Abstract

The COVID-19 pandemic has resulted in a significant loss of human life throughout the world, and it poses an unprecedented threat to public health, food systems, and the workplace. COVID-19 has a significant impact on our lives right now; in addition to physical health, it has an influence on human mental health, particularly among medical personnel.

Mental health status of laboratory technician participated in the fight against COVID-19 in Hanoi

These authors contributed equally to this work.

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For more than a year, the COVID-19 epidemic has been wreaking havoc on all parts of society, including the economy, culture, and, most importantly, human health, both physically and psychologically. Mental health is a relatively new topic that has received very less attention but plays a critical role in our lives. It is currently being impacted significantly by the COVID-19 pandemic, and we should pay more attention to it, particularly among frontline doctors fighting the epidemic, including laboratory technicians. We evaluated the mental health of this representative sample of participants in this study, paying special attention to additional impact variables such as emotional control, ability to deal with obstacles and demands, ability to develop and sustain relationships, and job interest. Discovered that specialists at the National Institute of Hygiene and Epidemiology, particularly those in specialized departments, suffer from mental health issues, with the fundamental competencies described above having a significant impact on how they manage their mental health.

Keywords: Mental health; COVID-19; laboratory technician; Hanoi.

Introduction

The COVID-19 pandemic has resulted in a significant loss of human life throughout the world, and it poses an unprecedented threat to public health, food systems, and the workplace. COVID-19 has a significant
impact on our lives right now; in addition to physical health, it has an influence on human mental health, particularly among medical personnel.

“The current study found to support that the medical staff unfolded greater fear, anxiety, and depression than the administrative staff. Moreover, the front-line medical staff working in the department of respiratory, emergency, ICU, and infectious disease, were twice more likely to suffer anxiety and depression than the non-clinical staff with the hard possibility to contact with coronavirus pneumonia patients.” (Lu et al., 2020).

The impact factors that they found were “Being isolated, working in high-risk positions, and having contact with infected people are common causes of trauma. These factors may have impacted medical and nursing staff in Wuhan, leading to mental health problems.” (Kang et al., 2020)

The author also conducted a study based on gender, age, marriage, education level, occupation, and department to identify several factors that may influence doctors’ mental health. In conclusion, the variables that contributed to mental health issues among healthcare workers have increased, and some new effects have emerged, but the major causes were the working environment, pressures, and overworked.

However, none of the studies above indicated much about the mental health of laboratory technicians who are in charge of the COVID-19 screening and testing process, as well as having direct contact with the infection source and playing an important role in the prevention and treatment of COVID-19. And since the COVID-19 situation differs from country to country, the impact on the mental health of healthcare workers varies, including in Vietnam, conducting research on the mental health status of laboratory technicians in Vietnam can provide new perspectives and knowledge in the field of mental health care worldwide.

So, during the COVID-19 pandemic, our goal is to conduct theoretical research and questionnaires on the mental health of laboratory technicians at the National Institute of Hygiene and Epidemiology, the deputation of the laboratory technicians who participated in the fight against COVID-19, to identify their mental state, factors influencing mental health status and make recommendations to improve the mental health of medical personnel at the National Institute of Hygiene and Epidemiology.

Methods

Theoretical study

Systematization of theoretical bases for medical staff’s mental health in the National Institute of Hygiene and Epidemiology during the COVID-19 pandemic, including the definition of mental health and its manifestations, the impact factors that can influence the mental state based on previous research, and press releases from the American Psychology Association (APA) and the World Health Organization (WHO).

Questionnaires measurement

We used questionnaires that were built based on the theoretical about mental health, the effect factors of it, and through referring scales of the mental health’s manifestations to assess mental health status, the ability to control emotions, the ability to deal with challenges and demands, the ability to form and maintain relationships, and interest in work. According to the findings of literature analysis, the Depression, Anxiety, and Stress Scale (DASS) is the most effective scale for assessing the mental health of healthcare workers in other countries affected by pandemics. DASS, on the other hand, meets the criterion for assessing three characteristics that this study focused on. Translate the scales to Vietnamese, organize the items to fit with the purpose of the research, consult experts such as MSc. Tran Thi Hai Yen, has a sample survey of 30 participants to measure the reliability and validity and the survey was qualified to use with With Cronback’s alpha value > 0,7 (0,93), the scale ensures reliability, can be used to measure the research’s goals.
The mental health questionnaire measures some additional demographics information and 3 manifestations including 42 items, each item got 4 answers. The average score was then categorized into 4 groups: Normal mental health status at 0 – 0.75; Suffer mild disorder in their mental health status at 0.75 – 1.5; Suffer moderate disorder in their mental health status at 1.5 – 2.25 and suffer severe disorder in their mental health status at 2.25 - 3. From February 21st to March 7th, 2021, the survey was sent to Hanoi’s National Institute of Hygiene and Epidemiology using Google Form. We had 130 respondents who were given questionnaires, 117 of whom returned completely filled out and analyzable, giving us a response rate of 90% (n=117), the demographic information be performed in Table 1.

Using scale

The PSQI assesses several distinct elements of sleep by utilizing a modified Pittsburgh Sleep Quality Index (PSQI) developed by Bach Mai Hospital in Hanoi, which consists of 19 items and offers seven component scores and one composite score. Each item is rated on a 0–3 scale. The sum of the seven component scores generates the global PSQI score, which ranges from 0 to 21, with lower values indicating better sleep quality and higher values indicating a sleeping problem.

Statistics analyze

We used the Statistical Package for the Social Sciences (SPSS, version 27.0) software to analyze the data. The frequency distribution was used to describe qualitative factors, whereas the mean and standard deviation were used to explain quantitative ones. Also to see the correlations between the mental health status and the other factors that can affect it.

Results

Theoretical basis

In this research, we are working on the definition of the mental health of medical staff in National Institute of Hygiene and Epidemiology during the COVID-19 pandemic is

“A state of mind characterized by emotional well-being good, behavioral adjustment, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relationships and cope with the ordinary demands and stresses of life” (VandenBos et al., 2007)

By people whose job is to protect and improve the health of their communities in National Institute of Hygiene and Epidemiology (NIHE) during the pandemic, the disease caused by a new coronavirus called SARS-CoV-2.

Our progress on researching the reality of the mental health of healthcare professionals in the National Institute of Hygiene and Epidemiology through three manifestations: the ability to manage emotions, the ability to deal with challenges and demands, and the ability to maintain interest in the COVID-19 pandemic are based on the theoretical foundation we have outlined above, as well as the complicated situation of the COVID-19 pandemic. We also look at the impact of four factors: sleeping quality, emotional regulation, interest retention, and the capacity to deal with demands and obstacles.

Practical mental health status

There are 100 persons with normal mental health status (85.5%), 16 individuals with mild mental health status (13.7%), and 1 person with moderate mental health status (0.9%) among the 117 responses. The results of the mental health status of healthcare workers at the National Institute of Hygiene and Epidemiology...
were calculated and have an average of $0.34 \pm 0.34$; the average score is not very separated, but the results returned have the unity we're looking for; which falls within the range of having normal mental health status. To find out more, we calculated the data of 13.7% of people with mild disorders and 0.9% of those with moderate disorders in their mental health condition. We also discovered that their mental health average score is 1.02, indicating that they have a minor problem.

In the next part, we evaluate the sleeping quality of the healthcare workers in the National Institute of Hygiene and Epidemiology, there are 38 people who don’t have sleeping disorders (32.5%) and 79 people with a sleeping disorder, which takes 67.5%.

We don’t monitor every mental health symptom; instead, we evaluate the disorder of those manifestations based on the reality that only a minor percentage of people suffer from mental illness. The ability to maintain interest in work and relationships, as well as the ability to control emotions, are both rated with the same percentages on the rating scale. They each had 103 individuals on the normal scale, with 9 persons having mild disorders in both skills, 4 having moderate disorders, and just 1 having severe disorders. None of the disorders were described as being extremely severe, further more data be displayed in Table 2.

On the other hand, the ability to deal with challenges and demands revealed a different result: 98 persons scored normal, accounting for 83.8% of the total, while 4 persons were identified as having a minor condition. There are 12 persons on the scale of moderate disorder, which is three times greater than the other two abilities, which each took 10.3%. Two persons are said to be suffering from serious disorders, and 1 is said to be suffering from a very severe disorder in their ability to cope with challenges and demands.

**Affect factors of the mental health status**

In the National Institute of Hygiene and Epidemiology, demographic variables had no statistically significant influence on the mental health of healthcare professionals. This is reflected in the comparison outcomes, which demonstrate that there is no statistically significant difference in mental health across participants of different genders, ages, marital status, and frequency of exposure to different infections.

The results of the National Institute of Hygiene and Epidemiology’s assessment of the correlations between psychological factors: emotional control, ability to complete challenges and demands, ability to maintain interest in work and relationships, and sleep quality with the mental health of medical staff are positive and high. The majority of the capacity to manage emotions, fulfill difficulties and demands, and retain an interest in work are all high, and the average mental health score is also high.

When we compare the average score of mental health status among departments, we discover that there are statistically significant differences in mental health status across function units, service units, and specialized units. Specialize units are higher than function and service units. We performed another comparison on the factors that impact mental health status since the average scores of mental health status between departments differed statistically significantly. The first is the ability to manage emotions; the specialty unit has the greatest score in this area, with a score of 6.73, followed by the service unit, which receives a score of 5.95.

The psychological elements of these 14.8 percent of persons with mental health problems have an impact, which includes the ability to control emotions, the ability to complete challenges and demands, and the capacity to retain an interest in work and relationships. The first skill shows just average connections with a mental health state, while the next two are both strong and favorable.

**Discussion**

The mental health of healthcare workers at the National Institute of Hygiene and Epidemiology is generally good and steady, with just a limited percentage of employees experiencing mental health issues during the
COVID-19 pandemic.

The following factors have a positive correlation with the mental health of healthcare workers in the National Institute of Hygiene and Epidemiology: the ability to complete challenges and demands; ability to maintain interest in work and relationships; and ability to manage emotions of healthcare workers in the National Institute of Hygiene and Epidemiology. If the medical personnel at the National Institute of Hygiene and Epidemiology improves their competence in these four areas, their mental health will improve as well.

The predictability of these 3 factors to the quality of mental health of healthcare workers in National Institute of Hygiene and Epidemiology is: The ability to complete challenges and difficulties is the best predictor of quality of mental health belong to healthcare workers in National Institute of Hygiene and Epidemiology; The ability to maintain interest, work, and ability of emotional management have equal chance to predict the quality of mental health of healthcare workers in National Institute of Hygiene and Epidemiology. The forecast rate exceeding 50% (51.4%) is considered reliable.

The quality of mental fitness of healthcare workers at the National Institute of Hygiene and Epidemiology is negatively correlated with the sleep disturbance factor of healthcare workers in the National Institute of Hygiene and Epidemiology. The predictability, in particular, is exceptionally high. This shown that if the sleep quality of healthcare professionals at the National Institute of Hygiene and Epidemiology is not assured, the mental health of healthcare workers at the National Institute of Hygiene and Epidemiology will suffer considerably. A forecast rate of higher than 50% also indicates the forecast’s reliability. The fit of the above prediction model is very high (with $R^2 = 1$) and significant statistical meaning.

**Conclusion**

During the COVID-19 pandemic, the reality of the mental health status of medical personnel at the National Institute of Hygiene and Epidemiology was as follows: 85.5% have a normal mental health status, 16.7% have a mild mental health problem, and 0.9% have a moderate mental health problem. The ability to control emotions is a reflection of mental health issues.

The employment features and shifting working conditions, as well as the working schedule, impacted the mental health of medical personnel at the National Institute of Hygiene and Epidemiology during the COVID-19 pandemic, resulting in all of the psychological repercussions. The loss of emotional control, the ability to deal with problems, demands, and the capacity to develop and maintain relationships, as well as a lack of enthusiasm in work, all contributed to a decline in the mental health of medical personnel at the National Institute of Hygiene and Epidemiology.

To summarize, the medical personnel at the National Institute of Hygiene and Epidemiology has an average rate of normal mental health statuses during the COVID-19 period, but some of the staff in the specialized unit and service unit have a mild disorder with all three of the abilities listed above, and their sleeping qualities are also affected.

So here are some suggestions for the National Institute of Hygiene and Epidemiology for enhancing the mental health of medical workers. To improve and develop the mental health of healthcare workers at the National Institute of Hygiene and Epidemiology, we should do so in conjunction with: increasing their ability to complete challenges, demands, maintaining interest in work and relationships, managing emotions, and improving their sleep quality. The model forecasting focuses in particular on boosting participant resilience to severe situations.

On the other hand, with complicated developments, the COVID-19 pandemic has not shown any signs of ending, medical staff at the National Institute of Hygiene and Epidemiology will continue to face challenges, difficulties, pressures, and sleep quality will continue to not be guaranteed then the development of psychological difficulties is a consequence in our near future. Therefore, we recommend:
• Immediate intervention on mental health is needed for the specialized department and the group in which the disorder is present. The content of the intervention focuses on increasing the ability to deal with challenges and demands and increase the quality of sleep for the participants.
• Each individual needs to take care of their physical health on their own, especially taking care of the sleeping quality.
• The National Institute of Hygiene and Epidemiology needs a long-term strategy on job assignment, working schedule, and environments, especially policies and support to ensure resting time for employees.

Data Availability Statement
The dataset compiled for this study is available on reasonable request to the corresponding authors.

Ethics Statement
The studies involving human participants were reviewed and approved by the National Institute of Hygiene and Epidemiology. The ethics committee waived the requirement of written informed consent for participation.

Conflict of Interest
All authors declare that they have no conflicts of interest.

Financial Disclosure
There are no financial conflicts of interest to disclose.

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References:
Table 1. Demographic characteristic of research participants
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<th>Quantity (n)</th>
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<tr>
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<td>Service unit</td>
<td>57</td>
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<tr>
<td>-------------------------------</td>
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<td>Group of people who</td>
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Table 2. Rating scale and situation of abilities disorders in among healthcare workers in National Institute of Hygiene and Epidemiology