

## Predictors of work-related stress among nurses working in primary and secondary health care levels in Dammam, Eastern Saudi Arabia

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ABSTRACT

**Introduction:** Work-related stress (WRS) is an insidious and persistent part of everyday life related to the response of people to work environment. Nursing is a strenuous job and WRS is prevalent among nurses. The aim of this study was to estimate the prevalence of WRS among nurses working in primary and secondary health care levels in Dammam, Eastern Saudi Arabia. **Materials and Methods:** A cross-sectional epidemiological study was conducted in 17 primary health care centers (PHCCs) representing the primary level of health care and Medical Tower Complex (MTC) representing the secondary health care level in Dammam city. The total number of nurses included in the study was 637 nurses (144 in PHCCs) and (493 MTC). Data were collected using a self-administered questionnaire, which was developed based on the pertinent literature. It included two main parts: Sociodemographic and job characteristics of nurses and 31 WRS questions. **Results:** The overall prevalence of WRS among all studied nurses was 45.5%; 43.1% and 46.2% in primary and secondary levels, respectively. In the primary level, there was a statistical significant association between WRS and being married (85.5%), and having living three children and more (53.2%). Moreover, younger age group 20-<30 years (79.4%), Saudi nationality (86.8%), being married (74.6%), having nonbachelor degree (83.3%), work shifts (89.5%), and working in surgical department (46.5%) were the significant associating factors with the occurrence of WRS among nurses in secondary levels. Young age was the only predicting factor for WRS in primary care level. While being female, Saudi, married, with work shifts, and working in surgical department were found to predict WRS in the secondary level. **Recommendations:** Appropriate strategy in health care organization to investigate stress in health care settings is recommended. Moreover, interventional programs to identify, and relieve sources and effects of stress should be developed.

**Key words:** Nurses, predictors, prevalence, Saudi Arabia, work-related stress

### INTRODUCTION

Stress is a pervasive and insidious part of everyday life and in the work environment.<sup>[1]</sup> According to United States National Institute for Occupational Safety and Health, job stress is defined as “the harmful physical and emotional responses that occur when the requirements of

the job do not match the capabilities, responses, or needs of the worker.”<sup>[2]</sup> Work-related stress (WRS) is simply stress, which is caused or made worse by working. Job stress is a substantial and growing concern for workers, their advocates, employers, occupational health and safety regulators, and workers’ compensation programs.<sup>[3]</sup> Different personality styles, gender difference, age, context, family history, emotional state, understanding of self and general social awareness will all influence each person’s stress level.<sup>[4,5]</sup> Usually, the effects of stress can be categorized as: Mental, physical, behavioral, and cognitive. Among the poor signs of WRS are the poor physical and mental health of the organization employees, poor attendance and less commitment to work, less productivity, distress and irritability and lastly the organization becomes less likely to be successful in a competitive market with poor

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image to stakeholders.<sup>[5,6]</sup> Nursing is generally perceived as a stressful and demanding profession. There is substantial evidence that nursing is a stressful occupation, which can lead to disruptions in both psychological and physical health and can impair professional practice. There is a growing body of evidence, which validates that health care providers particularly nurses experience stress in the course of carrying out their work without exception.<sup>[7-9]</sup> Various studies have shown that nursing is a strenuous job and WRS is prevalent among nurses.<sup>[10,11]</sup> The prevalence rates of stress among nursing staff vary across studies with researchers reporting rates of 29-40%.<sup>[12-14]</sup>

Many health professionals, in Saudi Arabia, are expatriates of various nationalities where Saudi physicians constituted 20% and Saudi nurses constituted 27% of the total number of physicians and nurses, respectively.<sup>[15]</sup>

By reviewing the literature and to the best of our knowledge, there was no available research that has investigated WRS and stress related work outcomes among nurses in different levels of health care in Saudi Arabia.

The aim of this study was to determine the prevalence of WRS and to find out the possible associated and predicting factors that affect WRS among nurses working in primary and secondary health care levels in Eastern Province, Saudi Arabia.

## MATERIALS AND METHODS

### Study design and sampling technique

A cross-sectional epidemiological study was carried-out in Dammam city; Eastern region of Saudi Arabia during January to May, 2013 G. The study sample included nurses working in the health facilities at primary and secondary health care levels, of all ages, both sex, Saudi and non-Saudi, and regardless of educational level or years of experience.

The total number of nurses included in the study was 637 nurses; 144 in primary health care centers (PHCCs) representing the primary level of health care and 493 in Medical Tower Center (MTC) representing the only secondary governmental health care level. They were selected by using the sample size equation described by Dahiru *et al.*<sup>[16]</sup> According to the number of nurses in PHCCs (270) and MTC (1070) with a prevalence rate of WRS among nurses of 30% as reported by Al-Hawajreh.<sup>[8]</sup>

Seventeen out of the 24 PHCCs were randomly selected and the MTC in Dammam. All nurses in the selected PHCCs as well as nurses working in medical and surgical wards,

intensive care unit, accident and emergency, outpatient clinics, operating theater, burn unit, and a day surgery unit; at MTC were randomly selected by proportional allocation technique in both PHCCs and MTC.

Permission was taken from the concerned health authority to conduct the study. The objectives of the study were explained to the nurses involved in the study after which they gave their verbal consent to participate. Confidentiality of the information was strictly adhered to by assuring the nurses that no details about their status will be released and data will be used only for research purposes.

## TECHNICAL DESIGN

Data were collected by using a self-administered questionnaire, which was written in both English and Arabic. Internal consistency reliability was tested by Cronbach's alpha coefficient for the whole questionnaire with a value of 0.87. The questionnaire was composed of two main parts:

- Sociodemographic and occupational characteristics such as age, sex, educational level, marital status, number of living children, years of experience, job position, department of work, working shifts, etc.
- Occupational stress was assessed using occupational stress scale developed by Al-Hawajreh<sup>[8]</sup> which consisted of 31 items to identify the presence and sources of WRS. A scoring system was used ranged from 1 to 5 as follows: 1 (never), 2 (rarely), 3 (sometimes), 4 (often), and 5 (always) with a total WRS scale of 155. The total WRS scale was divided into two categories: Presence of WRS or absence of WRS according to the mean score of the total WRS ( $87.83 \pm 17.75$  standard deviation) that is, who were scored above the means was diagnosed as having WRS and those below the mean with no WRS.

### Statistical analysis

The collected data were reviewed, coded, verified, and statistically analyzed using the Statistical Package for Social Sciences (SPSS) software version 16 (SPSS Inc., Chicago, Illinois, USA, 1998-2007). Descriptive statistics for all studied variables, Fisher's exact, and Chi-square tests were used. Logistic regression analysis was used to find the association between the characteristics of the nurses (independent variables) and WRS (dependent variable) and  $P < 0.05$  was considered as significant throughout the study.

## RESULTS

The mean age of studied nurses working in PHCCs and MTC in Dammam was  $35.2 \pm 8.2$  and  $28.6 \pm 5.6$  years, respectively

with a high statistical significant difference ( $P < 0.001$ ). Most of studied nurses working in either primary or secondary levels were Saudi (99.3% and 76.7%, respectively), females (91.7% and 86.4%, respectively) and married (80.6% and 64.5%, respectively) [Table 1].

The majority of studied nurses were staff nurses (85.4% in PHCCs and 88.4% in MTC) with a total experience of 10 years and more among 68.1% of nurses working in primary care compared to 17.6% among nurses working in secondary care with a statistical significant difference between the two levels ( $P < 0.001$ ). However, 49.3% of nurses working in PHCCs and 9.5% of nurses working in MTC had current experience of the same duration ( $P < 0.001$ ). None of the studied nurses working in primary care had postgraduate degrees, or having work shifts compared to 1.8% and 84.2% of nurses in secondary level, respectively [Table 1].

The overall prevalence of WRS among all studied nurses was 45.5%; moreover, the prevalence of WRS among

nurses working in primary and secondary health care levels was 43.1% and 46.2%, respectively [Figure 1].

Work-related stress is more common among married nurses (85.5%,  $P < 0.05$ ) and those with three or more children (53.2%,  $P < 0.01$ ) and the difference was statistically significant [Table 2]. Moreover, younger age group 20- <30 years (79.4%,  $P < 0.05$ ), Saudi nationality (86.8%,  $P < 0.001$ ), married (74.6%,  $P < 0.001$ ), qualifications, that is, nurses with nonbachelor degree (83.3%,  $P < 0.01$ ), having work shifts (89.5%,  $P < 0.01$ ), and working in surgical department (46.5%,  $P < 0.001$ ) were the significant associating factors with the occurrence of work-related disease among nurses in secondary health care levels [Table 2].

By studying the association between gender, monthly income, job position, postgraduate degrees, duration of total and current experience of nurses in both PHCCs and MTC with WRS among nurses, there was no any statistical significant association ( $P > 0.05$ ).

**Table 1: Sociodemographic and job characteristics of studied nurses in primary and secondary health care levels**

Sociodemographic and job characteristics	Levels of health care (No. (%))		P value
	Primary (n=144)	Secondary (n=493)	
Age in years			
20- <30	37 (25.7)	361 (73.2)	<0.001
30- <40	65 (45.2)	97 (19.7)	
40- <50	32 (22.2)	29 (5.9)	
50-60	10 (6.9)	6 (1.2)	
Range	20-58	20-55	
Mean±SD	35.2±8.2	28.6±5.6	
Gender			
Male	12 (8.3)	67 (13.6)	>0.5
Female	132 (91.7)	426 (86.4)	
Nationality			
Saudi	143 (99.3)	378 (76.7)	<0.001
Non-Saudi	1 (0.7)	115 (23.3)	
Marital status			
Single	19 (13.2)	160 (32.5)	<0.001
Married	116 (80.6)	318 (64.5)	
Divorced	7 (4.8)	9 (1.8)	
Widowed	2 (1.4)	6 (1.2)	
Number of living children			
<3	42 (29.2)	163 (33.1)	<0.001
≥3	65 (45.1)	55 (11.2)	
No children	37 (25.7)	275 (55.7)	
Job position			
Head nurse	17 (11.8)	15 (3.0)	<0.001
Staff nurse	123 (85.4)	436 (88.4)	
Nurse assistant	4 (2.8)	42 (8.6)	
Total experience in years			
>5	18 (12.5)	277 (56.2)	<0.001

**Table 1: Contd...**

Sociodemographic and job characteristics	Levels of health care (No. (%))		P value
	Primary (n=144)	Secondary (n=493)	
5- >10	38 (19.4)	129 (26.2)	
≥10	98 (68.1)	87 (17.6)	
Current experience in (years)			
>5	30 (20.8)	253 (51.3)	<0.001
5- >10	34 (23.7)	97 (19.7)	
≥10	71 (49.3)	47 (9.5)	
Refuse to answer	9 (6.2)	96 (19.5)	
Monthly income in Saudi Riyal			
5000- <10,000	33 (22.9)	382 (77.5)	<0.001
10000- <15,000	62 (43.1)	70 (14.2)	
≥15,000	49 (34.0)	24 (4.9)	
Refuse to answer	0 (0)	17 (3.4)	
Qualification			
Bachelor	14 (9.7)	111 (22.5)	<0.05
Nonbachelor	130 (90.3)	382 (77.5)	
Postgraduate degrees			
Master	0 (0)	8 (1.6)	-
Doctorate	0 (0)	1 (0.2)	
None	144 (100)	484 (98.2)	
Work shifts			
Present	0 (0)	415 (84.2)	-
Absent	144 (100)	78 (15.8)	
Departments			
Medical	0 (0)	81 (16.4)	-
Surgical	0 (0)	187 (37.9)	
Emergency unit	0 (0)	61 (12.4)	
Intensive care unit	0 (0)	80 (16.3)	
Others (burn unit, out-patient clinics, X-ray and endoscopy)	0 (0)	84 (17.0)	

SD: Standard deviation

Table 3 represents the results of the logistic regression analysis of significant factors predicting the occurrence of

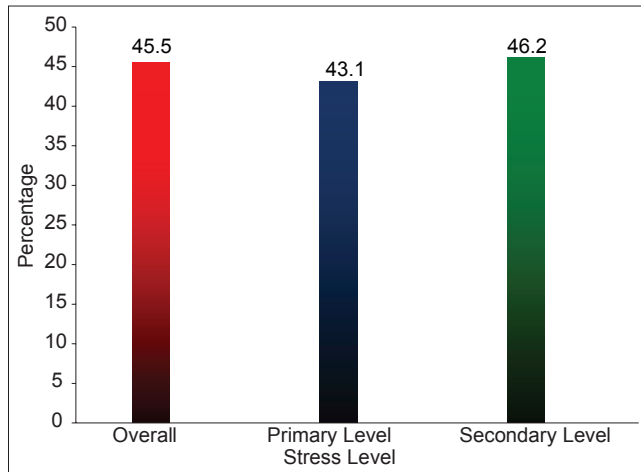


Figure 1: Prevalence of work-related stress among studied nurses

WRS in primary and secondary care levels. Young age was the only predicting factor that was found to be independently and significantly associated with WRS in primary care level (odds ratio [OR] =0.473, 95% confidence interval [CI] =0.27-0.83), ( $P < 0.01$ ). On the other hand, the following factors were found to be independently and significantly associated with WRS in secondary care level: female gender (OR = 0.663, 95% CI = 0.281-0.946), Saudi nationality (OR = -1.6, 95% CI = 0.096-0.368), married nurses (OR = 0.932, 95% CI = 1.635-3.94), presence of work shifts (OR = -1.2, 95% CI = 0.15-0.57), and working in surgical department (OR = 0.07, 95% CI = 0.869-1.00), ( $P < 0.001$ ).

## DISCUSSION

The sociodemographic features of the studied nurses showed that 73.2% in secondary health care level were aged 20-30 years compared with 25.7% in primary level, and the

Table 2: Association between sociodemographic and job characteristics of studied nurses and WRS according to levels of health care

Sociodemographic and job characteristics	Levels of health care (No. (%))					
	Primary			Secondary		
	Present (n=62)	Absent (n=82)	P value	Present (n=228)	Absent (n=265)	P value
Age in years						
20- <30	19 (30.6)	18 (22.0)	>0.05	181 (79.4)	180 (67.9)	<0.05
30- <40	30 (48.4)	35 (42.7)		36 (15.8)	61 (23.1)	
40- <50	11 (17.7)	21 (25.6)		8 (3.5)	21 (7.9)	
50-60	2 (3.3)	8 (9.8)		3 (1.3)	3 (1.1)	
Nationality						
Saudi	62 (100.0)	81 (98.8)	>0.05	198 (86.8)	180 (67.9)	<0.001
Non-Saudi	0 (0.0)	1 (1.2)		30 (13.2)	85 (32.1)	
Marital status						
Single	3 (4.8)	16 (19.5)	<0.05	50 (21.9)	110 (41.5)	<0.001
Married	53 (85.5)	63 (76.8)		170 (74.6)	148 (55.8)	
Divorced	5 (8.1)	2 (2.4)		6 (2.6)	3 (1.2)	
Widowed	1 (1.6)	1 (1.3)		2 (0.9)	4 (1.5)	
Number of living children						
<3	21 (33.9)	21 (25.6)	<0.01	81 (35.5)	82 (30.9)	>0.05
≥3	33 (53.2)	32 (39.0)		24 (10.6)	31 (11.7)	
No children	8 (12.9)	29 (35.4)		123 (53.9)	152 (57.4)	
Qualification						
Bachelor	7 (11.3)	7 (8.5)	>0.05	38 (16.7)	73 (27.5)	<0.01
Nonbachelor	55 (88.7)	75 (91.5)		190 (83.3)	192 (72.5)	
Work shifts						
Present	0 (0.0)	0 (0.0)	-	204 (89.5)	211 (79.6)	<0.01
Absent	62 (100.0)	82 (100.0)		24 (10.5)	54 (20.4)	
Departments						
Medical	0 (0.0)	0 (0.0)	-	41 (18.0)	40 (15.1)	<0.001
Surgical	0 (0.0)	0 (0.0)		106 (46.5)	81 (30.6)	
Emergency unit	0 (0.0)	0 (0.0)		25 (11.0)	36 (13.6)	
Intensive care unit	0 (0.0)	0 (0.0)		21 (9.2)	59 (22.3)	
Others (burn unit, out-patient clinics, X-ray and endoscopy)	0 (0.0)	0 (0.0)		35 (15.3)	49 (18.4)	

WRS: Work-related stress

**Table 3: Logistic regression analysis of significant factors predicting WRS among studied nurses in primary and secondary health care levels**

Level of health care/variables	B coefficient	B	P value	OR	95% CI of OR Lower-upper
Primary					
Age	-0.749	0.287	<0.01	0.473	0.27-0.83
Constant	23.7	4.01			
Model $\chi^2_{(11)}=26.180, P<0.01$					
Secondary					
Gender	0.663	0.31	<0.05	0.515	0.281-0.946
Nationality	-1.6	0.342	<0.001	0.188	0.096-0.368
Marital status	0.932	0.25	<0.001	2.53	1.635-3.94
Shifts	-1.2	0.33	<0.001	0.301	0.15-0.57
Departments	0.07	0.036	<0.05	0.932	0.869-1.00
Constant	2.2	4.4			
Model $\chi^2_{(16)}=91.500, P<0.001$					

CI: Confidence interval; OR: Odds ratio; WRS: Work-related stress

difference was statistically highly significant ( $<0.001$ ). This may justify the higher percent (32.5%) of single nurses in secondary level [Table 1].

Work-related stress can occur specifically when a conflict arise from the job demands of the employees and the employees themselves; and if not handled properly, the stress can become distress. Occupational stress among health workers has been a matter of much scientific inquiry in literature in the past decades. High level of stress at work is a major factor to both physical and psychological health.<sup>[17,18]</sup> The overall prevalence of WRS (45.5%) as well as its prevalence among nurses working in primary (43.1%) and secondary health care (46.2%) levels, in this study [Figure 1], were in agreement with other studies.<sup>[12,14]</sup> However, Al-Hawajreh has reported lower prevalence (30%) of job stress among Jordanian Hospital nurses.<sup>[8]</sup> This higher level of stress among the studied nurses indicate that nursing has been shown to be a strenuous profession with nurses exposed to stress-provoking factors than other health care workers, and involving in providing help to people experiencing life crisis.<sup>[19]</sup> WRS, in this study, was significantly associated with younger age of nurses working only in MTC [Table 2] and was the only predicting factor for the occurrence of WRS among nurses working in PHCCs [Table 3], age was significantly related to occupational stress in several studies that reported consistent results, that is the younger the subjects, the higher levels of occupational stress.<sup>[10,18,19]</sup>

Furthermore, married nurses working in both MTC and PHCCs was significantly associated with WRS [Table 2]; moreover, married nurses were among the predicting factors of occurrence of WRS among MTC nurses [Table 3], similar finding were reported by other studies.<sup>[8,18,19]</sup> When the relation between total and current years of exposure

and WRS was investigated in this study, no statistical significant association could be revealed. This finding is in agreement with Abd El-Fatah,<sup>[20]</sup> and Al-Hawajreh,<sup>[8]</sup> they could not revealed any significant association between the years of experience in nursing and job stress.<sup>[8,20]</sup> However, the finding is incongruent with other study which showed a positive relationship between years of experience and job stress.<sup>[21]</sup> Although in several studies income has been introduced as associated factors related to occupational stress,<sup>[22,23]</sup> the finding of the present study showed that income was not significantly associated with WRS among nurses in both PHCCs and MTC. Furthermore, the data of this study, in the MTC found that 89.5% of nurses who suffered from WRS had a working shifts compared to 79.6% without stress [Table 2] and the difference was statistically significant ( $P < 0.01$ ). Moreover, presence of night shifts was among the predicting factors of occurrence of WRS among MTC nurses [Table 3], Botha and Pienaar stated that work schedule as working late shifts or overtime is one of the main contributors of occupational stress among employees.<sup>[22]</sup>

Moreover, other feature of job characteristic of the hospital nurses in this study showed that 46.5% of the nurses were working in surgical wards with a statistically highly significant difference between departments ( $P < 0.001$ ) [Table 2]. This finding is not in - agreement with. Al-Hawajreh who reported that WRS stress was not statistically significant among nurses working in medical, surgical and other specialized hospital units.<sup>[8]</sup> Staff members of department dealing with many unpredictable challenges, including sudden death, violence, trauma, and overcrowding, on a daily if not hourly basis, have higher levels of stress and burnout than colleagues in other specialties.<sup>[24-28]</sup>

A Saudi study was done by Alomar 2003, on sources of WRS among the ministry of health hospital staff, Riyadh

city, Saudi Arabia, showed that WRS was not influenced by educational level, marital status, gender and language.<sup>[29]</sup> In contrary to our results the previously mentioned study found that age and experience showed negative correlation with stress.<sup>[29]</sup>

## CONCLUSION AND RECOMMENDATIONS

The results of this study demonstrated high prevalence of WRS among the studied nurses in both primary and secondary health care levels. Young age, being married and having more than three children were the associating factors of WRS among nurses in primary level. Young age, female gender, Saudi nationality, married nurse, presence of working shifts and working in surgical department were the significant predictors of WRS among nurses in secondary level. Appropriate strategy in health care organization to investigate stress management in health care settings is recommended. Moreover, interventional programs to identify, and relieve sources and effects of stress should be developed including more training, support, and better work conditions.

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