Egyptian Journal of Community Medicine

Psychological Profile of Front Line versus Non- Front Line Hospital Waste Disposal Workers during the Outbreak of COVID-19

Raghda A. Elshamy[1] *; Nahla A. Zaitoun [2]; Al Zahraa M. Soliman[1]

1 Department of Community, Environmental and Occupational Medicine, Faculty of Medicine, Zagazig University, Zagazig, Egypt
2 Department of Family Medicine, Faculty of Medicine, Zagazig University, Zagazig, Egypt

ABSTRACT

Background: Hospital waste disposal workers are vulnerable subgroup of front-line health care workers, and are at a significant danger of catching any infection. **Objective:** The purpose of this study was to determine psychological problems among hospital waste disposal workers during the outbreak of COVID-19. **Method:** A comparative cross-sectional study was conducted among 120 frontline hospital waste disposal workers handling any type of medical waste during COVID-19 versus 120 non-frontline academic departments' waste disposal workers. Data was collected using semi- structured questionnaire covering sociodemographic and occupational characteristics, the clinical picture of COVID-19 infection, COVID-19 related knowledge, and psychological problems including Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire (PHQ-9) and General Health Questionnaire (GHQ). **Results:** One hundred and twenty frontline hospital waste disposal workers versus 120 academic workers showed no significant difference regarding demographic factors. As regard mental disorders, frontline waste disposal workers experienced anxiety and depression more than other group (P-value<0.001). Binary logistic regression analysis for different factors affecting existence of anxiety and depression, showed that higher education level, 24 working hours/day, more than 10 shifts per month and good COVID-19 related knowledge were risk factors for anxiety, depression, social dysfunction and loss of confidence. On the other side, age ≥32 years was a protective factor for both anxiety (AOR 0.13) and depression (AOR 0.06) while usage of Personal Protective Equipment (PPE) (AOR 0.006) was a protective factor for social dysfunction & loss of confidence. **Conclusion:** Frontline hospital waste disposal workers had a risk of psychological problems during outbreaks.

INTRODUCTION

Workers in various occupations are affected because of their exposure to different types and varying degrees of Occupational hazards. Hospitals are highly risky places as hospital workers are exposed to a variety of occupational hazards (physical, chemical, biological, ergonomic and psychological) that may endanger their health and safety.[1]

COVID-19 outbreak began in Wuhan, China, in December. **(**COVID-19 outbreak was defined as a pandemic by the World Health Organization (WHO) in March 2020 due to the virus's rapid global spread.

At of the time of writing (December 2022), more than 600 million verified COVID-19 cases and more than 6.5 million fatalities have been documented globally.[2] Unprecedented public health problems brought on by COVID-19's rapid spread have an impact on people's health, safety, and well-being as well as those of their communities. These consequences might cause a variety of mental health (MH) problems in both the affected individuals and

Corresponding Author: Raghda A. Elshamy, Department of Community, Environmental and Occupational Medicine, Faculty of Medicine, Zagazig University, Egypt. Email: aliraghda95@gmail.com

Table 1: Demographic data of the studied groups

Characteristics	Frontline No=120 (%)	Non-Frontline No=120 (%)	P-value
Age			
Mean ± SD	33.7±5.9	34.1±6.1	
Range	(21-57)	(21-59)	
• <32 years (median)	68 (56.7)	55 (45.8)	0.09^
• ≥32 (median)	52 (43.3)	65 (54.2)	
Sex			
• Male	75 (62.5)	61 (50.8)	0.06^
• Female	45 (37.5)	59 (49.2)	
Marital status			
• Un-married	39 (32.5)	32 (26.7)	0.30^
• Married	81 (67.5)	88 (73.3)	
Education			
• Illiterate	29 (24.2)	35 (29.2)	
• Primary	51 (42.5)	54 (45.0)	0.40^
• Secondary or higher	40 (33.3)	31 (25.8)	
Residence			
• Rural	77 (64.2)	64 (53.3)	0.08^
• Urban	43 (35.8)	56 (46.7)	
Working hours/day			
• 8hs or less	37 (30.8)	98 (81.7)	<0.001**^
• More than 8 hs to 12hs	42 (35.0)	22 (18.3)	0.003*
• More than 12 hs to 24hs	41 (34.2)	0 (0.0)	<0.001**
No. of work shifts/month			
• <10 shifts	43 (35.8)		
• ≥10 shifts	77 (64.2)	NA	
Type of task			
• Cleaners and sweepers	46 (38.4)		
• Waste collector	37 (30.8)		
• Pit emptier	21 (17.5)		
• Inorganic trader	16 (13.3)	NA	
Usage of PPE			
• Yes	79 (65.8)	46 (38.3)	<0.001**^
• No	41 (34.2)	74 (61.7)	

*^ P-value for Chi-square test, **p<0.001 is highly statistically significant.*

on general population.[3] According to research from the SARS or Ebola outbreaks, sudden and immediately life-threatening illness may cause remarkable stress on health care workers (HCWs).[4] Egypt reported its first COVID-19 case in February 2020, and as of December 2022, there have been more over 515,000 verified cases, with 24,800 deaths.[2] Different groups of people are affected psychologically by the pandemic at different degrees. For instance, Egyptian study reported that 74.3% of Health Care Workers (HCWs) had a serious depressive illness or other mental diseases.[5]

There are several aspects of the COVID-19 pandemic that could increase the likelihood that it could affect workers' MH. First off, everyone has the idea that "no one is safe". The media's constant emphasis on the number of HCWs fatalities and the spread of the disease within healthcare institutions is believed to have exacerbated the pandemic's detrimental effects on workers.[6] Secondly, at hospitals, usual tasks have been severely affected, and many workers have been redistributed to front-line situations that carry a higher risk of infection or death.[7] Finally, the intense focus on changeable recommendations on quality and quantity of personal protective equipment (PPE) is likely to increase the impact of COVID-19 on MH of workers.[4]

For the protection of human health during any infectious disease outbreak, including COVID-19, it is essential to provide access to clean water, sanitation, waste management, and hygiene conditions.[3] Hospital waste disposal workers are an isolated vulnerable neglected subgroup of important front-line HCWs, and they are frequently at

Table 2: COVID-19-related knowledge and its sources among the front and non-frontline waste disposal workers

Characteristics	Frontline No=120 (%)	Non-Frontline No=120 (%)	P-value
COVID-19 related knowledge			
• Bad	31 (25.8)	18 (15.0)	0.054^
• Fair	27 (22.5)	34 (28.3)	0.29^
• Good	62 (51.7)	68 (56.7)	0.43^
Sources of COVID-19-related knowledge			
• Social media	48 (40.0)	55 (45.8)	0.40^
• Television	41 (34.1)	49 (40.8)	0.30^
• Doctors	18 (15.0)	10 (8.2)	0.10^
• Hospital training	5 (4.2)	0 (0.0)	0.06^^
• Others	8 (6.7)	6 (5.0)	0.70^

Others refer to (colleges & relatives), ^ P-value for Chi-square test, ^^ Fischer Exact test.
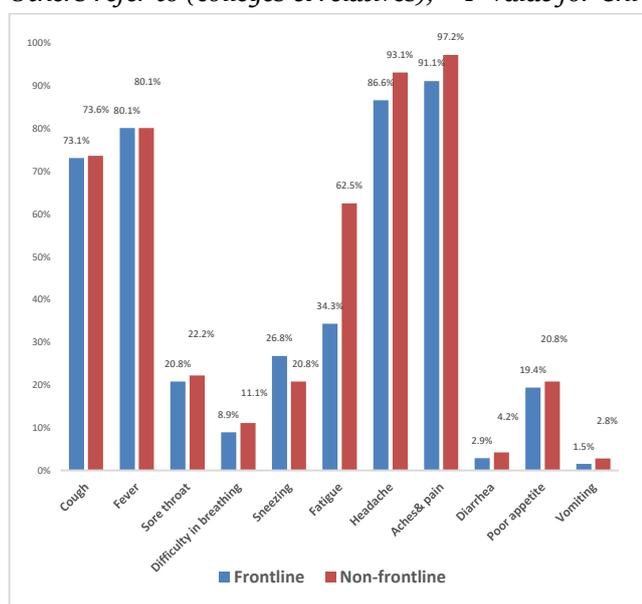

Figure 1: Percent of symptoms among the front and non-frontline waste disposal workers suffering COVID-19.

significant danger of catching any infection and dying, particularly in underdeveloped world. [2] Little is known about MH of waste disposal workers during the outbreak of COVID-19. The purpose of this study was to identify some psychological problems among hospital waste disposal workers during the outbreak of COVID-19.

METHOD

A comparative cross-sectional study was conducted at Zagazig university hospital (ZUH). Data were collected during June 2022 till December 2022.

The study populations were front line group who were waste disposal workers handling any type of medical waste related to COVID-19 (ordinary waste, personal protective equipment waste, drugs & radiological reports), without previous history of psychological disorders or previous history of medication with drugs affecting the central nervous system or past head trauma. A comparative group of academic departments' waste disposal workers who were not handling any type of medical waste related to COVID-19 at their current occupation nor even had a past occupational history of exposure to it was taken as non-frontline workers.

Sample size was calculated using Open epi version 6 statistical software under the assumption that the percentage of anxiety and depression among HCWs workers was 67%.[3], and among academic departments' waste disposal workers was 45%, the confidence interval was 95%, and the degree of precision was 80%, so the sample size was 240 workers (120 in each group). Simple random technique was used to collect the data.

Data were collected by using a semi-structured questionnaire. Maintaining the COVID-19 preventive guidelines of WHO.[2] All workers were interviewed at their work sites and asked questions covering the following sections:

Section I: Socio-demographic (age, sex, marital status, education and residence) and occupational characteristics (no. of worked hours/day, no of shifts/month, type of task, usage of PPE and income).

Section II: Clinical history of COVID-19 infection and COVID-19 related knowledge which was evaluated using the following "Yes - No" six judgement questions about the understanding of COVID-19: The following factors may contribute to infection: a. inhalation of droplets from sneezing, coughing, or talking to an infected person; b. contact with objects contaminated by an infected person; c. the

Table 3: Psychological disorders among waste disposal workers during the COVID-19 pandemic:

Psychological disorders	Frontline No=120 (%)	Non-Frontline No=120 (%)	P-value
Anxiety (total score=21)			
• Yes	37 (30.8)	21 (17.5)	0.01*^
• No	83 (69.2)	99 (82.5)	
Mean ± SD	15.3±4.1	12.4±3.6	<0.001**^^
Range	(10-20)	(7-18)	
Depression (total score=27)			
• Yes	48 (40.0)	19 (15.8)	<0.001**^
• No	72 (60.0)	101 (84.2)	
Mean ± SD	16.9±5.2	13.1±4.5	<0.001**^^
Range	(11-25)	(6-19)	
Social dysfunction& Loss of confidence (total score=24)			
• Yes	75 (62.5)	69 (57.5)	0.40^
• No	45 (37.5)	51 (42.5)	
Mean ± SD	17.1±2.8	16.8±1.4	0.30^^
Range	(13-21)	(14-19)	
Total of the three scores (total score=72)			
Mean ± SD	49.3±5.8	42.3±3.7	<0.001**^^
Range	(39-65)	(28-54)	

*Anxiety if the Score > 9, Depression if the Score > 10, social dysfunction and loss of confidence if the Score > 9; *p<0.05 is statistically significant, **p<0.001 is highly statistically significant; ^ P-value for Chi-square test; ^^P-value for independent t- test.*

incubation period of the virus does not exceed 14 days; d. contact with an asymptomatic person may also contribute to infection; e. there are already targeted drugs that could cure the disease; f. taking traditional medication could prevent infection of this disease. For each of the aforementioned six questions, a right answer was given one points, while a wrong answer was given zero points. Participants were categorized as having good, fair, and bad knowledge if their scores were greater than 5, equal to 4, and lower than 3, respectively.[8]

Section III: which measured psychological problems including 4 parts anxiety, depression, social dysfunction, and loss of confidence.

Generalized Anxiety Disorder-7 (GAD-7) questionnaire was used to assess the participant's anxiety symptoms. A 4-point Likert-scale with the values 0 (never) to 3 (nearly every day) was used to evaluate seven questions to measure the frequency of anxiety symptoms. The GAD-7's overall score ranged from 0 to 21. Anxiety was present if the overall GAD score was 9 or above.[9]

Patient Health Questionnaire (PHQ-9) was applied to measure how severe the depression was. PHQ scores can vary from 0 to 27 overall. Major depression was defined as a total score of 10 or higher for participants.[10]

General Health Questionnaire (GHQ) was used to measure social dysfunction and loss of confidence, 4-point scale with responses ranging from not at all (= 0) to more than usual (= 3) was used to ask participants about their agreement with positive and negative items. The total score of GHQ ranged from 0 to 24. Those who received a total score of nine or higher were found to have social disorders and a lack of confidence.[11] Total score of GAD-7, PHQ-9 and GHQ scores ranged from 0 to 72, with a larger score indicating greater psychological distress.

A pilot study was done on 24 workers during April 2022 to assess the questionnaire's simplicity, linguistic suitability, and average completion time. Linguistic experts translated the questionnaire into Arabic and then back to English. Cronbach's alpha values of GAD-7, PHQ-9 and GHQ questions were 0.73, 0.85, and 0.71 respectively. These results showed that all the items were internally consistent and reliable. The results of the pilot study were evaluated, and minor modification of the questionnaire was done. The questionnaire took nearly 20 minutes to finish. The study's findings did not include the pilot's participants.

Statistical analysis: Data analysis was performed using the software SPSS (Statistical Package for the Social Sciences) version 25. Qualitative variables were presented using their absolute frequencies and

compared using Chi-square (χ2) while quantitative

data was designated using means and standard

Table 4: Association between psychological disorders and both demographic and disease-related characteristics among the frontline waste disposal workers group:

Characteristics	Anxiety	p-value^	Depression	P-value^	Social dysfunction & Loss of confidence	P-value^
Overall prevalence	37 (30.8%)		48 (40.0%)		75 (62.5%)	
Age						
• <32 years (median) (no=68)	27 (39.7%)	0.01*	33 (48.5%)	0.02*	45 (66.2%)	0.3
• ≥32 years (median) (no=52)	10 (19.2%)		15(28.8%)		30 (57.7%)	
Sex						
• Male (no=75)	29 (38.7%)	0.01*	34 (45.3%)	0.1	48 (64.0%)	0.7
• Female (no=45)	8 (17.8%)		14 (31.1%)		27 (60.0%)	
Marital status						
• Married (no=81)	30 (37.0%)	0.03*	31 (38.3%)	0.6	49 (60.5%)	0.5
• Un-married (no=39)	7 (17.9%)		17 (43.6%)		26 (66.7%)	
Education						
• Illiterate (no=29)	4 (13.8%)	0.003*	7 (24.1%)	0.03*	14 (48.3%)	0.01*
• Primary (no=51)	13 (25.5%)		19 (37.3%)		29 (56.9%)	
• Secondary or higher (no=40)	20 (50.0%)		22 (55.0%)		32 (80.0%)	
Residence						
• Rural (no=77)	24 (31.2%)	0.90	32 (41.6%)	0.60	48 (62.3%)	0.90
• Urban (no=43)	13 (30.2%)		16 (37.2%)		27 (62.8%)	
Working hours/day						
• 8hs or less (no=37)	6 (16.2%)	0.03*	9 (24.3%)	0.002*	16 (43.2%)	0.006*
• More than 8 hs to 12hs (no=42)	13 (31.0%)		14 33.3%)		27 (64.3%)	
• More than 12 hs to 24hs (no=41)	18 (34.9%)		25(61.0%)		32 (78.0%)	
No. Of work shifts/months						
• <10 shifts (no=43)	7 (6.3%)	0.01*	10 (23.3%)	0.005*	21 (48.8%)	0.02*
• ≥10 shifts (no=77)	30 (39.0%)		38 (49.4%)		54 (70.1%)	
Type of task						
• Cleaners and sweepers (no=46)	17 (37.0%)	0.3	23 (50.0%)	0.001**	29 (63.0%)	0.001**
• Pit emptier (no=21)	4 (19.0%)	0.3	4 (19.0%)	0.3	10 (47.6%)	0.1
• Waste collector (no=37)	12 (32.4%)	0.9	16 (43.2%)	0.07	26 (70.3%)	0.001**
• Inorganic trader (no=16)	4 (25.0%)	0.8	5 (31.3%)	1	10 (62.5%)	0.007*
Usage of PPE						
• Yes (no=79)	22 (27.8%)	0.3	32 (40.5%)	0.8	38 (48.1%)	0.001**
• No (no=41)	15 (36.6%)		16 (39.0%)		37 (90.2%)	
COVID-19 related knowledge						
• Bad (no=31)	4 (12.9%)	<0.001**	5 (16.1%)	0.001**	11 (35.5%)	<0.001**
• Fair (no=27)	2 (7.4%)		9 (33.3%)		11 (40.7%)	
• Good (no=62)	31 (50.0%)		34 (54.8%)		53 (85.5%)	

*p<0.05 is statistically significant, **p<0.001 is highly statistically significant. ^ =P-value for Chi-square test.

deviations. Kolmogorov-Smirnov (distribution-type) and Levene (homogeneity of variances) tests were used to prove the normality of the data. Binary logistic regression was used to assess possible risk factors for anxiety, depression, social dysfunction, and loss of confidence among the frontline waste disposal workers. P –value<0.05 was considered statistically significant and <0.001 was considered highly statistically significant.

RESULTS

The average age of the frontline waste disposal workers was 33.7years ranging from 21 to 57 years and that of the non-frontline group was 34.1 years ranging from 21 to 59 years, (56.7%) and (45.8%) of both groups were less than 32 years respectively with no statistically significance difference between both groups. Also, there was no statistically significant difference between the two groups regarding gender, marital status, education, residence, and income (Table 1).

About one-third of the frontline waste disposal workers (34.2%) worked for More than 12 hs to 24 hs. /day with a mean of 15.7 hours while most of the non-frontline group (81.7%) worked for 8 hrs. or less /day with a mean of 7.5 hours, with highly

Table 5: Logistic regression analysis of possible risk factors for anxiety, depression, and social dysfunction& loss of confidence occurrence among the frontline waste disposal workers group

	β	AOR	95% CI		P-value
			Lower	Upper	
Predictors of Anxiety					
Age ≥32 years (median)	-1.9	0.13	0.032	0.59	0.008*
Education					
Secondary or higher	2.53	15.2	1.24	18.5	0.03*
Working hours/day#					
More than 12hs to24h	1.6	5.2	1.28	22.9	0.02*
≥10 shifts/month	2.1	3.2	1.2	8.3	0.03*
COVID-19 related knowledge					
Bad #					0.001**
Fair	3.7	42.7	5.5	331.5	0.001**
Good	3.5	34.2	3.8	307.8	0.002*
Predictors of Depression					
Age ≥32 years (median)	-2.8	0.06	0.032	0.59	0.001**
Working hours/day#					
More than 12hs to24h	1.8	6.1	1.3	28.1	0.02*
≥10 shifts/month	2.5	3.2	1.3	7.4	0.02*
COVID-19 related knowledge					
Bad #					0.003*
Good	3.8	46.1	1.6	131.9	
Predictors of social dysfunction& loss of confidence					
Education					
secondary or higher	2.43	11.1	1.04	17.5	0.04*
Usage of PPE	5.1	0.006	0.005	1.44	<0.001**
COVID-19 related knowledge					
Bad #					0.001**
Fair	3.7	42.7	5.5	331.5	0.001**
Good	3.5	34.2	3.8	307.8	0.002*

*AOR adjusted odds ratio, CI Confidence interval, *p<0.05 is statistically significant, **p<0.001 is highly statistically significant. # Reference category.*

statistically significant (p-value<0.001). The usage of PPE is highly statistically significant, more so among the frontline waste disposal workers than the non-frontline group (65.8% versus 38.3%, respectively) (p-value 0.001). Approximately one-third of the frontline waste disposal workers (38.3%) were cleaners and sweepers, (30.8%) were waste collectors, (17.5%) were pit emptier, and (13.3%) were inorganic traders. (Table 1).

There was no statistically significant difference between the frontline and non-frontline waste disposal workers regarding the level and sources of COVID-19-related knowledge–(Table 2). Figure (1) showed that ache and pain was the commonest

symptom followed by headache, fever, cough then fatigue, sneezing, sore throat, poor appetite, and lastly difficulty in breathing, diarrhea, and vomiting. The prevalence of anxiety and depression was statistically significantly higher among the front than non-frontline waste disposal workers (30.8% & 40.0% versus 17.5% &15.8% respectively) (p-value<0.001 for each) with an average score of (15.3±4.1 & 16.9±5.2 versus 12.4±3.6 & 13.1±4.5). But regarding social dysfunction and loss of confidence, it was higher among the front than non-frontline waste disposal workers, but this difference wasn't statistically significant (p-value=0.4). Workers on the front lines of waste disposal had a

significantly higher total psychological disorders score (49.3±5.8 versus 42.3±3.7, p-value<0.001) respectively (Table 3).

In univariate analysis assessing the association between socio-demographic characteristics, working circumstances and COVID-19 related knowledge and psychological disorders occurrence, age less than 32 years, male sex, married status, secondary or higher education, more working hours per week, ≥10 shifts per month and good COVID-19 related knowledge were statistically significantly associated with anxiety occurrence. Concerning depression, age less than 32 years, secondary or higher education, more working hours per week, ≥10 shifts per month, and good COVID-19-related knowledge are statistically significantly associated with depression occurrence. In regard to social dysfunction& Loss of confidence, secondary or higher education, more working hours per week, ≥10 shifts per month, non-usage of PPE, and good COVID-19-related knowledge were statistically significantly associated with social dysfunction& Loss of confidence (Table 4).

Binary logistic regression for the possible risk factors of psychological disorders showed that higher education level (AOR 15.2), 24 working hours/week (AOR 5.2), more than 10 shifts per month (AOR 3.2), and fair (AOR 42.7), and good (AOR 34.2) COVID-19 related knowledge were risk factors for anxiety. 24 working hours/week (AOR 6.1), more than 10 shifts per month (AOR 3.2), and good COVID-19-related knowledge (AOR 46.1) were risk factors for depression. Higher education level (AOR 11.1) and fair (AOR 42.7) and good (AOR 34.2) COVID-19-related knowledge were risk factors for social dysfunction& loss of confidence. On the other side, age ≥32 years was a protective factor for both anxiety (AOR 0.13) and depression (AOR 0.06) while usage of PPE (AOR 0.006) was a protective factor for social dysfunction& loss of confidence (Table 5).

DISCUSSION

Throughout the pandemic, healthcare workers experienced numerous risks that influenced their physical, emotional, and social well-being, which caused several infections and fatalities among them and their households.[12] As a result, this cross-sectional, hospital-based study was conducted to assess the psychological impact on hospital waste disposal workers during the COVID-19 outbreak.

The data was collected from 120 frontline hospital waste disposal workers versus 120 non-frontline academic departments' waste disposal workers. The

two groups were matched regarding age, gender, marital status, education, residence, and income, with no statistically significant difference between them. The average age of both groups was 33.7±5.9 and 34.1±6.1 which indicated that most healthcare workers were younger; this is consistent with studies that revealed younger adults are more experienced with high levels of anxiety and depression symptoms.[13]

As a result of the coronavirus disease 2019 (COVID-19) pandemic, hospital frontline employees are more likely to become infected with the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection due to the nature of their work [14] Even though there is little data on the effectiveness of personal protective equipment (PPE) in the prevention of infection, efficient use of PPE can greatly reduce the risk of infection. This explains why hospital frontline staff in this study used PPE significantly more than non-frontline staff (65.8% versus 38.3%, respectively) (p-value 0.001).

Although social media and television were considered the most reliable sources of information in this study, most frontline hospital waste disposal workers and other academic workers had good knowledge regarding COVID-19, as reported in other studies. [15-18] Moreover, there was no statistically significant difference between them. In another study conducted in India, HCW relied on information regarding COVID-19 from health authorities and international and governmental news, while the media was considered the least reliable source,[19] this can be explained by countries rather than Egypt may rely on official source of information.

As regards the frequency of psychological disorders among frontline workers, this study showed that 30.8% and 40% of frontline waste disposal healthcare workers reported anxiety and depression respectively with a statistically significant difference when compared to non-frontline waste disposal workers. In addition to 62.5% reported social dysfunction and loss of confidence, these findings are matched with other study in Bangladesh,[3] 81% of healthcare workers experienced psychological distress and Luo et al [20] reported that majority of participants showed depression and anxiety (46.1% and 39.8%) respectively, with statistically significant change among frontline workers than general population.

As regards to total psychological disorders, workers on the front lines of waste disposal have a

significantly higher total score than non-frontline workers (49.3±5.8 versus 42.3±3.7, p-value<0.001) respectively. This may be attributed to the fact that healthcare personnel psychological reactions to an outbreak of infectious diseases are complex and may be influenced by a variety of circumstances. Healthcare workers may have emotions of vulnerability or a loss of control, as well as worries about their own health and possible infection by others, their family's health, and the health of others. Additionally, a rising number of suspected and confirmed cases of COVID-19 and predictable supply constraints add to the pressure and worries that healthcare workers are already facing. [21] Frontline workers appeared to experience the psychological effects in a variety of ways, but most of them reported feeling depressed and receiving less psychological support, according to a Spanish study.[22] Frontline health workers also displayed more psychological symptoms than the general population. Other research reported the great vulnerability of frontline healthcare workers to psychological disorders, which are supposed to have close monitoring as they are at high risk for maladjustment.[23]

In the current study, the socio-demographic variables that correlated with high anxiety occurrence on frontline workers were age less than 32 years, married status, secondary or higher education, more working hours per day, ≥10 shift per month and good COVID-19 related knowledge, which contradicts results with other studies that found lower education to be associated with high psychological impact.[24]

The experience of over working with an average of hours more than six per week is statistically significantly associated with depression occurrence. Others discovered that extra working hours did not correlate with the occurrence of high psychological impact; this finding demonstrates that the subjective experience of being overworked, rather than the number of extra hours worked, affects mental health.[22] In this study, marital status, residence and the income are not connected with the occurrence of depression, however many studies have found that gender differences and marital status are major influencing factors on mental health.[24-26]

Binary logistic regression analysis showed age ≥32 years was a protective factor for both anxiety (AOR 0.13) and depression (AOR 0.06) while usage of PPE (AOR 0.006) was a protective factor for social dysfunction& loss of confidence, other study found

older age and PPE use decrease anxiety but not for depression.[27]

Limitations: This study is a single-center design with a self-reported questionnaire and with no revision to the responses of participants, and it may suffer from many biases. Data was not collected during the first wave of the pandemic, so workers had good experience with better knowledge and attitudes towards COVID-19.

CONCLUSION

Frontline hospital waste disposal workers are at high risk of mental disorders such as anxiety, depression, social dysfunction, and loss of confidence; they experience different changes in their mental health than other workers. There is overlap between the risk factors for anxiety and depression, which requires further preventive and intervention programs.

REFERENCES

1. The World Health Organization. Occupational health: health workers. 2022.Available from: https://www.who.int/news-room/fact-sheets/detail/occupational-health--health-workers

2. The World Health Organization. Corona virus (COVID-19) Dashboard. 2022. Available from: https://covid19.who.int/

3. Haque MR, Khan MMA, Rahman MM, Rahman MS and Begum SA. Mental health status of informal waste workers during the COVID-19 pandemic in Bangladesh. Plos one, 2022, 17(1): 0262141.

4. De Kock JH, Latham HA, Leslie SJ, Grindle M, Munoz SA, Ellis L et al. A rapid review of the impact of COVID-19 on the mental health of healthcare workers: Implications for supporting psychological well-being. BMC Public Health, 2021, 21(1): 104.

5. Elgohary HM, Sehlo MG, Bassiony M.M. Youssef, U.M., Elrafy, D.S. and Amin, S.I . Depression among health workers caring for patients with COVID-19 in Egypt. Egypt J Neurol Psychiatry Neurosurg, 2021, 57: 139.

6. Reger MA, Piccirillo ML, and Buchman-Schmitt J. COVID-19, mental health, and suicide risk among health care workers: looking beyond the crisis. J Clin Psychiatry, 2020, 81(5).

7. Neto ML, Almeida HG, Esmeraldo JD, Nobre CB, Pinheiro WR, de Oliveira CR, et al. When health professionals look death in the eye: the mental health of professionals who deal daily with the 2019 coronavirus outbreak. Psychiatry Res, 2020, 288:112972.

8. HuangaY and Zhaoa N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey Psychiatry Research, 2020, 288: 112954.

9. Huang FY, Chung H Kroenke K, Delucchi KL and Spitzer RL. Using the Patient Health Questionnaire-9 to measure depression among racially and ethnically diverse primary care patients. J Gen Intern Med, 2006, 21(6): 547-552.

10. Kroenke K, Spitzer RL and Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med, 2001, 16(9): 606-613.

11. Graetz B. Multidimensional properties of the general health questionnaire. Social psychiatry and psychiatric epidemiology, 1991, 26 (3):132-138.

12. Deo A, Mohammadnezhad M. Frontline Health Care Workers'(HCWs) perception of barriers to managing COVID-19 in Fiji. Frontiers in Public Health, 2022: 2423.

13. Adams SH, Schaub JP, Nagata JM, Park MJ, Brindis CD and Irwin Jr CE. Young adult Anxiety or Depressive Symptoms and mental health service Utilization during the COVID-19 pandemic. Journal of Adolescent Health, 2022, 70(6):985-8.

14. Alhazzani W, Møller MH, Arabi YM, Loeb M, Gong MN, Fan E, et al. Surviving Sepsis Campaign: Guidelines on the management of critically ill adults with coronavirus disease 2019 (COVID-19) (Internet). Illinois: The Society of Clinical Care Medicine, 2020, 48:440-69.

15. Sanders JM, Monogue ML, Jodlowski TZ and Cutrell JB. Pharmacologic treatments for coronavirus disease 2019 (COVID-19): a review. JAMA, 2020, 323:1824–36.

16. Taghrir MH, Borazjani R and Shiraly R. COVID-19 and Iranian medical students; a survey on their related-knowledge, preventive behaviors and risk perception. Arch Iran Med, 2020, 23:249–54.

17. Olum R, Chekwech G, Wekha G, Nassozi DR and Bongomin F. Coronavirus disease-2019: knowledge, attitude, and practices of health care workers at Makerere University Teaching Hospitals, Uganda. Front Public Health, 2020, 8:181.

18. Saqlain M, Munir MM, Rehman SU, Gulzar A, Naz S, Ahmed Z, et al. Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan. J Hosp Infect, 2020, 105:419–23.

19. Paul G, Sharma S, Singh G, Singh G, Sharma S, Paul BS, et al. Assessment of knowledge gaps and perceptions about COVID-19 among health care workers and general public-national cross-sectional study. Journal of Anaesthesiology, Clinical Pharmacology, 2020, 36(3):337.

20. Luo D, Liu Q, Chen Q, Huang R, Chen P, Yang BX, et al. Mental health status of the general public, frontline, and non-frontline healthcare providers in the early stage of COVID-19. Frontiers in Psychiatry, 2021, 12:553021.

21. World Health Organization [Internet]. Geneva: Shortage of personal protective equipment endangering health workers worldwide. Accessed February 4, 2023, from https://www.who.int/news-room/detail/03-03-2020-shortage-of-personal-protectiveequipment-endangering-health-workersworldwide

22. Rodríguez-Rey R, Garrido-Hernansaiz Hand Bueno-Guerra N. Working in the times of COVID-19. Psychological impact of the pandemic in frontline workers in Spain. International Journal of Environmental Research and Public Health, 2020, 17(21):8149.

23. Du J, Dong LU, Wang T, Yuan C, Fu R, Zhang L, et al. Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. General hospital psychiatry, 2020, 67:144.

24. Nianwei W, Fan Y, Jing X, Tianpei M, Chuan Y and Ningxiu L. Analysis of depression status and influencing factors of middle-aged and older people in China. J. Sichuan Univ. Med. Sci. Ed. 2021;52:767–771.

25. Garcia-Fernandez L, Romero-Ferreiro V, Padilla S, Lopez-Roldan P D, Monzo-Garcia M and Rodriguez-Jimenez R. Gender differences in emotional response to the COVID-19 outbreak in Spain. Brain Behav, 2020, 11:e01934.

26. Kirkman J. COVID-19 gender differences related to cognitive, emotional, and behavioral disorders. J. Res. Gend. Stud, 2020, 10:148–159.

27. Smith K, Chappell A, Spalding R, Wilson J, Haliwa I and Strough J. Older Age and Other Protective Factors of Mental Health During the COVID-19 Pandemic in the US. Innov Aging, 2021, 5(S1):720-725.