RESEARCH ARTICLE

Report on the mental health of health workers at the beginning of the Covid-19 pandemic in Kenya

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EXECUTIVE SUMMARY

The declaration of Coronavirus Disease 2019 (COVID-19) as a pandemic, and the rapid spread across the globe has placed a huge burden on the frontline health workforce. The risk of contracting the virus is greatest among the health workers, and yet societal expectations that the health workers provide workable solutions continue to mount. The risk to the mental health of health workers is therefore very high, and studies from regions that were the earliest to experience the devastation of CVOID-19 suggest that health workers will need to have their mental health attended to even as they attend to the needs of the general population.

It is in realization of this challenge that the Kenya Medical Association, in partnership with other health worker professional associations in Kenya including the Kenya Psychiatric Association, the Clinical Psychologists Association of Kenya, the Kenya Clinical Officers Association, and the National Nurses Association of Kenya, set up a team to address the mental health needs of the Kenyan frontline health worker. It was proposed that before we determine the type of services required, it was necessary to carry out a rapid survey to determine the mental health needs of health workers around the time COVID-19 was beginning to spread into our region.

A survey was designed and implemented using online platforms to collect data on the socio-demographic and professional characteristics of health workers, as well as on aspects of their mental health including COVID-19-related worries, depression, anxiety, hazardous alcohol use, posttraumatic stress disorder, and sleep problems. Out of the 1259 participants we approached for this study, 957 responded and completed the online questionnaire based on standardized instruments for assessing for the various mental disorders and psychological distress.

The median age was 35 years, and about two thirds were married. A majority of the respondents were from Nairobi (29%), Uasin Gishu (16.5%), Mombasa (7%), and 6.4% Kiambu. About 39% were non-specialist doctors (Medical Doctors, Medical doctor interns and Registrar), 19.5% nurses, and 16.3% specialist doctors. The other cadres (Clinical officers, pharmacist, lab officer, dentist and public health officer) made up 24.7% of the participants. Over half of the participants had less than 10 years of experience, and the vast majority (70%) were working in a public health facility. Only six percent reported that they had never been treated for a mental illness. About a quarter of the participants reported working directly with COVID-19 clients at the time of the survey.

The **main findings** of our study are as follows:

1. **Worry:**

Participants reported being 'Quite a bit' or 'Very worried' about:
- Contracting COVID-19 (71%)

- Being hospitalized for COVID-19 (58%)
- Dying of COVID-19 (43%)
- Losing a loved one due to COVID-19 (66%)
- Being rejected due to COVID-19 (42%)
- Infecting others with COVID-19 (65%)
- Not being able to do what they know best (61%)

Overall, 66% of the participants were 'Quite a bit' or 'Very worried' about at least one of the various issues identified above. Participants who had more years of experience, were specialist doctors, or were working in private facilities had lower likelihood of reporting worry, while those who had had contact with COVID-19 patients had higher likelihood of reporting worry.

2. Depression:

Our study established high rates of depression among healthcare workers with 15.4% having moderately severe to severe depression and 16 % having moderate depression. Factors associated with depression included female gender, younger age, unmarried status, and fewer years of experience in the sector.

3. Hazardous alcohol use:

About 44% of the participants in our study had hazardous alcohol use. Males, unmarried participants, those with fewer years of experience were more likely to report hazardous alcohol use. Nurses and specialist doctors were less likely to report harmful use compared to other cadres.

4. Anxiety:

Up to 36% of participants reported Generalized Anxiety Disorder. Factors associated with anxiety included younger age, female gender, being unmarried, and having fewer years of experience. Nurses and specialist doctors, as well as health workers in public facilities had lower likelihood of reporting anxiety in this study.

5. Posttraumatic stress disorder (PTSD)

In this study, 65% of the participants had symptoms of PTSD. The only factor associated with PTSD was marital status, with married participants having higher rates of PTSD than those that were not married.

6. Sleep problems

Among the participants, 24% had sleeping difficulties. Younger health care professionals had a higher likelihood of insomnia compared to those over 35 years old. Those with fewer years of work experience, and those in cadres other than nurses and doctors had a higher rates of sleep problems.

Conclusion and Recommendations

In this study, we report a very high rate of worries and mental disorders among health workers at the beginning of the COVID-19 pandemic. The *highest risk appears to be among young, unmarried health workers with fewer years of experience.* It is therefore important to put in place support structures targeting this demographic of health workers in order to reduce their risk and improve outcomes.

Specifically, we make the following recommendations based on our findings:

1. The national and county governments, as well as individual institutions, need to **create a conducive and supportive work environment** that boosts the morale of staff and reduces the risk of mental illness or psychological distress. This includes providing the necessary supplies that make the HCWs feel safer, such as Personal Protective Equipment (PPE) as well as those that make them feel that they are making a difference such as drugs and other vital supplies.

2. There is need to **put in place a mental health and psychosocial support teams within each institution** to continuously help healthcare workers cope with the stressful nature of working with COVID-19 patients. These teams would then have structured and timed meetings that allow staff to express their frustrations and solve any emerging problems. This may require hiring of mental health care providers where none exist.

3. All managers within the healthcare system need to **take proactive steps to bring teams together to discuss their experiences and check on each other's wellbeing**. These forums would help identify those who are affected severely to require professional care.

4. Each institution needs to **have a clear path for linkage to mental health services** for those who actually develop mental illness.

5. Each institution needs to **rethink the work schedules to allow for time for rest**. This may require more staffing to allow for this. It may also mean removing restrictions such as when one can go on leave.

6. There is need for governments and institutions to **build capacity among health care workers to offer Psychological First Aid to colleagues and patients**. This is key due to inadequate mental healthcare workers to provide psychological interventions which would be required in every crisis.

1.0: INTRODUCTION

The World Health Organization (WHO) declared a pandemic due to a novel caused *severe acute respiratory coronavirus 2* (SARS-CoV-2) (WHO, COVID-19, 2020) which has so far affected millions of people across the world, and caused several deaths. There is sufficient evidence to indicate that during any epidemic or pandemic, healthcare workers are affected mentally to a great extent (Preti et al. 2020). During the outbreak of SARS in Hong Kong and Beijing, 20% of the total number of reported cases in the end were of frontline healthcare workers and health care workers had to face a tremendous mental burden in addition to physical strain in taking care of patients with the highly contagious disease (Wu et al. 2008).

Reports of the psychological impact of SARS on hospital staff indicated that high levels of distress were common as characterized by intrusive thoughts, feelings, and memories and avoidance of such thoughts, feelings, and reminders (R. G. Maunder et al. 2004). A previous study found that during the outbreak of infectious disease, the affected hospitals experienced severe staff shortage as a result of personal or family health concerns, childcare issues, quarantine measures or inability to get to work. Health care workers were particularly worried for both their own and their family's health, and experienced significant psychosocial trauma (Martinese et al. 2009).

In Singapore following the SARS outbreak, doctors had to be more vigilant when examining and reviewing patients, with the burden of ensuring that probable SARS patients are identified quickly and moved to the designated hospital heavily laying on their shoulders. Delays or misdiagnosis would mean risking infection for themselves, fellow colleagues, other health care workers and family members, as well as admonishment from health authorities. Approximately 20% of the doctors and nurses were suffering from PTSD (Chan and Chan 2004).

Studies of the SARS outbreaks found that the enormous emotional burden carried by those health care workers who were on the front lines of the battle against the disease led to psychologic morbidity for many of them because of the high infectious potential and mortality rate of the disease, with the most commonly linked mental disorder being PTSD, but also among those with PTSD after these experiences, comorbid depression was common (Liu et al. 2012). Another study reported increased anxiety levels among Hong Kong health care workers who had contact with SARS patients compared with those who did not have such contact, among which general staff, health care assistants, and nurses reported higher anxiety levels compared with administrative staff and physicians (Phua, Tang, and Tham 2005).

Stigma is also a major challenge that front-line health care workers experience in relation to infectious disease outbreaks. In a qualitative study in Sierra Leone, health care providers described a profound sense of stigmatization, suffering, ostracized, loneliness, isolation and sadness since the onset of Ebola. They recounted changes in their professional, personal and social lives as they became de facto first responders in the

outbreak. Their social connectedness and sense of trust within and across health facilities, communities and families was destroyed by Ebola (McMahon et al. 2016). In a review study, healthcare workers experienced social disconnection from the community where people were avoiding contact with them or their family. Media coverage of healthcare workers may have also influenced public perception leading to stigmatization. Healthcare workers who perceived that they, or their families, were being avoided by others, were experiencing a more intense stress response (R. Maunder 2004).

In the case of COVID-19 pandemic, the widespread media coverage human to human transmission, limited of diagnostic tests, drugs, protective equipment, increased workload due to rising numbers of cases, and thoughts of being poorly supported might all contribute to poor mental health among these health care professionals. The ever-increasing number of confirmed and suspected cases, overwhelming workload, depletion of personal protection equipment, widespread media coverage, lack of specific drugs, and feelings of being inadequately supported (Lai et al. 2020) significantly contribute to the risk of their mental health illness (maria A. Oquendo, Carol A. Benstein 2019).

During the outbreak of SARS in Hong Kong and Beijing, 20% of the total number of reported cases in the end were of frontline healthcare workers, who had to face a tremendous mental burden in addition to physical strain in taking care of patients with the highly contagious disease(Wong et al. 2005). A previous study found that during the outbreak of infectious disease, the affected hospitals experienced severe staff shortage as a result of personal or family health concerns, childcare issues, quarantine measures or inability to get to work. Health care workers were particularly worried for both their own and their family's health, and experienced significant psychosocial trauma (Martinese et al. 2009).

In Singapore following the SARS outbreak, doctors had to be more vigilant when examining and reviewing patients, and it is reported that 20% of the doctors and nurses suffered PTSD (Chan and Chan 2004). A rapid review of literature done between March and April 2020 reported that health care workers working during the epidemic reported frequent concerns regarding their own health and the fear of infecting their families, friends and colleagues and that a high prevalence of high levels of stress, anxiety and depression symptoms was being reported (Barello et al. 2020).

There has been a call across the globe to put in all possible measures to preserve and enhance resilience of healthcare workers (Santarone, McKenney, and Elkbuli 2020) and for managers to proactively take steps to protect the mental wellbeing of staff (Greenberg et al. 2020). Such efforts need to be backed by evidence of the burden of the mental illness among these front liners, but unfortunately there is limited data from the Kenyan context to guide such efforts.

In this report, we set out to determine the prevalence of anxiety, depression, hazardous alcohol use, posttraumatic stress disorder (PTSD), and poor quality of sleep among health care professionals at the beginning of the COVID-19 pandemic. Additionally, we investigated the association between various socio-demographic characteristics and mental illness among health care professionals at the beginning of COVID-19 pandemic in Kenya. We also examined the COVID-19 related worries that preoccupied healthcare workers the most.

2.0: METHODOLOGY

2.1. Study Design

We utilized a cross- sectional descriptive online survey method to reach trained health professionals working in healthcare settings during the COVID-19 pandemic. We reached out to all frontline healthcare workers in Kenya, estimated to be 50,000 and these included nurses, doctors, clinical officers, laboratory workers and public health officers. According to the Kenya Health Workforce Report, 2015 the estimated numbers were 20,000 nurses, 6000 doctors, 10000 clinical officers, 8500 laboratory officers, and 5000 public health officers. We excluded health professionals working outside hospital settings, e.g. insurance companies.

We used virtual snowball sampling method to reach our participants, with an online survey being sent to different healthcare workers in our networks on Facebook, WhatsApp and email. The healthcare workers were requested to respond to the survey while a track of responses was kept using the redcap software until the desired number was achieved before closing the survey.

We managed to contact 1259 participants to participate in the survey. Twenty of them did not respond, and 49 responded but did not consent to participate in the study. A further 233 consented but didn't respond to the various sections of the questionnaire including the socio demographic and were thus excluded from the analysis. Thus, the response rate was 76% (957 participants).

2.2: Data Collection tools

Sociodemographic data: We developed a social demographic questionnaire to collect data on age, sex, cadre, place of work, role during the pandemic and years of experience.

Anxiety: Generalized anxiety disorder, GAD 7; It is a 7 item anxiety scale each with a score range from 0 to 3 with 0 being not at all sure, 1-several days, 2-over half the days and 3- every day. The seven items include 1. Feeling nervous, anxious, or on edge; 2 being able to stop or control worrying; 3 worrying too much about different things; 4trouble relaxing; 5 being restless; becoming easily annoyed or irritable; and 7. Feeling afraid as if something awful might happen (Johnson, Ulvenes, Oktedalen and Hoffart 2019). Scores ranges of 0-4, 5-9 and 10-14 were taken as representing mild, moderate and severe anxiety respectively. A score of 10 or greater represent a reasonable cutoff point for identifying cases for GAD. (Spitzer RI et al. 2006)

Depression: PHQ 9 (Kroenke, Spitzer, and Williams 2001); this is a 9 item quick self-reported and severity measure for current depression. The 9 items include 1. Anhedonia, 2. Depressed mood, 3. Insomnia or hypersomnia, 4. Fatique or loss of energy, 5. Appetite disturbance, 6. Guilt or worthlessness, 7. Diminished ability to think or concentrate, 8. Psychomotor agitation, and 9. Suicidal thoughts (Qui, Gelaye and Williams 2016). Each item has a score ranging from 0 to 3. (0-not at all,

1-several days, 2 -more than half the days and 3-nearly every day). It has a total score of 27. A total score range of 1-4 is indicative of minimal depression, 5-9 is an indication of mild depression, 10-14 moderate depression, 15-19 is moderately severe depression while 20-27 is for severe depression.

Hazardous Alcohol use: Alcohol Use Disorder Identification Test (AUDIT) (Bush et al. 1998); AUDIT) is useful in detecting hazardous drinking patterns that may be precursors to full-blown substance use disorders (Bohn, Babor, & Kranzler, 1995). It is a 10-item screening tool developed by WHO to assess alcohol consumption, drinking behaviors and alcohol related problems. It promotes recognition of problem drinking in the early stage, when resolution without formal treatment is more likely A score of 8 or more is considered to indicate hazardous or hazardous alcohol use.

Posttraumatic Stress Disorder (PTSD): Primary Care- Post traumatic Stress disorder (PC- PTSD) for Diagnostic statistical manual DSM V, (Prins et al. 2016). It is a 5-item questionnaire used as a screening measure to diagnose PTSD. It has five brief questions pertaining the traumatic event requiring a yes or no response from the participants. The stem is designed such that respondents who do not report trauma exposure do not answer subsequent questions about PTSD symptoms. The first item assesses nightmares and unwanted thought about the event, the second and third items assesses the efforts by the individual to avoid thoughts or reminders of the events and being on guard. The fourth and fifth items assesses the individual feelings about the event. A positive response for 3 out of the 5 questions about how the traumatic event(s) have affected them over the past month is optimally sensitive to probable PTSD.

Sleep quality: Pittsburg Quality of sleep Index (PQSI) (Carpenter and Andrykowski 1998). The PSQI is a 19- item self-report questionnaire that has been widely used to measures sleep quality and disturbance retrospectively over a 1-month period. The 19 items are combined into 7 clinically derived component scores including 1. Sleep duration, 2. Sleep disturbance, 3. Sleep latency, 4. Day time dysfunction due to sleepiness, 5. Sleep efficiency, 6. Overall sleep quality and 7. Sleep medication use. Each item component has a score range of 0 to 3 with 3 indicating the greatest dysfunction. The sum total score ranges from 0 to21with the highest score/global score indicating worse sleep quality. The scores were as follows: 0–7 = no clinically significant insomnia; 8–14 = subthreshold insomnia; 15–21 = clinical insomnia of moderate severity; 21–28 = severe clinical insomnia.

Worry: This was assessed on several domains including- contracting COVID-19, being hospitalized due COVID, dying of COVID, losing a loved one due to COVID, being rejected due to COVID, infecting others with COVID and not being able to do what you know best. All the items were rated on a Likert scale with response scores from never indicating no worry to very much indicating high severity of the worries

experienced by health care workers. All the domains of worries were associated with background characteristics of the respondents.

Survey Platform- REDCAP

These instruments were programmed into Redcap (Research Electronic Data Capture), a secure, web-based software platform designed to support data capture for research studies. To improve the user experience and quality of the data a number of features were introduced into all the forms:

- Branching logic to ensure the participants only answer the questions that match their previous answers. Questions are only visible based on previous answers
- Mandatory fields preventing skipping of important data
- Restrictions on the type of data input e.g. date field only accepting date field
- Range check to ensure data always makes sense
- Automatic calculation of scores for the various standard tools

The tools were then converted into a flowing survey tool with the following features:

- Administered online using a link that could be easily shared with the target population
- User interface supporting wide array of devices and screens enabling most participants to respond to the tool using mobile tools
- Capability of participants to resume surveys from where they left
- Automatic termination of the survey on decline of consent

REDCap® also provided advanced tools for analysis of the data, alerts and notifications, exports of data and data definitions into other tools enabling further analysis, data comparison and quality check tools, advanced user rights, security/encryption of data and elaborate reporting tools.

2.3: Data analysis

Descriptive statistics such as frequency listings and measures were used to summarize the socio demographic characteristics of the participants. Chi square test was used in the bivariate analysis to assess categorical factors associated with the various mental health disorders; variables significant at 0.20 were considered in the multivariate analysis. To determine factors associated with mental disorders, multivariable logistic regression analysis was performed and presented as adjusted odds ratios (AORs) and 95% CIs. Data analysis was performed using R Core Team (2013). In all analysis a p-value less than 0.05 was considered significant.

2.4: Ethical considerations

The study was reviewed and approved by the Moi Teaching and Referral Hospital/Moi University School of Medicine Institutional Research and Ethics Committee (IREC), as well as by the National Commission for Science, Technology, and Innovation (NACOSTI).

3.0: RESULTS

3.1: Characteristics of Respondents

The median age of the 957 respondents was 35 years (IQR: 30-42) with a range of between 20 and 83 years and majority (54.5%) were females. Sixty four percent of the respondents were married, 28.4 percent have never been married and close to 5 percent have ever been married but are now not in union.

In terms of county of residence majority of the respondents were from Nairobi (29%) followed closely by Uasin Gishu (16.5%). Close to seven percent of the respondents were from Mombasa and 6.4% were from Kiambu County. The remaining counties had less than 5 percent of the respondents.

The majority of the respondents were Christians, 12.3 percent were Muslim, and close to 2 percent were Hindu. Thirty-nine percent of the respondents were non-specialist doctors (Medical Doctors, Medical doctor interns and Registrar), nurses were 19.5 percent and specialist doctors were 16.3 percent while the other cadres (Clinical officers, pharmacist, lab officer, dentist and public health officer) were 24.7 percent.

Slightly more than 45 percent had undergraduate level of education. Twenty-eight percent of the respondents had masters training and 4.4 percent had PhD or Fellowship training. Close to 16 percent had diploma and six percent had higher diploma.

Majority of the respondents, 57 percent, had less than 10 years of experience in the health profession, twenty five percent had between 11 and 20 years of experience with the remaining 18 percent having more than 20 years of experience in the health profession. Seventy percent were working in a public and most were in level 6 facility 32 percent. There were 28.5 percent working in county referral, 22.7 percent in a sub-county, 11.3 percent in a Health Centre and 5.1 percent were working in a dispensary.

Most of the participants reported that they did not have a medical condition (77.2 percent) and only six percent reported that they had never been treated for a mental illness. There were 24 percent of the health providers who reported to have been working directly with COVID-19 clients at the time of the survey.

Table 1:
Background characteristics of respondents

	Overall (N=957)
Age (yrs)	
Mean (SD)	37.388 (10.178)
Range	20.000 - 83.000
Gender	
Male	435 (45.5%)
Female	522 (54.5%)
Marital status	
Married	619 (64.7%)
Single	272 (28.4%)
Widowed/Separated/Divorced	47 (4.9%)
Other	19 (2.0%)
County of residence	
N-Miss	97
Mombasa	65 (7.6%)
Kwale	14 (1.6%)
Kilifi	14 (1.6%)
Tana River	9 (1.0%)
Lamu	1 (0.1%)
Taita-Taveta	4 (0.5%)
Garissa	6 (0.7%)
Wajir	7 (0.8%)
Mandera	2 (0.2%)
Marsabit	1 (0.1%)
Isiolo	5 (0.6%)
Meru	10 (1.2%)
Tharaka-Nithi	6 (0.7%)
Embu	10 (1.2%)
Kitui	5 (0.6%)
Machakos	19 (2.2%)
Makueni	5 (0.6%)
Nyandarua	1 (0.1%)
Nyeri	9 (1.0%)
Kirinyaga	12 (1.4%)
Muranga	6 (0.7%)
Kiambu	55 (6.4%)
Turkana	7 (0.8%)
West Pokot	2 (0.2%)
Samburu	1 (0.1%)
Trans-Nzoia	12 (1.4%)
Uasin Gishu	142 (16.5%)
Elgeyo-Marakwet	4 (0.5%)
Nandi	8 (0.9%)
Baringo	8 (0.9%)
Laikipia	8 (0.9%)
Nakuru	24 (2.8%)
Narok	1 (0.1%)
Kajiado	17 (2.0%)

Kericho	9 (1.0%)
Bomet	5 (0.6%)
Kakamega	10 (1.2%)
Vihiga	4 (0.5%)
Bungoma	7 (0.8%)
Busia	17 (2.0%)
Siaya	5 (0.6%)
Kisumu	24 (2.8%)
Homa Bay	9 (1.0%)
Migori	8 (0.9%)
Kisii	8 (0.9%)
Nyamira	5 (0.6%)
Nairobi	249 (29.0%)
Religion	
Muslim	118 (12.3%)
Christian	794 (83.0%)
Buddhist	0 (0.0%)
Hindu	17 (1.8%)
Atheist	3 (0.3%)
African traditional	7 (0.7%)
Other	18 (1.9%)
Cadre	
N-Miss	1
Doctor - Medical Officer Intern	12 (1.3%)
Doctor - Medical Officer	273 (28.6%)
Doctor - Senior Registrar	20 (2.1%)
Doctor - Registrar	73 (7.6%)
Doctor - Specialist	156 (16.3%)
Nurse	186 (19.5%)
Laboratory officer	27 (2.8%)
Public health officer	39 (4.1%)
Dentist	52 (5.4%)
Pharmacist	37 (3.9%)
Clinical Officer	81 (8.5%)
Education level	
Diploma	151 (15.8%)
Higher Diploma	59 (6.2%)
Undergraduate	435 (45.5%)
Masters	270 (28.2%)
Phd	13 (1.4%)
Fellowship	29 (3.0%)
Years of experience	
0-10	546 (57.1%)
11–20	239 (25.0%)
21- 30	108 (11.3%)
31- 40	53 (5.5%)
41- 50	11 (1.1%)
Type of facility	

Public	672 (70.2%)
Private	285 (29.8%)
Level of facility	
Level 6 National	306 (32.0%)
Level 5 County referral	273 (28.5%)
Level 4 Subcounty	217 (22.7%)
Level 3 Heath centre	112 (11.7%)
Level 2 Dispensary	49 (5.1%)
Have a known medical condition	
Yes	218 (22.8%)
No	739 (77.2%)
Ever been treated for mental illness	
Yes	58 (6.1%)
No	899 (93.9%)
Currently working directly with COVID-19 clients	
Yes	231 (24.1%)
No	726 5.9%)

3.2 Worry Related to COVID-19
Table 2 shows the prevalence of various type of worried related to
COVID-19. We observed that at least a third of the HCWs were worried
about each of the COVID-19 related issues, including contacting the
disease, dying and infecting others.

Table 2

Prevalence of various types of worry

	Overall (N=957)
Contracting COVID	
Never	42 (4.4%)
A little	231 (24.1%)
Quite a bit	321 (33.5%)
Very much	363 (37.9%)
Being hospitalized for COVID	
Never	162 (16.9%)
A little	242 (25.3%)
Quite a bit	214 (22.4%)
Very much	339 (35.4%)
Dying of COVID	
Never	271 (28.3%)
A little	271 (28.3%)
Quite a bit	129 (13.5%)
Very much	286 (29.9%)
Losing a loved one due to COVID	
Never	126 (13.2%)
A little	201 (21.0%)
Quite a bit	232 (24.2%)
Very much	398 (41.6%)
Being Rejected due to COVID	
Never	302 (31.6%)
A little	252 (26.3%)
Quite a bit	190 (19.9%)
Very much	213 (22.3%)
Infecting others with COVID	
Never	135 (14.1%)
A little	200 (20.9%)
Quite a bit	251 (26.2%)
Very much	371 (38.8%)
Not being able to do what you know best	
Never	158 (16.5%)
A little	211 (22.0%)
Quite a bit	273 (28.5%)
Very much	315 (32.9%)

Association of Worry with participant characteristics

A total of 635 (66.4%) health providers reported to have been very worried about any of the COVID-19 related issues. We assessed whether the proportion differed by background characteristics, the results are shown in Table 3. Worry was associated with years of experience, cadre, type of facility and having had contact with a COVID-19 client. Participants who had more years of experience, were specialist doctors, or were working in private facilities had lower

likelihood of reporting worry, while those who had had contact with
COVID-19 patients had higher likelihood of reporting worry.

Table 3
Worry by background characteristics of respondents

Variable	Levels	Worry (N=957)		p-value
		Not very much (n=322)	Very much (n=635)	
Age in years	<35	135 (29.2)	327 (70.8)	0.262
	>=35	187 (37.8)	308 (62.2)	
Sex	Male	155 (35.6%)	280 (64.4%)	0.235
	Female	167 (32.0%)	355 (68.0%)	
Marital status	Married	214 (34.6%)	405 (65.4%)	0.828
	Not married	86 (31.6%)	186 (68.4%)	
Years of experience	0-10	165 (30.2%)	381 (69.8%)	0.026
	11–20	95 (39.7%)	144 (60.3%)	
	20+	62 (36.0%)	110 (64.0%)	
Cadre	Specialist	68 (43.6%)	88 (56.4%)	0.006
	Doctor	132 (34.9%)	246 (65.1%)	
	Nurse	59 (31.7%)	127 (68.3%)	
	Other	63 (26.7%)	173 (73.3%)	
Facility	Public	211 (31.4%)	461 (68.6%)	0.024
	Private	111 (38.9%)	174 (61.1%)	
Have known medical condition	Yes	67 (30.7%)	151 (69.3%)	0.300
	No	255 (34.5%)	484 (65.5%)	
Contact COVID19 clients	Yes	65 (28.1%)	166 (71.9%)	0.040
	No	257 (35.4%)	469 (64.6%)	

3.3: Mental disorders
3.3.1: Depression
Depression was assessed using the PHQ9, and a total of 882 health
providers responded to the questions. The mean score was 4.8.

The majority (68%) had mild symptoms of depression; seventeen
percent had moderate symptom while the remaining 16% had
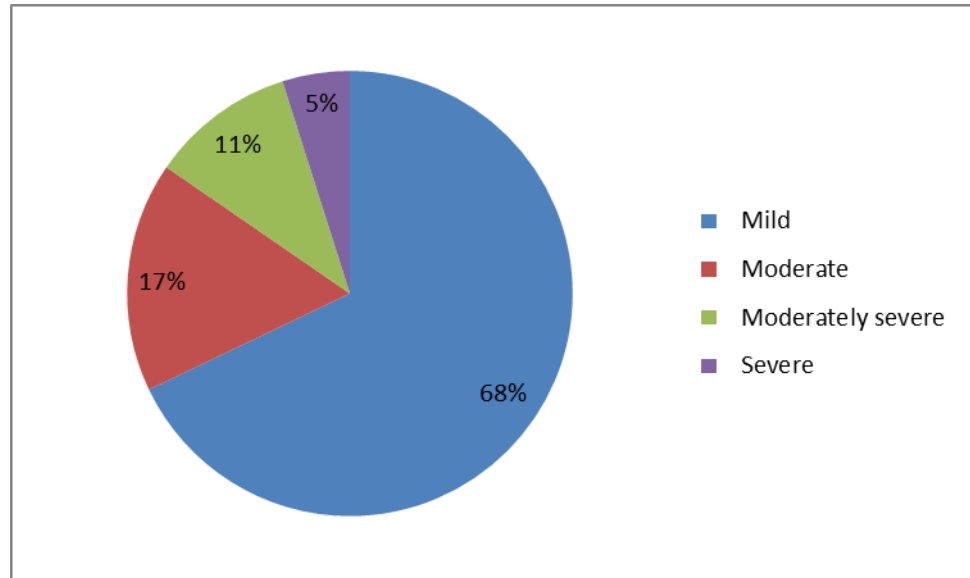moderately severe to severe symptoms as shown in Figure 1.

Figure 1. Distribution of severity of depression among the respondents

Table 4 shows severity of depression by background characteristics. We observed that the severity of depression differed by age, sex, marital status and years of experience. Younger participants, females, those not married, and those with fewer years of experience had a higher likelihood of having moderate/severe depressive symptoms.

Table 4

Severity of depression by background characteristics of respondents

Variable	Levels	PHQ (N=882)		
		Mild	Moderate/Severe	p-value
Age in years	<35	265 (61.9)	163 (38.1)	**<0.001**
	>=35	334 (73.6)	120 (26.4)	
Sex	Male	296 (73.1)	109 (26.9)	**0.003**
	Female	303 (63.5)	174 (36.5)	
Marital status	Married	419 (72.4)	160 (27.6)	**<0.001**
	Not married	180 (59.4)	123 (40.6)	
Years of experience	0-10	320 (62.9)	189 (37.1)	**<0.001**
	11–20	155 (71.4)	62 (28.6)	
	20+	124 (79.5)	32 (20.5)	
Cadre	Specialist	106 (70.7)	44 (29.3)	0.454
	Doctor	241 (67.7)	115 (32.3)	
	Nurse	116 (70.7)	48 (29.3)	
	Other	135 (64.0)	76 (36.0)	
Facility	Public	426 (69.4)	188 (30.6)	0.182
	Private	173 (64.6)	95 (35.4)	
Have known medical condition	Yes	138 (69.7)	60 (30.3)	0.600
	No	461 (67.4)	223 (32.6)	
Contact COVID19 clients	Yes	141 (68.1)	66 (31.9)	1.000
	No	458 (67.9)	217 2.1)	

3.3.2: Alcohol use disorder

Alcohol use disorder was assessed using the AUDIT. A total 887 health providers responded the mean score was 5.2 (SD,6.7). A total of 389 (43.9%) had harmful drinking behavior as shown in Figure 2.
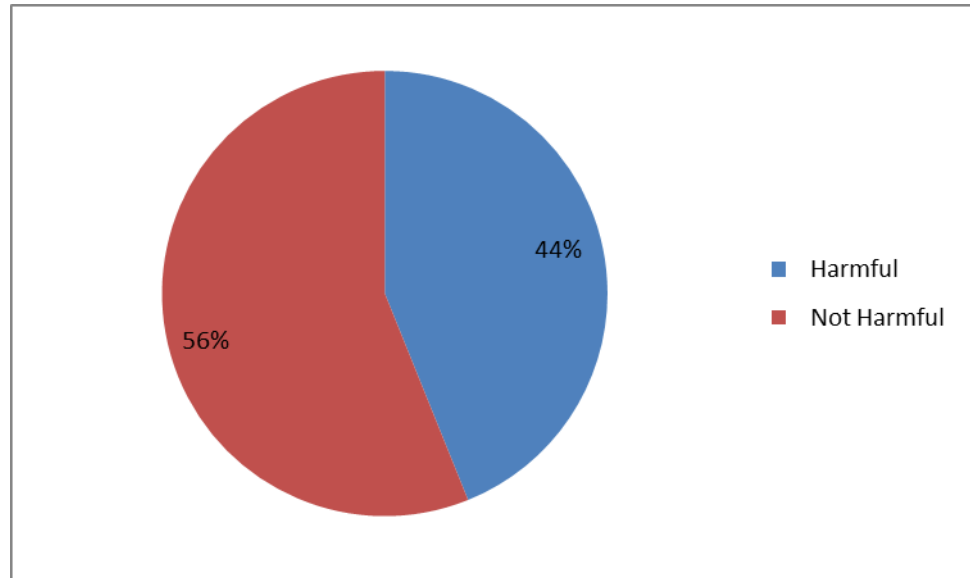
Figure 2: Alcohol use

Association of alcohol use and participant characteristics

As shown in Table 5, alcohol use differed by sex, marital status, cadre and years of experiences. Females, married participants, nurses, and health workers with longer experience had the lowest likelihood of reporting hazardous alcohol use.

Table 5
Alcohol use by background characteristics of respondents

Variable	Levels	AUDIT (N=887)		
		Harmful	Not Harmful	p-value
Age in years	<35	198 (45.9)	233 (54.1)	0.251
	>=35	191 (41.9)	265 (58.1)	
Sex	Male	198 (49.1)	205 (50.9)	**0.005**
	Female	191 (39.5)	293 (60.5)	
Marital status	Married	224 (38.7)	355 (61.3)	**<0.001**
	Not married	165 (53.6)	143 (46.4)	
Years of experience	0-10	238 (46.5)	274 (53.5)	**0.001**
	11–20	104 (47.5)	115 (52.5)	
	20+	47 (30.1)	109 (69.9)	
Cadre	Specialist	68 (45.6)	81 (54.4)	**<0.001**
	Doctor	178 (50.3)	176 (49.7)	
	Nurse	38 (22.8)	129 (77.2)	
	Other	104 (48.1)	112 (51.9)	
Facility	Public	265 (42.7)	356 (57.3)	0.312
	Private	124 (46.6)	142 (53.4)	
Have known medical condition	Yes	97 (48.0)	105 (52.0)	0.202
	No	292 (42.6)	393 (57.4)	
Contact COVID19 clients	Yes	92 (43.4)	120 (56.6)	0.94
	No	297 (44.0)	378 6.0)	

3.3.3: Generalized Anxiety Disorder

Generalized anxiety disorder was assessed using GAD-7, a total of 807
participants responded. The mean score was 4.6. Close to two thirds
(63.9%) of the participants did not have symptoms of generalized
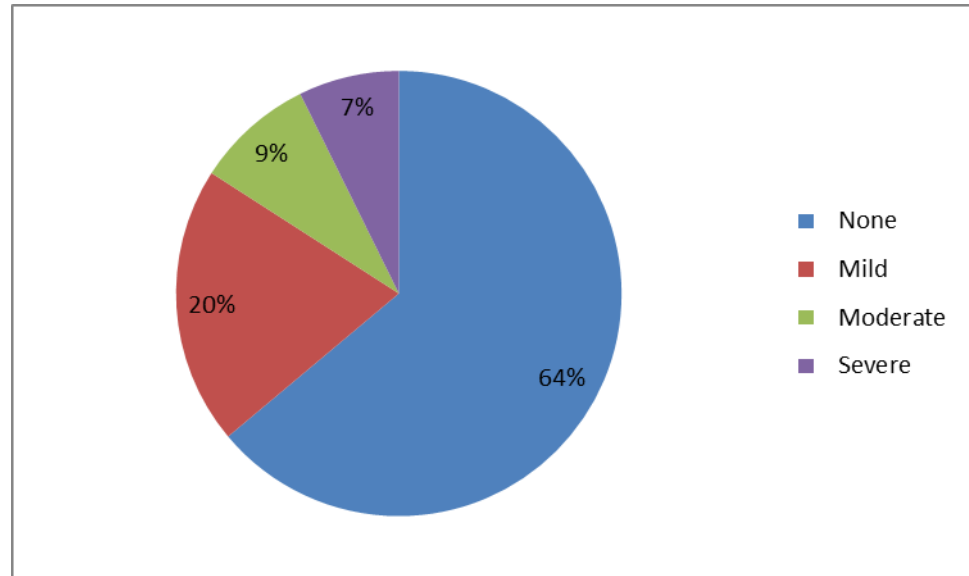anxiety (Figure 3).

Figure 3: Severity of generalized anxiety among the respondents

Association of Generalized anxiety disorder with participant characteristics

We observed that presence of generalized anxiety differed by age, sex, marital status, years of experience in medical profession and cadre (Table 6). Participants who were younger, female, unmarried, and with fewer years of experience had higher likelihood of having GAD. Nurses and specialist doctors, as well as health workers in public facilities had lower likelihood of reporting GAD in this study.

Table 6

Generalized anxiety by background characteristics of respondents

Variable	Levels	GAD (N=807)		
		Present	**None**	**p-value**
Age in years	<35	167 (43.5)	217 (56.5)	**<0.001**
	>=35	124 (29.3)	299 (70.7)	
Sex	Male	106 (29.2)	257 (70.8)	**<0.001**
	Female	185 (41.7)	259 (58.3)	
Marital status	Married	165 (31.2)	363 (68.8)	**<0.001**
	Not married	126 (45.2)	153 (54.8)	
Years of experience	0-10	191 (41.6)	268 (58.4)	**<0.001**
	11–20	70 (34.7)	132 (65.3)	
	20+	30 (20.5)	116 (79.5)	
Cadre	Specialist	40 (28.4)	101 (71.6)	**0.013**
	Doctor	116 (36.8)	199 (63.2)	
	Nurse	47 (30.9)	105 (69.1)	
	Other	87 (43.9)	111 (56.1)	
Facility	Public	190 (33.7)	373 (66.3)	**0.046**
	Private	101 (41.4)	143 (58.6)	
Have known medical condition	Yes	73 (39.0)	114 (61.0)	0.378
	No	218 (35.2)	402 (64.8)	
Contact COVID19 clients	Yes	76 (39.8)	115 (60.2)	0.253
	No	215 (34.9)	401 5.1)	

3.3.4: PTSD

The response rate to the DSMV for PTSD was 348 (36.4%). Among the respondents 225 (64.7%) had probable PTSD (Figure 4).
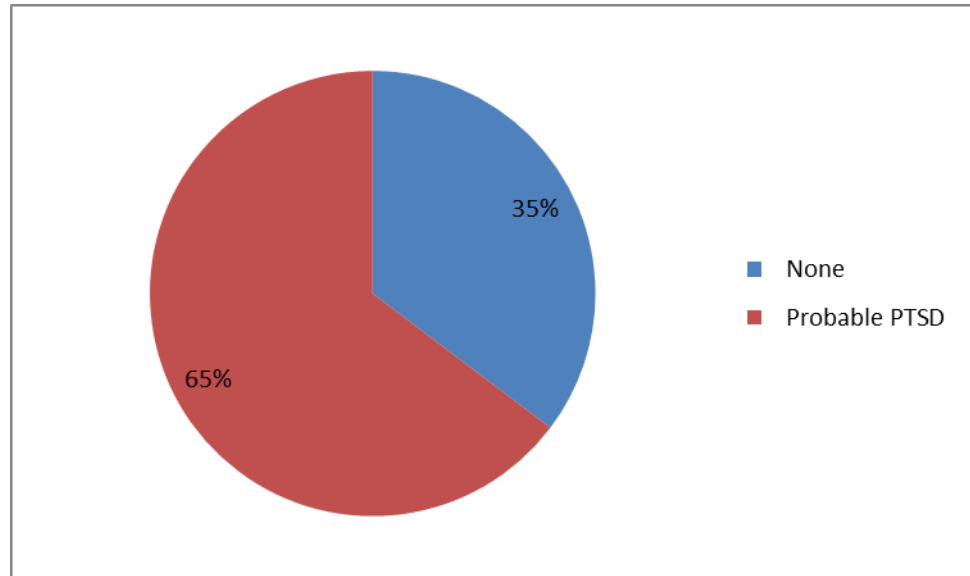
Figure 4: PTSD distribution among the respondents

Association of PTSD with participant characteristics

We observed that presence of probable PTSD differed by marital status (Table 7). Married health care professional reported a higher proportion with probable PTSD (69.4%) compared to those who were not married (56.8%).

Table 7
PTSD by background characteristics of respondents

Variable	Levels	PTSD (N=348)		p-value
		None	Probable PTSD	
Age in years	<35	67 (38.5)	107 (61.5)	0.262
	>=35	56 (32.2)	118 (67.8)	
Sex	Male	55 (37.2)	93 (62.8)	0.619
	Female	68 (34.0)	132 (66.0)	
Marital status	Married	66 (30.6)	150 (69.4)	**0.023**
	Not married	57 (43.2)	75 (56.8)	
Years of experience	0-10	75 (37.5)	125 (62.5)	0.100
	11–20	34 (38.6)	54 (61.4)	
	20+	14 (23.3)	46 (76.7)	
Cadre	Specialist	15 (27.8)	39 (72.2)	0.136
	Doctor	41 (30.8)	92 (69.2)	
	Nurse	25 (41.0)	36 (59.0)	
	Other	42 (42.4)	57 (57.6)	
Facility	Public	91 (37.0)	155 (63.0)	0.382
	Private	32 (31.4)	70 (68.6)	
Have known medical condition	Yes	30 (37.0)	51 (63.0)	0.817
	No	93 (34.8)	174 (65.2)	
Contact COVID19 clients	Yes	37 (39.8)	56 (60.2)	0.358
	No	86 (33.7)	169 (66.3)	

3.3.5: Insomnia (Pittsburg Sleep Quality Index)

There were a total of 780 participants who responded to the PSQI, the mean PSQI score was 5.2 (SD=3.7). A total of 189 (24.2%) reported to have experienced some form of Insomnia based on the PSQI.
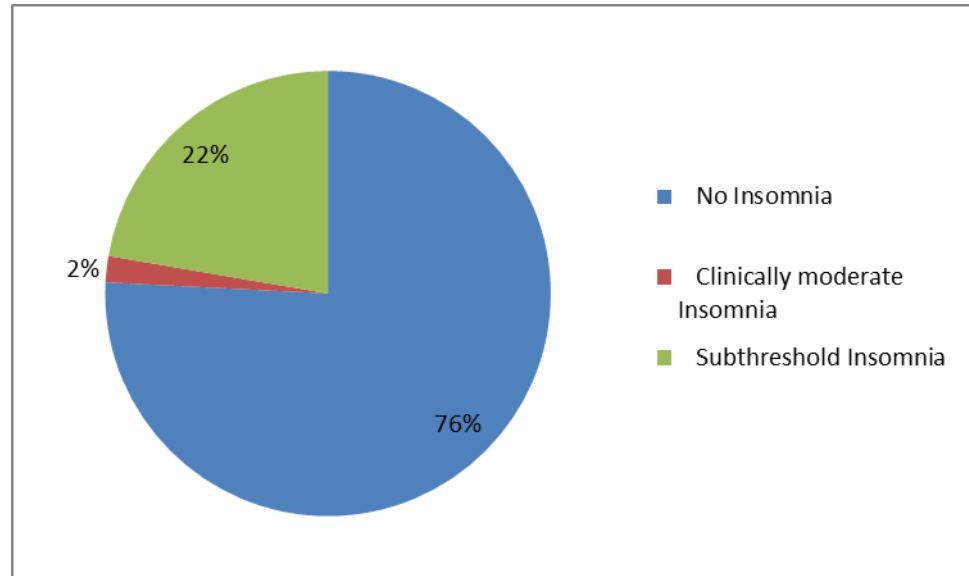
Figure 5: Insomnia among the respondents

Association of Insomnia disorder with participant characteristics

Insomnia differed by Age, cadre and years of experience in the health
profession. Participants who were younger and had fewer years of
experience had the highest likelihood of reporting insomnia (Table 8).
Further, nurses and specialist doctors had lower likelihood of reporting
insomnia compared to other cadres.

Table 8

Insomnia by background characteristics of respondents

Variable	Levels	PSQI (N=780)		p-value
		Insomnia	No Insomnia	
Age in years	<35	114 (30.3)	262 (69.7)	**<0.001**
	>=35	75 (18.6)	329 (81.4)	
Sex	Male	73 (20.8)	278 (79.2)	0.052
	Female	116 (27.0)	313 (73.0)	
Marital status	Married	110 (21.9)	392 (78.1)	0.052
	Not married	79 (28.4)	199 (71.6)	
Years of experience	0-10	123 (27.3)	327 (72.7)	**0.043**
	11–20	42 (21.6)	152 (78.4)	
	20+	24 (17.6)	112 (82.4)	
Cadre	Specialist	24 (17.5)	113 (82.5)	**0.022**
	Doctor	80 (25.5)	234 (74.5)	
	Nurse	27 (19.4)	112 (80.6)	
	Other	58 (30.7)	131 (69.3)	
Facility	Public	133 (24.8)	404 (75.2)	0.668
	Private	56 (23.0)	187 (77.0)	
Have known medical condition	Yes	50 (28.6)	125 (71.4)	0.155
	No	139 (23.0)	466 (77.0)	
Contact COVID19 clients	Yes	47 (25.1)	140 (74.9)	0.816
	No	142 (23.9)	451 6.1)	

4.0: DISCUSSION

In this study we report for the first time, the prevalence of mental illness among health care workers in Kenya at the beginning of the COVID-19 pandemic. This is a good evidence base to inform government and institutional efforts to promote mental wellness among healthcare workers working during these extraordinary times.

4.1: Mental disorders and the associated factors
4.1:1 COVID-19 related worry

Between 42% and 71% of participants reported being 'Quite a bit' or 'Very worried' about aspects of COVID-19, with 66% of the participants were 'Quite a bit' or 'Very worried' about at least one of them. The leading three issues participants worried about were losing a loved one to COVID-19, infecting others, and getting infected with COVID-19. This is in keeping with a recent review that indicated that other than the main diagnostic categories of mental illness, many healthcare workers have various concerns regarding COVID that increase their risk of experiencing psychological distress (Spoorthy, Pratapa, and Mahant 2020). Participants who had more years of experience, were specialist doctors, or were working in private facilities had lower likelihood of reporting worry, while those who had had contact with COVID-19 patients had higher likelihood of reporting worry. Such worry has been associated with the fact that this disease is new, is highly contagious, had no cure and there is rapidly evolving information about its outcomes.

4.1.2: Depression:

Our study established high rates of depression among healthcare workers with 15.4% having moderately severe to severe depression and 16 % having moderate depression. These findings are higher than that found in similar studies in Nepal (Gupta et al. 2020), Singapore and India (Chew et al. 2020) and elsewhere (Pappa et al. 2020).

  Factors associated with depression included female gender, younger age, unmarried status, and fewer years of experience in the sector. The gender association is in keeping with previous work (Wilson et al. 2020) (Zhu et al. 2020). People living along or outside of supportive relationships are also at higher risk of developing a variety of mental illnesses, or to have more severe symptoms when they develop these disorders. We see younger age and fewer years of experience as impacting the level of comfort and therefore the risk of more severe symptoms due to the uncertainty presented by this new pandemic.

4.1.3: Hazardous alcohol use

Up to 43.9% of the participants in our study had hazardous alcohol use. This is higher than a previous study done among 206 healthcare workers from 15 facilities in Kenya that reported a prevalence rate of 35.8%. Studies have demonstrated an increase in alcohol use as individuals try to cope with the COVID-19 related stresses. For example,

a study done in Australia among 13000 participants reported that 20% of the participants had been drinking more during COVID-19 than before (Tran et al. 2020). This increase in drinking pattern could be linked to among others reduction in social activities thus creating boredom as well as loss of structure in daily activities (Da Im and Schiano 2020).

The factors we found to be associated with alcohol use among healthcare workers were consistent with what is already known on the subject. Males, unmarried participants, those with fewer years of experience were more likely to report hazardous alcohol use. Nurses and specialist doctors were less likely to report harmful use compared to other cadres.

4.1.4: Anxiety

A higher proportion of our participants (36%) reported generalized anxiety disorder compared to similar studies elsewhere (Pappa et al. 2020, Gupta et al. 2020). Factors associated with anxiety included younger age and female gender, which is similar to what was found in a Turkish study (Özdin and Bayrak Özdin 2020). Further, participants who were unmarried, and with fewer years of experience had higher likelihood of having GAD. Nurses and specialist doctors, as well as health workers in public facilities had lower likelihood of reporting GAD in this study. These findings reflect both biological and social or context-specific determinants of anxiety in this study population.

4.1.5: Probable PTSD

Our study found that two thirds of the healthcare workers had been exposed to potentially traumatic events that produced symptoms that approximated those of posttraumatic stress disorder (PTSD). This is slightly higher than findings of a study done among 863 medical care workers from seven provinces in China using the Impact of Event Scale-6 which reported a prevalence of 40.2% (Si et al. 2020). Similar high rates of PTSD have been shown in previous Flu out breaks. For example a study done among nurses working in South Korea during the Middle East Respiratory Syndrome (MERS) reported that more than half of the develop PTSD (Jung et al. 2020).

4.1.6: Sleeping difficulties

Among the participants, 24.2% had sleeping difficulties, which is lower than the prevalence of 38.9% reported from a meta-analysis (Pappa et al. 2020). Interestingly, younger health care professionals had a higher likelihood of insomnia compared to those over 35 years old. Proportion with Insomnia decreased with increased experience in the health profession and those in other cadres other than nurses and doctors had a higher proportion with insomnia. It is possible that insomnia is also linked to the risk of the other mental disorders, since sleep disturbance is one of the earliest and most common indicator of psychological distress.

4.2: Limitations of the study

While these findings are novel, a few limitations must be considered in interpreting these findings.

First, this was an online survey and may have selection bias whereby the non-responders who did not have internet access or were older, may have different characteristics compared to those who responded.

Second, it is possible that there is respondent bias meaning that the responses to the self-administered questionnaires were not accurate as this left no room for clarifications of the concept being enquired.

Thirdly, this study was carried out early on in the pandemic, which means that it may be a reflection of the burden of mental illness even prior to the pandemic.

Finally, cross-sectional data can identify associations, not causal relationships with COVID-19, and a longitudinal study would be best carried out to ascertain this.

4.3 Conclusion and Recommendations

In this study, we report a very high rate of worries and mental disorders among health workers at the beginning of the COVID-19 pandemic. The **highest risk appears to be among young, unmarried health workers with fewer years of experience**. This risk is likely to be worsened by the pressure that COVID-19 is likely to bring, hence compromising the ability to provide services optimally. This evidence is a call to prioritize Kenyan healthcare worker mental and psychological wellness by putting in place all possible measures to preserve and enhance resilience of healthcare workers in order to sustain productivity and ensure continuity of care during these tough times.

We therefore make the following recommendations:

1. The national and county governments, as well as individual institutions, need to **create a conducive and supportive work environment** that boosts the morale of staff and reduces the risk of mental illness or psychological distress. This includes providing the necessary supplies that make the HCWs feel safer, such as Personal Protective Equipment (PPE) as well as those that make them feel that they are making a difference such as drugs and other vital supplies.

2. There is need to **put in place a mental health and psychosocial support teams within each institution** to continuously help healthcare workers cope with the stressful nature of working with COVID-19 patients. These teams would then have structured and timed meetings that allow staff to express their frustrations and solve any emerging problems. This may require hiring of mental health care providers where none exist.

3. All managers within the healthcare system need to **take proactive steps to bring teams together to discuss their experiences and check on each other's wellbeing**. These

forums would help identify those who are affected severely to require professional care.

4. Each institution needs to **have a clear path for linkage to mental health services** for those who actually develop mental illness.

5. Each institution needs to **rethink the work schedules to allow for time for rest**. This may require more staffing to allow for this. It may also mean removing restrictions such as when one can go on leave.

6. There is need for governments and institutions to **build capacity among health care workers to offer Psychological First Aid to colleagues and patients**. This is key due to inadequate mental healthcare workers to provide psychological interventions which would be required in every crisis.

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