

Analyses of Mental Disorders of Frontline and Non-frontline Medical Workers

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ABSTRACT

In 2019, the COVID-19 caused a worldwide pandemic. Besides pneumonia, mental disorders were also affecting the general public, especially the medical workers. This study mainly focuses on the comparison between frontline and non-frontline health personnel by analyzing the previous research about the topic and integrating the data. Relevant 25 articles studying 15182 personnel in medical service are included. To find associated factors, this study considered age, gender and whether working at the frontline from different perspectives. The result shows that the non-frontline workers have more risk in anxiety, fear, and professional stress, while the frontline personnel have more risk in depression, PTSD, and ammonia. Female medical workers have much more risk in being affected by mental disorders during the pandemic.

Keywords: *COVID-19, Depression, Medical workers, Anxiety*

1. INTRODUCTION

In 2019, beginning in Wuhan, China, a worldwide disaster spread across the continents, threatening people's lives. Although the mortality of the virus is much lower than SARS 2003, this epidemic influences a much broader range of people, spreading across the earth. Moreover, because of the continuous mutation, the existed vaccine cannot fully prevent infection, causing the pandemic to last over 2 years till now. In such circumstances, the risk of stress and anxiety becomes a serious problem that affects the general public, especially medical workers. In this case, besides fighting against the pandemic, the mental health problems of the public also draw consideration. Depression is a prevailing disease in modern society disrupting the daily lives of people, while mild depression, which is more common than major depression, can cause pervasive mood change, loss of energy, sleep problems and so on. Anxiety is another common mental problem that affects the public, causing mood disorders, feeling weak, trembling, experiencing GI problems and so on. Since conic pressure is one of the main causes of both the former disorders, during the pandemic, stress is also an important aspect of people's mental health.

Current analyses of people's depression and anxiety during the pandemic mainly focus on the frontline healthcare workers and the patients, but the non-frontline

healthcare workers draw less attention. For instance, a meta-analysis by Luise J. Froessler and Yazan Abdeen in America carefully measured several mental conditions and the possible factors [1], and the medical researchers around the world started conveying studies on the subject. Although there are some articles that analyze the differences between the pressure on front-line and non-frontline workers, the results are always different and cause debates. The frontline medical staff are identified by whether they have direct contact with the patients, and the non-frontline medical workers often include the nurses, doctors, as well as regular staff in hospitals from irrelevant departments and administration offices.

Thus, this article mainly analyzes the depression and stress of healthcare workers of frontline and non-frontline by reviewing the existing studies, and gives suggestions about further measures of the mental health of healthcare workers. Three sections will be concluded in this study: an introduction, a methodology which presents the process and results from statistics, and a discussion which further develops the topic. Nowadays, the mental health of front-line workers has already received much attention, but the mental health of non-frontline workers is still ignored to some degree. Through more studies done on the non-frontline workers, the Sanitation Department can make corresponding changes to support the non-frontline workers, who also

take over much of the work from the frontline workers, and contribute a lot to the recovery from the pandemic.

2. METHODOLOGY

2.1. Brief Description

This passage collects data from existed articles by searching on the Internet. The literature includes multiple aspects of researches about different medical workers, mental diseases, and study methodologies. The papers are carefully filtered by scanning the methods and results in these studies, which is the essential part of an article. After selecting the studies online, all the information is listed in an Excel form, and sorted the articles to with different standards. Different from other meta-analysis about the mental illness of frontline and second line medical staff, this article also considered the difference in department, which can also be divided into frontline department and non-frontline department.

2.2. Defining related concepts

To better define the difference between the health personnel, this paper reviews many previous articles that compare the difference of front-line and non front-line medical personnel. Therefore, the definition of front-line staff is shown in the introduction. The front-line departments include emergency doctors, intensive care medical staff and clinicians, anesthesiologists, intensive care personnel, ICU staff and ambulance personnel, while some public service providers, pediatric nurses, general and comprehensive plastic surgery residents, gynecologists and obstetricians and surgeons.

2.3. Article acquisition and analyse

2.3.1 Collection

The articles to be analyzed are collected from PubMed, Science Direct, and SSRN, highly professional academic database. On these websites, studies about the mental diseases of medical workers during the COVID-19 epidemic are selected and filtrated by different collections of keywords and scanning. Although multiple researchers have been working on the mental conditions of hospital employees, some studies are outdated, ragged, or misinterpreted.

Frontline workers are distinguished from non-frontline workers by their direct and frequent attachments to COVID patients, whereas non-frontline workers have no direct or accidental attachments to the patients. Firstly, the publication time of the studies is limited to the past 2 years, in order to identify the most recent epidemic. Secondly, the searching words are selected mainly from two categories: medical workers and mental disorders. For instance, “frontline nurse” will

be inputted with “PTSD”, “depression”, or “PTSS” to make the search result more diverse. Third, the final data should be selected from high or median quality papers, so most of the articles in the database are from the top “download” or “quote” list. Browsing studies from different websites, and collecting 21 articles, including 8 about frontline medical workers, 6 about non-frontline medical workers, and 7 about both is the main step.

2.3.2 Data

The data is from 21 articles [2]-[22] written by researchers from more than 12 countries (Cluj-Napoca, Romania, America, France, Italy, China, Bilith, Japan, Turkey, Swidden, England, Norway), including 2 articles collecting data from the International Internet [12][13], mainly focused on the mental disorders of medical workers. Except for several articles collected that didn't give the information for calculating the overall age [2] [3] [8] [10] [12] [13] [16] [17] [19], the average age of the total sample is 39.56, and other information about the age of part of the sample also reveals the main age range from 30 to 50. While some articles give the exact size of the sample with possible mental disorders, other articles only compare their statistics based on the average score of the rating scales between two groups of people divided by certain factors.

2.3.3 Relevant standards

The rating scales used for determining depression rates are: Hospital Anxiety and Depression Scale (HADS) (cutoff score >7), Beck Depression Inventory (BDI) (level 0-63), Patient Health Questionnaire-9 (PHQ-9) (level 0-3), 21-item Depression, Anxiety and Stress Scale (DASS-21), and Goldberg Anxiety and Depression Scale (GADS) (cutoff score >2). The rating scales used for determining anxiety rate are: HADS, Generalized Anxiety Disorder Seven-Item (GAD-7) (level 0-3), and DASS-21, GADS (cutoff score >5). The rating scales used for determining PTSD possibilities are: Peritraumatic Dissociation Questionnaire (PDEQ) (cutoff score >15), and Post Traumatic Symptom Scale (PTSS-10) (cutoff score >12.5).

The rating scales used for determining stress degree are: Stress NRS-11 scale (level 0-10), Diagnostic and Statistical Manual of Mental Disorders (DSM-5), DASS-21, Effort Reward Imbalance (ERI) (level 7-28), and Perceived Stress Scale (PSS) (level 0-56). The rating scale used for determining suicidal ideation is Brief Symptom Inventory (BSI). The rating scales used for determining ammonia are: Sleep Condition Indicator (SCI) (cutoff score >16), and 7-item Insomnia Severity Index (ISI) (level 0-28). The rating scale used for determining COVID-19 phobia is COVID-19 Phobia Scale (C19P-S) (level 0-5). The rating scales used for

determining burnout degree are: Stanford Professional Fulfillment Index (PFI).

Since the medical workers are among those who have the most attachments to the COVID-19 patients, mental analysis of these positions is gigantic. The studies found include multiple professions, which can be categorized into 5 kinds of specialized frontline professions (emergency physicians, ICU staff, ambulance personnel, Anesthetist-intensivists, and critical care healthcare workers) in 9 articles, 5 kinds of specialized non-frontline professions (pediatric nurses, general plastic surgery residents, surgeons, obstetricians, and gynecologists) in 4 articles, and some general professions including both frontline and non-frontline medical workers. Since it had long been recognized that the comment mental problems like depression and anxiety are more likely to affect female instead of male. All papers that have analyzed the difference in prevalence rates and scale scores based on gender found more female possibility in mental problems than male, except those three articles that only studied a single gender [17], or didn't consider the gender issue [10] [20].

3. RESULT AND DISCUSSION

3.1. The influence of gender

There are about 64.46% (9787/15182) females in the total sample, including 15182 personnel. The anxiety rate in females is 44.53% (2287/5136), and that in males is 29.61% (421/1422). The depression rate in female is 41.53% (2133/5136), and that in males is 29.18% (415/1422), and the average score of BDI is 16 in female and 16.2 in males [9]. The rate of having possible PTSD in females is 38.15% (847/2220), and that in males is 20.64% (259/1255). The stress rate in females is 43.12% (1238/2871), and that in males is 34.40% (291/846). The average score of PSS is 31.5 in females and 31.2 in males [9], and average score of Stress NRS-11 scale is 7.51 in females and 6.71 in male [20]. In this case, female medical workers have much more risk in being affected by mental disorders (as shown in table 1).

Table 1. Gender Difference in Mental Disorders

	Female	Male
n	9787.00	5395.00
Anxiety	44.53%	29.61%
Depression	49.53%	29.18%
BDI(AVG)	16.00	16.20
Possible PTSD	38.15%	20.64%
Stress	43.12%	34.40%
PSS(AVG)	31.50	31.20
Stress NRS-11(AVG)	7.51	6.71

3.2 The influence of frontline or non-frontline

Besides gender, the main focus of the passage is whether the frontline and non-frontline can impact the mental conditions of medical workers during pandemic. Although the relationship between close attachment to COVID patients and the possibility of mental disorders in hospital staff has been researched by many studies, the results vary. In the database, there are 9986 frontline workers, and 5196 non-frontline workers. The depression degree has a great difference : the frontline 35.46% (2554/7203), non-frontline 19.55% (501/2563).

The same result is found in the measure of possible PTSD symptoms: frontline 29.57% (1049/3547), non-frontline 27.32% (403/1475), and among those who use the PHQ-9 to score the depression rate, the average score is 4.9 in frontline workers and 4.0 in non-frontline workers. The rates of ammonia in the frontline and non-frontline are 66.80% (499/747) and 58.33% (7/12), and the medium number of ISI-7 is 6.0 in frontline workers and 4.0 in non-frontline workers. The possibility of fearing COVID-19 is measured by C19P-S at 50.30 in frontline workers and 50.01 in non-frontline workers. However, the opposite result appears in the measure of anxiety: frontline 38.11% (2745/7203), non-frontline 39.83% (1050/2636). The rates of high-level stress in frontline and non-frontline are 38.93% (2102/5399) and 43.26% (834/1928). Therefore, the non-frontline workers have more risk in anxiety, fear, and professional stress, while the frontline personnel have more risk in depression, PTSD, and ammonia (as shown in table 2).

Table 2. The effect of frontline or non-frontline on medical workers' mental disorders

	Frontline	Non-frontline
n	9986.00	5196.00
Depression	35.46%	19.55%
Possible PTSD	29.57%	27.32%
PHQ-9(AVG)	4.90	4.00
Ammonia	66.80%	58.33%
ISI-7	6.00	4.00
Anxiety	38.11%	39.83%
Stress	38.93%	43.26%
C19P-S(AVG)	50.30	50.01

4. CONCLUSION

This study analyzed 23 articles in order to provide an overall view for the health administrative department to manage the psychological assistance of health workers in the future. During the epidemic period, the psychological status of health workers should receive higher attention than the general public. Although the COVID-19 pandemic has already been through the harshest period,

the risk of future outbreaks still exists, so this work still needs further attention.

In this article, frontline and non-frontline medical workers both have the dominant mental disorder. On the one hand, the front-line medical staff have a higher attachment to COVID-19 infected people, which means that they are at higher risk of infection with COVID-19 and are more concerned in the special period. To keep the virus from spreading to the public, the doctors and nurses who have direct communication with the patients also need to be isolated, creating mental pressure and isolation from family and friends. On the other hand, the non-frontline personnel, though they never need to treat the already known patients, the unknown of getting access to the virus makes them more anxious, as the hospital and health centers have the highest COVID possibility. Females also need more attention during the pandemic, since their mental conditions are less stable than males. Most of the female workers in the medical domain are nurses who need to take care of the daily lives of patients and have more contact with them than other professions. This study is only basic research on a few factors that could have affected the mental condition of medical staff. In order to prevent mental illness, more research is needed to determine the exact causes of mental illness rather than related factors.

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