

## Prevalence and risk factors of work related stress among residents at Ain Shams University Hospitals

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### Abstract

**Background:** Work related stress is an increasingly important occupational problem and a significant cause of economic loss. **Objectives:** To measure the prevalence and to determine the risk factors of work related stress among residents working in Ain Shams University Hospitals. **Subjects and Methods:** A cross-sectional study was conducted in which the study population consisted of residents working in different departments in the four main Ain Shams University Hospitals. In this study, 488 residents from a total of 557 accepted to participate, their age ranged from 24 to 29 years old (mean  $\pm$  SD = 26.9  $\pm$  1.3 years), 49.6% of them were males and 50.4% were females. Self-administered questionnaire was used including general health questionnaire-12 items (GHQ) and questionnaire for stress risk factors. **Results:** 58% of the residents were stressed, 28.1% of them scored mild stress and 29.9% scored severe stress. Regarding stress risk factors, being a female, difficulty in taking vacation, uncomfortable work environment, problems in communication with supervisors and perception of doing work of no value were the most important independent predictors for work related stress by using logistic regression model. **Conclusion:** Stress is prevalent among residents working at Ain Shams University Hospitals which imply that immediate intervention programs are needed to overcome these problems and to keep residents physically and mentally healthy.

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### Introduction

Work related stress is an important problem that affects physicians. WHO defines work related stress as the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and

which challenge their ability to cope<sup>(1)</sup>.

Resident doctors in developing countries encounter additional challenges including shortage of health sector budget, low income and disparities in health care distribution.

The need to study and work simultaneously make them more susceptible to psychological problems <sup>(2)</sup>. The intense emotional, psychological, and physical demands during residency were aimed to nurture caring, dynamic, and competent medical professionals towards enhancing patient centered care. Despite such noble intentions and goals, these efforts have led to opposite consequences and effects. Work related stress can result in poor morale and motivation, poor communication and decision-making as well as poor relationships with colleagues. It also has financial implications through doctors taking sick leave or ceasing to practice medicine <sup>(3)</sup>.

In Egypt, a study was carried out at Al Mansoura University Hospitals among anesthesiologists who had academic career showed that 69.4% of them were encountering job stress <sup>(4)</sup>. Another study conducted at Ain Shams University Hospitals showed that 62.3% of nurses had moderate level of stress <sup>(5)</sup>.

In South Africa, a study carried by *Govender et al (2012)* showed that 51% of doctors working at public hospitals were found to be stressed; 27% of them were highly stressed <sup>(6)</sup>. In India, the overall

prevalence of stress among resident doctors working in four medical colleges and associated hospitals of Delhi was 32.8% <sup>(7)</sup>. In Canada, *Edmonds et al (2012)* reported that 50% of healthcare workers working in oncology departments at four major hospital centers in Ontario had high levels of psychological distress <sup>(8)</sup>.

Various stressors have been found to be related to job stress among doctors as demands of work, excessive work load, long duty hours, financial problems, conflict between professional and personal lives, problems with patients and those related to occurrence of death <sup>(9)</sup>.

Medical residents are overburdened with work expectations causing negative health effects. It inhibits motivation causing reduced concentration, attention, and impaired cognitive function. These effects predispose residents to medical errors and injuries, substance abuse, and suicide attempts <sup>(10)</sup>.

Ain Shams University hospitals include 557 residents working in the different departments in year 2011-2012. These residents face many stressors and inspite the fact that the quality of health care can be extremely influenced by the

stressed health staff, there is scarce in studies concerning work related stress conducted among Egyptian physicians. So, this study will be beneficial to highlight the problem regarding the magnitude of work related stress and the associated risk factors in order to prevent or reduce it.

### Objectives

1. To measure the prevalence of work related stress among residents working at Ain Shams University hospitals.
2. To determine the risk factors of work related stress among residents at Ain Shams University hospitals.

### Subjects and methods

A cross-sectional study was conducted among residents at Ain Shams University Hospitals in the period from first of April 2013 to end of May 2014. Data obtained from the information center revealed that there were 557 residents at Ain Shams University hospitals in all its departments in 2011-2012. There were 266 residents at internal medicine hospital, 210 residents at EL Demerdash hospital for surgery, 35 residents at gynecology and obstetrics hospital, 33 residents at pediatric hospital and 13 residents

at oncology department. A self-administered questionnaire was completed by the residents. The questionnaire includes:

A) Socio-demographic and job characteristics information.

B) General Health Questionnaire-12 items: it is a validated questionnaire with high sensitivity that has been widely used to screen populations for stress<sup>(7)</sup>. It was decided to use the Likert style for scoring (0-1-2-3). All those who had scored 15 and below were labeled as not stressed, those who had scored above 15 were considered to be in mild stress and those who scored 20 and above were considered to have severe stress<sup>(11)</sup>.

C) Work related stress questionnaire (modified form of Al Omar, 2003 questionnaire<sup>(12)</sup>): It included statements cited in the literature as stress causes and classified into the following categories: leisure time factors, factors intrinsic to work, work environment and relationships with others at work.

For scaling the responses a five-point Likert scale of agreement or disagreement was used. The format of a typical five-level Likert item is: 1= strongly disagree, 2= disagree, 3= neutral, 4=agree and 5= strongly

agree. Pilot study was carried out on 10 residents to test the tool to ensure its practicability and applicability. Data were revised, coded and entered to personal computer and analyzed using SPSS version 18. Suitable analysis was done according to the type of data. Ethical committee and administrative approvals were obtained before conducting the study.

## Results

Only 488 of residents have completed the questionnaire with response rate 89.2%. The demographic characteristics of the studied sample showed that their age ranged from 24 to 29 years old, majority of them were single 60.2% and 50.4% of them were females. Exploring the job characteristics revealed that 35% of the residents were juniors, 30.3% were sub seniors, while 34.6% were seniors. Residents working at gynecology and obstetrics department were 7.2% of the studied sample, 6.6% at pediatric department, 52.9% at internal medicine department, 30.7% at surgery department and 2.7% at oncology department.

Work related stress is prevalent among residents working at Ain

Shams University Hospitals. More than half of the residents 58% were stressed, 28.1% of them scored mild stress and 29.9% of them scored severe stress.

Univariate analysis of the socio-demographic factors revealed that age, marital status, number of children and pregnancy status did not show significant relations with stress, while gender did significantly affect work related stress. Females had significantly higher level of stress than males (table 1). Analysis of the job characteristic factors did not reveal an association between job rank and specialty in relation to stress.

The current study revealed an association between leisure time factors and work related stress where residents who were suffering from short break during work, family problems due to their work and lack of time for practicing hobbies and sports or difficulty in taking vacation were significantly more stressed than those not suffering (table 2).

The current study revealed a significant association between work related stress and the following variables: workload, long working hours, irregularity of schedule of work shift (days and nights), perception of doing job of

no value, role ambiguity and role conflict (table 3).

Moreover, the current study revealed significant relation between problems with supervisors, colleagues, subordinates, patients and their families and work related stress (table 5). In addition, the current finding revealed that there was a statistically significant relation between uncomfortable environmental work condition and work related (table 4).

Multivariate logistic regression analysis revealed that difficulty in taking vacation, problems in communication with supervisors, perception of doing job of no value, uncomfortable work environment and being a female were the most important independent predictors of work related stress (table 6).

## Discussion

The results of this study show that more than half of the residents 58% were stressed. *Shams and El Masry* (2013) reported that 69.4% of the anesthesiologists who had academic career and working at Mansoura University Hospitals were stressed <sup>(4)</sup> while *Boran et al* (2012) showed that 27% of health care professionals reported high levels of stress <sup>(13)</sup>. The higher

overall prevalence of stress in the current study could be due to different working environment at the place under study, especially that it is associated with academic demands, high flow of patients and low resources <sup>(4)</sup>.

Female residents had significantly higher level of stress than males. Reasons for this difference should be considered. More serious consequences might occur among females compared with males experiencing the same level of occupational stress. Moreover, female physicians confront more workplace adversity than males in terms of mistrust from the patients, as well as having the dual responsibilities of career and family <sup>(14)</sup>. This finding is consistent with the results of *Gramstad et al* (2013) which revealed that female physicians experienced higher levels of job stress than males <sup>(15)</sup>. However, male doctors showed more stress than female doctors in a study done in governmental hospitals in India by *Baba* (2012) <sup>(16)</sup>.

The current study revealed an association between *leisure time factors* (short break, difficulty in taking vacation, no time for practicing sports and family problems due to work) and work

related stress among residents (table 2). Several past studies are in agreement with this finding. *El Hussiney (2006)* who studied burnout among doctors who have administrative positions at Ain Shams University, found that doctors who had no times for practicing sports or favorite hobbies as well as those who had insufficient vacation (less than two weeks) had significantly higher emotional exhaustion and depersonalization scores <sup>(17)</sup>. Moreover, *Ahmad (2010)* found a significant association between work-family conflict and stress and burnout among doctors. Work-family conflict could lead to stress and emotional exhaustion because resources are lost in the process of juggling both work and family roles <sup>(18)</sup> which could explain the current finding. Moreover, insufficient doctors result in increase their nightshifts, extending working hours and working on weekly vacation and even national legal holidays.

Concerning *workload*, the present study found a statistically significant association between workload and work related stress as shown in table (3). One explanation that was stated in a previous study by *Aslam et al (2013)* that is

applicable to the current situation is that workload is more in public hospitals as patients' turnover rate is drastic in these hospitals that patients have to wait in emergency departments for longer hours and that causes a lot of pressure for doctors and other staff and act as a source of stress <sup>(19)</sup>.

The current result is supported by the finding of *Ahmad (2010)* who found that workload is a significant stressor associated with stress and emotional exhaustion <sup>(18)</sup>. Moreover, *Abdel Hamid (2004)* reported that workload was one of the major causes of stress among nurses working in Ain Shams University Hospitals <sup>(5)</sup>.

Regarding *long working hours*, the current study found a statistically significant association between long working hours and work related (table, 3). It could be due to the fact that working long hours requires constantly caring for ill people, facing death of people and knowing that their occupation carries enormous responsibility and that people's lives depend on them <sup>(19)</sup>.

The current result is supported by the finding of *El Hussiney (2006)* which revealed that total hours worked per day were significantly associated with

burnout syndrome <sup>(17)</sup>. In contrast, the current result disagrees with the result of *Govender et al (2012)* who did not find a significant relationship between stress and long working hours. This contradiction in results could be explained by limited sample size and by the differences in working conditions and culture <sup>(6)</sup>.

Concerning *work shifts*, the current study found that the effect of irregularity of work shifts on work related stress is statistically significant (table 3). It could be explained by the fact that human body clock is used to work at day and sleep at night but when body clock routine is changed anxiety, fatigue, stress and feeling of depression are inevitable mainly due to sleep deprivation. In addition, work shifts disturb the doctors' family and personal life. The present result is consistent with the result of *Aslam (2013)* which revealed that night shifts and relation with peers have a positive relationship with levels of stress <sup>(19)</sup>.

The current study showed that there was a significant relation between stress and *perception of doing job of no value* (table 3). It could be explained by the fact that inability to be involved in decision making pushes the workers to feel

that their role is worthless. Another explanation is that in public hospitals, doctors often have to do some non-clinical tasks which could be of no value <sup>(20)</sup>. This agrees with the result of *Imtiaz and Ahmad (2010)* who reported a significant relation between stress and low acceptance of work done among medical officers working in the main medical organizations in Islamabad <sup>(20)</sup>.

The current finding shows that the residents who were suffering from *no clear job description (role ambiguity)* are at risk of stress about two and half times than those who were not suffering (table 3). It could be due to that uncertainty, inadequate knowledge of employees about their responsibilities, authority, objectives and goals of their organization increase the level of stress among employees and increase the workload <sup>(21)</sup>.

Regarding *role conflict*, residents who were suffering from opposed views with their supervisors (role conflict) are at risk of stress about three times than those who were not suffering (table 3). Expressing a different opinion may lead to a situation where damage and stress can occur <sup>(22)</sup>. This is in agreement with the

finding of *Karimi et al (2014)* who concluded that there was a significant, linear and positive relationship between role overload, role conflict, role ambiguity and occupational stress among nurses (23).

Of the significant factors, there was a relation between *problems with supervisors, colleagues and subordinates* and work related stress (table 5). It could be due to that ineffective management, supervisors' excessive authority, favouritism and discrimination result in stress (24). Poor relationships with others lead to less trust and support between peers, subordinates, and supervisors which result in stress (12). The current results are supported by the results of *El Hussiney (2006)* which revealed that doctors who are having good relationships with their colleagues and subordinates had significantly lower degree of emotional exhaustion and depersonalization (17). *Abdel Hamid (2004)* reported that problems with supervisors, patients and their families were the major causes of stress among nurses working in Ain Shams University Hospitals (5).

On the other hand, *Menon et al (2007)* showed that working relationships were relatively rarely

identified as stressors suggesting that colleagues may be an important source of support (9). In addition, *Sieminska and Dawid (1997)* have identified the buffering effect of social support on stress. They reported that social support for doctors is the most important to return to inner equilibrium (25).

The current study revealed significant relations between *problems with patients and their families* and work related stress (table 5). It could be explained by the fact of that working with patients who have frequent complaints and discomfort seems to cause excessive workload as providing psychological support to them and/or responding to the their complaints (26). These results are supported by the results of *Assibi et al (2013)* which revealed that problems with patients and their families are significantly associated with work related stress among nurses (27).

Moreover the current study revealed that there was a statistically significant relation between *uncomfortable environmental work condition* and work related stress (table 4). *Roelofsen (2002)* attributed this to a clear association between an individuals' uncomfortable working



environment and psychological and physical health problems which result in stress <sup>(28)</sup>. This result is in consistent with the result of *Al-Dubai et al (2013)* which revealed that one of the five most important stressors reported by majority of the Malaysian medical residents was lack of adequate comfortable rest rooms and other facilities for doctors <sup>(29)</sup>.

In multivariable logistic regression analysis, difficulty in taking vacation, problems in communication with supervisors, perception of doing job of no value, uncomfortable work environment and being a female were the most important independent predictors of work related stress (table 6). This analysis showed that residents who were suffering from difficulty in taking vacation, uncomfortable work environment, perceive their job as of no value, have increased the risk of work related stress by about 2.5 folds than those who were not suffering. Also residents who were suffering from problems with their supervisors have increased the risk of work related stress by 2.2 folds than those who were not suffering. In addition, being a female increase the risk of stress by 1.9 folds than being a male.

### Conclusion:

Conclusion drawn from this study is that the degree of work related stress among residents in Ain Shams University Hospitals is considerably high; this stress is mainly related to their work place and caused by a number of workplace stressors identified by them. The most important independent risk factors identified by logistic regression model were: difficulty in taking vacation, problems in communication with supervisors, perception of doing job of no value, uncomfortable work environment and being a female.

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**Table (1): Relation between socio-demographic data and work related stress among the study group**

Variables	Stressed n=283 N (%)	Not stressed n=205 N (%)	X <sup>2</sup>	P	Odds ratio	95% CI
<b>Gender</b>						
Females	161 (65.4)	85 (34.6)	<b>11.3</b>	<b>0.001</b>	<b>1.9</b>	<b>1.3-2.7</b>
Males	122 (50.4)	120 (49.6)				
<b>Age</b>						
24-26	109 (59.2)	75 (40.8)	0.1	0.7	1.1	0.7-1.6
27-29	173 (57.5)	128 (42.5)				
<b>Marital status</b>						
Married	108 (57.1)	81 (42.9)	0.2*	0.9	Ref	--
Single	172 (58.5)	122 (41.5)			1.1	0.7-1.5
Divorced	3 (60)	2 (40)			1.1	0.2-6.9
<b>Pregnancy</b>						
Pregnant	20 (62.5)	12 (37.5)	0.2	0.6	0.8	0.4-1.9
Not pregnant	57 (67.1)	28 (32.9)				
<b>Number of children</b>						
No children	220 (57.1)	165 (43)	0.7	0.7	Ref	--
1 child	48 (60)	32 (39.5)			1.1	0.7-1.8
2 children	15 (65.2)	8 (34.8)			1.4	0.6-3.4

\*Fisher exact test. Ref = reference group

**Table (2): Relation between leisure time and work related stress among study group**

Variables	Stressed n=283 N (%)	Not stressed n=205 N (%)	X <sup>2</sup>	P	Odds ratio	95% CI
<b>Suffering from family problems due to work</b>						
Disagree	40 (32.3)	84 (67.7)	<b>52.9</b>	<b>&lt;0.001</b>	Ref	--
Neutral	71 (56.8)	54 (43.2)			2.8	1.6-4.6
Agree	172 (72)	67 (28)			5.4	3.4-8.6
<b>In ability to practice hobbies or sports due to work</b>						
Disagree	9 (28.1)	23 (71.9)	<b>22.3</b>	<b>&lt;0.001</b>	Ref	--
Neutral	27 (42.2)	37 (57.8)			1.9	0.7-4.7
Agree	247 (63)	145 (37)			4.4	2-9.7
<b>Difficulty in taking vacation</b>						
Disagree	26 (59.1)	18 (40.9)	<b>17.8</b>	<b>&lt;0.001</b>	2.4	1.1-5
Neutral	32 (37.6)	53 (62.4)			Ref	--
Agree	225 (62.7)	134 (37.3)			2.8	1.7-4.5
<b>Breaks period during work are short</b>						
Disagree	30 (51.7)	28 (48.3)	<b>12.8</b>	<b>0.002</b>	1.3	0.7-2.4
Neutral	56 (45.9)	66 (54.1)			Ref	--
Agree	197 (64)	111 (36)			2.1	1.4-3.2

**Table (3): Relation between factors intrinsic to work and work related stress among study group**

Variables	Stressed n=283 N (%)	Not stressed n=205 N (%)	X <sup>2</sup>	P	Odds ratio	95% CI
<b>Perception of doing work of no value</b>						
Disagree	126 (46.7)	144 (53.3)	<b>33.4</b>	<b>&lt;0.001</b>	Ref	--
Neutral	79 (68.1)	37 (31.9)			2.4	1.5-3.9
Agree	78 (76.5)	24 (23.5)			3.7	2.2-6.2
<b>High work load</b>						
Disagree	47 (44.3)	59 (55.7)	<b>17.6</b>	<b>&lt;0.001</b>	Ref	--
Neutral	94 (54.3)	79 (45.7)			1.5	0.9-2.4
Agree	142 (67.9)	67 (32.1)			2.7	1.6-4.3
<b>Long working hours</b>						
Disagree	31 (48.4)	33 (51.6)	<b>12.8</b>	<b>0.002</b>	1.1	0.6-2
Neutral	54 (47)	61 (53)			Ref	--
Agree	198 (64.1)	111 (35.9)			2	1.3-3.1
<b>Irregularity of schedule of work shifts</b>						
Disagree	42 (45.2)	51 (54.8)	<b>11.2</b>	<b>0.004</b>	Ref	--
Neutral	69 (54.3)	58 (45.7)			1.4	0.8-2.5
Agree	172 (64.2)	96 (35.8)			2.2	1.3-3.5
<b>Absence of job description</b>						
Disagree	36 (42.9)	48 (57.1)	<b>19.8</b>	<b>&lt;0.001</b>	Ref	--
Neutral	56 (48.7)	59 (51.3)			1.3	0.7-2.2
Agree	191 (66.1)	98 (33.9)			2.6	1.6-4.3
<b>Suffering from contradiction of opinions with supervisors</b>						
Disagree	36 (40.4)	53 (59.6)	<b>18.9</b>	<b>&lt;0.001</b>	Ref	--
Neutral	117 (56.5)	90 (43.5)			1.9	1.2-3.2
Agree	130 (67.7)	62 (32.3)			3.1	1.8-5.2

**Table (4): Relation between work environment and work related stress among study group**

Variables	Stressed n=283 N (%)	Not stressed n=205 N (%)	X <sup>2</sup>	P	Odds ratio	95% CI
<b>Uncomfortable work environment (noise, heat...)</b>						
Disagree	27 (40.9)	39 (59.1)	<b>14.8</b>	<b>0.001</b>	Ref	--
Neutral	55 (50.9)	53 (49.1)			1.5	0.8-2.8
Agree	201 (64)	113 (36)			2.6	1.5-4.4
<b>Exposure to health hazards and accidents</b>						
Disagree	13 (54.2)	11 (45.8)	0.4	0.1	1.2	0.5-3.1
Neutral	43 (48.9)	45 (51.1)			Ref	--
Agree	227 (60.4)	149 (39.6)			1.6	1-2.5



**Table (5): Relation between communication with others and work related stress among study group**

Variables	Stressed n=283 N (%)	Not stressed n=205 N (%)	X <sup>2</sup>	P	Odds ratio	95% CI
<b>Suffering from problems with supervisors</b>						
Disagree	58 (38.9)	91 (61.1)	<b>34.7</b>	<b>&lt;0.001</b>	Ref	--
Neutral	43 (58.1)	31 (41.9)			2.2	1.2-3.8
Agree	182 (68.7)	83 (31.3)			3.4	2.3-5.2
<b>Suffering from problems with subordinates</b>						
Disagree	136 (50.9)	131(49.1)	<b>13</b>	<b>0.002</b>	Ref	--
Neutral	58 (70.7)	24 (29.3)			2.3	1.4-4
Agree	89 (64)	50 (36)			1.7	1.1-2.6
<b>Suffering from problems with colleagues</b>						
Disagree	138 (51.9)	128(48.1)	<b>9</b>	<b>0.01</b>	Ref	--
Neutral	55 (64.7)	30 (35.3)			1.7	1-2.8
Agree	90 (65.7)	47(34.3)			1.8	1.2-2.7
<b>Suffering from problems in communication with patients</b>						
Disagree	101 (46.3)	117(53.7)	<b>24.6</b>	<b>&lt;0.001</b>	Ref	--
Neutral	55 (75.3)	18 (24.7)			3.5	2-6.4
Agree	127 (64.5)	70 (35.5)			2.1	1.4-3.1
<b>Suffering from problems with in communication with patients' family</b>						
Disagree	88 (48.9)	92 (51.1)	<b>10.8</b>	<b>0.005</b>	Ref	--
Neutral	52 (68.4)	24 (31.6)			2.3	1.3-4
Agree	143 (61.6)	89 (38.4)			1.7	1.1-2.5

**Table (6): Multivariate logistic regression analysis for the most important independent predictors of work related stress**

Independent predictors	B	P	Odds ratio	95% CI	
				Lower limit	Upper limit
Perception of doing work of no value	0.96	<b>0.001</b>	2.6	1.5	4.7
Uncomfortable working environment (noise, heat...)	0.908	<b>0.009</b>	2.5	1.3	4.9
Difficulty in taking vacation	0.888	<b>0.001</b>	2.4	1.4	4.2
Suffering from problems with supervisors	0.801	<b>0.001</b>	2.2	1.4	3.6
Gender (female)	0.661	<b>0.002</b>	1.9	1.3	2.9
Suffering from problems in communication with patients	0.428	0.07	1.5	1	2.4
Inability to take decision	0.298	0.4	1.3	0.7	2.5