Original Article

Impact of COVID-19 on mental health and health-related quality of life of humanitarian and healthcare workers in low-income countries. The case of Eastern Africa.

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Abstract: BACKGROUND: The COVID-19 pandemic has had a direct impact on the health care system, adversely affecting services delivery and continuity, particularly in low-income countries. The overwhelming workload, the shortage of personal protective equipment, and the lack of specific Personal protective equipment (PPE), and drugs are some noted challenges. As a result of this critical situation, healthcare and humanitarian workers who are directly involved in the diagnosis, management, and prevention of COVID-19 are at high risk of contracting COVID-19 disease and developing psychological disorders, distress, and other mental health symptoms. OBJECTIVE: To assess the magnitude of mental health and health-related quality of life (HRQoL) outcomes and associated factors among humanitarian and healthcare workers (HCW) working on prevention and management of COVID-19 in East African Countries (EAC). DESIGN, SETTINGS, AND PARTICIPANTS: This cross-sectional, online-based survey study collected socio-demographic, mental health, and HRQoL data from 739 frontline and second-line workers in healthcare facilities and humanitarian NGOs working on COVID-19 prevention and management in seven Eastern African countries (Burundi, Kenya, Tanzania, South Sudan, Somalia, Ethiopia, and Rwanda). MAIN OUTCOMES AND MEASURES: The degree of symptoms of depression, anxiety, insomnia, and distress, alcohol, and tobacco consumption, HRQoL (SF-6Dv2 and CORE-6D), and fear of COVID-19. ANALYSIS: Multivariable logistic regression analysis, one-way ANOVA, and T-test to identify factors associated with mental health and HRQoL outcomes. RESULTS: A total of 739 contacted individuals in December 2020 completed the survey. The study participants included 62.7% of males and 37.3% of females. Among them, 12.4% were humanitarians and 87.6% were healthcare workers. About 83% were from Burundi and 17% from other Eastern African countries. The HRQoL mean scores measured by the SF-6Dv2 and the CORE-6D were respectively 0.86 and 0.80. Multivariable logistic regression analysis showed that country of origin, chronic disease, being tested positively to COVID-19, being exposed to death due to COVID-19, increased alcohol uptake, having experienced nightmare, insomnia, distress, stress, and fear of COVID-19 were independent predictors of HRQoL of front- and second-line workers. Multivariable Logistic Regression Analysis also found that having a chronic disease, being exposed to patients and death due to COVID-19 cases, depression, insomnia, stress, and fear of COVID-19 were independent predictors of the CORE-6D score. CONCLUSION: This study showed that healthcare and humanitarian workers are affected by mental health disorders such as depression, anxiety, stress, and insomnia, which negatively impacted their Health-related quality of life (HRQoL). The study findings suggested that psychological support to ensure humanitarian and healthcare worker's safety and wellbeing is required during and after this pandemic.

Keywords: COVID-19; Mental health; HRQoL; HCW and Humanitarian workers; EAC.

INTRODUCTION

December 31, 2019, China has reported the first COVID-19 case in Wuhan city, which has subsequently spread around the world(1). According to the latest report by World Health Organization (WHO), this disease has spread in 220 countries around the world accounting for 83 322 449 Confirmed cases, and 1 831 412 Confirmed deaths (**WHO,2021**). Since the beginning of the pandemic, the virus has rapidly spread across the African region, and according to the latest report by WHO Afro, eastern African countries have seen a slight increase in cases and deaths compared to the developed countries (**WHO,2021**). Globally, as millions of people stay at home to minimize transmission of COVID-19, health-care workers prepare to do the exact opposite as they go to clinics and hospitals, putting themselves at high risk from COVID-2019(2). A previous study showed that show that more than 3300 health-care workers have been infected as of early March, and by the end of February at least 22 had died in China, and 20% of responding health-care workers were infected in Italy (2).

As a result of this critical situation, front-line health and humanitarian workers who are directly involved in the diagnosis, management, and prevention of COVID-19 are at high risk of contracting COVID-19 disease and developing psychological disorders, distress, and other mental health symptoms. A large study with a probabilistic sampling of the UK population indicated that comparing before and during the lockdown, there was an increase in the overall mental distress, with the prevalence of clinical levels reaching 27.3% of the participants(3). A cross-sectional study conducted in Vietnam in March 2020, showed a moderate rate of psychological distress and lower HRQoL outcomes among frontline HCWs during the COVID-19 outbreak in Vietnam(4). the same study was reported in Italy and China(1,5). little information is known on the impact of COVID-19 on health-related quality of life and mental health of frontline and second-line workers in Eastern African Countries (EAC), hence we conduct this study.

METHOD

DESIGN

This cross-sectional, web-based study collected data between December 1st to December 20th, 2020, using an online questionnaire spread via social media to humanitarian and health care workers living in Burundi, Rwanda, Tanzania, Somalia, South Sudan, Kenya, and Ethiopia. Because of the self-selected and nonprobabilistic nature of the sample, invitations and response rates was not quantifiable, as reported by the American Association for Public Opinion Research (AAPOR) reporting guideline(6). The questionnaire investigated demographic variables, workplace characteristics (ie, being a frontline or second-line worker), and information regarding the direct consequences of COVID-19, including having contacts with patients or family members infected or deceased. Frontline and second-line HCWs were defined by a single yes or no question, "Are you currently working on frontline or second-line with COVID-19 patients?" Frontline workers were those directly involved in treating, testing COVID-19, while second-line workers were those who were indirectly involved in treating, preventing COVID-19 in communities or health facilities. Key mental health outcomes were the degree of symptoms of depression, anxiety, insomnia, and distress, and health-related quality of life, assessed by a Short-form Six-Dimension (SF-6Dv2) (7) health index designed for calculating Quality Adjusted Life Years (QALYs), and a Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE_OM) (8), and Fear of COVID-19 scale(9).the completion of the questionnaire was estimated to take approximately 15 minutes.

ETHICAL CONSIDERATIONS

An online consent was obtained from the participants. Participants were free to refuse to participate in the research without having to justify themselves. Failure to answer

the questionnaire on his part was considered as an objection, and the fact of answering the questionnaire act as his consent. Participation in the study was of course free, anonymous, and confidential.

SETTINGS, AND PARTICIPANTS

This cross-sectional, online-based survey study collected socio-demographic, mental health, and HRQoL data from frontline and second-line workers in healthcare facilities and humanitarian NGOs working on COVID-19 prevention and management in seven EAC **(Burundi, Kenya, Tanzania, South Sudan, Somalia, Ethiopia, and Rwanda).** The population eligible to participate were humanitarian and health care workers working on frontline and second-line of COVID-19 response in EAC.

Statistical Analysis

Data was collected in Excel and imported into SPSS version 15.0. Descriptive statistics were performed to summarize the frequency of demographic, socio-economic, and clinical factors and outcomes. One-way ANOVA, T-test, univariate analysis, and multivariable logistic regression were performed to examine the association between variables and selected outcomes. Logistic regression was used to obtain the crude and the adjusted correlation with 95% confidence intervals(95%CIs) between HRQoL and associated factors, with adjustment for potential confounders. The interactions were tested by the Breslow-Day Chi-square test and logistic regression.

RESULTS

Descriptive analysis.

In this study, 739 participants completed the survey. As showed in table 1.A**(Appendice A)**, of 739 participants, 62.7% were males and 37.3% were females. 12.4% were humanitarians and 87.6% were health care providers (out of them, 36.3% were medical doctors, 23.3% of the nurse, 19.1% of medical interns, 3.8% of social workers, 5.1% of lab technicians). Most participants were from Burundi representing 83% vs. 17% from other seven EAC (out of them, 8.6% were Kenyans,3.1% were Rwandans, 0,7% were Somalians, 2.3% were south Sudanese, 1.9% were Ethiopians, and 0.4% were Tanzanians). The majority of respondents were aged above 30 years old. The marriage status was similar among respondents 50.1% vs. 49.9% of married. out of total respondents, 89.5% were from urban areas while 10.9% live work in rural areas. The clinical characteristics of participants are presented in Table 2. As seen in table 2.A.**(Appendice A)**, 33.4 % of them express depression symptoms, 24.3% experienced insomnia, 44.1% were stressed out, and 33% were distressed. 4.2% were tested positive, 19.1% have been suspected of COVID-19, 17.5% have been quarantined, 30.9%were exposed to COVID-19 patients in the hospital while 7.4% were exposed to a family member suffering from covid-19, 4.0% have been exposed to death from COVID-19, most participants (53.2%) experienced shortage of PPE, and 30.4 % lack of medicines. As showed in table2, 28.4% increased alcohol consumption and 4% increased smoking.

Logistic regression analysis

Univariate analysis

The mean QALY SF-6Dv2 was .86±.182, The mean CORE6D was .80±.143, and the mean Fear of COVID-19 was 19.23±6.42. Females had a lower HRQoL score compared to males (0.85vs 0.87) but it was not statistically significant(p=0.093). The results of univariate analysis for the association between socio-demographic factors and the mean QALY SF-6Dv2 are presented in table 3.B **(Appendice B)**. The difference between the mean QALY SF-6Dv2 was statistically significant for Age (p<0.001), marriage status (p=0.026), education level (p=0.003), Country of origin (p<0.001), and monthly income (p=0.017). old and

single HCW and humanitarian had lower HRQoL scores compared to their counterpart (p<0.005).

The association between clinical factors and QALY SF-6Dv2 are shown in table 4.B**(Appendice B)**. The difference between clinical factors and the mean QALY SF-6Dv2 was statistically significant for Worker with chronic disease (p=0.002), positively tested of COVID-19(p<0.001), been suspected of covid-19 (p<0.001), been quarantined (p<0.001), exposed to COVID-19 in hospital and family (p<0.001), exposed to death (p=0.026), shortage of PPE &drugs (p<0.001), having called a physician (p=0.001) and experienced traumatic memories (p<0.001, and smoking status (p<0.001).

Multivariate analysis.

As showed in table 5.B**(Appendice B)**, the factors associated with HRQoL scores using the multivariable Logistic Regression Analysis showed that country of origin, chronic disease, being tested positively COVID, being exposed to death due to COVID-19, increased alcohol uptake, having experienced nightmare, insomnia, distress, stress, and fear have a significant negative effect on the SF-6Dv2 score(p<0.05) among frontline and second-line workers.

As seen in Table 6.B **(Appendice B)**, the factors associated with HRQoL scores using multivariable Logistic Regression Analysis found that having a chronic disease, being exposed to patients and death due to COVID-19 cases, depression, insomnia, and stress and fear of COVID-19 have a significant negative effect on CORE_OM score(p<0.05).

As reported in figure 1: study results found a strong interaction between gender and country of origin in relation to anxiety and depression. Among the male, the odds of being anxious was 3.2 times higher among humanitarians and health care provider working in other ester African countries compared to those working in Burundi. For female, on the other hand, compared to their counterparts in Burundi, the odds of being anxious was 8.8 times higher among female humanitarians and health care works in other eastern African countries. The same interaction was found for depression as shown in figure 2.

Figure 1. Interaction between Gender and country of origin in relation to Anxiety.
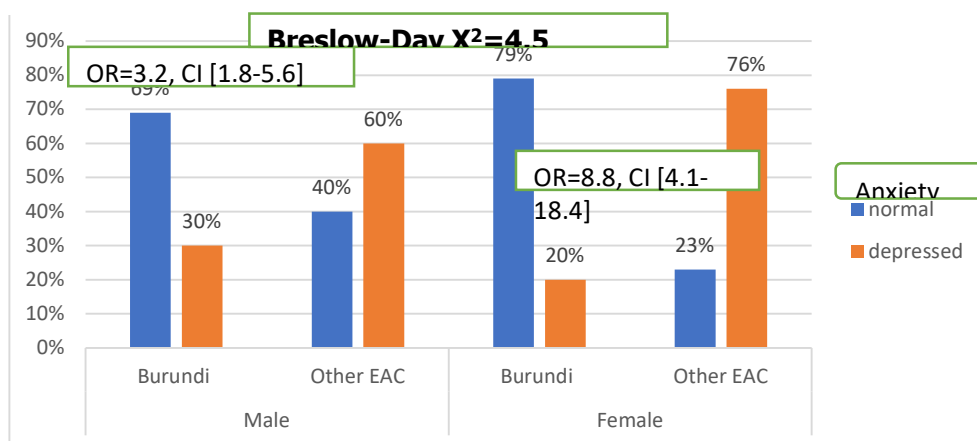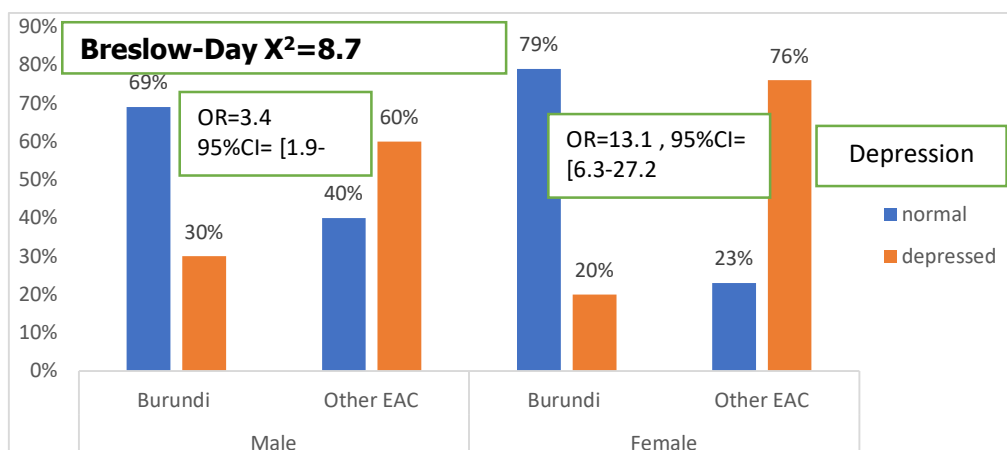

Figure 2: Interaction effect of gender and Country of origin in relation to depression

DISCUSSION

This study evaluated HRQoL and mental health problems of humanitarians and health care providers working on the frontline and second line of COVID-19 response using the SF-6Dv2, CORE6D, and Fear of COVID-19 questionnaire and examine the effects of sociodemographic and clinical factors associated with HRQoL. Health care workers are at high risk of contracting COVID-19 and face intensive pressure in treating, diagnosing patients suffering from covid-19, while humanitarian is working hard to slow the spread of the virus in the communities. this can lead to excessive fatigue and tension which led to anxiety, sadness, grievance, helplessness, and depression, among other emotions(10). Our study results showed 33.4 % of respondents felt depressed, 24.3% experienced insomnia, 44.1% were stressed out, and 33% were distressed. Our results showed a strong interaction between gender and country of origin in relation to depression and anxiety, being a female working in other EAC was more likely associated with depression and anxiety than Burundian counterparts. We hypothesize that this difference is due to more cases in these EAC than in Burundi (WHO,2021). Overall, our results demonstrated a slightly lower rate of depression, insomnia, and distress among HCW and humanitarians when compared to other findings from China (1), but higher when compared to reports from Italy and Vietnam(4,5). This difference may be due to more cases and strict preventive measures in China than EAC. Our findings showed a higher degree of depression and anxiety across all eastern African countries in general but women working in Burundi were less likely to be depressed and anxious compared to other eastern African countries. This difference can be explained by the fact that Burundi had not only less COVID-19 cases and deaths compared to other EAC, but also societal responses to COVID-19 were different worldwide(11). Similar results were found in China and Italy and Vietnam(4,5,10). Out of our respondents, the mean QALY-SF-6Dv2 score was 0.86±0.182, which was higher than what was found in China and lower than what was found in Vietnam(4). This difference is related to the fact that China had more covid-19 cases and deaths than EAC as well as Vietnam. Burundi has a higher QALY-SF-6Dv2 score (0.89) than other EAC (0.74). This can be explained by the fact that Burundi has few COVID-19 cases and has not applied lockdown compared to other EAC. Mixed results were found on the HQRoL score related to change of alcohol and smoking consumptions as follows: the HQRoL score was lower among smokers who increased cigarette uptake (0.79) compared to those who did not change (0.87) and those who decreased (0.94). the same results were found with alcohol consumption. Our findings demonstrated that increasing both smoking and alcohol consumption reduced HRQoL while decreasing were associated with higher HRQoL. Similar results were found in Australia and Netherland, where smoking and alcohol consumption were associated with stress, which may consequently deteriorate the HQoL(12,13). Multivariate analysis showed that the socio-demographic

characteristics associated with HRQoL of the respondents were gender, occupation, country of origin, and living with chronic disease. Females were associated with a lower QALY-SF-6Dv2 score compared to males. A QALY-SF-6Dv2 score of respondents living in other EAC was worse, which may be related to the more serious epidemic situation, strict societal preventive measures, and higher risk of infection among frontline and second-line workers compared to Burundi. The multivariate analysis also showed that the mental health problems were associated with lower HRQoL (QALY-SF-6Dv2) score as follows: being Destressed (0.77), being stressed (0.82), having insomnia (0.73), being depressed (0.77), having increased smoking (0.79). The analysis also revealed that a low HRQ0L score was associated with having the chronic disease (0.79), been tested positive for COVID-19 (0.74), been exposed to death (0.70), been expressed nightmare (0.75), and having fear of COVID-19. These results demonstrated that mental health was the main contributor to the reduction of HQRoL among our participants during the COVID-19 pandemic. The same findings were found in other reports from China, Vietnam, and Italy (4,5,10). The fear of being infected by COVID-19 was negatively associated with the HQRoL score. The higher the possibility of infection, the more likely professionals are to suffer from anxiety (4). These findings suggest that health institutions and organizations could prioritize the safety of health care and humanitarian workers through psychological interventions during and after the pandemic.

LIMITATIONS

There are limitations to this study that require further research work. As the study used an online questionnaire, there might be selection and information bias due to languages or cultural differences. The response rate was higher in Burundi and lower in other EAC which may cause bias in the comparison of results across the EAC region. Also, the survey was done while the COVID-19 vaccine was announced and COVID-19 management and prevention enhanced across the globe by easing the lockdown and social gathering which should alleviate the burden of psychological distress of COVID-19 and improve the health status of workers. Despite these limitations, the strength of this study has to be recognized as we used commonly used and validated SF-6Dv2, CORE6D, and Fear of COVID-19 questionnaire in collecting data. Also, the questionnaire was translated into both French and English language to increase the understanding of questions for our participants.

CONCLUSION:

The study showed a high level of psychological distress and a moderate level of HRQoL outcome among humanitarian and health care workers in EAC during the COVID-19 pandemic from December 1st to December 20th,2020. Both humanitarian and health care workers in Kenya, Rwanda, Ethiopia, Somalia, and South Sudan had a significantly higher psychological burden and lower HRQoL score than their Burundian counterparts. mental health problems and clinical aspects were the main contributor's factors to the reduction of HRQoL among study participants. Therefore, this study suggested that COVID-19 protection and mental health interventions would improve the health status and wellbeing of HCW and humanitarians. Also, this study findings will be useful for public health policymakers, health facility and NGO managers to increase the wellbeing of HCW and humanitarians during and after the pandemic.

APPADENCES

Appendice A

Table 1. A: Participants Socio-Demographic Characteristics.

Variable	Frequency	Percentage	Mean QALY	Mean CORE	Mean Fear-Covid-19
Gender					
Male	463	62.7	.87	.81	18.98
Female	276	37.3	.85	.79	19.68
Age					
18-24	75	10.1	.90	.81	19.56
25-29	259	34.9	.89	.82	18.90
30-34	143	19.3	.84	.78	18.48
35-39	150	20.2	.84	.78	19.57
40-44	60	8.1	.86	.79	19.66
45-49	31	4.2	.80	.76	21.19
>50	24	3.2	.85	.81	20.65
Marriage status					
Unmarried	371	50.3	.88	.82	18.66
Married	366	49.7	.85	.78	19.76
Education level					
1st secondary school level (6th to 9th grade)	2	.3	.97	.87	19.50
2nd secondary school level (10th to 13th grade)	62	8.4	.91	.79	21.22
Bachelor degree	303	41.1	.85	.79	20.11
Master degree	97	13.1	.83	.79	18.74
Doctorate	274	37.1	.88	.81	18.10
Residence					
Rural	77	10.5	.83	.76	19.90
Urban	654	89.5	.87	.80	19.13
Country of origin					
Burundi	616	83.0	.89	.81	19.11
Kenya	64	8.6	.69	.73	22.09
Rwanda	23	3.1	.86	.81	13.96
Somalia	5	.7	.67	.68	19.20
South Sudan	17	2.3	.77	.76	20.41
Ethiopia	14	1.9	.76	.74	19.14
Tanzania	3	.4	.87	.83	18.00
Country of origin					
Burundi	614	83.4			
Other Eastern African countries	123	16.6			
Tanzania	3	.4			
Type of occupation					
Humanitarian	92	12.4	.86	.80	20.46
Medical Doctor	268	36.3	.84	.79	18.23

Medical Intern	141	19.1	.91	.85	17.45
Nurse	172	23.3	.86	.78	20.83
Social worker	28	3.8	.82	.77	22.26
Labo Technician	38	5.1	.94	.82	20.94
Occupation					
Humanitarian	92	12.4			
health care worker	643	87.6			

Monthly Income range (USD dollar)

<100	120	17.7	.902	.85	17.80
100-190	219	32.3	.87	.79	20.06
200-290	68	10.0	.88	.81	18.76
300-390	35	5.2	.82	.74	18.62
400-490	32	4.7	.88	.80	17.03
500-1000	123	18.1	.86	.81	18.84
>1000	82	12.1	.79	.77	20.04
Working position					
Second line	145	20.0	.87	.79	19.37
Frontline	581	80.0	.86	.80	19.27

Table 2. A: Clinical Characteristics of participants.

Variables	Frequency	Percentage	Mean QALY	Mean CORE	Mean Fear-Covid-19
Comorbidities					
None	445	84.1	.86	.81	19.13
Hypertension	15	2.8	.84	.77	19.43
Diabetes	10	1.9	.75	.74	17.40
Asthma	2	.4	.96	.76	15.00
Other	57	10.8	.81	.75	19.79
Pregnant women					
No	685	97.6	.86	.80	19.43
Yes	17	2.4	.82	.77	17.18
Women with children					
No	411	55.9	.87	.81	18.91
Yes	324	44.1	.85	.78	19.67
Positively tested COVID					
No	710(95.8)	95.8	.87	.80	19.16
Yes	31(4.2)	4.2	.74	.69	21.00
Been suspected of COVID-19					
No	599(80.9)	80.9	.89	.81	18.98
Yes	141(19.1)	19.1	.76	.74	20.21
Been in quarantine					
No	610(82,5)	82.5	.89	.81	19.04
Yes	129(17.5)	17.5	.76	.74	20.13
Exposed to COVID-19 patients in the hospital					
No	511(69.1)	69.1	.89	.82	19.44

Yes	228(30.9)	30.9	.80	.75	18.86
Exposed to COVID-19 patients in family					
No	687(92.6)	92.6	.87	.81	19.15
Yes	55(7.4)	7.4	.76	.73	20.28
Those exposed to death from Covid-19					
No	711(96.0)	96.0	.87	.81	19.11
Yes	30(4.0)	4.0	.70	.67	21.83
Shortage of PPE					
No	347(46.8)	46.8	.90	.82	19.09
Yes	395(53.2)	53.2	.83	.78	19.36
Shortage of Medicine					
No	516(69.6)	69.6	.89	.82	18.98
Yes	225(30.4)	30.4	.80	.77	19.80
Have you called a physician					
No			.88	.81	19.04
Yes			.74	.74	21.98
Have you been traumatic memories					
No			.90	.82	18.54
Yes			.75	.73	21.95
Change in alcohol drinking					
do not drink	363	49.1	.87	.81	18.74
not at all	116	15.7	.90	.82	19.40
Moderate increase	203	27.5	.87	.80	19.50
Significant increase	9	1.2	.63	.68	21.67
Moderate decrease	28	3.8	.80	.78	21.71
Significant decrease	20	2.7	.77	.75	19.45
Change in smoking status					
Do not smoke	671	90.7	.87	.80	19.24
No	29	3.9	.91	.83	17.76
Moderate increase	35	4.7	.83	.78	20.34
Significant increase	2	.3	.26	.48	25.50
Moderate decrease	1	.1	1.00	.95	11.00
Significant decrease	2	.3	.92	.87	14.50
Insomnia symptoms					
Normal	553		.91	.83	18.33
Mild	127		.78	.74	20.90
Moderate	38		.67	.68	23.87
Severe	14		.50	.59	26.64
Depression symptoms					
Normal	476		.91	.85	18.30
Mild	175		.82	.77	20.60

Moderate	57		.70	.70	22.45
Severe	9		.36	.52	26.44
Distress symptoms					
Normal	492		.91	.83	18.25
Mild	166		.82	.78	20.43
Moderate	61		.66	.65	22.30
Severe	15		.55	.62	25.00
Anxiety					
Normal	414	55.9	.91	.83	18.01
Mild	207	28.0	.85	.79	19.98
Moderate	102	13.8	.75	.72	21.57
Severe	17	2.3	.55	.58	25.41

Appendice B

Table 3. B: sociodemographic risk factors associated with Mean SF6DV identified by univariate analysis among frontline and second-line workers.

Variable	N (%)	Mean SF6DV	t	P-value	95%CI
Gender			1.68	0.093	0.003-0.05
Male	463(62.7)	.87			
Female	276 (37.3)	.85			
Age			3.54	.000	.01-.02
18-29	331(45.0)	.89			
30-50+	406(55.0)	.84			
Marriage status			2.2	.026	.003-.05
Unmarried	367(50.1)	.88			
Married	365(49.9)	.85			
Education			3	.003	.01-.04
Secondary degree level	64(0.9)	.91			
University degree level	669(90.1)	.86			
Residence			.11		0.003-2.47
Rural	77(10.5)	.83			
Urban	654(89.5)	.87			
Country of origin			8.6	.000	.01-.17
Burundi	614(83.4)	.89			
Other Eastern African countries	123(16.6)	.74			
Occupation			.64		-.003-.05
Humanitarian	92(12.4)	.86			
health care worker	643(87.6)	.86			
Monthly income			2.72	.017	.007-.07
100-490	472(69.7)	.87			
>490$	205(30.3)	.83			

Table 4. B: Clinical risk factors associated with Mean SF6DV identified by Univariate analysis among frontline and second-line workers.

Variable	N (%)	Mean SF6DV	t	P-value	95%CI
Chronic disease			3.04	.002	.02-07
No	677(92.0%)	.87			
Yes	59(8%)	.79			
Are you pregnant			1.01	.331	-.04-.13

No	681	.86			
Yes	17	.82			
Do you have children?			1.73	.083	-.003-.05
No	407	.87			
Yes	323	.85			
Positively tested COVID			1.98	<.001	.06-19
No	710(95.8)	.87			
Yes	31(4.2)	.74			
Been suspected of COVID-19				<.001	.09-.16
No	599(80.9)	.89			
Yes	141(19.1)	.76			
Been quarantined				<.001	.08-.15
No	610(82,5)	.89			
Yes	129(17.5)	.76			
Exposed to COVID-19 patients in the hospital				<.001	.06-.11
No	511(69.1)	.89			
Yes	228(30.9)	.80			
Exposed to COVID-19 patients in family				<.001	.06-.16
No	687(92.6)	.87			
Yes	55(7.4)	.76			
Those exposed to death from Covid-19				.026	.10-.23
No	711(96.0)	.87			
Yes	30(4.0)	.70			
Shortage of PPE				<.001	.03-.08
No	347(46.8)	.90			
Yes	395(53.2)	.83			
Shortage of Medicine				<.001	.06-.11
No	516(69.6)	.90			
Yes	225(30.4)	.83			
Have you called a health care provider?			2.6	.001	.04-.13
No	676	.88			
Yes	53	.74			
Have you had traumatic memories?			6.3	<.001	.10-.19
No	586	.90			
Yes	147	.75			
Having depression symptom			10.6	<.001	.11-.16
Not depressed	66.6	.91			
Depressed	33.4	.77			
Insomnia			12.8	<.001	.14-.24
Normal sleep	557(75.7)	.91			
insomnia	179(24.3)	.73			

Being stressed				11.3	<.001	.10-.14
Not stressed	293(55.9)	.94				
Stressed	441(44.1)	.82				
Destressed				11.7	<.001	.11-.17
Not destressed	492(67)	.91				
destressed	242(33)	.77				
Smoking					.034	.85-.88
No change	698(94)	.87				
Increase	35(4)	.79				
Decrease	3(2)	.94				
Alcohol					.056	
no change	478(65.1)	.88				
increase	209(28.4)	.86				
decrease	48(6.5)	.79				

Table 5. B: Associated Factors for Mental Health Outcomes (mean QALY-SF6DV2) Identified by Multivariable Logistic Regression Analysis.

Variable	B	t	Sig.	95% Confidence Interval for B	
				Lower Bound	Upper Bound
(Constant)	1.028	23.531	.000	.942	1.114
Being female	-.028	-1.981	.048	-.055	.000
Being older	-.002	-.119	.905	-.037	.033
Married	.029	1.316	.189	-.014	.072
Higher education	-.031	-1.288	.198	-.077	.016
Urban area	.004	.187	.852	-.036	.044
Other EAC	-.048	-2.407	.016	-.088	-.009
Health care worker	.036	1.740	.082	-.005	.077
Higher monthly income	.006	.347	.728	-.026	.038
Working on frontline	-.010	-.594	.552	-.044	.024
Having a chronic disease	-.048	-2.093	.037	-.093	-.003
Being pregnant	-.030	-.699	.485	-.113	.053
Have a child	.008	.367	.714	-.034	.049
been Tested positive covid-19	.068	2.139	.033	.006	.130
Been Suspected of covid-19	-.019	-.922	.357	-.059	.021
Been in Quarantine	-.030	-1.420	.156	-.071	.011
Been exposed to COVID-19 patient	-.005	-.313	.755	-.036	.026
Been exposed to a family member	-.005	-.197	.844	-.054	.044
Been exposed to death	-.070	-2.130	.034	-.135	-.005
Experienced a Shortage of PPE	-.015	-1.000	.318	-.043	.014
Experienced a shortage of drug	-.012	-.743	.458	-.043	.019
Having called a health care provider	-.011	-.465	.642	-.060	.037
Had traumatic memories	-.050	-2.935	.003	-.084	-.017
Increased alcohol uptake	-.027	-2.325	.020	-.050	-.004

Increased tobacco use	-.032	-1.165	.245	-.085	.022
Been depressed	-.029	-1.613	.107	-.064	.006
Been anxious	.015	.840	.401	-.020	.050
Experienced Insomnia	-.082	-4.410	.000	-.118	-.045
Been destressed	-.052	-2.850	.005	-.088	-.016
Been stressed out	-.034	-2.145	.032	-.065	-.003
Having fear of COVID	-.002	-2.305	.022	-.005	.000

Table 6. B: Associated factors for Mental Health Outcomes (mean CORE_OM) Identified by Multivariable Logistic Regression Analysis.

Variable	B	t	Sig.	95% Confidence Interval for B	
				Lower Bound	Upper Bound
(Constant)	.894	25.354	.000	.825	.963
Being female	-.007	-.635	.526	-.029	.015
Being older	-.011	-.769	.442	-.040	.017
Married	.029	1.629	.104	-.006	.064
Higher ducation	.017	.870	.385	-.021	.054
Urban area	.028	1.675	.094	-.005	.060
Other EAC	.011	.690	.491	-.021	.043
Health care worker	.006	.366	.715	-.027	.039
Higher monthly income	.018	1.347	.179	-.008	.043
Working on frontline	.017	1.205	.229	-.011	.044
Having a chronic disease	-.042	-2.276	.023	-.079	-.006
Being pregnant	-.013	-.387	.699	-.080	.054
Have a child	-.017	-1.003	.316	-.051	.016
been Tested positive covid-19	-.013	-.506	.613	-.063	.037
Been Suspected of covid-19	-.003	-.200	.841	-.036	.029
Been in Quarantine	-.005	-.318	.751	-.039	.028
Been exposed to COVID-19 patient	-.030	-2.341	.020	-.056	-.005
Been exposed to a family member	.003	.147	.883	-.037	.043
Been exposed to death	-.055	-2.067	.039	-.107	-.003
Experienced a Shortage of PPE	.005	.405	.686	-.018	.028
Experienced a shortage of drug	-.009	-.740	.460	-.035	.016
Having called a health care provider	-.001	-.030	.976	-.040	.039
Had traumatic memories	-.021	-1.497	.135	-.048	.006
Increased alcohol uptake	-.002	-.266	.790	-.021	.016
Increased tobacco use	-.023	-1.064	.288	-.067	.020
Been depressed	-.032	-2.194	.029	-.060	-.003
Been anxious	.004	.242	.809	-.025	.032
Experienced Insomnia	-.048	-3.183	.002	-.077	-.018
Been destressed	-.022	-1.481	.139	-.051	.007
Been stressed out	**-.036**	**-2.819**	**.005**	**-.061**	**-.011**
Having fear of COVID	-.004	-4.445	.000	-.005	-.002

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