (3 items)	1.46±1.28	0.31±0.44	6.11 (0.00)
Other Stress Dimension:			
▪ Environment stressors (9 items)	2.42±0.72	3.95±0.09	14.90 (0.00)

ENSS¹: Expanded Nursing Stress Scale

Significant values at the $p \leq 0.05$

Table (3): Rating of Stress Associated with Death and Dying and Inadequate Emotional Preparation

Stress Situation Categories	Doesn't Apply		Never Stressful		Occasionally Stressful		Frequently Stressful		Extremely Stressful		Mean± SD
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
Death and Dying Subscale											
1. Performing procedures that patients experience as painful	0	(0.0)	13	(8.7)	43	(28.7)	27	(18.0)	67	(44.7)	2.98±1.04
2. Feeling helpless in the case of a patient who fails to improve	0	(0.0)	21	(14.0)	29	(19.3)	40	(26.7)	60	(40.0)	2.92±1.07
3. Listening or talking to a patient about his/her approaching death	2	(1.3)	19	(12.7)	32	(21.3)	21	(14.0)	76	(50.7)	3.00±1.16
4. The death of a patient	0	(0.0)	3	(2.0)	25	(16.7)	29	(19.3)	93	(62.0)	3.41±0.83
5. The death of a patient with whom you developed a close relationship	5	(3.3)	1	(0.7)	17	(11.3)	15	(10.0)	11 2	(74.7)	3.52±0.96
6. Physician(s) not being present when a patient dies	11	(7.3)	6	(4.0)	30	(20.0)	52	(34.7)	51	(34.0)	2.84±1.15
7. Watching a patient suffer	4	(2.7)	32	(21.3)	30	(20.0)	61	(40.7)	23	(15.3)	2.44±1.07
Total mean											3.01±0.70
Inadequate Emotional Preparation Subscale											
1. Feeling inadequately prepared to help with emotional needs of patient's family	4	(2.7)	25	(16.7)	74	(49.3)	32	(21.3)	15	(10.0)	2.19±0.92
2. Being asked a question by a patient for which I do not have a satisfactory answer	4	(2.7)	17	(11.3)	61	(40.7)	42	(28.0)	26	(17.3)	2.46±0.99
3. Feeling inadequately prepared to help with the emotional needs of a patient	8	(5.3)	22	(14.7)	44	(29.3)	40	(26.7)	36	(24.0)	2.49±1.16
Total mean											2.38±0.78

Scale: Doesn't Apply= 0, Never Stressful= 1, Occasionally Stressful=2, Frequently Stressful=3, Extremely Stressful=4

Table (4): Rating of Stress Associated with Conflict with Physicians and Problems with Peers

Stress Situation Categories	Doesn't Apply		Never Stressful		Occasionally Stressful		Frequently Stressful		Extremely Stressful		Mean± SD
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
Conflict with Physicians Subscale											
1.Criticism by a physician	6	(4.0)	4	(2.7)	37	(24.7)	46	(30.7)	57	(38.0)	2.96±1.04
2.Conflict with a physician	11	(7.3)	20	(13.3)	28	(18.7)	41	(27.3)	50	(33.3)	2.66±1.26
3.Disagreement concerning the treatment of a patient	44	(29.3)	14	(9.3)	39	(26.0)	29	(19.3)	24	(16.0)	1.83±1.44
4.Making a decision concerning a patient when the physician is unavailable	39	(26.0)	8	(5.3)	56	(37.3)	36	(24.0)	11	(7.3)	1.81±1.26
5.Having to organize doctors' work	25	(16.7)	9	(6.0)	54	(36.0)	37	(24.7)	25	(16.7)	2.18±1.27
Total mean											2.29±0.90
Problems with Peers Subscale											
1.Lack of opportunity to talk openly with other personnel about problems in the work setting	6	(4.0)	24	(16.0)	43	(28.7)	55	(36.7)	22	(14.7)	2.42±1.05
2.Lack of opportunity to share experiences and feelings with other personnel in the work setting	7	(4.7)	23	(15.3)	29	(19.3)	69	(46.0)	22	(14.7)	2.50±1.06
3.Lack of an opportunity to express to other personnel on the unit my negative feelings towards patients	6	(4.0)	27	(18.0)	76	(50.7)	21	(14.0)	20	(13.3)	2.14±0.99
4.Difficulty in working with a particular nurse outside my immediate work setting	17	(11.3)	10	(6.7)	56	(37.3)	43	(28.7)	24	(16.0)	2.31±1.16
5.Difficulty in working with a particular nurse in my immediate work setting	17	(11.3)	25	(16.7)	50	(33.3)	33	(22.0)	25	(16.7)	2.16±1.22
6.Difficulty in working with nurses of the opposite sex	22	(14.7)	16	(10.7)	82	(54.7)	15	(10.0)	15	(10.0)	1.90±1.09
Total mean											2.24±0.75

Scale: Doesn't Apply= 0, Never Stressful= 1, Occasionally Stressful=2, Frequently Stressful=3, Extremely Stressful=4

Table (5): Rating of Stress Associated with Problems Relating to Supervisors and Workload

Stress Situation Categories	Doesn't Apply		Never Stressful		Occasionally Stressful		Frequently Stressful		Extremely Stressful		Mean± SD
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
Problems Relating to Supervisors Subscale											
1. Conflict with a supervisor	12	(8.0)	18	(12.0)	64	(42.7)	39	(26.0)	17	(11.3)	2.20±1.05
2. Lack of support from my immediate supervisor	9	(6.0)	1	(0.7)	64	(42.7)	39	(26.0)	37	(24.7)	2.62±1.05
3. Lack of support by nursing administrators	9	(6.0)	3	(2.0)	48	(32.0)	44	(29.3)	46	(30.7)	2.76±1.09
4. Lack of support from health care administrators	8	(5.3)	3	(2.0)	43	(28.7)	34	(22.7)	62	(41.3)	2.92±1.12
5. Criticism by a supervisor	5	(3.3)	7	(4.7)	33	(22.0)	26	(17.3)	79	(52.7)	3.11±1.10
6. Being held accountable for things over which I have no control	7	(4.7)	7	(4.7)	22	(14.7)	23	(15.3)	91	(60.7)	3.22±1.14
7. Criticism by nursing administration	3	(2.0)	9	(6.0)	26	(17.3)	32	(21.3)	80	(53.3)	3.18±1.04
Total mean											2.86±0.81
Workload Subscale											
1. Unpredictable staffing and scheduling	2	(1.3)	9	(6.0)	23	(15.3)	44	(29.3)	72	(48.0)	3.16±.98
2. Not enough time to provide emotional support to the patient	8	(5.3)	6	(4.0)	32	(21.3)	37	(24.7)	67	(44.7)	2.99±1.14
3. Not enough time to complete all of my tasks	6	(4.0)	8	(5.3)	20	(13.3)	45	(30.0)	71	(47.3)	3.11±1.08
4. Too many non-nursing tasks required, such as clerical work	2	(1.3)	4	(2.7)	29	(19.3)	46	(30.7)	69	(46.0)	3.17±0.92
5. Not enough time to respond to the needs of patients' families	6	(4.0)	4	(2.7)	40	(26.7)	33	(22.0)	67	(44.7)	3.00±1.08
6. Not enough staff to adequately cover the unit	6	(4.0)	7	(4.7)	23	(15.3)	41	(27.3)	73	(48.7)	3.12±1.08
7. Demands of patient classification system	10	(6.7)	9	(6.0)	33	(22.0)	30	(20.0)	68	(45.3)	2.91±1.23
8. Having to work through breaks	3	(2.0)	6	(4.0)	25	(16.7)	40	(26.7)	76	(50.7)	3.20±0.98
9. Having to make decisions under pressure	5	(3.3)	3	(2.0)	25	(16.7)	41	(27.3)	76	(50.7)	3.20±1.010
Total mean											3.09±0.81

Scale: Doesn't Apply= 0, Never Stressful= 1, Occasionally Stressful=2, Frequently Stressful=3, Extremely Stressful=4

Table (6): Rating of Stress Associated with Uncertainty Concerning Treatment and Dealing with Patients and Their Families

Stress Situation Categories	Doesn't Apply		Never Stressful		Occasionally Stressful		Frequently Stressful		Extremely Stressful		Mean± SD
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
Uncertainty Concerning Treatment Subscale											
1. Inadequate information from a physician regarding the medical condition of a patient	9	(6.0)	17	(11.3)	47	(31.3)	43	(28.7)	34	(22.7)	2.50±1.13
2. A physician ordering what appears to be inappropriate treatment for a patient	19	(12.7)	27	(18.0)	16	(10.7)	40	(26.7)	48	(32.0)	2.83±1.44
3. Fear of making a mistake in treating a patient	6	(4.0)	9	(6.0)	25	(16.7)	26	(17.3)	84	(56.0)	3.15±1.14
4. A physician not being present in emergency	11	(7.3)	2	(1.3)	32	(21.3)	30	(20.0)	75	(50.0)	3.04±1.19
5. Not knowing what a patient or a patient's family ought to be told about the patient's condition	13	(8.7)	22	(14.7)	36	(24.0)	21	(14.0)	58	(38.7)	2.59±1.35
6. Being exposed to health and safety hazards	21	(14.0)	8	(5.3)	20	(13.3)	27	(18.0)	74	(49.3)	2.83±1.44
7. Uncertainty regarding the operation and functioning of specialized equipment	10	(6.7)	8	(5.3)	46	(30.7)	28	(18.7)	58	(38.7)	2.77±1.21
8. Feeling inadequately trained for what I have to do	9	(6.0)	6	(4.0)	50	(33.3)	40	(26.7)	45	(30.0)	2.70±1.12
9. Being in charge with inadequate experience	8	(5.3)	19	(12.7)	36	(24.0)	54	(36.0)	33	(22.0)	2.56±1.12
Total mean											2.73±0.81
Dealing with Patients and Their Families Subscale											
1. Patients' families making unreasonable demands	5	(3.3)	4	(2.7)	37	(24.7)	51	(34.0)	53	(35.3)	2.64±1.01
2. Patients making unreasonable demands	8	(5.3)	4	(2.7)	52	(34.7)	55	(36.7)	31	(20.7)	2.95±1.00
3. Being blamed for anything that goes wrong	13	(8.7)	2	(1.3)	27	(18.0)	53	(35.3)	55	(36.7)	2.90±1.17
4. Being the one that has to deal with patients' families	11	(7.3)	4	(2.7)	38	(25.3)	37	(24.7)	60	(40.0)	2.87±1.18
5. Having to deal with violent patients	12	(8.0)	20	(13.3)	40	(26.7)	38	(25.3)	40	(26.7)	2.58±1.23
6. Having to deal with abusive patients	9	(6.0)	22	(14.7)	38	(25.3)	34	(22.7)	47	(31.3)	2.49±1.24
7. Having to deal with abuse from patients' families	8	(5.3)	4	(2.7)	56	(37.3)	34	(22.7)	48	(32.0)	2.73±1.10
8. Not knowing whether patients' families will report you for inadequate care	10	(6.7)	4	(2.7)	32	(21.3)	65	(43.3)	39	(26.0)	2.79±1.07
Total mean											2.74±0.82

Scale: Doesn't Apply= 0, Never Stressful= 1, Occasionally Stressful=2, Frequently Stressful=3, Extremely Stressful=4

Table (7): Rating of Stress Associated with Discrimination and ICU Environment

Stress Situation Categories	Doesn't Apply		Never Stressful		Occasionally Stressful		Frequently Stressful		Extremely Stressful		Mean± SD
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
Discrimination Subscale											
1. Being sexually harassed	93	(62.0)	12	(8.0)	22	(14.7)	15	(10.0)	8	(5.3)	0.88±1.28
2. Experiencing discrimination because of race or ethnicity	101	(67.3)	9	(6.0)	17	(11.3)	15	(10.0)	8	(5.3)	0.80±1.27
3. Experiencing discrimination on the basis of sex	79	(52.7)	4	(2.7)	7	(4.7)	25	(16.7)	35	(23.3)	1.55±1.74
Total mean											1.08±1.21
ICU Environment Subscale											
1. Closed atmosphere "absence of natural light & air"	9	(6.0)	3	(2.0)	44	(29.3)	16	(10.7)	78	(52.0)	3.00±1.20
2. Insufficient equipment	3	(2.0)	10	(6.7)	46	(30.7)	14	(9.3)	77	(51.3)	3.01±1.12
3. Radiation exposure	16	(10.7)	10	(6.7)	27	(18.0)	29	(19.3)	68	(45.3)	2.82±1.35
4. Irritant gases exposure	17	(11.3)	7	(4.7)	41	(27.3)	16	(10.7)	69	(46.0)	2.75±1.37
5. Noise exposure "Beeping and buzzing sounds of machines"	6	(4.0)	10	(6.7)	25	(16.7)	29	(19.3)	80	(53.3)	3.11±1.15
6. Insufficient work space.	10	(6.7)	7	(4.7)	34	(22.7)	31	(20.7)	68	(45.3)	2.93±1.21
7. Being found a scapegoat for disconnected machinery, non-working plugs and dislodging endotracheal tubes	12	(8.0)	16	(10.7)	28	(18.7)	26	(17.3)	68	(45.3)	2.81±1.32
8. Switching off of life support machines for patients with brain death or at the end of life	10	(6.7)	3	(2.0)	50	(33.3)	24	(16.0)	63	(42.0)	2.84±1.19
Total mean											2.91±0.95

Scale: Doesn't Apply= 0, Never Stressful= 1, Occasionally Stressful=2, Frequently Stressful=3, Extremely Stressful=4

Table (8): Relation between ICU Nurses' Socio-demographic and Occupational Characteristics and Total Mean of ENSS N= (150)

Socio-demographic characteristics	ENSS Mean± SD	Test of Significance p value
Age:		
▪ ≤ 20-29	157.01±32.59	F=3.887 P=0.010 *
▪ 30-39	153.66±23.12	
▪ 40-49	135.68±33.79	
▪ 40-≤60	152.00±11.26	
Sex:		
▪ Male	144.29±36.10	t= 1.402
▪ Female	152.72±28.00	P=0.163
Marital status:		
▪ Single	141.06±39.32	t= 3.371
▪ Married	157.97±19.84	P=0.001*
Having children:		
▪ Yes	155.45±18.65	t= 1.984
▪ No	145.78±39.52	P=0.049*
Level of education:		
▪ Diploma in nursing	158.59±21.35	F= 6.062
▪ Bachelor of nursing	146.55±33.20	P=0.003*
Years of Experience:		
▪ Less than 2 years	157.18±35.19	F=4.644 P=0.011*
▪ 2-5 years	153.69±22.49	
▪ More than 5 years	138.54±32.38	
Occupational Characteristics:		
Hospital type:		
▪ Ministry of health	157.10±08.26	F=3.134 P=0.027*
▪ University	157.54±31.62	
▪ Health insurance	147.75±36.89	
ICU type:		
▪ GICU	156.64±25.16	F=7.349 P=0.000*
▪ CCU	130.25±41.63	
▪ SICU	147.00±26.21	
▪ Specialized ICU	158.76±03.50	
Residence:		
▪ Away from work	152.06±28.78	t=0.642
▪ Near to work	147.42±33.58	P=0.424
Transportation:		
▪ Not available	151.61±29.35	t=0.124
▪ Available	149.81±29.35	P=0.725
Work schedule:		
▪ Morning	139.30±28.50	t=-2.056-
▪ Rotating	153.09±29.78	P=0.042*

*Significance level $p < 0.05$

ENSS: Expended Nursing Stress Scale

References:

1. Evans L.: An exploration of district nurses' perception of occupational stress. *Br J Nurs*. 2002; 11(8): 576 - 585
2. Brunero S., Cowan D., Grochulski A., et al.: Stress management for nurses. Sydney; New South Wales Nurses' Association 2006; 4-33. Available at: http://www.health.nsw.gov.au/nursing/pdf/stress_mngt.pdf. Accessed on May 20, 2014
3. Welker-Hood K. Does workplace stress lead to accident or error? Many nurses feel the pressure. *American Journal of Nursing*. 2006; 106 (9): 104
4. Xianyu Y. & Lambert V.: Investigation of the relationships among workplace stressors, ways of coping, and the mental health of Chinese head nurses. *Journal of Nursing and Health Sciences*. 2006; 8 (3): 147-155
5. Wong D., Leung S. & Lam D.: Mental health of Chinese nurses in Hong Kong: the roles of nursing stresses and coping strategies. *Online Journal of Issues in Nursing*. 2001; 5 (2): 1-22
6. Beau SP.: Registered nurses' perceptions of factors causing stress in the intensive care environment in state hospitals. Master Thesis. Eastern Cape region of South Africa. Nelson Mandela Metropolitan University, Faculty of Health Sciences, 2006
7. Ganz F.: Tend and Befriend in the Intensive Care Unit. *Critical Care Nurse*. 2012; 32 (3) :25-33
8. Harvey G.: Critical incident stress in ICU nursing. Canadian Association of Critical Care Nurses 2006. Available at: <http://www.caccn.ca/new/index.php>. Accessed on May 15, 2014
9. Chang E., Hancock K., Johnson A., et al.: Role stress in nurses: review of related factors and strategies for moving forward. *Journal of Nursing and Health Sciences*. 2005; 7 (1): 57-65
10. Hegge M. & Larson V.: Stressors and coping strategies of students in accelerated baccalaureate nursing programs. *Journal of Nurse Educator* 2008; 13 (1): 26-30
11. McNeely E.: The consequences of job stress for nurses' health: Time for a check-up. *Nursing Outlook*. 2005; 53 (6): 291-299
12. Channuwong S. & Kantatian W.: Stress Management Strategies for Managers: An Integration of Eastern and Western Approaches, *European Journal of Social Sciences*. 2012; 29 (1): 66-75
13. Lambert VA., Lambert CE., Petrini M., et al.: Workplace and personal factors associated with physical and mental health in hospital nurses in China. *Nursing & Health Sciences* 2007; 9 (2): 120-126
14. Antigoni F., Padiaditaki O. & Dimitrios T.: Nursing staff under heavy stress: focus on Greece: A critical review. *International Journal of Caring Sciences*. 2011; 4(1):11-12
15. Mark G, Smith AP. Occupational stress, job characteristics, coping, and the mental health of nurses. *British Journal of Health Psychology*. 2012; 17(3):505-21. DOI:10.1111/j.2044-8287.2011.02051.x, 1:17.
16. Kawano Y.: Association of Job-related Stress Factors with Psychological and Somatic Symptoms among Japanese Hospital Nurses: Effect of Departmental Environment in Acute Care Hospitals. *J Occup Health*. 2008; 50:79-85
17. French SE., Lenton R., Walters V., et al.: An empirical evaluation of on expanded Nursing Stress Scale. *J NursMeas*. 2000; 8:161-178
18. Saini R., Kaur S. & Dasm K.: Assessment of stress and burnout among intensive care nurses at a tertiary care hospital. *Journal of Mental Health and Human Behaviour*. 2011; 16 (1): 43-48
19. Shash H.: The relationship between job stress, job performance, and social support among nurse at Alexandria Main University Hospital. Master's Thesis. Faculty of Nursing, University of Alexandria; 2006
20. Chang E., Bidewell JW., Huntington AD., et al.: A survey of role stress,

- coping and health in Australian and New Zealand hospital nurses. *Int J Nurs Studies*. 2007; 44:1354- 1362
21. Arafa M., Abou-Nazel M., Ibrahim N, et al.: Predictors of psychological well-being of nurses in Alexandria, Egypt. *International Journal of Nursing Practice*. 2003; 9 (5): 313 – 20
 22. Umro A.: Stress and coping mechanism among nurses in Palestinian hospitals: A pilot study. Master's Thesis. Faculty of Graduate studies, An-Najah National University, 2013
 23. Gillespie M. & Melby V.: Burnout among nursing staff in accident and emergency acute medicine: a comparative study. *Journal of Clinical Nursing*. 2003; 12: 842-851
 24. Astbury J.: Determinants of stress for staff in a neonatal intensive care unit. *Journal of Advanced Nursing*. 2009; 57 (2): 108-111
 25. Kamal S., Al-Dhshan M., Abu-Salameh K., et al.: The effect of nurses' perceived Job related stressors on job satisfaction in Taif governmental hospitals in Kingdom of Saudi Arabia. *Journal of American Science*. 2012; 8 (3): 119-125
 26. Li J. & Lambert VA. : Workplace stressors, coping, demographics and job satisfaction in Chinese intensive care nurses. *Nurs Crit Care*. 2008; 13(1): 12-24
 27. Montgomery VL. Effect of fatigue, workload, and environment on patient safety in the pediatric intensive care unit. *Pediatr Crit Care Med*. 2007; 8(2): S11-16
 28. Yildirim D. & Aycan Z.: Nurses' work demands and work family conflict: a questionnaire survey. *Int J Nurs Stud*. 2008; 45(9): 1366-1378
 29. Mallory JL. The impact of a palliative care, educational component on attitudes toward care of the dying in undergraduate nursing students. *Journal of Professional Nursing*. 2003; 19 (5): 305-312
 30. Mok E., Lee WM. & Kam-yuet Wang F.: The issue of death and dying: employing problem – based learning in nursing education. *Nurse Education Today*. 2002; 22 (4): 319-329
 31. Mouhammad M.: Stress coping strategies among nurses in the intensive care units. Master's Thesis. Faculty of Nursing. Alexandria University; 2008
 32. Hamaideh SH., Mrayyan MT., Mudallal R., et al.: Jordanian nurses' job stressors and social support. *IntNurs Rev*. 2008; 55(1): 40-47
 33. Lambert VA., Lambert CE. & Misae I.: Workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health of Japanese hospital nurses. *International Journal of Nursing Studies*. 2004; 41(1): 85-97
 34. Hays M., All A., Mannahan C., et al.: Reported stressors and ways of coping utilized by intensive care unit nurse. *Journal of Dimensions Critical Care Nursing*. 2006; 25(4): 185-193
 35. Mohamed FA., Gaafar AY., & AbdAlkader WM.: Pediatric Nurses' Stresses in Intensive Care Units and Its Related Factors. *Journal of American Science*. 2011; 7(9): 304 - 315
 36. AL-Omar B.: Sources of Work-Stress among hospital-staff at the Saudi MOH. *JKAU: Econ & Adm*. 2003; 17 (1): 3-16
 37. Andal E.: A Pilot Study Quantifying Filipino Nurses' Perception of Stress. *Californian Journal of Health Promotion*. 2006; 4(4): 88-95
 38. Damit A.: Identifying sources of stress and level of job satisfaction amongst registered nurses within the first three years of work as a registered nurse in Brunei Darussalam. Master's thesis. Faculty of Health, Queensland University of Technology; 2007
 39. Alnems A., Aboads F., AL-Yousef M., et al.: Nurses' perceived job related stress and job satisfaction in Amman Private Hospitals 2005. Available at: http://faculty.Ksu.edu.sa/msawalha/Documents/M_y%20publication.pdf. Accessed on May15, 2013

40. Payne N.: Occupational stressors and coping as determinants of burnout in female hospice nurses. *Journal of Advanced Nursing*. 2001; 33(3): 396 - 405
41. Milutinović D., Golubović B., Brkić N. et al.: Professional stress and health among critical care nurses in Serbia. *Arh Hig Rada Toksikol*. 2012; 63: 171-180
42. Liu C., Spector PE. & Shi L.: Use of both qualitative and quantitative approaches to study job stress in different gender and occupational groups. *Journal of Occupational Health Psychology*. 2008; 13 (4): 357–370
43. Chaplin TM., Hong K., Bergquist K., et al.: Gender differences in response to emotional stress: An assessment across subjective, behavioral, and physiological domains and relations to alcohol craving. *Alcoholism: Clinical & Experimental Research*. 2008; 32(7): 1242–1250
44. Schmaus BJ., Laubmeier KK., Boquiren VM., et al.: Gender and stress: Differential psychophysiological reactivity to stress re exposure in the laboratory. *International Journal of Psychophysiology*. 2008; 69 (2): 101-106
45. Raja Lexshimi RG., SaadiahTahirSanthna LP. & MdNizam J.: Prevalence of Stress and coping mechanism among staff Nurses in the intensive care unit. *Medicine & Health*. 2007; 2 (2): 146 - 153. ISSN 1823-2140
46. Al Hosis K., Mersal F. & Keshk L.: Effects of Job Stress on Health of Saudi Nurses Working in Ministry of Health Hospitals in Qassim Region in KSA. *Life Science Journal*. 2013; 10 (1):1036-104

