A Mental Health Survey of Medical Professionals Working During the COVID-19 Pandemic at Shaukat Khanum Cancer Hospital, Lahore

Muhammad H. Chatha 1, Sanaa A. Khan 1, Wajahat Nazir Ahmed 1, Ahsun Khan 2, Muhammad Abu Bakar 3, Muhammad Asif 4

1. Anesthesia and Pain Management, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore, PAK
2. Anesthesia and Critical Care, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore, PAK
3. Biostatistics and Epidemiology, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore, PAK
4. Psychiatry, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore, PAK

Corresponding author: Sanaa A. Khan, sanaa.a.khan7@gmail.com

Abstract

Introduction

The last months of 2019 saw the emergence of a novel coronavirus, SARS-COV-2, capable of causing widespread disease in humans. The rapid spread of this new disease culminated in one of the biggest pandemics in known history. The far-reaching social, economical, and health effects of this pandemic are still unfolding on a global scale.

Given the interconnectedness of social, environmental, and biological factors in manifesting psychiatric illnesses, it is fair to assume that the profound effects of this pandemic would likely increase the strain on mental healthcare systems.

The objective of this study was to assess the mental health burden amongst healthcare workers at Shaukat Khanum Memorial Cancer Hospital and Research Center (SKMCH & RC) at the start of the COVID-19 pandemic and to identify any differences in the mental health scores of anxiety, depression, and sleep disturbance for professionals directly involved in the care of COVID-19 patients as compared to those who were not.

Material and methods

This was an observational cross-sectional clinical study that used self-reported questionnaires after approval from the hospital’s ethical board. The sample size was calculated based on a study published previously by Huang using a 23.04% incidence of anxiety in medical staff. Depression was quantified using the Patient Health Questionnaire-9 score (PHQ-9), anxiety by the Beck Anxiety Inventory, and sleep quality using the Pittsburgh Sleep Quality Index checklist (PSQI). A total of 221 healthcare workers who completed the questionnaires were included in the study and the results were analyzed using SPSS Statistics v. 23 (IBM Corp., Armonk, NY). Levene’s test was used to assess the equality of variances, and an independent sample t-test and chi-square test were applied for the comparison of means. A one-way ANOVA test was used to compare means across more than two groups.

Results

Of the 221 healthcare workers recruited in the study, 57% were males, and 43% were females. Among the sample, 43% of participants were doctors, 27.1% were nurses, and others were technicians and medical assistants.

It was observed that 50% of males and 36% of female healthcare workers experienced moderate to severe depression at the onset of the pandemic. Furthermore, 35% of males and 25% of females suffered from moderate to severe anxiety, and more than 80% of our study population reported poor quality of sleep.

Conclusion

The present study reported a high prevalence of anxiety levels, depressive symptoms, and poor sleep quality among the healthcare professionals working in SKMCH & RC Lahore during the COVID-19 pandemic irrespective of direct contact with COVID-19 patients in a healthcare setting.

Categories: Psychiatry, Psychology
Keywords: depression, healthcare provider, mood and anxiety, sleep problems, covid-19 outbreak
Introduction

At the beginning of December 2019, there was a sudden outbreak of the novel coronavirus in the city of Wuhan, Hubei province, China. Before any concrete steps could be taken, the virus spread rapidly across the world. The pandemic has evolved into one of the deadliest pandemics to afflict humanity, with over 64 million deaths worldwide accounting for a loss of 0.5% of the world population. There are 1,551,251 confirmed cases in Pakistan alone, with 30,470 deaths reported so far to the date of writing this paper [1]. These numbers are expected to rise by the time this article is published.

While the quick development and deployment of vaccination programs have helped contain the fallout of the pandemic to some extent, the challenge is far from over. With new mutations of the COVID-19 virus such as the Delta and Omicron variants and lack of vaccination coverage owing to both limitations in capacity as well as anti-vaccination societal attitudes, it is difficult to accurately chart a course for the future.

Due to the apparent health emergency, global economic recession, social distancing, lack of recreational activities, and uncertainty about the future, it is reasonable to anticipate a worsening of a historically neglected mental health crisis. Finding themselves in unfavorable, new social settings, it is unsurprising that people have struggled to adapt.

COVID-19 is known to cause both physical and mental health damage to health care professionals [2]. Healthcare workers, including doctors, nurses, and paramedical staff, are working on the frontlines against the pandemic. As is often the case, medical personnel dealing with such large-scale outbreaks are prone to psychological stress and mood changes, affecting their health [3]. Medical professionals are likely to be adversely affected by the fear of being a source of transmission to their immediate family and friends [4]. The fear of contagion may add to their stress.

Since the start of the outbreak, there have been numerous efforts internationally to see the psychological impact of the pandemic on healthcare workers, but we have not seen many such studies in Pakistan. In a study conducted in China, the incidence of anxiety in tertiary care centers among medical staff involved in treating COVID-19 patients is as high as 23.04%, with female staff being more vulnerable [5]. Another study involving multiple hospitals in China concluded that 44.6% of the staff experienced severe anxiety symptoms [6].

Healthcare workers, may in general, be at a higher risk of mental health-related disorders [7] and, according to a study conducted in China, be at a greater risk of having poor sleep quality owing to the stressful nature of their job [2]. As expected, sleep quality for medical staff treating COVID-19 was also more negatively affected than the general population [8].

The quality of sleep is a crucial indicator of good health [9]. It boosts the immune system to prevent infections and improves physical and mental health, which positively influences the performance of health care workers [8]. Some studies have established an association between both anxiety and depression with poor sleep quality [10]. In a different study, this correlation between anxiety, depression, and sleep quality was corroborated [11].

Caregivers managing COVID-19 patients are also at a greater risk of developing psychological distress and other unfavorable mental health symptoms [5]. This may lead to decreased efficiency in dealing with the situation at hand and may also cause long-lasting mental ailments, as seen in the SARS pandemic, where healthcare workers were seen to develop PTSD [3].

The debate regarding the impact of the COVID-19 pandemic on mental health diseases revealed gaping deficiencies in existing data regarding the prevalence of anxiety, depression, and sleep disturbance among health care professionals in Pakistan. Hence, there was a dire need to determine the mental health burden and address it accordingly.

The objective of this study was to assess the mental health burden amongst health care workers at Shaukat Khanum Memorial Cancer Hospital and Research Center (SKMCH & RC), a tertiary healthcare center in the second-largest city of Pakistan, at the start of the COVID-19 pandemic and to identify any difference in the mental health scores of anxiety, depression and sleep disturbance for professionals directly involved in the care of COVID-19 patients as compared to those who were not.

Materials And Methods

This was an observational cross-sectional clinical study, conducted between April to July 2020 at SKMCH & RC, Lahore. Self-reported questionnaires were used to collect data after approval from the institutional review board. The sample size was calculated based on a study published previously by Huang (2020) using a 23.04% incidence of anxiety in medical staff [2]. A total of 221 healthcare workers who completed the questionnaires were included in the study.
Healthcare professionals working in the ICU, operating theaters, COVID inpatient ward, outpatient COVID screening units, emergency room, and the radiology department were recruited. Healthcare workers were asked if they were directly involved in the care of COVID-19 patients or not.

The process and purpose of the study were explained in person to the participants and informed written consent was taken in accordance with the hospital policies of the institutional review board. Data was collected from SKMCH & RC Lahore through printed survey forms distributed in person to health care workers. Details included in proforma comprised demographic data, Patient Health Questionnaire-9 score (PHQ-9), Beck Anxiety Inventory (BAI), and Pittsburgh Sleep Quality Index (PSQI). After completion, the forms were kept in a designated folder and the confidentiality of participants was maintained. Calculation of scores from the questionnaires was done and entered electronically in an Excel sheet. At the end of data collection, statistical analysis was done with help from the statistical department at SKMCH & RC.

Demographical variables recorded were age, gender, profession, marital status, education level, and monthly salary. We used the patient health questionnaire-9 form to screen for symptoms of depression among the study participants. This is a reliable questionnaire to assess patients for screening for depression [12-13]. The BAI was employed to assess the anxiety levels of the study participants. This inventory questionnaire is an established tool for the assessment of anxiety symptoms [14]. The quality of sleep among the participants was measured using the PSQI form, which is a reliable and valid indicator of sleep quality [15-16]. All these assessment questionnaires have been used and validated in the Pakistani population [17-21].

Data were analyzed using SPSS Statistics v. 23 (IBM Corp., Armonk, NY). Levene’s test was used to assess the equality of variances, an independent sample t-test and chi-square test were applied for comparison of means, and a one-way ANOVA test was used to compare means across more than two groups.

**Results**

The characteristics of the participants are shown in Table 1. Of the 221 samples analyzed, 126 (57%) were males, 95 (43%) were females, and the mean (standard deviation) age of the participants was 29.21±6.053 years. Among the sample, 95 (43%) participants were doctors, 60 (27.1%) were nurses, and others were technicians and medical assistants. Around 52.9% of participants were married, and 47.1% of participants earned a monthly salary of 50,000-100,000 Pakistani rupees (PKR). The majority of the participants (78.7%) had a post-graduate degree, and 80.5% had direct contact with COVID-19 patients.
| Demographic characteristics | Variables     | Count (%) |
|-----------------------------|--------------|-----------|
| Total surveyed              |              | 221 (100) |
| Gender                      | Male         | 126 (57)  |
|                             | Female       | 95 (43)   |
| Profession                  | Doctor       | 95 (43)   |
|                             | Assistant    | 11 (5)    |
|                             | Nurse        | 60 (27.1) |
|                             | Technician   | 55 (24.9) |
| Marital status              | Divorced     | 1 (0.5)   |
|                             | Married      | 117 (52.9) |
|                             | Single       | 103 (46.6) |
| Direct contact              | No           | 43 (19.5) |
|                             | Yes          | 178 (80.5) |
| Salary bracket              | Less than 50,000 PKR | 76 (34.4) |
|                             | 50,000-100,000 PKR | 104 (47.1) |
|                             | 100,000-200,000 PKR | 26 (11.8) |
|                             | More than 200,000 PKR | 15 (6.8)  |
| Education                   | Up to intermediate levels | 14 (6.3)  |
|                             | Under-graduate | 33 (14.9) |
|                             | Post-graduate | 174 (78.7) |

**TABLE 1: Demographic characteristics**  
PKR: Pakistani rupee

The scores of PHQ-9, BAI, and PSQI were stratified by gender, profession, salary, and contact with COVID-19 patients. The results are given in Table 2 and demonstrated in Tables 1-6. The mean scores of PHQ-9, BAI, and PSQI were 8.98, 16.43, and 7.99, respectively. On average, males had a higher score on PHQ-9 and the BAI scale. Compared with the healthcare professionals who did not have exposure to COVID-19 patients, the scores were elevated for those who had direct contact. Further, the participants with a monthly income of 50,000-100,000 PKR reportedly had high scores for PHQ-9 and BAI as compared to their other counterparts.
The prevalence of anxiety and depressive symptoms and the assessment of sleep quality were stratified by gender, occupation, and direct contact with COVID-19 patients. Salary findings are shown in Tables 3-5, respectively. The overall prevalence of high, moderate, and low anxiety levels was found to be 18.55%, 11.76%, and 69.68%. There was no statistically significant difference in the prevalence of anxiety levels by stratifying the variables under study.
### Table 3: Prevalence of anxiety levels in healthcare professionals of Pakistan during the COVID-19 outbreak

| Variables                                      | High Anxiety | Low Anxiety | Moderate Anxiety |
|------------------------------------------------|--------------|-------------|------------------|
| Gender (Sig. 2-sided: 0.354) (chi-square test) |              |             |                  |
| Male                                           | 20.63%       | 65.87%      | 13.49%           |
| Female                                         | 15.79%       | 74.74%      | 9.47%            |
| Profession (Sig. 2-sided: 0.28) (chi-square test) |              |             |                  |
| Doctor                                         | 21.05%       | 71.58%      | 7.37%            |
| Assistant                                      | 18.18%       | 54.55%      | 27.27%           |
| Nurse                                          | 21.67%       | 65.00%      | 13.33%           |
| Technician                                     | 10.91%       | 74.55%      | 14.55%           |
| Direct contact with COVID-19 patients (Sig. 2-sided: 0.645) (chi-square test) | | | |
| No                                             | 23.26%       | 67.44%      | 9.30%            |
| Yes                                            | 17.42%       | 70.22%      | 12.36%           |
| Salary brackets in PKR (Sig. 2-sided: 0.547) (chi-square test) | | | |
| <50,000                                        | 14.47%       | 71.05%      | 14.47%           |
| 50,000-100,000                                 | 21.15%       | 68.27%      | 10.58%           |
| 100,000-200,000                                | 26.92%       | 61.54%      | 11.54%           |
| >200,000                                       | 6.67%        | 86.67%      | 6.67%            |
| Total                                          | 18.55%       | 69.68%      | 11.76%           |

Further, as depicted in Table 4, the prevalence of moderately severe or severe depressive symptoms was found among 27.6% of the healthcare professionals. There was a statistically significant difference in the prevalence of depressive symptoms within the gender variable. Except for the moderately severe level, depressive symptoms were found to be higher in males. Compared with other salary ranges, severe depressive symptoms were significantly higher in participants lying in the salary bracket of 100,000-200,000, while moderately severe symptoms were higher for those earning a salary range of 50,000-100,000.
Next, Table 5 demonstrates that 81.90% of the surveyed healthcare professionals had a poor quality of sleep with a PSQI score of greater than 5. While there were no statistically significant differences within the demographic variables, the findings indicate a slightly significant difference in the quality of sleep between different salary brackets. One-third of those earning above 200,000 PKR enjoyed a good quality of sleep which is relatively higher than those in lower salary brackets. On the other hand, the highest percentage of the participants who had a poor quality of sleep was found among the ones with a salary bracket of 100,000-200,000 PKR.

Table 4: Prevalence of depressive symptoms in healthcare professionals of Pakistan during the COVID-19 outbreak
PKR: Pakistani rupee
Table 5: Assessment of sleep quality in healthcare professionals of Pakistan during the COVID-19 outbreak

| Variables                        | Good sleep quality | Poor sleep quality |
|----------------------------------|--------------------|--------------------|
| Gender (Sig. 2-sided: 0.945)     |                    |                    |
| Male                             | 18.25%             | 81.75%             |
| Female                           | 17.89%             | 82.11%             |
| Profession (Sig. 2-sided: 0.733) |                    |                    |
| Doctor                           | 20.00%             | 80.00%             |
| Assistants                       | 18.18%             | 81.82%             |
| Nurse                            | 13.33%             | 86.67%             |
| Technician                       | 20.00%             | 80.00%             |
| Direct contact with COVID-19 patients (Sig. 2-sided: 0.328) (chi-square test) | | |
| No                               | 23.26%             | 76.74%             |
| Yes                              | 16.85%             | 83.15%             |
| Salary brackets in PKR (Sig. 2-sided: 0.099) (chi-square test) | | |
| <50,000                          | 23.68%             | 76.32%             |
| 50,000-100,000                   | 13.46%             | 86.54%             |
| 100,000-200,000                  | 11.54%             | 88.46%             |
| >200,000                         | 33.33%             | 66.67%             |
| Total                            | 18.10%             | 81.90%             |

Table 5: Assessment of sleep quality in healthcare professionals of Pakistan during the COVID-19 outbreak

PKR: Pakistani rupee

Discussion

The percentage of healthcare workers with moderate to severe anxiety was 30.3% without any association with factors such as gender, profession, salary, or direct contact with COVID-19 patients in healthcare settings. Studies conducted on healthcare workers from Pakistan [22-23] have consistently shown a higher percentage of study subjects suffering from anxiety when compared to an estimated prevalence of 23% reported in a systematic review of 12 studies conducted on more than 33 thousand healthcare workers from other Asian countries [24]. It is to be noted, however, that the majority of data for this systematic review was collected from studies conducted in China and Singapore, countries with a significantly higher GDP than Pakistan, therefore economic factors cannot be excluded when it comes to explaining a 30% increase in symptoms of moderate to severe anxiety amongst healthcare workers from Pakistan.

A study from our neighboring country, India conducted on over 1000 healthcare workers concluded that 37% of healthcare workers were suffering from anxiety [25]. This is comparable to our results. It is to be noted that while our data were collected at the onset of the pandemic, this study was conducted from March to May 2020 when India was experiencing a rapid increase in COVID-19 cases culminating in a public health crisis worthy of making international headlines. It can be hypothesized that anticipation of a similar disaster would also have had an effect on anxiety levels amongst Pakistani healthcare workers, given that both countries share comparable population demographics, healthcare infrastructure, and sociopolitical dynamics. It can be hypothesized that as the pandemic evolved, the proportion of healthcare workers with clinical anxiety may have increased more than the levels reported in our study due to these events unfolding on the global healthcare front. Therefore it seems appropriate to advocate for continuous research regarding anxiety levels amongst this high-risk population to better quantify the extent of the problem and assess the actual impact of the COVID-19 pandemic on mental health.

Around 27.6% of respondents were found to be suffering from moderately severe or severe depression. There
was an association between gender and a monthly salary with the development of symptoms of depression. Although globally, the prevalence of depression is higher in females as compared to males [26], this is not the first time an association has been found between male healthcare workers and the presence of depressive symptoms. It is to note that direct contact with COVID-19 patients did not lead to a significant difference in the prevalence of depressive symptoms in healthcare professionals.

There is a stark contrast when comparing our results with the general global population, with the prevalence of moderate to severe depression reported at 4.5% [27]. Our results are comparable to prevalence rates of depression amongst the general Pakistani population [28]. Furthermore, healthcare workers working in other low-income countries such as Bangladesh (27-30%) and India (27%) have similar rates of depression [29-30].

Only one-fifth of healthcare professionals surveyed reportedly experienced good quality of sleep. Sleep disorders are not uncommon among healthcare workers, and growing reports range from 21-65.5% about the prevalence of sleep difficulties [31]. However, during the current COVID-19, they are at an even increased risk of mental health issues and sleep problems [32]. In our study, the reported prevalence of poor sleep quality was 81.9%, indicating an increase in sleep disturbances among healthcare workers during the pandemic. This conforms to a cross-sectional study conducted by Abdullah and Musa, which included physicians from different medical settings during the COVID-19 outbreak and confirmed a negative impact on participants' sleep during this time [33]. In another study, the prevalence of poor sleep quality during the pandemic was 78.8%, comparable to our results [31]. The finding that a higher monthly salary was associated with good sleep quality underscores the prevalence of economic stress caused during the pandemic.

There are, nevertheless, certain limitations to the study. It was conducted specifically with healthcare workers, so its results may not be generalizable to other professions. All the respondents were from Lahore, a metropolitan city. The results could reveal different anxiety levels, depressive symptoms, and sleep quality as compared to semi-urban areas where the healthcare facilities differ. Moreover, the design of the study was cross-sectional, so the results should be interpreted cautiously.

Conclusions
The present study reported a high incidence of anxiety levels, depressive symptoms, and poor sleep quality among the healthcare professionals working in SKMCH & RC Lahore during the COVID-19 pandemic. There was no significant difference between mental health scores for professionals directly involved in the care of COVID-19 patients as compared to those who were not. Prospective studies using experimental or longitudinal designs with an increased sample size should be conducted to examine the long-term psychological impact of the COVID-19 outbreak among healthcare workers in Pakistan. Further, continuing investigation of psychological consequences with regards to outbreaks of such life-threatening epidemics should be conducted on a routine basis as part of preparedness efforts globally.

Appendices
Table 6 shows the demographic details included in the questionnaire; Figures 1-3 show the Patient Health Questionnaire-9 score (PHQ-9), the Beck Anxiety Inventory (BAI), and the Pittsburgh Sleep Quality Index checklist (PSQI).

| Age | Gender | Profession | Marital status | Direct contact to COVID-19 | Diagnosed pre-existing mental health condition | Exempt from attending duties in hospital | Education level (select one) | Salary per month |
|-----|--------|------------|----------------|---------------------------|-----------------------------------------------|-----------------------------------------|----------------------|-----------------|
|     |        |            |                |                           |                                               |                                         | High school, college, undergraduate, Post-graduate | < 50,000 50,000-100,000 100,000-200,000 200,000-300,000 300,000-400,000 400,000-500,000 > 500,000 |

TABLE 6: Demographic details
**FIGURE 1: Patient Health Questionnaire-9**

| Over the past 2 weeks, how often have you been bothered by any of the following problems? (Use "○" to indicate your answer) | Not at all | Several days | More than half the days | Nearly every day |
|---|---|---|---|---|
| 1. Little interest or pressure in doing things | 0 | 1 | 2 | 3 |
| 2. Feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| 3. Trouble falling or staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |
| 4. Feeling tired or having little energy | 0 | 1 | 2 | 3 |
| 5. Poor appetite or overeating | 0 | 1 | 2 | 3 |
| 6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down | 0 | 1 | 2 | 3 |
| 7. Trouble concentrating on things, such as reading the newspaper or watching television | 0 | 1 | 2 | 3 |
| 8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual | 0 | 1 | 2 | 3 |
| 9. Thoughts that you would be better off dead or of hurting yourself in some way | 0 | 1 | 2 | 3 |

For items 1, 2, 3, 4, 5, 6, 7, 8, and 9, circle the number that best describes how often you have been bothered by this problem in the past 2 weeks.

Total Score: ___

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

| Not difficult at all | Somewhat difficult | Very difficult | Extremely difficult |
|---|---|---|---|

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.
Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

| Symptom                     | Not At All | Mildly but it didn’t bother me much | Moderately - it wasn’t pleasant at times | Severely - it bothered me a lot |
|-----------------------------|------------|------------------------------------|------------------------------------------|--------------------------------|
| Numbness or tingling        | 0          | 1                                  | 2                                        | 3                              |
| Feeling hot                 | 0          | 1                                  | 2                                        | 3                              |
| Weakness in legs            | 0          | 1                                  | 2                                        | 3                              |
| Unable to relax             | 0          | 1                                  | 2                                        | 3                              |
| Fear of worst happening     | 0          | 1                                  | 2                                        | 3                              |
| Dizzy or lightheaded        | 0          | 1                                  | 2                                        | 3                              |
| Heart pounding/racing       | 0          | 1                                  | 2                                        | 3                              |
| Unsteady                    | 0          | 1                                  | 2                                        | 3                              |
| Terrified or afraid         | 0          | 1                                  | 2                                        | 3                              |
| Nervous                     | 0          | 1                                  | 2                                        | 3                              |
| Feeling of choking          | 0          | 1                                  | 2                                        | 3                              |
| Hands trembling             | 0          | 1                                  | 2                                        | 3                              |
| Shaky / unsteady            | 0          | 1                                  | 2                                        | 3                              |
| Fear of losing control      | 0          | 1                                  | 2                                        | 3                              |
| Difficulty in breathing     | 0          | 1                                  | 2                                        | 3                              |
| Fear of dying               | 0          | 1                                  | 2                                        | 3                              |
| Scared                      | 0          | 1                                  | 2                                        | 3                              |
| Indigestion                 | 0          | 1                                  | 2                                        | 3                              |
| Pain / lightheaded          | 0          | 1                                  | 2                                        | 3                              |
| Face flushed                | 0          | 1                                  | 2                                        | 3                              |
| Hot/cold sweats             | 0          | 1                                  | 2                                        | 3                              |

**Column Sum**

**Scoring** - Sum each column. Then sum the column totals to achieve a grand score. Write that score here __________.

**Interpretation**

A grand sum between 0 – 21 indicates very low anxiety. That is usually a good thing. However, it is possible that you might be unrealistic in either your assessment which would be denial or that you have learned to “mask” the symptoms commonly associated with anxiety. Too little “anxiety” could indicate that you are detached from yourself, others, or your environment.

A grand sum between 22 – 35 indicates moderate anxiety. Your body is trying to tell you something. Look for patterns as to when and why you experience the symptoms described above. For example, if it occurs prior to public speaking and your job requires a lot of presentations you may want to find ways to calm yourself before speaking or let others do some of the presentations. You may have some conflict issues that need to be resolved. Clearly, it is not “panic” time but you want to find ways to manage the stress you feel.

A grand sum that exceeds 36 is a potential cause for concern. Again, look for patterns or times when you tend to feel the symptoms you have circled. Persistent and high anxiety is not a sign of personal weakness or failure. It is, however, something that needs to be proactively treated or there could be significant impacts to you mentally and physically. You may want to consult a physician or counselor if the feelings persist.

---

**FIGURE 2: Beck Anxiety Inventory**
Sleep Quality Assessment (PSQI)

What is PSQI, and what is it measuring?
The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates "poor" from "good" sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month.

INSTRUCTIONS:
The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

During the past month,
1. How often do you usually go to bed?
2. How long (in minutes) does it take you to fall asleep each night?
3. How long have you usually gotten up in the morning?
4. How many times did you wake up at night?
5. How many hours were you in bed?

During the past month, how often have you had trouble sleeping because you
Not during the past month (0) Less than once a week (1) Once or twice a week (2) Three or more times a week (3)
A. Cannot get to sleep within 30 minutes
B. Wake up in the middle of the night or early morning
C. Have to get up to use the bathroom
D. Cannot breathe comfortably
E. Cough or snore loudly
F. Feel too hot
G. Have bad dreams
H. Feel anxious
J. Other reason(s): please describe, including how often you have had trouble sleeping because of this reason(s):

6. During the past month, how often have you taken medicine (prescription or "over-the-counter") to help you sleep?
7. During the past month, how often have you had trouble staying awake while doing things, eating meals, or engaging in social activity?
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to do things?
9. During the past month, how would you rate your sleep quality overall?

Very good (0) Fairly good (1) Fairly bad (2) Very bad (3)

Scoring
Component 1  #5 Score
Component 2  #2 Score (c1<15min; 16-30min; 1; 31-60 min; >60min)  #1 Score (c2=0; 1; 2; 3; 4; 5)
Component 3  #4 Score (c3=0; 1; 2; 3; 4; 5)
Component 4  (total # of hours of sleep) x 100  #5 Score (c4=0; 1; 2; 3; 4; 5)
Component 5  (total # of hours of sleep)  #6 Score (c5=0; 1; 2; 3; 4; 5)
Component 6  #7 Score (c6=0; 1; 2; 3; 4; 5)
Component 7  Global PSQI

A total score of *5* or greater is indicative of poor sleep quality. If you scored *5* or more it is suggested that you discuss your sleep habits with a healthcare provider.

Additional Information

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. Institutional Review Board of Shaukat Khanum Memorial Cancer Hospital and Research Center issued approval IRB-20-14. IRB Review Process of Shaukat Khanum Memorial Cancer Hospital and Research Center is in compliance with ICH-GCP Guidelines. Animal subjects: All authors have confirmed that this study did not involve animal subjects or tissue. Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. WHO COVID-19 dashboard. (2022). Accessed: September 4, 2022: https://who.sprinklr.com/.
2. Huang Y, Zhao N: Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry Res. 2020, 288:112954.
3. Kang P, Lu Y, Hao L, et al.: Psychological consequences and quality of life among medical rescuers who responded to the 2010 Yushu earthquake: A neglected problem. Psychiatry Res. 2015, 230:517-23. 10.1016/j.psychres.2015.09.047

4. Mauder R, Hunter J, Vincent L, et al.: The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. CMAJ. 2005, 168:1245-51.

5. Xiao H, Zhang Y, Kong D, Li S, Yang N: The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. Med Sci Monit. 2020, 26:e923549. 10.12659/MSM.923549

6. Lange T, Dimitrov S, Born J: Effects of sleep and circadian rhythm on the human immune system. Ann N Y Acad Sci. 2010, 1193:48-59. 10.1111/j.1749-6632.2009.05250.x

7. Schernhammer ES, Colditz GA: Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). Am J Psychiatry. 2004, 161:2295-302. 10.1176/appi.ajp.161.12.2295

8. Safa M, Khalilzadeh S, Talischi F, Alizadeh S: Correlation of anxiety-depression and sleep quality in mothers of children with cystic fibrosis and asthma. Tarafuros. 2012, 11:44-8.

9. Oh CM, Kim HY, Na HK, Cho KH, Chu MK: The effect of anxiety and depression on sleep quality of individuals with high risk for insomnia: a population-based study. Front Neural. 2019, 10:849. 10.3389/neur.2019.00849

10. Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP: Mental health survey of medical staff in a tertiary infectious disease hospital for COVID-19 [article in Chinese]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2020, 38:192-5. 10.3760/cma.j.cn121094-20200219-00063

11. Lai J, Ma S, Wang Y, et al.: Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw. Open. 2020, 3:e2003976. 10.1001/jamanetworkopen.2020.3977

12. Indu PS, Anilkumar TV, Vijayakumar K, Kumar KA, Sarma PS, Remadevi S, Andrade C: Reliability and validity of PHQ-9 when administered by health workers for depression screening among women in primary care. Asian J Psychiatr. 2018, 37:10-4. 10.1016/j.ajp.2018.07.021

13. Ahmad S, Hussain S, Akhtar F, Shah FS: Urdu translation and validation of PHQ-9, a reliable identification, severity and treatment outcome tool for depression. J Pak Med Assoc. 2018, 68:1166-70.

14. Fydrich T, Dowdall D, Chambless DL: Reliability and validity of the Beck Anxiety Inventory. J Anxiety Disord. 1992, 6:55-61. 10.1016/0887-6185(92)90026-4

15. Hashmi AM, Khawaja IS, Butt Z, Umair M, Naqvi SH, Jawad-U-Haq: The Pittsburgh Sleep Quality Index: validation of the Urdu translation. J Coll Physicians Surg Pak. 2014, 24:123-6. 0.2014/JCPSP.123126

16. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ: The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989, 28:195-213. 10.1016/0165-1781(89)90047-4

17. Khan MS, Bawany FI, Khan A, Shah SB, Lashari MN: Risk assessment for obstructive sleep apnea and anxiety in a Pakistani population with coronary artery disease. Sleep Breath. 2015, 19:291-6. 10.1007/s11325-014-0108-5

18. Alvi T, Assad F, Aurangzeb, Malik MA: Anxiety and depression in burn patients. J Ayub Med Coll Abbottabad. 2009, 21:137-41.

19. Sikander S, Lazarus A, Bangash O, et al.: The effectiveness and cost-effectiveness of the peer-delivered Thinking Healthy Programme for perinatal depression in Pakistan and India: the SHARE study protocol for randomised controlled trials. Trials. 2015, 16:534. 10.1186/s13063-015-1063-9

20. Sikander S, Ahmad I, Atif N, et al.: Delivering the Thinking Healthy Programme for perinatal depression through volunteer peers: a cluster randomised controlled trial in Pakistan. Lancet Psychiatry. 2019, 6:128-36. 10.1016/S2215-0366(18)30467-X

21. Surani AA, Zahid S, Surani A, Ali S, Mubeen M, Khan RH: Sleep quality among medical students of Karachi, Pakistan. J Pak Med Assoc. 2015, 65:380-2.

22. Riaz B, Rafai WA, Ussaid A, et al.: The psychological impact of COVID-19 on healthcare workers in Pakistan. JAYA. 2021, 1:89-98. 10.7861/fhj.2020-0193

23. Mahmood QK, Jafree SR, Jaliil A, Nadir SM, Fischer F: Anxiety amongst physicians during COVID-19: cross-sectional study in Pakistan. BMC Public Health. 2021, 21:118. 10.1186/s12889-020-10134-4

24. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P: Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. Brain Behav Immun. 2020, 88:901-7. 10.1016/j.bbi.2020.05.026

25. Gupta S, Prasad AS, Dixit PK, Padmakumari P, Gupta S, Abhisheka K: Survey of prevalence of anxiety and depressive symptoms among 1124 healthcare workers during the coronavirus disease 2019 pandemic across India. Med J Armed Forces India. 2021, 77:S404-12. 10.1016/j.mjafi.2020.07.006

26. Ford DE, Erlinger TP: Depression and C-reactive protein in US adults: data from the Third National Health and Nutrition Examination Survey. Arch Intern Med. 2004, 164:1010-4. 10.1001/archinte.164.9.1010

27. Dattani S, Hannah H, Roper M. ‘Mental Health’. (2021). Accessed: September 4, 2022: https://ourworldindata.org/mental-health

28. Mizra I, Jenkins R: Risk factors, prevalence, and treatment of anxiety and depressive disorders in Pakistan: systematic review. BMJ. 2004, 328:794. 10.1136/bmj.328.7445.794

29. Tasnim R, Sujian MS, Islam MS, et al.: Prevalence and correlates of anxiety and depression in frontline healthcare workers treating people with COVID-19 in Bangladesh. BMC Psychiatry. 2021, 21:271. 10.1186/s12888-021-02545-4

30. Singh RK, Bajpai R, Kawsan P: COVID-19 pandemic and psychological wellbeing among health care workers and general population: A systematic-review and meta-analysis of the current evidence from India. Clin Epidemiol Glob Health. 2021, 11:100737. 10.1016/j.cegh.2021.100737

31. Abbas A, Al-Otaibi T, Gheith OA, Nagib AM, Farid MM, Walaa M: Sleep quality among healthcare workers during the COVID-19 pandemic and its impact on medical errors: Kuwait experience. Turk Thorac J. 2021, 22:142-8. 10.7512/TurkThoracJ.2021.20245
52. Fiorillo A, Gorwood P: The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. Eur Psychiatry. 2020, 63:e32. 10.1192/j.eurpsy.2020.35
53. Abdullah DM, Musa DH: Insomnia and stress of physicians during COVID-19 outbreak. Sleep Med X. 2020, 2:100017. 10.1016/j.sleepx.2020.100017