

EFFECT OF WORKING HOURS ON DEPRESSION AND MENTAL WELLBEING AMONG HEALTHCARE PROVIDERS OF OPERATION THEATER OF MULTIPLE TERTIARY CARE HOSPITALS OF KARACHI, PAKISTAN

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Abstract

BACKGROUND

“Health is wealth” is a time-tested adage. Health becomes more relevant when it comes to professionals whose job is to provide people with services that maintain an optimum state of mental, physical, and social well-being. Healthcare professionals (HCP) differ from general population regarding the nature of their work, stress, burnout etc. We initiated this study to see how working hours effect on depression and mental wellbeing of operation theater Workers.

METHODS

The study included 346 participants who work in Operation Theater of multiple hospitals of Karachi. An Analytical Cross-sectional study was used and stratified random sampling technique was used to collect the sample. Questionnaires had administered directly to the operation theater participant after their consent Warwick Edinburg Mental Wellbeing Scale (WEMWBS) was used to assess depression and mental wellbeing.

RESULT

There were 67.9 % male and 32.5% female participant in the study. The mean age of the participant was $35.53 \pm SD 10.51$ with a range of 23 to 69 years. The prevalence of stress related to long working hours was 48.26%. The mean score of WEMWBS was $44.69 \pm SD 9.213$.

Probable clinical depression, mild depression and normal mental wellbeing was 33.8%,17.1% and 49.1% respectively. Data has analyses by SPSS software version 24.

CONCLUSION

Most of the participants of the study were working average 8 to 9 hours per day so my study does not show significant association between working hours and depression however after applying correlation test with multiple independent variables showed significant relationship with depression.

INTRODUCTION

Background

According to WHO “Health is a state of complete physical, mental and social well-being and not merely the absence of disease”. Healthy

Lifestyle have many benefits like eating healthy diet lowering the risk of many diseases such as hypertension, cardiovascular diseases, and Gastrointestinal disorders etc. In Recent studies shows mental wellbeing plays key role in dealing

with daily stress and protection from mental illness. Healthcare Professionals are more susceptible to stress so mental wellbeing plays significant role in Health care professionals because they daily deal with emergency conditions, long working hours, shift duties due to it they can't spend more time with their families and friends and face violence and insecurity, so they are more susceptible to stress as compared to general population. Doctors, nurses and other healthcare professionals suggest patients to eat healthy diet, give advice how they become mentally strong, but healthcare professional do they behave same for themselves like do they eat healthy diet, sleep well and exercise daily? [1] Prevalence of stress is high in healthcare professionals of Pakistan due to unhealthy lifestyle, financially unstable due to overly dealing with death situations and hostility [2]. Researches shows in nurses cause of obesity and overweight is due to long working hours and shift duties [3]. Furthermore, my researches related to dietary habit shows that shift duties are associated with poor dietary habits. Furthermore, overload of nurse's work contributes to poor dietary habit and unhealthy lifestyle causes obesity [4]. Due to shift duties and long working hours, eating due to stress accessibility to fast food and outside food during working severely affect the health of healthcare professionals [5]. According to Norwegian study on physicians shows that the physical health was like general population. However, many researchers found that incidence of mental disorder like depression and predisposition to suicide is higher in healthcare professionals [6]. Health Care Worker are not only suffer from unfortunate physical outcome from pandemic but also face psychological issues like post traumatic disorder, stress & depression [7]. Data collected from China and Italy shows that during pandemic 50.3% Depression, 44.6% anxiety and 34 % insomnia found in Healthcare workers [8, 9]. Obesity is the major public health problem all over the world and this problem not only related to general public but also in Health care workers. Researchers conducted studies related to obesity in South Africa indicate that 56 % women and

29% Men are overweight [10]. According to their study high rate of mental health and substance use disorders found in population and suicidal rate among physicians is higher than any other profession [11]. Healthcare workers are working in different situations like in emergency, shift duties, more working hour, on calls and different stress full situations which lead to mental health problem [12]. Different literature shows that prevalence so sleep related issues, substances use and mental health problems are higher among physicians [13]. However, bad mental status of employees in developed countries like depression, anxiety and suicidal thinking cause poor work quality and affect their aspect of life. [14] Many researchers are conducting research on long working hours and depression outcomes and there is a large amount of data which shows that long working hours effect on mental and emotional wellbeing and depression [15] Moreover, many research exhibit that harmful effect of long working hours arise in both male and female employees. [16]

LITERATURE REVIEW

Study conducted in Germany they include shift and non-shift workers of tertiary care hospital and compare their physical activity, dietary habits, and stress level. According to their study non-shift workers were mostly older as compared to shift worker. In their study 10 men and 34 female health care workers included. Study shows smoking habit is more in shift workers. Physical Activity found less in shift workers as compared to non-shift workers. Sleep quality is impaired in shift worker and disturbed in non-shift workers. Shift workers shows different dietary habits and more stress level as compared to non-shift workers. Sample size of this study is small. This study does not show risk of metabolic health outcome in shift and non-shift workers [17]. A cross sectional descriptive study conducted in South Africa shows that about three-quarter of healthcare workers are overweight or obese. Majority of participants were female 82.4%. The participant's age is between 21 to 63 years. This study shows that about 51.9% of healthcare workers are obese, 21.4% were overweight and only 24.3% of healthcare workers are normal

weight. About 64% of participants are overweight think that they are normal weight. Most common Health problem found in Health care workers is musculoskeletal problem 41%, stress, hypertension, and varicose vein respectively [18].

A qualitative case study is conducted in Ontario, Canada. Study finding shows that long term care workers sustain their health and mental wellbeing by doing different self-care plans such as eating healthy food, exercise regularly like walking, gym, yoga, and swimming. According to this study 83.3% of the healthcare professionals follow self-care measures. These self-care practices positively impact on the emotional health and stress. Some study participant also reveals that they have time and resources to grow their own food which give them relaxation and emotional strength while some other worker reported that due to financial barrier, they can't follow healthy practices [19].

An observational cross-sectional survey and cohort study is done in London which include 3 groups one group is those who directly contact with covid suspected or confirm patient second group is those health care workers who don't contact with covid patients third group is non-healthcare academic and research staff. Covid'19 have adverse effect the physical and mental health of the healthcare workers. Direct patient contact has negative impact on the mental health of HCWs as compared to non-patient contact. HCWs face elevated level of stress, physical, dietary, sleep disorders and mental problems as compared to non-healthcare workers. They have different behavioral problem like smoking, diet and exercise which severely affect their personal relationship [20]. Study conducted in Punjab province of Pakistan shows that working hours of junior doctors are more as compared to senior doctors. 50% of doctors sleep less than 7 hours per day. The most frequent persistent disease found in doctor is Myopia and Hyperopia and 9.7% back problem. 10.4% of the Healthcare workers were smokers. Only 34.5% of healthcare worker are satisfied with the time spend with their family. Females were more in job related stress as compared to male participants. 71.6% of the participant don't want to change their profession if they have chance. This study shows that dietary

pattern of Pakistani Healthcare workers is same as general population, and they are not following the recommended diet and exercise. This study shows that Salt intake was not measure in this study. Occupational stress is not more objectively inquire [21]. Mental wellbeing score is higher in male as compared to female and multiple regressions shows that those eating healthy diet is positively related to mental wellbeing. Although those who eat more restaurant food, and high intake of tea and coffee face occupational stress and have back problems want to change their profession [21]. This literature gives knowledge regarding occupational health and inspects behavioral practices related to health consciousness in the critical environment of healthcare workers. The key findings give information about the personal health practices of healthcare professionals. It indicates that work impact on health and disease in many ways, comprise job related problems like income, working hours, workload, stress and relationship with coworkers. Work environment not only affect the health and mental wellbeing of worker but also on their families [22]. Study conducted in Karachi regarding the long duty hours and unhealthy dietary habits among nurses reveals that because of the unhealthy dietary habits long duty hour nurses has less BMI as compared to schedule nurses. Unhealthy dietary habits were evaluated by comparing meal skipping per day, consumption of fruits, vegetables, and junk food during working days [20]. In their study 41.3% of nurses working in long duty hours and out of which 56.5% skip their meals too [23]. According to their study findings long duty hour and schedule nurse's intake fruits and snacks 45.5% and 56.5% respectively. This finding indicates that those nurses who work in long duty hour less intake fruits and snacks [23]. According to their findings 70% of nurses eat meal four times a day in which long duty hour and fixed duty hours were 64.3% and 37% respectively. Out of which only 2 nurses eat five times a day and worked in long duty hours. This study indicates that those nurses who work in private sector are more frequently skip their meal as compared to government sector nurses [23]. This study only

shows association between working hours and dietary pattern on nurses only. It doesn't indicate the mental wellbeing and depression which may effect on their health so purpose of my study is to find their mental wellbeing and depression associated with long working hours and include all health Care Professionals including Doctors (Surgeon, Anesthesiologist. Residents, Fellow, House Officers), Nurses, Surgical Technologist/Technicians, ward boys who work in Operation Theater of different Tertiary care hospitals of Karachi.

PROBLEM STATEMENT OVERVIEW

There is lack of studies conducted to assess the effect of working hours on depression and mental wellbeing of healthcare providers working in Operation Theater, so the purpose of my study is to assess the depression among healthcare workers of operation theater.

RESEARCH QUESTION/HYPOTHESIS

ALTERNATE HYPOTHESIS Working hours in Operation Theater are affecting the depression and mental wellbeing of workers.

NULL HYPTHESIS Working hours in operation theater is not affecting the mental health of health care workers of Operation Theater.

OBJECCTIVES AND AIMS

Main Objective:

To determine the effect of working hours on depression and mental wellbeing of healthcare providers working in operation theater.

Specific Objectives.

1. To access long working hours, affect depression and mental wellbeing of operation theater workers.

RESEARCH METHODOLOGY

Research Method

Quantitative

Study Design

Analytical Cross-Sectional Study

Study Site

Study conducted in Operation Theater of Multiple Tertiary care hospitals of Karachi Civil Hospital Karachi, Dow University Hospital Ojha and Patel Hospital.

Study Sample

All healthcare workers including male and female doctors, nurses, surgical technologist, Operation Theater assistant working in operation theater of Tertiary care hospitals of Karachi.

Sample Size

Sample size is calculated from WHO Sample size calculator P1= 28.5% in resident working for ≥ 80 hr./week P2= 17.3% in resident working less than 80hr/week, power of test as 80% and 95% CI n= 173 in each group (Group 1 include Surgeon, Anesthesiologist, Resident and House Officer, Group 2 include Nurse, anesthesia Technician and OT Technician/ Technologist) from tertiary care hospitals of Operation Theater.

Statement of problem

Operation theater workers working in incredibly stressful environment, so purpose of studying is to compare their working hours with depression and mental wellbeing

Selection of Sample

Inclusion Criteria

All healthcare workers including male and Female doctors, nurses, Surgical Technologist, Operation Theater Assistant of age between 20 years to 70 years and are working in Operation Theater and give consent for the study.

Exclusion Criteria

All Healthcare workers working in other units rather than Operation theaters and are less than 20 years and greater than 70 years are excluded and who don't give consent for study.

Sampling Technique/Methodology

Stratified Random Sampling Technique is used

to select the study population.

Sources of Data and Collection of Data

Data is collected from operation theater of three tertiary care hospitals of Karachi. Civil Hospital Karachi, Patel Hospital & Dow university Hospital ojha. Data is collected through self-administered Questionnaires.

Data variables

Dependent Variable Depression and mental wellbeing

Independent variables Working Hours, Income, Age, Gender, Sleeping hours, Marital status, Education level, Type of job

Data Analysis Strategies/Statistical Tests

The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) was used which consisted of 14 questions and scoring range for each question

was 1 to 5 and the total score was from 14-70. The score is obtained by summing each 14 questions score, with least score which was less than 41 indicating the probable clinical depression, score range from 41-44 was indicating the mild depression and higher score indicating the normal mental wellbeing. Social demographic variables were used for analysis of probable clinical depression, mild depression and normal mental wellbeing. Firstly, we calculated the prevalence of depression and normal mental wellbeing of participants then compared it with working hours. Then use the Correlation Test for association depression and mental wellbeing as dependent variable and age, gender, income, stress, sleeping hours as independent variable and found the association between them by correlation coefficient 'r' (Range between -1 to +1) and p-value. A two tailed alpha with p-value <0.05 was considered statistically significant. Data analyses were performed using SPSS version 24.

Table 1 Prevalence of depression and normal mental wellbeing by characteristics of participants.

Variables	Probable Clinical Depression	Mild Depression	Normal Mental wellbeing	Pearson Correlation 'r'	P-value
Gender				-0.111	0.039
Male	68(58.1%)	46(78%)	120(70.6%)		
Female	49(41.9%)	13(22.0%)	50(29.4%)		
Age				-0.107	0.048
20-30	53(45.3%)	24(40.7%)	80(47.1%)		
31-40	27(23.1%)	16(27.1%)	65(38.2%)		
41-50	20(17.1%)	10(16.9%)	8(4.7%)		
≥51	17(14.5%)	9(15.3%)	17(10%)		
Marital Status				-0.035	0.511
Married	72(61.5%)	37(62.7%)	111(65.3%)		
Unmarried	45(38.5%)	22(37.3%)	59(34.7%)		
Education Level				-0.008	0.883
Matric	11(9.4%)	10(16.9%)	16(9.4%)		
Intermediate	18(15.4%)	15(25.4%)	33(19.4%)		
Graduation	33(28.2%)	18(30.5%)	42(24.7%)		
Post-Graduation	55(47%)	16(27.1%)	79(46.5%)		
Monthly Income				-0.018	0.741
< 50K	31(26.5%)	14(23.7%)	53(31.2%)		

50k- 1 lac	60(51.3%)	34(57.6%)	76(44.7%)		
>1 lac	26(22.2%)	11(18.6%)	41(24.1%)		
Variables	Probable Clinical Depression	Mild Depression	Normal Mental wellbeing	Pearson Correlation 'r'	P-value
Profession				0.048	0.371
Doctors	68(58.1%)	18(30.5%)	87(51.2%)		
Paramedical Staff	49(41.9%)	41(69.5%)	83(48.8%)		
Working hours/day				0.215	0.852
Av. 8- 9hrs	83(70.9%)	35(59.3%)	89(52.4%)		
>9hrs	23(19.7%)	17(28.8%)	33(19.4%)		
>10hrs	11(9.4%)	7(11.9%)	48(28.2%)		
Stress Related to Long working hours				0.178	0.001
Yes	52(44.4%)	26(44%)	89(52.35%)		
No	65(55.6%)	33(55.9%)	81(47.6%)		
Stress related to uncertain future				0.184	0.001
Yes	35(29.9%)	17(28.8%)	87(51.1%)		
No	82(70.1%)	42(71.2%)	83(48.8%)		
Stress related to insufficient Acknowledgment				0.201	0.000
Yes	38(32.47%)	16(27.1%)	85(50%)		
No	79(67.5%)	43(72.9%)	85(50%)		
Stress related to illegitimate political, administrative pressure				0.113	0.036
Yes	34(29%)	16(27.1%)	80(47%)		
No	83(70.9%)	43(72.9%)	90(52.9%)		
Sleeping hours/day				0.010	0.852
8 hrs	61(52.1%)	45(76.3%)	71(41.8%)		
<8 hrs	39(33.3%)	10(16.9%)	93(54.7%)		
>8hrs	17(14.5%)	4(6.8%)	16(3.5%)		
Working Experience				-0.028	0.599
< 5 years	45(38.5%)	12(20.3%)	57(33.5%)		
5-10 years	36(30.8%)	20(33.9%)	73(42.9%)		
11- 15 years	24(20.5%)	13(22.0%)	24(14.1%)		
<15 years	12(10.3%)	14(23.7%)	16(9.4%)		

Job stress				0.081	0.130
Yes	80(68.4%)	36(61%)	101(59.4%)		
No	37(31.6%)	23(39%)	69(40.6%)		
Job Type				0.107	0.046
Government	66(56.4%)	32(54.2%)	76(44.7)		
Private	51(43.6%)	27(45.8%)	94(55.3%)		
No. of Jobs				0.213	0.000
Single Job	110(94%)	52(88.1%)	131(77.1%)		
More than 1 Job	7(6%)	7(11.9%)	39(22.9%)		

Timeframes/Study Duration

Study Duration is 6 months from August'21 to Jan'22

RESULTS

In this study, 346 sample sizes were taken, two groups included doctors and paramedical staff of Operation theater 173 samples were taken from each group. There were more male participants (67.6%) than female participants (32.5%). The mean age of the participant was $35.53 \pm SD 10.51$ with a range of 23 to 69 years. The prevalence of stress related to long working hours was 48.26%. The mean score of WEMWBS was $44.69 \pm SD 9.213$. Probable clinical depression, mild depression and normal mental wellbeing

was 33.8%,17.1% and 49.1% respectively. By comparing psychographic factors of participants with gender, age, stress related to long working hours, uncertain future, insufficient Acknowledgment, illegitimate political, administrative pressure, type of job private or government and number of jobs has shown significant relationship with depression and normal mental wellbeing. Most of the participants of study are working in average 8 to 9 hours per day, that is 59.8%, more than 9 hours per day 21.1% and more than 10 hours per day 19.1%. Sleeping hours of participant average 8 hours, less than hours and more than 8 hours were 51.2%,41.0% and 7.8% respectively.10% of participant taking medication for anxiety.

Table 2.

WEMWBS category						
		Frequenc y	Percent	Valid Percent	Cumulative Percent	
Valid	< 41 Probable clinical Depression	117	33.8	33.8	33.8	
	41-44 Mild Depression	59	17.1	17.1	50.9	
	45-57 Normal individual	132	38.2	38.2	89.0	
	>57 High Mental wellbeing	38	11.0	11.0	100.0	
	Total	346	100.0	100.0		
		N	Minim um	Maximu m	Mean	Std. Deviation
Warwick-Edinburgh		346	21	70	44.96	9.213

Mental Well-being Scale Score					
Valid N (listwise)	346				

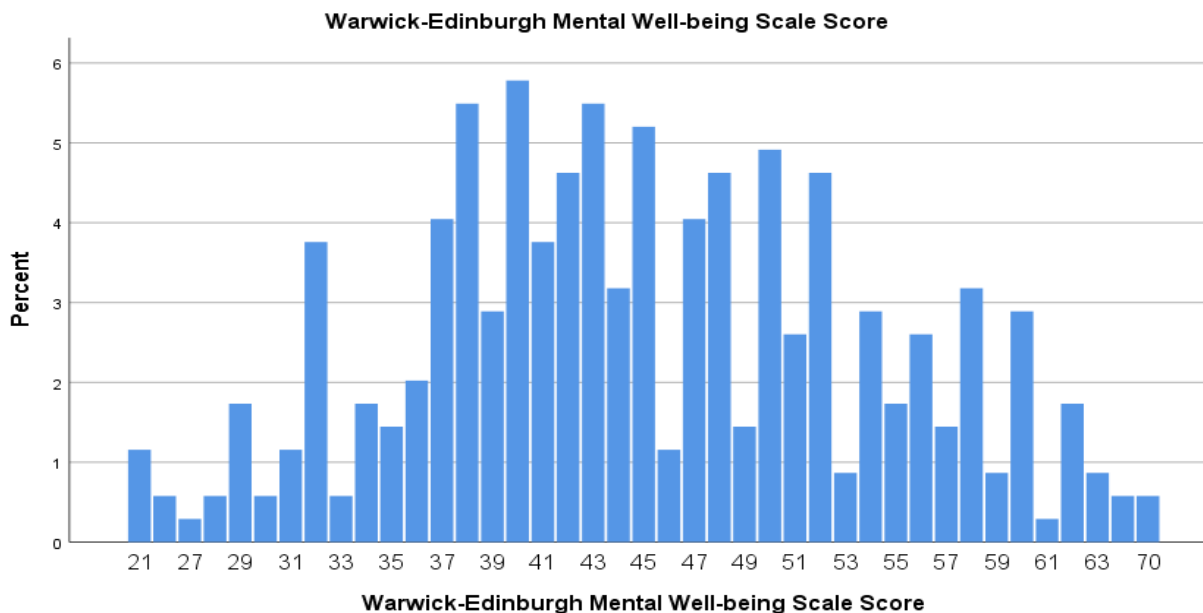


Table 3.

		Frequency	Percent	Valid Percent	Cumulative Percent
Job type government or private					
Valid	Government Employee	174	50.3	50.3	50.3
	Private Employee	172	49.7	49.7	100.0
	Total	346	100.0	100.0	
Qualification					
Valid	Matric	37	10.7	10.7	10.7
	intermediate	66	19.1	19.1	29.8
	Graduate	93	26.9	26.9	56.6
	Post-graduate	150	43.4	43.4	100.0
	Total	346	100.0	100.0	
Designation					
Valid	Surgeon	28	8.1	8.1	8.1
	PG/ Resident	93	26.9	26.9	35.0
	House Officer	19	5.5	5.5	40.5



	Anesthesiologist	31	9.0	9.0	49.4
	Anesthesia Technician	48	13.9	13.9	63.3
	OT Technician/Surgical Technologist	86	24.9	24.9	88.2
	Ward Girl	19	5.5	5.5	93.6
	Nurses	22	6.4	6.4	100.0
	Total	346	100.0	100.0	
Working experience					
Valid	less than 5 years	114	32.9	32.9	32.9
	5-10 years	129	37.3	37.3	70.2
	11-15 years	61	17.6	17.6	87.9
	More than 20 years	42	12.1	12.1	100.0
	Total	346	100.0	100.0	
Income per month					
Valid	Less than 50K	98	28.3	28.3	28.3
	Between 50k to 1 lac	170	49.1	49.1	77.5
	More than 1 lac	78	22.5	22.5	100.0
	Total	346	100.0	100.0	
Working Hours per Day.					
Valid	Average 8 to 9 hours per day	207	59.8	59.8	59.8
	More than 9 hours per day	73	21.1	21.1	80.9
	More than 10 hours per day	66	19.1	19.1	100.0
	Total	346	100.0	100.0	
How many hours on average do you sleep in a day?					
Valid	8 hours	177	51.2	51.2	51.2
	less than 8 hours	142	41.0	41.0	92.2
	More than 8 hours	27	7.8	7.8	100.0
	Total	346	100.0	100.0	
Do you take any medication for anxiety or depression?					
Valid	Yes	35	10.1	10.1	10.1
	No	311	89.9	89.9	100.0
	Total	346	100.0	100.0	

DISCUSSION

The main findings of my study were that rate of depression was higher among males and those who are married 58.1% as compared to female 41.9% and my study population was mostly male as compared to the China study as their female participant is higher than male participant, but rate of depression was same in male and female 19.2%, 19.1 % respectively. And in my study the higher mental wellbeing in male 70.65% as compared to female 29.4% in contrast to China study because their female participants have better mental wellbeing as compared to male. [25]. Mean score of WEMWBS of our study is $44.69 \pm SD 9.213$ which is less than the study conducted in Lahore, Pakistan with same mental wellbeing score was 47.72 ± 9.53 SD as their study my study also showed negative association between income and WEMWBS score. In my study doctors have more depression rate as compared to paramedical staff and my study also show significant association between stress related to long working hours and depression [26]. In my study the depression rate is higher among those who work in government hospital as compared to private hospital that is 53.6% and 43.6% respectively as compared to Japan study as their depression is less in university hospital as compared to other teaching hospital. Effect of long working hours on depression was high in their study because their most of the participants are residents who work more than 10 hours in a day, but my study participant are mostly working in average 8 to 9 hours per day, so my study did not show any significant association between working hours and depression [27].

CONCLUSION

Most of the participant of the study were working average 8 to 9 hours per day so my study does not show and significant association between working hours and depression however after apply correlation test with multiple independent variables showed that age, gender, stress related to long working hours, uncertain future, insufficient acknowledgement and political administrative pressure and type of job has significant relationship with depression.

REFERENCES

1. Ahmad, W., Taggart, F., Shafique, M. S., Muzafar, Y., Abidi, S., Ghani, N., ... & Ghaffar, N. (2015). Diet, exercise and mental wellbeing of healthcare professionals (doctors, dentists and nurses) in Pakistan. *PeerJ*, 3, e1250.
2. Ahmad, W., Waqas, A., Saleem, H. A., & Naveed, S. (2017). Exploring diet, exercise, chronic illnesses, occupational stressors and mental well-being of healthcare professionals in Punjab, Pakistan. *BMC research notes*, 10(1), 1-3.
3. Shan, Z., Li, Y., Zong, G., Guo, Y., Li, J., Manson, J. E., ... & Bhupathiraju, S. N. (2018). Rotating night shift work and adherence to unhealthy lifestyle in predicting risk of type 2 diabetes: results from two large US cohorts of female nurses. *bmj*, 363.
4. Nejman, M., & Gotlib, J. (2017). Impact of shift work of nurses on their nutrition attitudes. *Piel Pol*, 63, 13-19.
5. Hakim, S. A., Eldin, W. S., & Mohsen, A. (2016). Dietary behavior and its relation with lifestyle, rotating work shifts and job satisfaction among nurses of Ain Shams university hospitals. *Egypt J Community Med*, 34(2), 75-86.
6. Buyukuslu, N., & Velioglu, Y. (2014). Hizli. Nutrition and health status of health care professionals. *J Nutr Health Food Eng*, 1(6), 234-239.
7. Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., & Greenberg, N. (2020). i Rubin, GJ (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, 395(10227), 912-920.
8. Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., ... & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*, 3(3), e203976-e203976.

9. Rossi, R., Soggi, V., Pacitti, F., Di Lorenzo, G., Di Marco, A., Siracusano, A., & Rossi, A. (2020). Mental health outcomes among front and second line health workers associated with the COVID-19 pandemic in Italy. *MedRxiv*.
10. Phetla, M. C., & Skaal, L. (2017). Perceptions of healthcare professionals regarding their own body weight in selected public hospitals in Mpumalanga Province, South Africa. *South African Medical Journal*, 107(4), 338-341
11. Kalmoe, M. C., Chapman, M. B., Gold, J. A., & Giedinghagen, A. M. (2019). Physician suicide: a call to action. *Missouri medicine*, 116(3), 211.
12. Torquati, L., Mielke, G. I., Brown, W. J., Burton, N. W., & Kolbe-Alexander, T. L. (2019). Shift work and poor mental health: a meta-analysis of longitudinal studies. *American journal of public health*, 109(11), e13-e20.
13. Mihailescu, M., & Neiterman, E. (2019). A scoping review of the literature on the current mental health status of physicians and physicians-in-training in North America. *BMC Public Health*, 19(1), 1-8.
14. Li, Z., Dai, J., Wu, N., Jia, Y., Gao, J., & Fu, H. (2019). Effect of long working hours on depression and mental well-being among employees in Shanghai: the role of having leisure hobbies. *International journal of environmental research and public health*, 16(24), 4980.
15. Lee, K., Suh, C., Kim, J. E., & Park, J. O. (2017). The impact of long working hours on psychosocial stress response among white-collar workers. *Industrial health*, 55(1), 46-53.
16. Bannai, A., Ukawa, S., & Tamakoshi, A. (2014). Long working hours and psychological distress among schoolteachers in Japan. *Journal of occupational health*, 14-0127.
17. Roskoden, F. C., Krüger, J., Vogt, L. J., Gärtner, S., Hannich, H. J., Steveling, A., ... & Aghdassi, A. A. (2017). Physical activity, energy expenditure, nutritional habits, quality of sleep and stress levels in shift-working health care personnel. *PloS one*, 12(1), e0169983.
18. Phetla, M. C., & Skaal, L. (2017). Perceptions of healthcare professionals regarding their own body weight in selected public hospitals in Mpumalanga Province, South Africa. *South African Medical Journal*, 107(4), 338-341.
19. Syed, I. U. (2020). Diet, physical activity, and emotional health: What works, what doesn't, and why we need integrated solutions for total worker health. *BMC Public Health*, 20(1), 1-9.
20. Khanji, M. Y., Maniero, C., Ng, S., Siddiqui, I., Gupta, J., Crosby, L., ... & Gupta, A. (2021). Early and Mid-Term Implications of the COVID-19 Pandemic on the Physical, Behavioral and Mental Health of Healthcare Professionals: The CoPE-HCP Study Protocol. *Frontiers in psychology*, 12, 39.
21. Ahmad, W., Taggart, F., Shafique, M. S., Muzafar, Y., Abidi, S., Ghani, N., ... & Ghaffar, N. (2015). Diet, exercise and mental-wellbeing of healthcare professionals (doctors, dentists and nurses) in Pakistan. *PeerJ*, 3, e1250.
22. Lee, M. P., Hudson, H., Richards, R., Chang, C. C., Chosewood, L. C., & Schill, A. L. (2016). Fundamentals of total worker health approaches: Essential elements for advancing worker safety, health, and well-being.
23. Shafi, Z., Arif, S., & Nasir, A. (2020). Association of long duty hours and unhealthy dietary habits among nurses at private and public sector in Karachi, Pakistan. *Journal of Liaquat University of Medical & Health Sciences*, 19(01), 55-61.

24. Li, Z., Dai, J., Wu, N., Jia, Y., Gao, J., & Fu, H. (2019). Effect of long working hours on depression and mental well-being among employees in Shanghai: the role of having leisure hobbies. *International journal of environmental research and public health*, 16(24), 4980.
25. Ahmad, W., Taggart, F., Shafique, M. S., Muzafar, Y., Abidi, S., Ghani, N., ... & Ghaffar, N. (2015). Diet, exercise and mental-wellbeing of healthcare professionals (doctors, dentists and nurses) in Pakistan. *PeerJ*, 3, e1250.
26. Ogawa, R., Seo, E., Maeno, T., Ito, M., Sanuki, M., & Maeno, T. (2018). The relationship between long working hours and depression among first-year residents in Japan. *BMC medical education*, 18(1), 1-8.

Appendix 1

Mental Wellbeing Scale

The Warwick Edinburg Mental Wellbeing Scale (WEMWBS) was used to assess mental wellbeing of healthcare workers.

Please tick (✓) the box that best describes your experience of each over the last 2 weeks

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

■ Satisfaction
■ Affect
■ Competence
■ Relatedness
■ Autonomy

WEMWBS Score

Mental Wellbeing” is assessed using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS). This has been validated for use in the general population and facilitates monitoring mental wellbeing in the general population. Scale ranges from 14 to 70 (will be calculated through cut of points by S.D & MEANS)

- A score of <40 is indicative of probable clinical depression or anxiety.
- A score of 41-44 is indicative of possible/ mild depression
- Higher scores indicate higher positive mental wellbeing.