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ORIGINAL ARTICLE

Sources and expressions of stress among physicians in a general hospital

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Abstract *Background:* Work stress is an important problem that affects physicians. Multiple sources can contribute to this problem. High rates of stress among physicians can be manifested in various expressions including cognitive, behavioral, and somatic expressions. Work performance and quality of medical care administered to the patients can be undermined by over stressed physicians.

Objective: The aim of the study was to reveal sources and expressions of stress among hospital physicians and their relationship with socio-demographic and job factors.

Subjects and methods: Two hundred and forty-seven physicians working in a general hospital in Kuwait were the candidates of this study. Quick Stress Questionnaire (QSQ) was used. It consisted mainly of two parts, the first dealt with the sources of stress while the second entailed cognitive, behavioral, and somatic expressions of stress. In addition, sociopage title demographic and work characteristics of physicians were studied and their association with stress domains was illustrated.

Results: The most commonly encountered sources of work stress were work concerns (55.9%),

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followed by financial (51.0%), and family (45.7%) concerns. The most commonly encountered expressions are "sleeping disturbance, night awakening, and troublesome dreams" (27.5%) followed by "anxiety, fears, and worrying" (25.9%). The least commonly encountered ones are "acne, eczema, hives, breaking out, and skin blotching and skin blanching" (3.6%) followed by "tics, tremors, and muscle spasms" (4.0%).

Conclusion: Work, financial, and family concerns were the main sources of stress among physicians. Cognitive expressions were the most common manifestations of stress followed by behavioral expressions, while the least expressed were the somatic manifestations.

1. Introduction

Stress is a general term which refers to two distinct concepts, namely 'stressors' (environmental characteristics, or thoughts which cause an adverse reaction in the individual) and 'strain' (the individual's adverse reaction to the stressor). Multiple definitions for stress have been proposed during the past years. These definitions have focused on certain situations as being stressful on individuals, responses to these situations or both.[1,2]

Health care providers around the world are subject to pressures resulting from a sharp escalation of change, growing economic pressures, technological advances, increasing patient expectations, rationing of health care, and the requirement for more evidence-based and high quality health care, improved performance, and productivity. It is well documented that health workers experience higher levels of stress and stress-related health problems than other occupational groups.[3–5] Among health worker groups, those thought to be most at risk for developing chronic stress syndromes are intensive care service workers and mental health professionals.[6,7] These specialties are mainly encountered in the hospitals and not in the primary health care units.

Searching the literature for work stress among hospital physicians in Kuwait did not reveal any studies dealing with this important topic. Thus, the current study was formulated to reveal sources of work stress among hospital physicians in Kuwait, identify different forms of stress expression and the relation of these outcomes to personal and job characteristics.

2. Methods

An observational cross-sectional study design was adopted for this study. Out of the six general governmental hospitals in Kuwait, Amiri Hospital was randomly selected to carry out this research. All physicians available during the field work of the study in that hospital were the target population of this study. Out of 457 physicians; the number of available physicians during the field period of the study was 396; out of these, only 247 returned the filled questionnaires with a response rate of 62.4%. Data were collected over three months starting from March to May, 2011 using a specially designed questionnaire. This questionnaire consisted of several sections. The first section dealt with socio-demographic characteristics, including age, sex, nationality, marital status, number of years in current and whole practice, educational qualification, and current job. The second section included the Quick Stress Questionnaire (QSQ).[8] It is a 25 item self report questionnaire, designed to measure sources and expressions of stress. The part dealing with sources of stress consisted of 8 questions each is a 9 point Likert scale (ranging from 1 'little' to 9 'extreme'), in addition to one more open ended question dealing with other sources. The part dealing with expressions of stress consisted of three domains namely cognitive, somatic, and behavioral. Each of the cognitive and behavioral domains consisted of three questions, while the somatic domain consisted of 7 questions. The last three questions dealt with overall level of stress, comparing level of stress during the current with the previous year, and level of stress when seeking counseling or treatment.

A pilot study was carried out on 20 physicians (not included in the final study). This study was formulated with the following objectives: test the clarity, applicability of the study tools, accommodate the aim of the work to actual feasibility, identify the difficulties that may be faced during the application, as well as study all the procedures and activities of the administrative aspects. The necessary modifications according to the results obtained were done. Also, the structure of the questionnaire sheet was reformatted to facilitate data collection.

A pre-coded sheet was used. All questions were coded before data collection. This facilitates both data entry and verification as well as reduces the probability of errors during data entry. Data were fed to the computer directly from the questionnaire without intermediate data transfer sheets. The Excel program was used for data entry. A file for data entry was prepared and structured according to the variables in the questionnaire. After data were fed to the Excel program; several methods were used to verify data entry. These methods included the following: simple frequency, cross-tabulation, as well as manual revision of entered data. Percent scores were calculated for each domain of the QSQ. The sum of the scores of each domain was transformed into a percent score starting from zero and ending at 100. The following formula was utilized: (observed sum of scores divided by the maximum possible sum of score multiplied by 100). As a 9 point Likert scale was used; a score $\geqslant 6$ was considered as positive for each question response.

All the necessary approvals for carrying out the research were obtained. The Ethical Committee of the Kuwaiti Ministry of Health approved the research. A written format explaining the purpose of the research was prepared and signed by the physician. In addition, the purpose and importance of the research were discussed with the physicians before distribution of the questionnaires.

2.1. Statistical analysis

Before analysis; data were imported to the Statistical Package for Social Sciences (SPSS) which was used for both data analysis

and tabular presentation. Descriptive statistical measures as count and percentage were used for categorical variables and arithmetic mean, standard deviation and median were used for quantitative variables. Used analytic measures included Mann Whitney test and Spearman correlation coefficient. The level of significance selected for this study was $P \leqslant 0.05$.

3. Results

Table 1 shows sociodemographic characteristics of hospital physicians. The majority of physicians were males (78.9%), above 40 years of age (51.4%), non-Kuwaiti (84.2%), married (84.6%), holding a bachelor or master degree (82.6%), engaged in a surgical specialty (51.0%), spent less than 10 years in the current job and less than 15 years as physicians.

Table 2 portrays sources and expression of stress among hospital physicians. Physicians stated multiple sources of work stress. Academic/work concerns came on the top of the list of sources (55.9%) followed by financial (51.0%) and family (45.7%) concerns. Sexual (4.2%) concern is observed at the bottom of the list followed by self image (11.3%) and day to day quarrel (16.6%). Health concern was stated by only 17.0% of physicians, while 32.0% of physicians admitted that social/personal relationship is a source of stress at work. Stress was classified as cognitive, somatic and behavioral expression. Somatic expression was the least detected (23.7 ± 17.7%, while cognitive expression was the most common one (31.4 ± 22.5%) followed by behavioral expression (25.7 ± 16.9%) as revealed by the mean percent score. The most commonly encountered expressions are ''sleeping disturbance, night awakening, and troublesome dreams'' (27.5%) followed by ''anxiety, fears, and worrying'' (25.9%), while the least commonly encountered ones are ''acne, eczema, hives, breaking out, and skin blotching and skin blanching'' (3.6%) followed by ''tics, tremors, and muscle spasms'' (4.0%).

Table 1 Sociodemographic characteristics of participant physicians.

Character	Number (247)	%
Age (years)		
<40	120	48.6
⩾40	127	51.4
Gender		
Male	195	78.9
Female	52	21.1
Nationality		
Kuwaiti	39	15.8
Non-Kuwaiti	208	84.2
Marital status		
Single	38	15.4
Married	209	84.6
Educational qualification		
Bachelor/master	204	82.6
Board	43	17.4
Specialty		
Surgical	126	51.0
Medicine	121	49.0
Duration at current job (years)		
<10	181	73.3
⩾10	66	26.7
Total experience duration (years)		
<15	137	55.5
⩾15	110	44.5

Table 3 reveals relation among sociodemographic characteristics and sources and expressions of stress among hospital physicians. Gender, nationality, marital status, and specialty did not show any significant association with both the number of sources and expression domains of stress. Significantly higher number of sources is observed among physicians less than 40 years (2.7 ± 1.8% compared with 2.0 ± 1.9%, $P = 0.004$), with bachelor or master degree (2.5 ± 1.9% compared with 1.6 ± 1.7%, $P = 0.003$), and those spending less than 15 years as physicians (2.6 ± 1.8% compared with 2.0 ± 1.9%, $P = 0.005$). Cognitive expression domain is significantly more encountered among those who spent less than 10 years in the current place of work (33.4 ± 23.4% compared with 36.1 ± 19.4%, $P = 0.036$)or less than 15 years at the medical career (34.5 ± 22.9% compared with 27.7 ± 21.6%, $P = 0.017$). Behavioral expression domain was more manifested significantly among physicians less than 40 years (28.9 ± 20.8% compared with 20.5 ± 19.2%, $P = 0.001$), those holding a bachelor/master degree (26.1 ± 20.3% compared with 17.4 ± 19.4%, $P = 0.006$), those who spent less than 10 years at the current place of work (26.4 ± 21.1% compared with 19.7 ± 17.5%, $P = 0.042$), and those who spent less than 15 years of medical work (28.5 ± 20.4% compared with 22.8 ± 16.8%, $P = 0.012$).

Using Spearman correlation revealed that significant negative correlation was revealed between age and total number of stress sources ($r = -0.189$), cognitive expression ($r = -0.188$), and behavioral expression (r = −0.213). Also total working years as a physician significantly negatively correlated with sources of stress ($r = -0.175$), cognitive expression ($r = -0.188$), and behavioral expression ($r = -0.195$).

4. Discussion

Work stress is becoming an important health problem affecting all workers in the health care field. Multiple factors are interacting to increase the extent of work stress among physicians working in hospitals. The health care systems, in general, are undergoing major structural and financial changes. One important new stressor is the increasing complexity of multimodal cancer treatment with difficulties for the individual health professionals to govern the treatment in all its details.[9–13] Additional challenges are added as the newly developing evidence-based medicine approach imposes additional work load on physicians who are basically suffering from increased work load and long waiting time. Yet medical education typically offers little formal preparation for this important task.[14] Without proper training, the discomfort and uncertainty may lead physicians to emotional distress. These imbalances with increasing demand of human and material resources on one side and a lack of sufficient financial sources on the other side have produced a negative influence on the workplace environment and are potential sources of stress and burnout of health care workers.[15] The impetus for the current study is to analyze sources and expressions of stress of hospital physicians. To achieve this aim, 247 physicians

Table 2 Sources and expression of stress among hospital physicians.

Sources and expression of stress	No.	%
Sources of stress		
Academic/work concerns	138	55.9
Social/personal relationship	79	32.0
Family	113	45.7
Financial	126	51.0
Self image	28	11.3
Health	42	17.0
Sex	10	4.2
Day to day quarrel	41	16.6
Cognitive expression		
Feelings of depression, hopelessness, powerlessness, and/or poor self-esteem	31	12.6
Anger, hostility, irritability, and dissatisfaction	39	15.8
Anxiety, fears, and worrying	64	25.9
Mean percent score (median)	31.4 ± 22.5 (29.2)	
Somatic expression		
Muscle tension, headache, backaches, and muscle aches	49	19.8
Indigestion, stomach ache, diarrhea, ulcer attacks, constipation, and colitis	29	11.7
Tics, tremors, and muscle spasms	10	4.0
Sleeping, night awakening, and troublesome dreams	68	27.5
Eating disorders, over eating, and under eating	31	12.6
Hypertension	35	14.2
Acne, eczema, hives, breaking out, and skin blotching and skin blanching	9	3.6
Mean percent score (median)	23.7 ± 17.7 (21.4)	
Behavioral expression		
Excessive drinking and/or use of drugs (including nicotine and caffeine)	35	14.2
Forgetfulness, mental insufficiency, inability to study, and lack of motivation	44	17.8
Avoidance behavior (procrastination, escape, TV watching, excessive partying, absenteeism	20	8.1
Mean percent score (median)	24.6 ± 20.4 (20.8)	
Total expression mean percent score (median)	25.7 ± 16.9 (24.0)	

from one hospital in Kuwait were recruited to share in this study.

In the current study multiple sources of work stress were stated by physicians. Work (55.9%) and financial (51.0%) concerns came on the top of the list of sources of stress followed by family concerns (45.7%). An Australian study dealing with work stress among physicians revealed the same order of sources of work stress as this study. Work concern was the most common source of stress followed by financial and family concerns.[16] Physicians are exposed to multiple factors that might explain the high weight of work concerns. Several studies showed that physicians face long work hours, long working days, high job demands and high emotional demands.[17,18] Physicians are also expected to suffer from work-life conflicts due to the nature of their job.[17–20] This might explain the high proportion of physicians (45.7%) stating family concerns as one of the major sources of stress. Also, the high proportion of non-Kuwaiti physicians (84.2%), who may or may not be living with their families, can explain the high family concerns in addition to the financial concerns. Non-Kuwaiti physicians tended to have more multiple sources of concerns than the non-Kuwaiti physician, in general, yet the difference is not statistically significant ($P = 0.063$).

The current study also revealed that personal (sexual and self image) and health concerns appeared at the bottom of the list of sources of work stress. This confirms the results of the Australian study which revealed that health concerns were at the least mentioned source of stress.[16] The low level of somatic expression of work stress among the physicians of the study confirms these low health concerns. Only 3.6% and 4% of physicians stated that they suffered from 'acne, eczema, and other skin disorders' and 'tics, tremors, and muscle spasms' respectively. Although 14.2% of the physicians admitted that they suffer from hypertension yet, this figure is far below that revealed for the general population in Kuwait (20.5%).[21]

The highest recorded somatic expression was 'sleep disturbance, night awakening, and troublesome dreams' which was stated by 27.5%. Somatic expression mean percent score was the lowest compared with the other work stress expression domains (23.7 ± 17.7% compared with 31.4 ± 22.5% for cognitive domain and 25.7 ± 16.9% for behavioral domain). Contrary to the other expression domains; somatic domain was not significantly associated with any of the studied personal or job characteristics of physicians.

Cognitive expressions had the highest mean percent score (31.4 ± 22.5%), 'anxiety, fears, and worrying' were positively

Table 3 Relation among sociodemographic characteristics and sources and expressions of stress among hospital physicians, mean ± standard deviation (median) are presented.

Character	Sources	Stress expression			
		Cognitive	Somatic	Behavioral	Total
Age (years)					
<40	2.7 ± 1.8(3.0)	34.4 ± 23.0(33.3)	24.7 ± 17.9(21.4)	28.9 ± 20.8(29.2)	27.9 ± 17.3(25.9)
⩾40	2.0 ± 1.9(2.0)	28.7 ± 21.8(25.0)	22.9 ± 17.5(21.4)	20.5 ± 19.2(12.5)	23.7 ± 16.5(22.1)
P	0.004*	0.053	0.430	0.001*	0.060
Gender (P)					
Male	2.3 ± 1.8(2.0)	30.5 ± 21.9(29.2)	23.1 ± 17.6(19.6)	25.3 ± 20.4(20.8)	25.3 ± 16.7(24.0)
Female	2.3 ± 2.1(2.0)	35.1 ± 24.6(37.5)	26.2 ± 18.3(25.9)	22.1 ± 20.2(20.8)	27.3 ± 17.9(26.4)
P	0.794	0.275	0.255	0.252	0.448
Nationality					
Kuwaiti	1.9 ± 1.9(1.0)	31.2 ± 25.1(29.2)	20.9 ± 17.9(16.1)	22.1 ± 19.8(16.7)	23.6 ± 17.5(18.3)
Non Kuwaiti	2.4 ± 1.9(2.0)	31.5 ± 22.1(29.2)	24.3 ± 17.7(21.4)	25.1 ± 20.5(25.0)	26.1 ± 16.9(25.0)
P	0.215	0.232	0.962	0.399	0.534
Marital status					
Single	2.8 ± 2.1 (3.0)	35.3 ± 22.7 (37.5)	24.2 ± 19.1 (20.5)	27.1 ± 20.9 (25.0)	27.4 ± 17.4 (27.4)
Married	2.3 ± 1.8 (2.0)	30.8 ± 22.5 (25.0)	23.7 ± 17.5 (21.4)	24.2 ± 20.3 (20.8)	25.4 ± 16.9 (24.0)
P	0.063	0.712	0.223	0.397	0.292
Ed. qualification					
Bachelor/master	2.5 ± 1.9 (2.0)	32.3 ± 22.2 (29.2)	24.6 ± 17.9 (23.2)	26.1 ± 20.3 (25.0)	26.7 ± 17.0 (25.9)
Board	1.6 ± 1.7 (1.0)	27.5 ± 24.2 (25.0)	19.7 ± 16.2 (16.1)	17.4 ± 19.4 (12.5)	20.9 ± 16.3 (18.3)
P	0.003*	0.099	0.098	0.006*	0.023*
Specialty					
Surgical	2.3 ± 2.0 (2.0)	29.7 ± 21.0 (25.0)	24.7 ± 18.2 (23.2)	23.2 ± 19.9 (16.7)	25.5 ± 16.9 (24.0)
Medicine	2.3 ± 1.7 (2.0)	33.4 ± 23.9 (29.2)	22.7 ± 17.2 (19.6)	26.1 ± 20.7 (25.0)	25.9 ± 17.1 (24.0)
P	0.680	0.283	0.392	0.331	0.947
Job (years)					
<10	2.5 ± 1.9 (2.0)	33.4 ± 23.4 (33.3)	23.9 ± 17.6 (21.4)	26.4 ± 21.1 (25.0)	26.7 ± 17.4 (25.0)
⩾10	1.9 ± 1.7 (2.0)	26.1 ± 19.4 (25.0)	23.1 ± 18.2 (20.5)	19.7 ± 17.5 (14.6)	22.9 ± 15.8 (21.2)
P	0.068	0.036*	0.643	0.042*	0.189
Experience (years)					
<15	2.6 ± 1.8 (2.0)	34.5 ± 22.9 (33.3)	25.1 ± 17.5 (23.2)	28.5 ± 20.4 (29.2)	28.1 ± 16.9 (26.9)
⩾15	2.0 ± 1.9 (1.5)	27.7 ± 21.6 (25.0)	22.1 ± 17.9 (17.9)	19.8 ± 19.4 (12.5)	22.8 ± 16.8 (21.2)
P	0.005*	0.017*	0.136	0.001*	0.012*

* Significant (*P* value of Mann Whitney test).

expressed by 25.9%, while 15.8% suffered from 'anger, hostility, irritability, and dissatisfaction' and 12.6% positively complained from 'feelings of depression, hopelessness, powerlessness, and poor self esteem'. Cognitive manifestations were significantly more expressed among physicians spending fewer years either in the current job or in their whole career. This might be attributed to the high number of sources they are exposed to and or to the high work load as revealed in other studies.[22] Other studies revealed high mean level of psychosocial stress at work among US, UK and German physicians with varying levels among each.[23]

High workload and work-related stress were revealed to increase the risk of drug abuse, problems in social relationships, depression and anxiety, and suicide in doctors.[24] The current study contradicts these findings as only 14.2% of the studied physicians expressed 'excessive drinking and or use of drugs' (including nicotine and caffeine). A previous study in Kuwait revealed daily smoking by 20.6%.[21] This contradiction can be explained also by cultural and religious prospects in Middle Eastern countries that forbid both drug and alcohol addictions.

In spite of the moderate negative impact of work stress, on cognitive, behavioral, and somatic aspects of health of physicians; it is recommended that all the sources of revealed stress especially work, financial, and family concerns should be dealt with through restructuring of work and raising satisfaction of physicians about their job. Further studies are recommended to reveal the exact impact of work stress on the performance of physicians and the quality of health care administered to the patients.

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