

Association of Violence with Anxiety and Depression among Iraqi Junior Doctors

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Abstract Background: Doctors are not protected to the occurrence and consequences of mental disorders such as anxiety, depression, and occupational burnout, likely owing to their exposure to high levels of occupational stress. **Methods:** Written questionnaires were completed by 323 junior resident doctors from 20 teaching Hospitals in Baghdad city. The questionnaire inquired about exposure to any sort of violence, and the presence of any psychological symptoms that may refer to anxiety or depression. The questions were borrowed from the Center for Epidemiologic Studies Depression Scale (CES-D). **Findings:** More than one half of the doctors (164, 50.8%) reported the presence of anxiety symptoms, and 147 (45.5%) reported depressive symptoms. There was a significant association between exposure to any sort of violence at work (OR= 1.976, $p < .005$) or outside the work (OR= 1.912, $p < .005$), and reporting anxiety symptoms. The odds ratio of exposure to arrest, kidnapping or intentional injury was 2.242 ($p .006$). A significant association was also found between reporting depressive symptoms and exposure to violence at the work (OR=2.547, $p =.002$) or outside the work (OR=1.841, $p =.008$), and with history of killing, kidnapping or injury of family members (OR= 1.769, $p .012$) or colleagues (OR= 1.796, $p .031$). Exposure to pressure during work was also significantly associated with depressive symptoms (OR=2.455, $p .002$). **Interpretation:** The unsafe situation in Iraq has led to a high prevalence of anxiety and depression among junior doctors, Special efforts are needed to insure psychological support, and rehabilitation programs for this “vulnerable” group.

Keywords Anxiety, Depression, Iraq, Junior, Doctors

1. Introduction

As Human beings, doctors are not protected to the occurrence and consequences of psychological illnesses. [1] Doctors (especially junior residents) face particular challenges such as high patients' attendance, long duty hours, repetitive exposure to traumatic events, potentially violent situations, and critical decision-making that place them at more risk of anxiety, depression and other stress related psychosocial problems. [2]

Physicians are vulnerable to some mental disorders such as anxiety, depression, and occupational burnout, likely owing to their exposure to high levels of occupational stress. [3] Many researches demonstrated that one-fourth to one-third of residents will be clinically depressed at some point in their training. [4-6]

A study in USA revealed that the prevalence of depression in resident physicians is higher than that of the general population, and is associated with physical health, an unhappy childhood, and stress at work. [7]

Although the actual incidence of anxiety and depression in medical doctors is unknown, many studies on medical students in developing countries like Saudi Arabia and Pakistan reported 47% to 73% prevalence of anxiety and depression. [8-10]

The literature revealed that exposure to violence may lead to abnormal neurological changes that can cause malfunction of the limbic system of the brain especially in cases of long periods of exposure to trauma, particularly when the exposure occurred at childhood. [11] Such trauma usually causes adverse psychological effects that may last for a very long time, may interfere with their capability, and inversely reflected on their performance regarding the health care services they are affording.

Several studies have evaluated the mental health of doctors in developed countries and indicated that the prevalence of depressive symptoms among physicians ranged from 10% to 15% in the US, Britain, Norway, and Japan. [12-15] A recent Dutch investigation concluded that anxiety and depressive symptoms were prevalent in 24% and 29% of physicians, respectively. [16] Researchers in China focused on anxiety and depressive symptoms among physicians and concluded that the prevalence of depression ranged between 31.7%, and 65.3%. [17-19] In United Kingdom; about half of the senior medical staff suffer from

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high levels of stress and anxiety, and half of the junior doctors are suffering from emotional disturbance. [20] Poor psychological health amongst doctors negatively affects the quantitative and qualitative care of patient, leading to poor performance and affects patient's satisfaction, and adherence to treatment, [21] moreover, it may have serious consequences on the wellbeing of the whole community. [22] Up to 100, 000 patients in USA die each year because of preventable unpleasant measures The stress of medical resident training, including lack of sleep and leisure time, are among the most commonly cited reasons for such errors. [23] Residents who are depressed are about six times more likely to make medication errors than those who are not depressed. [24]

Iraqi doctors represent a unique group, they have been exposed to successive shots of intolerable stress, making them the most vulnerable group among all doctors globally, knowing that Iraq has been labeled as the most dangerous country in the world. Doctors in Iraq are not only lacking sleep or leisure time, they are living in panic through being continuously at risk of assassination, kidnapping, threats, and forced displacement which became part of everyday life in Iraq. The rate of violent events among Iraqi specialist doctors during 2004-2007 was estimated to be 3.7%, and the rate of violent death at 1.6%. [25] This stress continuous stress has pushed many of them to flee during the past years seeking asylum in other countries [26] resulting in a severe shortage in workforce and quality of health services, and added more burden on the (already limping) health system.

Rationale of the study: Anxiety and depression symptoms are important to assess especially among medical doctors as they have a sensitive job that deals with human life. Raised levels of anxiety and depression among resident doctors can lead to physical and emotional ailments, poor performance, absenteeism and negativity in terms of attitudes and behavior. [27] It is also associated with medical errors, decreased ability to handle work-related stress, discontinuation of medical training, disruption in personal lives, and suicide. [7]

The objective of this study was to explore the prevalence of anxiety and depressive symptoms in a sample of Iraqi junior doctors living in Baghdad city in an attempt to understand the pressure that the junior doctors are exposed to.

2. Methods

This cross sectional study was conducted in 20 major and teaching hospitals in Baghdad city during the period from July through August 2016. A convenient non probability sample of junior doctors was chosen, those were either newly graduated or candidates of postgraduate studies working as rotators or permanent residents in the surveyed hospitals.

The first part of the questionnaire was developed by the researchers and enquired about the exposure of doctors to any sort of violence including exposure to insults, assaults,

threats, arrest, kidnapping or being intentionally injured. Also exposure of their colleagues or family members to any sort of violence (killed, kidnapped or injured), and whether any of their seniors or colleagues have left the country to escape the risk of violence, whether they have frequently seen bodies or injured people on the road, and whether they are exposing to any notable pressure in their job.

The second part of the questionnaire was about the presence of any psychological symptoms that may refer to anxiety or depression (ten items for each) in those doctors. The questions related to depression were borrowed from the Center for Epidemiologic Studies Depression Scale (CES-D), [28, 29] they included the respondent's feelings during the last month, responses ranged from (not at all, sometimes or most of the time). The likelihood of having anxiety or depression was set when the score is above the median (more than 10).

We did not attempt to diagnose these diseases, but we, rather, classified those doctors as having "probable" anxiety or depression on symptomatic basis.

2.1. Ethical Issue

The self-administered questionnaire form was anonymous. A verbal consent was taken from all the respondents after explaining to them the purpose of the study, giving them the full choice to participate, and assuring them that all the information will be kept strictly confidential and will not be used for any purpose other than research work. The questionnaire was validated and approved by the Ethics Committee at the College of Medicine/ Mustansiriyah University.

2.2. ADAS Calculation

The calculation of anxiety and depression scores was done as follows: the 10 items of anxiety questions were coded as not at all, sometimes, and most of the time, each item was scored (0 to 2), with higher scores indicating most of the time. For each person, a total score of more than 10 (median) indicates significant anxiety symptoms. [30] The same was applied for depression questions.

2.3. Statistical Analysis

Analysis of data was carried out using the available statistical package of SPSS-22 (Statistical Packages for Social Sciences- version 22).

Data was presented in simple measures of frequency, percentage, mean, standard deviation, and range. The significance of association of different percentages (qualitative data) was tested using Pearson Chi-square test (χ^2 -test) with application of Yate's correction or Fisher Exact test when indicated. Statistical significance was considered whenever the P value is equal or less than 0.05.

The odds ratio (OR) as a measure of association between an exposure and an outcome was calculated. Odds ratio is most commonly used in case-control studies, however it can also be used (with some modifications and/or assumptions)

in cross-sectional and cohort study designs.

Table 1. Demographic characteristics of the study sample: age range (24–39) with mean of 29.5 ± 3.8

		No.	%
Gender	Male	178	55.1
	Female	145	44.9
Specialty:	Rotator	88	27.2
	Permanent resident	71	22.0
	Board candidate	164	50.8
Monthly income:	<\$1000	291	90.1
	>\$1000	32	9.9
Total		323	100

3. Results

Of the 400 forms that were distributed; 323 were collected giving a response rate of 81%. The junior doctors' age

ranged from 24–39 (mean 29.5 ± 3.8), with 55.1% males and 44.9% females, half of the sample (50.8%) was postgraduate (Board) candidates, 27.2% rotators and 22% were permanent residents, more than 90% of the doctors reported a monthly income of less than \$1000. See table 1.

Table 2 shows the percent of doctors that were exposed to different forms of violence including exposure to insults, assaults or threats (77.7%), being arrested, kidnapped or intentionally injured (18.6%), also exposure to any sort of violence at work (65%) or outside the work (37.2%), and exposure of their colleagues (76.8%) or family members to any sort of violence (killed, kidnapped or injured) (48.1%). All doctors (100%) reported that they know colleagues who left the country to escape the risk of violence, (73.1%) said that they have frequently seen injured people or dead bodies on the road or during duty (100%), and (79.6%) answered “yes” for exposure to a notable pressure at their work place.

Tables (3A and 3B) demonstrate the response of the participants to each of the ten questions of anxiety and depression scales.

Table 2. Frequency of exposure to different forms of violence

		No.	%
Being insulted, assaulted, or threatened while being in duty		251	77.7
Exposure to any sort of violence at work		210	65.0
Exposure to any sort of violence outside the work		120	37.2
Being arrested, kidnapped, or injured (violently) during the last 10 years		60	18.6
Family members being killed, kidnapped, or injured (violently) in the last 10 years		136	42.1
Senior/colleagues being killed, kidnapped, or injured (last 10 years)		248	76.8
Colleagues left Iraq to escape violence	<10	179	55.4
	10---19	92	28.5
	=>20	52	16.1
Have frequently seen injured people or dead bodies on the road		236	73.1
Have seen cases of violent injury or death during duty.	Many	228	70.6
	Some	72	22.3
	Few	23	7.1
Exposure to any kind of pressure while doing their job?		257	79.6

Table 3A. Anxiety symptoms among the study sample (n=323)

Have experienced the following symptoms during the last month	Not at all		Sometimes		Most of time	
	No.	%	No.	%	No.	%
Feeling more nervous and anxious than usual	39	12.1	163	50.5	121	37.5
Feeling afraid for no reason at all	99	30.7	154	47.7	70	21.7
Having nightmares	128	39.6	162	50.2	33	10.2
Getting upset easily	53	16.4	167	51.7	103	31.9
Feeling panicky	114	35.3	171	52.9	38	11.8
Can feel your heart beating fast	106	32.8	165	51.1	52	16.1
Feel calm and can sit still easily	87	26.9	192	59.4	44	13.6
Bothered by stomach aches or indigestion	96	29.7	174	53.9	53	16.4
Your arms and legs shake and tremble	170	52.6	119	36.8	34	10.5
Bothered by headaches neck and back pain	60	18.6	175	54.2	88	27.2

Table 3B. Depressive symptoms among the study sample (n=323)

Have experienced the following symptoms during the last month	Not at all		Sometimes		Most of time	
	No.	%	No.	%	No.	%
Poor appetite or eating more than usual	80	24.8	189	58.5	54	16.7
Trouble keeping the mind on what was doing	45	13.9	180	55.7	98	30.3
Feeling depressed	40	12.4	180	55.7	103	31.9
Feeling that would be better off dead	175	54.2	116	35.9	32	9.9
Hurting yourself in a way or another	251	77.7	54	16.7	18	5.6
Feeling alone	126	39.0	149	46.1	48	14.9
Feeling sad	68	21.1	189	58.5	66	20.4
Bothered by things that usually don't bother you	63	19.5	207	64.1	53	16.4
Feel hopeful about the future	125	38.7	145	44.9	53	16.4
People are unfriendly	74	22.9	169	52.3	80	24.8

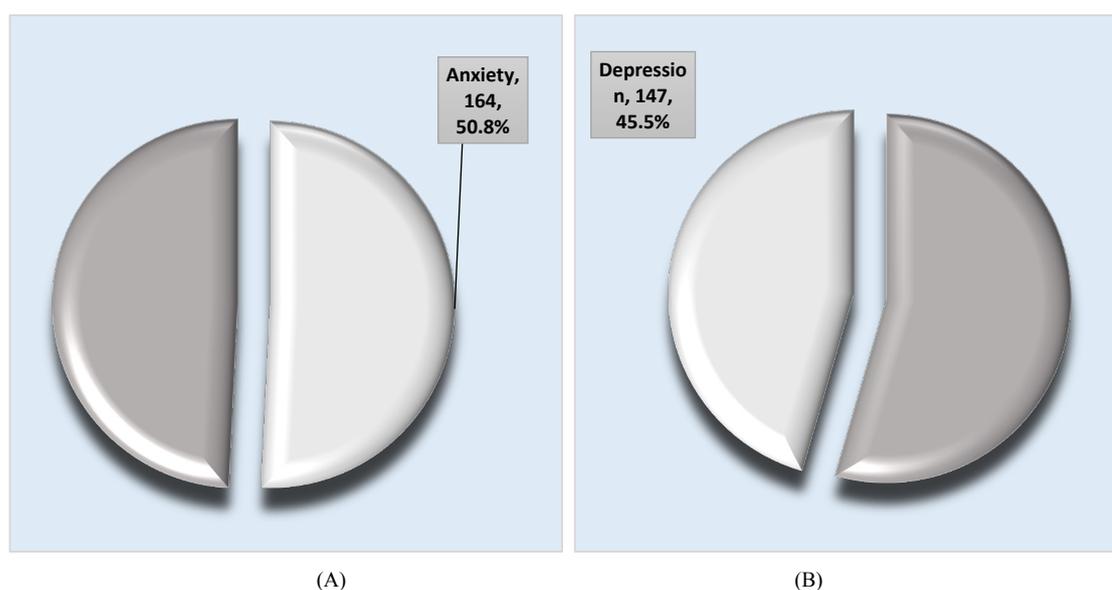
**Figure 1.** Prevalence of Anxiety (A) and for Depression (B) among the study sample

Figure (1) illustrates the prevalence of anxiety and depression according to the score of positive symptoms, 164 doctors reported a score of more than 10 giving a prevalence of 50.8%, while 147 doctors reported a score that is indicative of depressive symptoms with a prevalence of 45.5%.

Table (4) depicts that being a female is associated with a higher risk of experiencing anxiety symptoms (OR= 2.300, $p < .0001$). There was a significant association between exposure to any sort of violence at work (OR= 1.976, $p < .005$) or outside the work (OR= 1.912, $p < .005$) and reporting anxiety symptoms. The odds ratio of exposure to arrest, kidnapping or intentional injuries was 2.242 ($p .006$). A significant association was also found between anxiety and history of killing, kidnapping or injury of family members (OR= 1.579, $p .044$) and the frequency of seeing cases of violent injury/death during duty (OR= 3.204, $p .047$).

Table (5) shows that doctors' exposure to violence was significantly associated with depressive symptoms. A significant association was found between reporting depressive symptoms and exposure to insult, assault or threats during many cases of violent injury/death during work (OR= 4.834, $p .004$), Exposure to pressure during work was also significant (OR=2.448, $p < .001$), exposure to any sort of violence at work (OR=2.547, $p .002$), or outside the work (OR=1.841, $p .008$). A significant association was also found between depression and history of killing, kidnapping or injury to family members (OR= 1.769, $p .012$) or colleagues (OR= 1.796, $p .031$) and seeing many cases of violent injury/death during work (OR= 4.834, $p .004$), Exposure to pressure during work was also significantly associated with depressive symptoms (OR=2.455, $p .002$).

Table 4. Association between exposure to different forms of violence and reporting anxiety symptoms

		Anxiety (>Median)		No		OR	95%CI	P value
		No.	%	No.	%			
Gender	Female	90	62.1	55	37.9	2.300	1.468-3.602	0.0001*
	Male	74	41.6	104	58.4	-		
Being insulted, assaulted, or threatened while being in duty	Yes	134	53.4	117	46.6	1.603	0.944-2.724	0.080
	No	30	41.7	42	58.3	-		
Exposure to any sort of violence at work	Yes	119	56.7	91	43.3	1.976	1.241-3.146	0.004*
	No	45	39.8	68	60.2	-		
Exposure to any sort of violence outside the work	Yes	73	60.8	47	39.2	1.912	1.208-3.026	0.005*
	No	91	44.8	112	55.2	-		
Being arrested, kidnapped, or injured (violently) during the last 10 years	Yes	40	66.7	20	33.3	2.242	1.244-4.040	0.006*
	No	124	47.1	139	52.9	-		
Family members being killed, kidnapped, or injured in the last 10 years	Yes	78	57.4	58	42.6	1.579	1.012-2.465	0.044*
	No	86	46.0	101	54.0	-		
Colleagues being killed, kidnapped, or injured during the last 10 years	Yes	129	52.0	119	48.0	1.239	0.738-2.079	0.417
	No	35	46.7	40	53.3	-		
Have frequently seen injured people or dead bodies on the road	Yes	120	50.8	116	49.2	1.011	0.618-1.653	0.965
	No	44	50.6	43	49.4	-		
	Many	121	53.1	107	46.9	3.204	1.219-8.421	0.047*
Have seen cases of violent injury or death during duty	Some	37	51.4	35	48.6	2.995	1.060-8.467	
	Few	6	26.1	17	73.9	-		
	Yes	131	51.0	126	49.0	1.040	0.605-1.786	0.888
Exposed to any kind of pressure while doing their job	No	33	50.0	33	50.0	-		

*Significant difference in proportions using Pearson Chi-square test at 0.05 level.

Table 5. Association between exposure to different forms of violence and reporting depressive symptoms

		Depression (>Median)		No		OR	95%CI	P value
		No.	%	No.	%			
Gender	Male	80	44.9	98	55.1	1.052	0.678-1.634	0.821
	Female	67	46.2	78	53.8	-		
Being insulted, assaulted, or threatened while being in duty	Yes	126	50.2	125	49.8	2.448	1.391-4.308	0.002*
	No	21	29.2	51	70.8	-		
Exposure to any sort of violence at work	Yes	112	53.3	98	46.7	2.547	1.573-4.125	0.001*
	No	35	31.0	78	69.0	-		
Exposure to any sort of violence outside the work	Yes	66	55.0	54	45.0	1.841	1.166-2.905	0.008*
	No	81	39.9	122	60.1	-		
Being arrested, kidnapped, or injured (violently) during the last 10 years	Yes	34	56.7	26	43.3	1.736	0.986-3.057	0.054
	No	113	43.0	150	57.0	-		
Family members being killed, kidnapped, or injured in the last 10 years	Yes	73	53.7	63	46.3	1.769	1.132-2.766	0.012*
	No	74	39.6	113	60.4	-		
Colleagues being killed, kidnapped, or injured during the last 10 years	Yes	121	48.8	127	51.2	1.796	1.050-3.071	0.031*
	No	26	34.7	49	65.3	-		
Have frequently seen injured people or dead bodies on the road	Yes	113	47.9	123	52.1	1.432	0.868-2.363	0.159
	No	34	39.1	53	60.9	-		
	Many	115	50.4	113	49.6	4.834	1.595-14.654	0.004*
Have seen cases of violent injury or death during duty	Some	28	38.9	44	61.1	3.023	0.931-9.815	
	Few	4	17.4	19	82.6	-		
	Yes	128	49.8	129	50.2	2.455	1.366-4.411	0.002*
Exposed to any kind of pressure while doing their job	No	19	28.8	47	71.2	-		

*Significant difference in proportions using Pearson Chi-square test at 0.05 level.

4. Discussion

The 323 junior doctors from 20 major and teaching hospitals in our study aged between 24-39 years, which means that they grew up under high stress during the period of unrest that the Iraqis were experiencing in the eighties and nineties (including the Iraq-Iran-war, the first Gulf war and the economic sanction), [31, 32] during which the cohort of Iraqi children and youth (some of whom are now included in our study) have been subjected to dire conditions, they were facing very real dangers of disease, starvation, psychological trauma and death, [33] such conditions make people less resilient to adverse experiences later in their life.

The prevalence of “probable” anxiety was shown to be 50.8%, which means that more than half of the resident doctors were experiencing symptoms of anxiety; likewise, the prevalence of “probable” depression was shown to be 45.5%. This prevalence is remarkably higher than that in the general population. WHO reported (in the Iraqi Mental Health survey) that the prevalence of anxiety in the general population was 13.8% and of depression was 7.2%, [34] while in a previous study conducted in Baghdad; the prevalence of probable depression among health care providers was found to be 66.5%. [35] This indicates that the high prevalence among junior doctors is not just part of the general unstable condition in the country, but that there is an additional pressure on this stratum that makes the problem an issue.

The comparison of our findings with other countries revealed that it is way higher than the results of a study in USA which showed a prevalence of depression among health practitioners of only 9.6%, [36] while another study in Orlando/Florida revealed a prevalence of depression of 7% for mild and 5% for moderate to severe scoring. [37] Our results were also higher than those in the regional countries; in Pakistan, the prevalence of anxiety and depression in resident doctors was 27.3%, [38] in Nigeria the prevalence of depression was 17.3% in resident doctors and 1.3% in non-resident doctors with no gender significant variations, [39] and in Turkey, the prevalence of probable depression among 156 resident doctors was found to be 16%, more in females. [40] While our results were close to the findings in some Arab countries like UAE where the reported prevalence of anxiety and depression was 57.4% and 63.3% respectively although these countries are considered stable in comparison to Iraq. [41]

Female doctors showed a more tendency to have anxiety symptoms than males; this finding is consistent with other articles which suggested that females are more vulnerable to develop mental disorders when exposed to traumatic events. [42]

As Iraq now tops the most dangerous countries in the world, we dealt with anxiety and depression from the angle of its relation to violence. Since the USA invasion in 2003, the Iraqi academics (and doctors in particular) continued to face intolerable levels of violence and systematic targeting.

[43] they are exposed continuously to assassination, kidnapping, threats, and humiliation. [26]

About two thirds of the sampled doctors reported exposure to different forms of violence, and about one fifth of them were exposed to either arrest, kidnapping or intentional injuries. The results of the current study revealed a statistically significant association between depression symptoms and exposure to violence during duty and with frequent seeing and dealing with cases of violent injury/death during duty. Several articles confirmed that doctors exposed to high stressful conditions especially those working in the emergency units and in times of wars are more susceptible to develop mental disorders. [43-45]

5. Limitations

As anxiety and depression could be multifactorial; the effect of confounders (personality, family history of psychological problems, threshold of stress) couldn't be evaluated, however, we did not attempt to diagnose these diseases but we, rather, classified the respondents as having “probable” anxiety or depression on symptomatic basis.

6. Conclusions

The study revealed a high prevalence of anxiety and depression among junior doctors, that might be due to the high pressure they are exposing to in their job, their daily living with high risk, and their gloomy future. Special efforts are needed to insure psychological support for those doctors through special sessions of residency counseling, assurance, rehabilitation programs, and providing security protection for them at least at the work during doing their job.

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