

## **Prevalence and socio-demography risk factors of depression, anxiety and stress in Kota Kinabalu district healthcare workers, Sabah**

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### **ABSTRACT**

**Objective:** This cross-sectional study was conducted to assess the prevalence and socio-demography risk factors of depression, anxiety and stress among Kota Kinabalu district healthcare workers from January to June 2018.

**Method:** A self-administered questionnaire was used to collect all the socio-demography information such as gender, marital status, occupation, years of service, income, workplace location and types of living. The prevalence of depression, anxiety and stress was assessed through the Depression, Anxiety and Stress Scale for 21 Items (DASS-21) questionnaire. IBM SPSS software was used for the statistical analysis.

**Result:** Based on voluntary consent, there were a total of 395 respondents which included doctors, nurses, medical attendants, health inspectors, pharmacists, nutritionists and laboratory technicians. Pregnant and workers with physical disability was excluded. Prevalence rates of depression, anxiety, and stress were recorded as 16.2%, 26.3%, and 11.4% respectively. Regression modelling suggested depression score were associated with occupation ( $F=1.331$ ;  $p=0.026$ ) and anxiety score were associated with age ( $F=3.472$ ;  $p=0.016$ ), occupation ( $F=3.645$ ;  $p=0.001$ ) and workplace location ( $F=2.748$ ;  $p=0.048$ ). Meanwhile, stress scores were associated with occupation ( $F=2.773$ ;  $p=0.031$ ) and workplace location ( $F=2.258$ ;  $p=0.032$ ). Occupation was identified as the most significant factor that contributed to depression, anxiety and stress among healthcare workers.

**Conclusion:** More research is recommended to identify relevant and accurate biomarkers as well as other potential occupational risk factors for depression, anxiety and stress to improve the wellbeing of healthcare workers.

**Keywords:** *Occupational risks; healthcare workers; depression; anxiety; stress*

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## 1. Introduction

Mental illness is an increasingly common problem in the community. More than 300 million people were estimated to have a depression and experiencing anxiety disorder in 2015 [1]. Healthcare workers are among the high-risk professions for acquiring occupational mental health diseases. They are required to meet the vast expectations and health care needs of the public. They may also be required to work in shifts as health care is a 24 hour service. With such demands, this continuous strain can have a severe effect on their psychological well-being and quality of life [2, 3]. Besides, ongoing stress among these healthcare professionals leads to negative effects on their psychological well-being [4, 5]. Healthcare professionals with poor mental health may also deter their professional performance and can have a significant consequence on the quality of care they deliver to patients [6, 7].

Psychological effects for stress include low self-confidence, exhaustion, and sleep/appetite disorders [8]. Meanwhile, high risk of cardiovascular disease, high blood pressure, decreased immunity, migraines, muscle pains and chronic exhaustion are the physical effects of stress [9]. Furthermore, worsen maladaptive behaviors, such as smoking, over/under-eating, excessive alcohol intake, and substance misuse [10, 11] were also related to high levels of stress.

In Australia, the main prevalent mental disorders with a 12-month prevalence rates of approximately 4% and 14% respectively were reported as depression and anxiety [12]. Globally, depression was identified as the principal cause of Years Lost due to Disability (YLD), while anxiety were the sixth highest cause in 2015 [7].

Assessing the level of depression, anxiety, and stress in healthcare workers and classifying the socio-demography risk factors for these mental conditions is important for a safer and amenable working area through encouraging the well-being of its personnel. Socio-demography risk factors such as age, gender, ethnicity, marital status, occupation, years of service, workplace location, income and types of living were related to mental health illnesses.

Hence, this study was designed to evaluate the depression, anxiety and stress prevalence among healthcare workers at Kota Kinabalu District Health Office. This study also determined the socio-demography risk factors that are related with depression, anxiety and stress

among healthcare worker under the Kota Kinabalu District Health Office.

## 2. Materials and Method

This is a cross-sectional study designed to evaluate the variables of prevalence and associations of depression, anxiety and stress score with socio-demography risk factors amongst Kota Kinabalu district healthcare workers. Data from 395 consented respondents were involved in this research and fulfilled the inclusive criteria and data collection was conducted from January until June 2018. Socio-demography information such as gender, marital status, job, years of service, income and types of living was collected using self-administered questionnaire.

The prevalence of depression, anxiety and stress was measured through the Depression, Anxiety and Stress Scale for 21 Items (DASS-21) questionnaire. IBM SPSS software was utilised for statistical data analysis. The socio-demographic data was nominal and the DASS21 data was continuous. Spearman rho and Kruskal-Wallis test was used to determine the relationship between these variables. The strength of relationship between variables was analysed with an enter (conditional) binomial logistic regression and significant predictors of the variables to the study were identified. The statistical significance level was defined as  $p < 0.05$ .

## 3. Results

The socio-demographics background of the respondents was presented in Table 1 and as observed, most of the respondents were female, age in the range of 30-39 years old, ethnicity of Kadazan, married, working as nurses, workplace location in Kota Kinabalu, had working experience of more than 5 years, living with family and had a monthly income of more than RM3500.00.

Table 2 indicate the mean DASS scores and prevalence for each mental health level. The prevalence of depression, anxiety and stress was determined at 16.2%, 26.3% and 11.4% respectively. Among those individuals, 13.9% had mild and moderate depression levels, 1.8% severe and 0.5% had extreme depression levels. However, 83.8% of the respondents were found to have normal depression scores. Results showed, anxiety symptoms at mild and moderate levels were 17.9%, severe 4.3% and extreme 4.1%. Seventy-three-point seven respondent fell into the normal anxiety category. Other than that, stress symptoms at mild and

moderate level were 8.1%, severe 2.8% and extreme 0.5%. Majority respondents at 86.6% were at the normal stress category.

Figure 1 shows the prevalence of depression, anxiety and stress based on the healthcare occupations. Depression prevalence was the highest among pharmacist and follow by health inspectors; anxiety was highest amongst health inspector follow by pharmacist; and stress was highest amongst health inspector followed by doctors.

Table 3 displays the relationship between the study variables with socio-demography risk factors. This association test was conducted by 1 to 1 variable and showed that depression was associated with marital status ( $p=0.041$ ) and occupation ( $p=0.001$ ). Meanwhile, anxiety was associated with age ( $p=0.045$ ), marital status ( $p=0.038$ ), occupation ( $p=0.001$ ), workplace location ( $p=0.016$ ) and income ( $p=0.027$ ) where else stress was correlated with occupation ( $p=0.01$ ) and workplace location ( $p=0.05$ ).

Table 4 shows the analysis of binary logistic regression between depression score with socio-demography risk factors using Type III Sum of Squares method. Results show that depression score only have significant association with occupation ( $F=1.331$ ;  $p=0.026$ ) after controlling all other factors. In general, this result produced a model of Depression Score =  $1.331$  (occupation) +  $6.307$  (constant) with  $F = 1.448$ ;  $p=0.06$  and  $r = 0.179$ ;  $R^2 = 0.032$ . Figure 2 describes the detailed association between depression score with each occupation parameter. Pharmacist were identified as having high risks for depression follow by Health Inspector.

Table 5 shows the analysis of binary logistic regression between anxiety score with socio-demography risk factors using Type III Sum of Squares method. Result show anxiety scores have significant association with age ( $F=3.472$ ;  $p=0.016$ ), occupation ( $F=3.645$ ;  $p=0.001$ ) and workplace location ( $F=2.748$ ;  $p=0.028$ ) after controlling all other factors. In general, this result produced a model of Anxiety score =  $3.472$  (age) +  $3.645$  (occupation) +  $2.748$  (workplace location) +  $6.920$  (constant). Figure 3 describes the detailed association between anxiety score with each occupational parameter. Health inspector were shown to have high risk of anxiety follow by Pharmacist.

Table 6 shows the analysis of binary logistic regression between stress score with socio-demography risk factors using Type III Sum of Squares method. Result showed that stress score has significant association

with occupation ( $F=2.773$ ;  $p=0.031$ ) and workplace location ( $F=2.258$ ;  $p=0.032$ ) after controlling all other factors. In general, this result produced a model of Stress score =  $2.773$  (occupation) +  $2.258$  (workplace location) +  $15.640$  (constant). Figure 4 describes the detailed association between stress score with each occupation parameter. Health inspector were shown to have high risk of stress follow by Doctors.

#### 4. Discussion

Research about depression, anxiety and stress is not something new, especially in the healthcare system in Malaysia. The main study objective was to assess the prevalence and socio-demography risk factors of depression, anxiety and stress of the Kota Kinabalu district healthcare workers. Among the mental health issues, the prevalence of anxiety was the highest (26.3%), followed by depression (16.2%) and stress (11.4%). The symptom of this appears to be only slightly lower than the values obtained from the Malaysia National Health Morbidity Survey (2015) which was 29.2% for occupational workers but higher than the average community population (8.2%) in Selangor [13]. Previous research also determines the highest prevalence of mental health problems among medical officers in Malaysian hospitals was anxiety (28.6%), depression (10.7%) and stress (7.9%) [14].

It was also interesting that based on the National Health Morbidity Survey (2015), Sabah was the state with the highest prevalence of mental health problems at 42.9% [15]. In 2014, a study identified that the prevalence of depression among Malaysians ranged from 8-12% [16]. This value is still lower than the prevalence of 16% obtained in this study. A recent study done in 2017 among university students showed a depression prevalence of at 6%, anxiety at 5% and stress at 4% [17]. This comes to show that healthcare workers have much more mental health issues compared to university students who are presumed to be in a very vulnerable mental state.

This discussion was also in line with previous studies conducted among doctors and nurses in Johor which showed a prevalence of anxiety to be between 17.9% to 25.4% [18]. This number is lower than concern among fellow housing (63.7%) [19] and students (63.0%) [20] at Malaysian universities. Compared to research from other countries, studies conducted in Turkey found a higher level of emergency than depression or stress among doctors [21]. Anxiety is among the highest prevalence compared to depression and stress as reported in other recent studies. On the contrary, the

findings from previous multinational studies in the Asia, America and Europe showed that doctors suffer most from stress and depression rather than anxiety [22]. However, the difference in outcome may be attributed to the difference between the social factors, cultural, economic, technology and values among countries, which are not examined in detailed in this study.

In this study, the occupation was the major socio-demographic factor associated with depression, anxiety and stress. Our results presented, health inspectors (45.9%) and pharmacists (33.3%) were among the occupation with the highest prevalence of anxiety. Meanwhile, this group of occupation also has the highest prevalence of depression at 23.3% among pharmacist and 20% among health inspectors. Meanwhile, stress was highest among health inspectors (18.8%) and followed by doctors (12.2%). Not many previous studies were available to analyse and compare the level of depression, anxiety and stress among healthcare workers. Mostly, research on depression, anxiety and stress focus only on nurses and doctors as they are the largest employees in the sector. A study conducted in Australia found that nurses had symptoms of depression at a prevalence rate of more than 30%, compared to only 4% among the general population of Australia [16]. The prevalence of depression between nurses in this research is also within the range stated in the earlier works worldwide with depression rates extending from 18-53% [23,24-27].

A study identified that the biggest causes for stress among nurses and junior doctors was poor work and social life balance and the threat of medical ethic [28]. Previous studies have shown that one of the main causes of stress among doctors are due to the issues arising from the non-clinical staff, for instance, X-Ray operators, pharmacist and laboratory technologists [29, 30]. There appears to be some lack of cooperation between clinical and non-clinical staff [31]. These results are a little worrying because a major feature of a health care system is the interdependence of various disciplines and departments.

The symptoms of depression, anxiety and stress among healthcare staff lead to high turnover, absenteeism and productivity lost in the healthcare system, thus leaving low facilities and unable to meet patient demands and putting patients at risk [32, 33]. The impact of this problem cannot be easily taken off by employer, the effects of negligence will raise social problems, wrongdoing, crime and the most serious will lead to suicide. Recent studies suggest that depression, anxiety and stress are influenced by many socio-demographic

(gender, age, income, educational level, marital status, living style), occupational (occupation, job description, job satisfaction, working experience) and economic (income) factors. The common predictors that may increase the probability of stress, anxiety and depression were age, job satisfaction, sleep disorders, years of services, and marital status [34-38].

An intervention is required to improve workplace environments and reducing pressure as well as nurse working conditions in helping to reduce and / or prevent depression [39], stress, and anxiety symptoms [40, 41]. This study is limited to only a small representative sample from the healthcare personnel that cannot be generalized to the whole healthcare system. A cross-sectional study design present in this study also has limited the analysis to distinguish the risk factor. Therefore, further research in the form of longitudinal study design will be beneficial to fully determine the predictor of depression, anxiety and depression.

## 5. Conclusion

Healthcare workers are integral players in our health system. The prevalence of anxiety is high, where else the prevalence for depression and stress are considerably moderate. Occupation is the major factor associated with depression, anxiety and stress. In addition, anxiety is also significantly influenced by factors such as age and workplace location, meanwhile stress is significantly associated with workplace location. The prevalence of depression was highest among pharmacist and follow by health inspectors; anxiety was highest among health inspector follow by pharmacist; and stress was highest among health inspector follow by doctor. Future research can be conducted to gain more accurate measurements for depression, anxiety and stress such as the use of stress biomarkers like cortisol enzyme.

A short and long-term support strategies and interventions need to be established to overcome the physical and psychological exhaustion associated with these mental states among healthcare workers. Even though, the stress, depression and anxiety among the healthcare workers may not be avoided but aware of its prevalence in the workplace is considerably important. A healthy workforce is vital in safeguarding both personal wellbeing and quality patient care is achieved.

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## Conflicts of Interest

All authors disclose no actual or potential conflicts of interest including any financial, personal, or other relationships with other people or organisations that could inappropriately influence (bias) their work.

## Author Contributions

Narinderjeet Kaur is the main researcher of this paper. Syed Shajee Husain is the research supervisor. Jiloris F. Dony, Azlan M. Naing are the co-researcher of this paper. Awang Setia Musleh and Khamisah Lukman are the co-writer. Shamsul Bahari Shamsudin is the corresponding author of this paper. .

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**Table 1: Socio-demographic background**

<b>Socio-economic factors</b>	<b>n (%)</b>
<b>Gender</b>	
- Male	103 (26.1)
- Female	292 (73.9)
<b>Age (years)</b>	
- Less than 30	98 (24.8)
- 30-39	178 (45.0)
- 40-49	82 (20.8)
- 50-60	37 (9.4)
<b>Ethnicity</b>	
- Malay	43 (10.9)
- Chinese	21 (5.3)
- Indian	23 (5.8)
- Kadazan	125 (31.6)
- Sino-kadazan	22 (5.6)
- Bajau	46 (11.6)
- Dusun	11 (2.8)
- Brunei	3 (0.8)
- Others	101 (25.6)
<b>Marital Status</b>	
- Single	75 (19.0)
- Married	314 (79.5)
- Divorce or Widower	6 (1.5)
<b>Occupation</b>	
- Doctor	41 (10.4)
- Nurse	175 (44.3)
- Medical Attendant	34 (8.6)
- Health inspector	85 (21.5)
- Pharmacist	30 (7.6)
- Nutritionist	4 (1.0)
- Laboratory technician	17 (4.3)
<b>Workplace location</b>	
- Kota Kinabalu	134 (33.9)
- Menggatal	85 (21.5)
- Inanam	31 (7.8)
- Telipok	33 (8.4)
- Luyang	112 (28.4)
<b>Years of service (years)</b>	
- Less than 5	77 (19.5)
- 5 and above	318 (80.5)
<b>Income (RM)</b>	
- Less than 3500	179 (45.3)
- 3501 and above	216 (54.7)
<b>Type of living</b>	
- With family	333 (84.3)
- Alone	62 (15.7)

N=395

**Table 2: Distributions of occupational depression, anxiety and stress.**

Level of mental health	Depression	Anxiety	Stress
	n (%)	n (%)	n (%)
Extreme	2 (0.5)	16 (4.1)	2 (0.5)
Severe	7 (1.8)	17 (4.3)	11 (2.8)
Moderate	29 (7.3)	44 (11.1)	19 (4.8)
Mild	26 (6.6)	27 (6.8)	13 (3.3)
Normal	331 (83.8)	291 (73.7)	350 (86.6)
Mean ± S.D.	4.4 ± 5.83	5.1 ± 6.19	7.1 ± 7.15
Prevalence (%)	16.2	26.3	11.4

N=395

**Table 3: Association of depression, anxiety and stress with socio-demography risk factors**

Socio-demography risk factors	Depression Stac. (p)	Anxiety Stac. (p)	Stress Stac. (p)
Gender	-1.654 (0.098)	-0.842 (0.400)	-0.996 (0.319)
Age (years)	3.483 (0.323)	<b>8.068 (0.045)*</b>	4.028 (0.258)
Ethnicity	8.727 (0.366)	8.285 (0.406)	4.028 (0.258)
Marital Status	<b>6.372 (0.041)*</b>	<b>6.558 (0.038)*</b>	2.959 (0.228)
Occupation	<b>27.347 (0.01)*</b>	<b>37.473 (0.01)*</b>	<b>28.916 (0.01)*</b>
Workplace location	8.516 (0.070)	<b>12.225 (0.016)*</b>	<b>9.489 (0.05)*</b>
Years of service (years)	-0.047 (0.962)	-0.432 (0.666)	-0.619 (0.586)
Income (RM)	-1.424 (0.154)	<b>-2.216 (0.027)*</b>	-0.915 (0.360)
Type of living	1.766 (0.077)	0.821 (0.412)	1.424 (0.154)

N=395

\* significant at  $p < 0.01$



**Table 4: Depression and socio-demography risk factors model.**

Dependent variable (Depression Score)	Type III Sum of Squares	Statistic F	P value
(intercept)	207.729	6.307	0.012*
Gender	0.535	0.016	0.899
Age (years)	105.861	1.107	0.361
Ethnic	389.223	1.477	0.164
Marital status	54.761	0.831	0.436
Occupation *	350.763	1.331	0.026*
Years of service	22.321	0.678	0.411
Workplace location	209.087	1.587	0.177
Income (RM)	3.290	0.100	0.752
Living status	34.608	1.051	0.306

N = 395

F = 1.448; p=0.06 and r = 0.179; R<sup>2</sup> = 0.032

\* Significant at p≤0.05

Model: Depression score = 1.331 (occupation) + 6.307 (constant)

**Table 5: Anxiety and socio-demography risk factors model.**

Dependent variable (Anxiety Score)	Type III Sum of Squares	Statistic F	P value
(intercept)	241.706	6.920	0.009*
Gender	65.528	1.876	0.172
Age (years) *	363.860	3.472	0.016*
Ethnic	289.860	1.037	0.408
Marital status	64.134	0.918	0.400
Occupation *	968.323	3.645	0.001*
Years of service	53.738	1.539	0.216
Workplace location *	383.989	2.748	0.028*
Income (RM)	0.521	0.015	0.903
Living status	0.316	0.009	0.924

N = 395

F = 2.336; p≤0.01 and r = 0.300; R<sup>2</sup> = 0.090

\* Significant at p≤0.05

Model: Anxiety score = 3.472 (age) + 3.645 (occupation) + 2.748 (workplace location) + 6.920 (constant)

**Table 6: Stress and socio-demography risk factors model.**

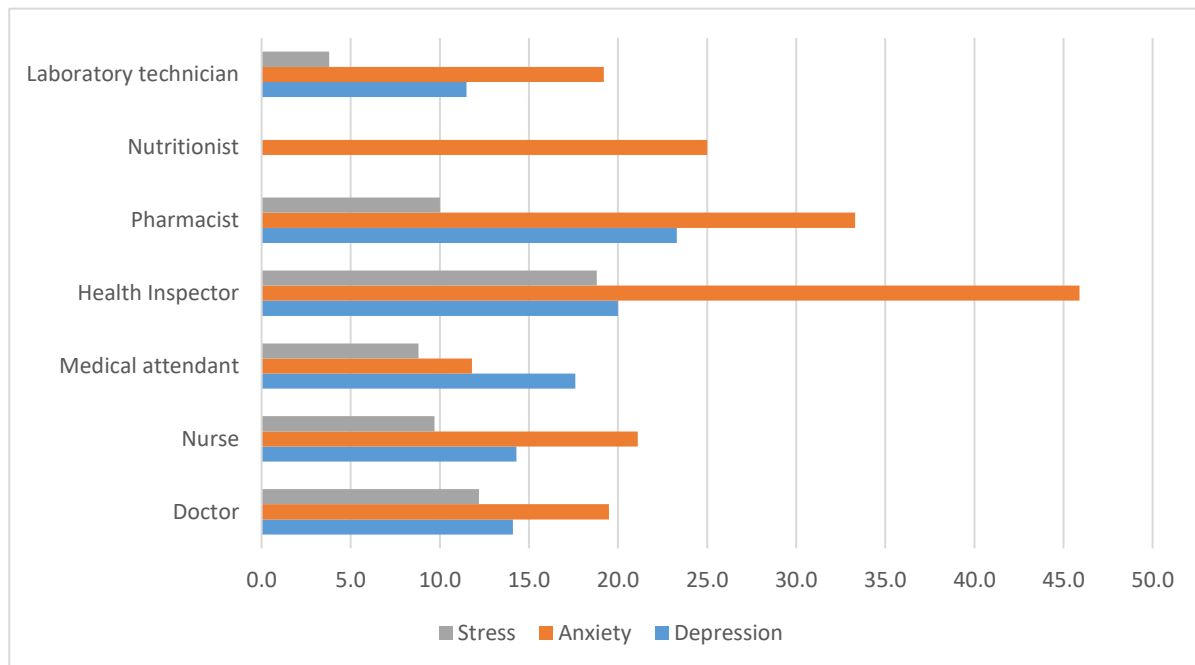
Dependent variable (Stress Score)	Type III Sum of Squares	Statistic F	P value
(intercept)	758.351	15.640	0.001*
Gender	18.480	0.377	0.540
Age (years)	237.527	1.614	0.186
Ethnic	531.863	1.356	0.215
Marital status	11.479	0.117	0.890
Occupation *	695.799	2.773	0.031*
Years of service	17.882	0.365	0.564
Workplace location *	443.040	2.258	0.032*
Income (RM)	4.264	0.087	0.768
Living status	25.558	0.251	0.471

N = 395

F = 1.586; p ≤ 0.01 and r = 0.202; R<sup>2</sup> = 0.041

\* Significant at p ≤ 0.05

Model: Stress score = 2.773 (occupation) + 2.258 (workplace location) + 15.640 (constant)



**Figure 1: Prevalence of depression, anxiety and stress by healthcare occupation**

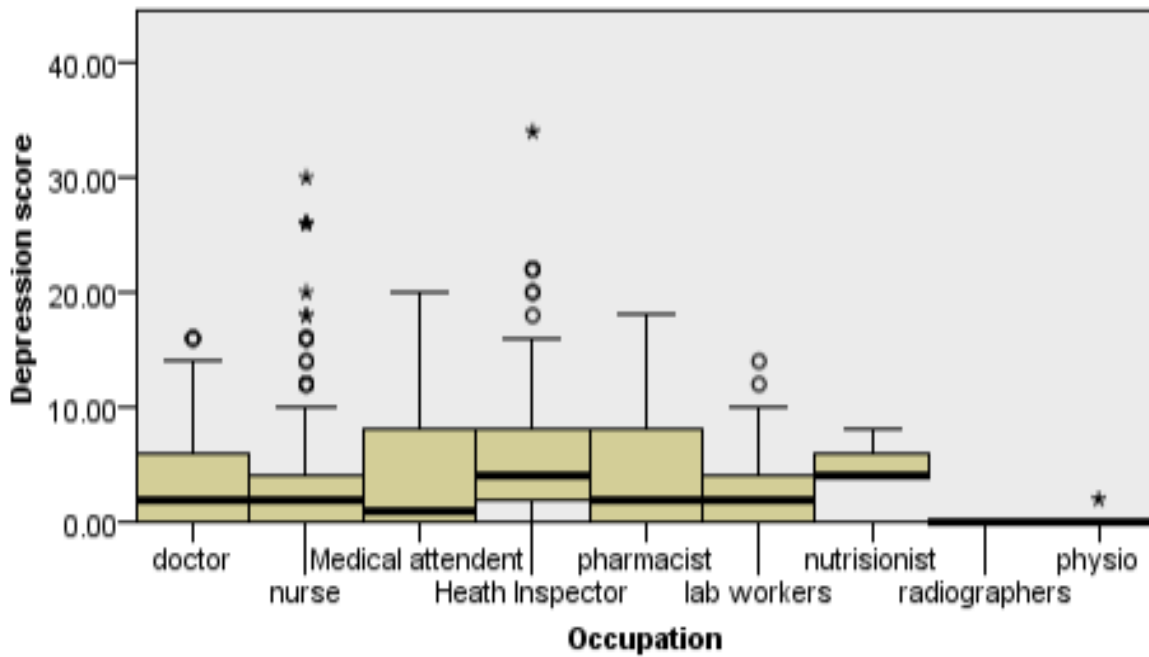


Figure 2: Association of healthcare occupation with depression score

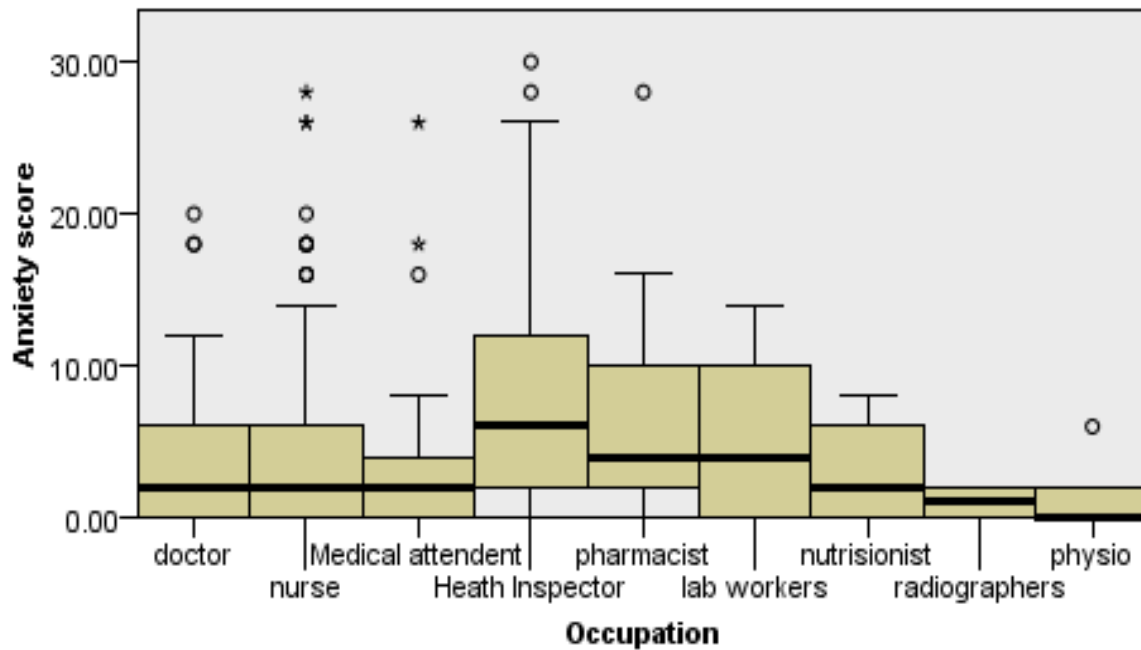


Figure 3: Association of healthcare occupation with anxiety score

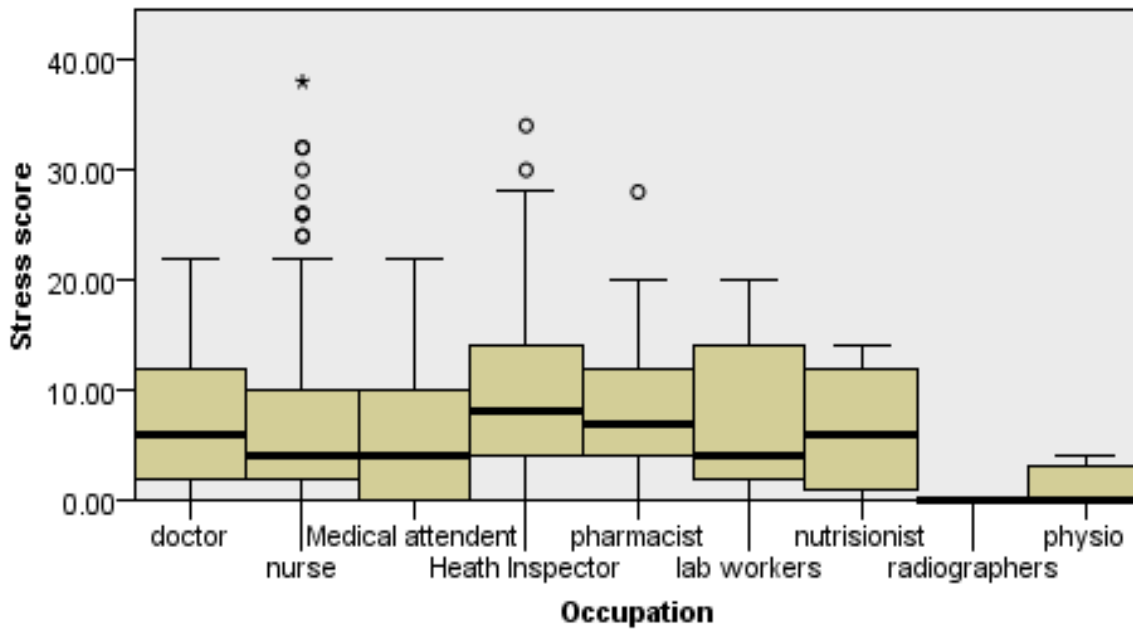


Figure 4: Association of healthcare occupation with stress score