

Is There a Relation between Gastroesophageal Reflux Disease and Occupational Stress among Nurses? A Case Study from Iran 2016

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ABSTRACT

Background:

GastroEsophageal Reflux Disease (GERD) is the most common gastrointestinal disorders, which may be caused or aggravated by occupational stress. In this study we aimed to investigate the prevalence of GERD in nurses working in hospitals of a province in Iran and assessing its relationship with their occupational stress.

Materials and Methods:

The study was a cross-sectional and correlational one. The study population included all nurses working in public hospitals of a province in Iran in 2016. The stratified random sampling was used. The data were collected using Nursing Stress Scale (NSS) and Gastroesophageal Reflux Disease Questionnaire. The SPSS software version 22 and independent t, Chi-square, and Mann-Whitney tests were used for data analysis.

Results:

The prevalence of GERD and severe levels of occupational stress among nurses were 26.8%, and 25.9%, respectively. Statistical analyses showed no significant correlation between occupational stress and the risk of GERD, but a significant relation was found between the sex of the nurses and their occupational stress and between their type of employment and the risks of GERD.

Conclusion:

The prevalence of GERD among nurses had no significant difference with that in the general community. Although nursing is considered as a stressful job, it seems that nurses adapt themselves with the working conditions after a while and experience stress levels similar to other people in the community.

Keywords: Gastroesophageal reflux, Occupational stress, Relationship, Nurses, Iran, Lorestan

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INTRODUCTION

Work-related stress is something abnormal, which may result from the high volume of work, the physical factors of the workplace, and organizational conflicts. It may have short term effects on the body including palpitations, slow breathing, increased blood pressure, headache, and hyperhidrosis. Its long term effects may include cardiovascular diseases, dyspepsia, and depression (1). If there is too much occupational stress, it may endanger the employees' health by causing physical, psychological, and behavioral problems, thus reducing the quality of their performance and ultimately

threatening the organizational goals (2). Simmons and Nelson asserted that the individual consequences of severe levels of occupational stress were manifested physically, psychologically, and behaviorally. In the physical dimension, it causes dizziness, backache, and fatigue, which in turn cause distraction and carelessness. In the psychological dimension, it leads to the reduced self-esteem and work aversion. And in the behavioral dimension, it results in negligence, lack of power to make decisions, and impaired concentration (3).

Nurses are among the groups that suffer most from occupational stress. A study conducted by Wong and colleagues showed that the Chinese nurses were suffering from abundant and severe levels of occupational stress and have low mental health (4). Conflicts among nurses, co-workers, or doctors, suffering from incurable diseases, lack of adequate preparation, having long working hours, and the increased workload are among the factors that cause stress for nurses. Emotional exhaustion, depersonalization, and reduced personal achievements are some results of occupational stress among nurses. Different studies have shown that occupational stress leads to job dissatisfaction and job change among nurses (5). Moreover, physical and mental disorders such as anxiety, blood pressure, sleep disorders, and drug abuse are among the consequences of occupational stress (6).

The GastroEsophageal Reflux Disease (GERD) is one of the most common gastrointestinal disorders. In this disease, the return of gastric contents into the esophagus causes clinical symptoms such as heartburn and bitter taste in the mouth (7). Most patients show symptoms of exacerbated GERD in stressful situations (5). A case study in the city of Gonbad-e Kavus indicated that mental disorders (anxiety and depression) were associated with an increased risk of GERD (8).

Experimental studies show that acute stress can increase the secretion of gastric acid, slow down and delay the gastric emptying, and cause the reflux of gastric contents into the esophagus. About 60% of patients suffering from GERD believe that they show more symptoms of the disease when faced with stress (9-11). Malekzadeh and co-workers carried out a study in which they reported stress to be a risk factor for GERD (12).

This disorder results from the reflux of acid and other gastric contents. The mechanisms that are effective in the pathogenesis of this disorder include: the decreased lower esophageal sphincter (LES) pressure, the impaired esophageal acid clearance, the presence of hiatus hernia, the slowness of gastric emptying, and the increased gastric acid secretion.

On the other hand, symptoms and response to these symptoms in this disease are different depending on age, sex, race, and ethnicity. For example, following the occurrence and exacerbation of reflux, men develop esophagitis twice as much as women (13).

No similar study was found in the scientific databases to have dealt with the relationship between GERD and occupational stress among nurses. Considering the fact that the nursing job is considered as a very stressful job and too much stress may lead to physical, mental, and behavioral diseases for nurses, this study was designed and performed with the aim of investigating the prevalence of GERD and its relationship with occupational stress among the nurses of the hospitals of Lorestan province, Iran.

MATERIALS AND METHODS

This is a cross-sectional and correlational study. The study population included all nurses working in hospitals affiliated to Lorestan University of Medical Sciences in 2016. The required sample size was determined as 516 nurses using Morgan Table and they were selected by stratified random sampling method. The sampling was done during working hours in the morning, afternoon, and evening. After explaining the purpose of the study and obtaining the written consent from the nurses, we distributed the following questionnaires among the nurses:

- Gastroesophageal Reflux Disease Questionnaire, which was designed and validated by Jones and colleagues in 2009, who reported the sensitivity and specificity of the questionnaire as 65% and 71%, respectively (the same as the clinical diagnosis of gastroenterologists) (14). Validity and reliability of its Persian version was established in a cross-sectional study by Mansour-Ghanaei and co-workers (15). Angel and others tested its reliability and validity in Mexico in 2014. The internal consistency and discriminant validity of the questionnaire were reported as 93% and 88%, respectively. The sensitivity, specificity, and positive predictive value of the questionnaire in comparison with its gold standard were 72%, 72%, and 87% respectively (16). Six questions are included in this questionnaire; four questions relating to the reflux predicting symptoms and two questions relating to the symptoms not predicting it. A score between 0 and 3 is given to each question based on the number of times one has faced these signs over the past week. The maximum score acquired from the questionnaire is 18 and those with a score greater than 8 are considered to be suffering from GERD.

Table 1: Characteristics of the nurses participating in the study

Variable		N (%)
Sex	Male	92 (20.2)
	Female	363 (79.8)
Ward	ICU/CCU ¹	176 (38.7)
	Emergency	94 (20.6)
	General	185 (40.7)
Working shift	Fix	62 (13.6)
	Rotational	393 (86.4)
Type of employment	Permanent	66 (14.5)
	Indirect Contract ²	90 (19.8)
	Direct contract ³	168 (36.9)
	Tarhi ⁴	131 (28.8)
Total		455 (100)

1 Intensive Care Unit/ Coronary Care Unit

2 Contract through a third party

3 Contract between hospitals and nurses

4 A period of recruitment as a commitment because of utilization of free public education

• Nursing Stress Scale (NSS) that was designed and validated by Toft Gary and Anderson in 1981. Validity and reliability of its Persian version was confirmed in numerous studies (17-19). The tool consists of 29 questions in seven areas: the patient's suffering and death, conflicts with physicians, lack of adequate preparation, shortage of supportive sources, conflict with other nurses, working pressure, and uncertainty of treatment. The perceived stress level is measured in Likert scale, ranging between "never stressful" = 0 points, to "always stressful" = 3 points. A score between 0 and 28 is considered as mild stress, between 29 and 57 is considered as moderate stress, and between 58 and 87 is considered as acute stress (20).

• The Data were statistically analyzed using SPSS software version 22 and independent t test (to evaluate the difference between the means of two independent groups), Chi-square test (to investigate the relationship between two nominal variables), and Mann-Whitney U test (to compare differences in an ordinal dependent variable between two independent groups) were used as appropriated. *P* values < 0.05 were considered as statistically significance.

RESULT

The response rate was 89%. Of the 455 participants in the study, 363 nurses (79.8%) were women and 92 nurses (20.2%) were men. The mean \pm SD age of the participants was 29 ± 6 years and their mean \pm SD work experience was 64 ± 61.3 months. The demographic information of the participants

are shown in table 1. The prevalence of GERD was 25.9% (118 nurses) for the nurses. The mean \pm SD age of the nurses suffering from reflux was 29.9 ± 6.2 years and their mean \pm SD work experience was 67.5 ± 70.7 months. T test indicated no significant difference in this respect between the nurses suffering and those not suffering from GERD (*P* = 0.624 and *P* = 0.478, respectively). The test analyzing the significance of the relationship between developing GERD and different demographic variables (sex, the hospital where one works, the department where one works, the type of employment, and work shift) indicated that the type of employment is associated with the risk of developing GERD, so that the "Tarhi" (newly educated registered) nurses were shown to be more likely to develop reflux than other groups of the nurses (*p* = 0.02) (table 2). The nurses' mean score of occupational stress was 46 ± 19 . The results of the test show the significance of the relationship between occupational stress and the demographic variables are shown in table 3. Occupational stress was 48.39 ± 20.12 among the nurses with GERD and 45.94 ± 18.77 among those without GERD, which was not significant based on the t test (*p* = 0.231).

18.2% of the nurses under study were suffering from mild occupational stress, 55% from moderate occupational stress and 26.8% from severe stress. Among these groups, 19, 62, and 37 nurses were suffering from GERD, respectively (*p* = 0.408). The relationship between stress severity and other variables is shown in table 4.

Table 2: The relationship between the risk of developing gastroesophageal reflux disease and demographic variables

Variable	Gastroesophageal reflux disease		P value
	No (%)	Yes (%)	
Sex	Male	24.6	0.109
	Female	75.4	
Ward	ICU/CCU ¹	33.1	0.339
	Emergency	22	
	General	44.9	
Type of employment	Permanent	22	0.002
	Indirect Contract	23.7	
	Direct contract	23.7	
	Tarhi	30.6	
Working shift	Fix	14.4	0.757
	Rotational	85.6	
Total	100	100	

¹ Intensive Care Unit/ Coronary Care Unit

Table 3: The relationship between the nurses' mean score of occupational stress and demographic variables and the risk of developing gastroesophageal reflux disease

Variable	Mean ± SD	P value	
Sex	Male	41.31 ± 19.6	0.003
	Female	47.91 ± 18.82	
Ward	ICU/CCU ¹	47.77 ± 19.03	0.513
	Emergency	45.08 ± 19.46	
	General	46.19 ± 19.12	
Working shift	Fix	43.96 ± 19.03	0.248
	Rotation	46.98 ± 19.15	
Type of employment	Permanent	48.09 ± 21.29	0.337
	Indirect Contract	46.46 ± 18.13	
	Direct contract	47.94 ± 18.16	
	Tarhi	44.14 ± 19.86	
GERD ²	Yes	48.39 ± 20.12	0.231
	No	45.94 ± 18.77	

¹ Intensive Care Unit/ Coronary Care Unit

² GastroEsophageal Reflux Disease

DISCUSSION

This study has been conducted with the aim of investigating the prevalence of GERD and its relationship with occupational stress among the nurses of the hospitals of Lorestan province. No similar study was found in the literature to assess the relationship between GERD and occupational stress among nurses. It thus seems that the present study is the first one dealing with this area.

The prevalence of GERD among the nurses under study was 25.9%, while it was reported in a study done on the nurses of a large Indian hospital in 2011 as 16.2%. Another study conducted on the staff of a hospital in one of the major cities in Iran (Tabriz) in 2005 showed the prevalence of GERD symptoms

(heartburn and acid reflux) was 26.8% and 34.1%, respectively (21). The difference between the results of these studies may be due to differences in the study population, assessment tools, and races (22). The prevalence of GERD among the general population of Iran has been reported to be between 6.3% and 29.2%; therefore, the prevalence of GERD among the nurses under study lies within the range of the prevalence of this disease among the general population of Iran. Despite the fact that nursing is a stressful job, it seems that nurses finally manage to adapt themselves with their working conditions and experience stress levels similar to other people in the community.

The present study found no significant difference

Table 4: The difference between the nurses' occupational stress severity in terms of demographic variables and the risk of developing gastroesophageal reflux

Variable		Stress			P value
		Severe (%)	Moderate (%)	Mild (%)	
Sex	Male	31.3	20.8	11.5	0.02
	Female	68.7	79.2	88.5	
Ward	ICU/CCU ¹	32.5	40.4	39.3	0.436
	Emergency	22.9	22	16.4	
	General	44.6	37.6	44.3	
Working shift	Fix	15.7	14.8	9.8	0.354
	Rotational	84.3	85.2	90.2	
Type of employment	Permanent	14.5	12.8	18	0.438
	Indirect contract	20.5	18.4	22.1	
	Direct contract	30.1	39.6	36.1	
	Tarhi	34.9	29.2	23.8	
GERD ²	Yes	22.9	24.8	30.3	0.408
	No	77.1	75.2	69.7	
Total		100	100	100	

¹ Intensive Care Unit/ Coronary Care Unit

² GastroEsophageal Reflux Disease

between the nurses with and without reflux in terms of age and work experience, but found a significant relationship between the risk of developing reflux and the type of employment. The study conducted on the staff of an Iranian big city (Tabriz) did find a significant association between age and the risk of developing GERD either (21), but the study on the staff of an Indian hospital reported a significant relationship between age and the risk of developing GERD (23). The studies carried out on the general population of Tehran (2006 and 2009) also found no significant relationship between age and reflux symptoms (24). However a systematic review in 2005 reported a significant relationship between age and the risk of developing reflux (25). A systematic review in 2013 also found little evidence regarding the relationship between age and GERD in the general population (26). The mean age of the employees participating in the present study and the study conducted in India was 29 and 35.7 years, respectively. The difference in the mean age of the study population of the two studies may have affected the significance of the relationship between age and prevalence of reflux. Considering the fact that the Tarhi nurses are doing nursing services at their first years of working experience, the relationship between the type of employment and the risk of developing GERD may have been affected by age, although this relationship has been rejected in some studies. The relationship between age and

type of employment (Tarhi) and the prevalence of GERD strengthens the hypothesis that nurses adapt themselves with their job conditions and tolerate stress as do other members of the society. It seems that the higher age and the changes resulting from it may exacerbate the risk factors of GERD such as loosening of the LES and hiatal hernia. Different studies show inconsistent findings about the relationship between age and the risk of developing GERD. It is thus suggested to design and conduct a specific study to determine the relationship between these two variables. In general, the findings of different studies strengthen the hypothesis that there is an inverse relationship between age and occupational stress and its direct association with GERD.

This study revealed that only 26.8% of the nurses had acute stress. The studies conducted on occupational stress level of nurses in hospitals and other educational centers of Iran (Shiraz, Hamedan, Isfahan, and Zanzan) between 2010 and 2014 using the same tool indicate different results, having no justifiable similarity neither with one another nor with the results of the present study (2,27,28). The range of mild, moderate, and acute occupational stress was 40%, 30.5%, and 51.3% in the above studies, respectively. The unjustifiable contradictory results of different studies may indicate poor reliability and validity of the Persian version of the NSS. The unjustifiable difference in the results may also have resulted from the large number of the questions

and the ambiguity or vagueness of some of them or the nurses' carelessness in responding the questions. Moreover, the effect of some other demographic features such as the conditions of hospitals, cultural differences, and the level of expectations cannot be ignored.

This study revealed that the female nurses were experiencing greater stress than the male ones ($p = 0.02$). A similar study conducted in a city in Iran (Ahvaz, 2011) as well as another study carried out in the United States of America (2008) showed that female nurses' occupational stress was significantly higher than the male nurses (28,29). However, another study conducted in another Iranian city (Zanjan) showed no significant relationship between sex and the severity of occupational stress among the nurses (30). It seems that women are more stress tolerant than men in their nursing jobs because of their higher emotional feelings, direct encounter with the suffering of patients, and ability to withstand high work pressure.

In the present study, the mean score of occupational stress in the nurses with work shifts was higher than those with fixed working shifts, although the relationship was not statistically significant. However, several studies have reported a significant association between the work shift and severity of occupational stress (31-33). It seems that work shifts lead to circadian rhythm sleep disorder and thus affect occupational stress. Furthermore, insomnia and long night work shifts could lower one's stress threshold.

No significant relationship was found in the present study between occupational stress and the risk of developing GERD ($p = 0.23$). In the study conducted on the general population of Tehran anxiety was shown to be significantly higher in patients with GERD than the control group (34). In a case control study on the general population of a city in Iran (Gonbad-e Kavus, 2007), it was shown that psychosomatic disorders, anxiety, social dysfunction, and depression were associated with greater gastric reflux. The study concluded that psychosocial factors might have an important role in creating the symptoms of GERD (8). In a case control study conducted in 2013 on the general population of Korea with a sample of 6834 people, a significant association was reported between acute stress and GERD after modifying the confounding factors (35). Another case control study carried out on the general population of Norway in 2010 with a sample size of 65,333 people indicated a significant relationship between occupational stress and symptoms of GERD (36). In another case control study carried out on the general population of Spain in

2008, the patients with symptoms of GERD received higher scores in mental disorders (37).

The present study showed that there was no significant difference between the prevalence of GERD among the nurses and the general population. Although nursing is a stressful job, it seems that nurses manage to adapt themselves with their working conditions after a while and experience stress levels similar to other people of the community. Some evidence of the relationship between stress and GERD has been shown in the studies conducted on the general population, whereas the present study showed no evidence of the relationship between these two variables. The inconsistency between the results of the present study and those the studies conducted on the general population may be due to the differences in the type of study, the study population, the sample size, and accuracy of response to the questionnaires. It is finally recommended to design and perform a case control study with a greater sample size to investigate the relationship between occupational stress and the risk of developing GERD among two groups of nursing and non-nursing staff.

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CONFLICT OF INTEREST

The authors declare no conflict of interests related to this work.

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