ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE SCHOOL OF MEDICINE DEPARTMENT OF ANESTHESIOLOGY, CRITICAL CARE AND PAIN RESEARCH THESIS

Prevalence and associated factors of burnout among frontline health care workers during COVID-19 outbreak in Eka Kotebe COVID-19 treatment center

By:Dr. Denekew Assefa (MD)

November 2020.

Addis Ababa, Ethiopia

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A Research Thesis To Be Submitted To Addis Ababa University School Of Medicine In Partial Fulfillment Of The Requirement For Specialty Certificate In Anesthesiology, critical care and pain medicine.

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The thesis here, entitled "Prevalence and associated factors of burnout among frontline health care providers during COVID-19 outbreak in Eka Kotebe COVID-19 treatment center " is accepted in its present form by the board of examiners as partial fulfillment off the requirement for specialty certificate in Anesthesiology Critical Care And Pain Medicine.

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ACRONYMS AND ABBREVIATIONS

A.A…….Addis Ababa

AAU……Addis Ababa University

ACCPM…….Anesthesiology, Critical care, and Pain Medicine

AOR …….Adjusted Odd Ratio

BOS……..Burnout Syndrome

CI……..confidence Interval

COR ……Crude Odd Ratio

COVID-19…..Corona Virus Diseases 2019

DP ……Depersonalization

Dr……..Doctor

EE ……Emotional Exhaustion

HCP…….Health Care Personnel

HCW……Health Care Workers

HSS ……. Human Service Survey

IRB ……. Institutional review board

Max……maximum

Min……..minimum

MBI ……. Maslash‖s burnout inventory

MBI-HSS …… Maslash‖s Burnout Inventory-Human Survey Service

MD……..Medical Doctor

N CON …….New corona virus

PA ……..Personal Accomplishment

PB…….Professional Burnout

PPE……Personal protective Equipment

PTSD ……..Post-Traumatic Stress Syndrome

SARS-COV-2….sever acute respiratory syndrome corona virus 2

WHO…….world health organization

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ABSTRACT

Background: COVID-19 is a highly infectious disease which increases work-related and psychological stress and level of burn out among front line health workers.

Objective: To describe the prevalence of burnout among front line healthcare workers and the associated factors at Eka Kotebe COVID-19 treatment center .

Methodology: Institutional based Cross-sectional study design was conducted on 200 sample frontline health workers selected by simple random sampling technique. These health workers were selected at Eka Kotebe COVID-19 treatment center because it is one of the national COVID-19 treatment centers. The study participants were stratified based on their profession .Structured self-administered questionnaire was used. The questionnaire contains of 22 items, which includes 8 items in emotional exhaustion, 5 items in depersonalization and 9 items in personal accomplishment. Pre-test was conducted on 10% of sample in BLH to assure reliability and validity. Data was coded, entered and analyzed by SPSS version 26.

Result: The study showed that 170(85.0%) of front-line health workers had a high level of burnout (high score of either EE, DP).107 (53.5%) of frontline health workers had a high score in both EE & DP subscale. The study also showed that 41(20.5%), 54 (27.0%), and 105 (52.5%) front line health workers experienced low, moderate, and high levels in the emotional exhaustion axis, respectively. In the depersonalization axis, the values for low, moderate, and high levels of burnout were 15 (7.5%), 17 (8.5%), and 168(84.0%), respectively. Also, 5(2.5%), 7 (3.5%) and 188 (94.0%) health workers scored low, moderate, and high in the personal accomplishment axis, respectively. Among the studied characteristics, gender, low level of baseline job satisfaction, service year as a health care provider, and development of acute infection was associated with high levels of all three domains of burnout.

Conclusion: Burnout is prevalent among healthcare workers caring for COVID-19 patients in Eka Kotebe COVID-19 treatment center .

Gender, job satisfaction, and year of practice as health care providers contribute to the level of front line health care provider burnout during the covid-19 pandemic at Eka Kotebe COVID-19 treatment center.

1. INTRODUCTION

1.1. Back Ground of the Study

COVID-19 is a highly infectious and pathogenic viral infection caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), that started in Wuhan, China, and spread quickly to the glob[1]. It was assumed to be associated with the Huanan seafood market in Wuhan, in the Hubei province of China[2]. Although the intermediate source of origin is not known, it is confirmed that there is fast human to human spread[1]. The first case was diagnosed on December 30, 2019, and declared as a pandemic by WHO in January 2020. Antiviral drugs or vaccines are not approved to be used against COVID-19[1].

This viral infection causes several diseases; respiratory, enteric, hepatic, neurologic, and vascular system[3]. It has been characterized by a wide clinical future ranging from no symptoms to a severe form of respiratory illness, like ARDS[4]. The main symptoms of COVID-19 included fever, fatigue, and cough. Patients also can present with productive cough, hemoptysis, and diarrhea [5].

The virus infects more than 21 million people, involves 215 countries, and has become the cause of death of 758,036 from December 30, 2019, till the end of August 2020 (world meter).

In Ethiopia, initially the case was detected on 13 March 2019, and the victim was later identified as a Japanese citizen. From March 2019 till August 2020, 26,204 Ethiopians were infected with the virus and killed 479 people (world meter).

COVID-19 pandemic creates a high work related and psychosocial stressor which affect the mental and emotional health of frontline health workers that may progress to burnout symptoms[6]. This pandemic causes many challenges to the health care system especially in an unprepared, poorly organized third world country health care system that has a high baseline rate of physician burnout [7].

Since it is highly pathogenic and uncontrollable nature together with a relatively high rate of infection and mortality among healthcare providers COVID-19 can provoke anxiety and stress in medical staff[8] .

Burnout is a syndrome of emotional exhaustion and depersonalization that occurs commonly among individuals who are on work[9].

Burnout has three dimensions. 1, Emotional exhaustion is defined as the depletion of emotional reserve , feelings of strain, and chronic fatigue which reflects the stress component [10]. Emotionally exhausted workers lack adaptive resources and cannot give any more concern to their jobs.2) Depersonalization is defined as impersonal, negative, and uncaring responses towards the recipients of service, care, treatment, or instruction. It occurs in response to emotional exhaustion. By placing distance between the employee and the recipient, depersonalization makes job demands more difficult to manage. 3) Low personal accomplishment is defined as a feeling of low self-efficacy, a decrease in sense of competence as well as a tendency to consider oneself negatively [10]. The measurement of burnout was first introduced by the development of the MBI-HSS (Maslash‖s & Jackson, 1981). The scale have 22 items which includes : Emotional exhaustion (EE) with 9 items, depersonalization (DP) with 5 items, and low personal accomplishment (PA) with 8 items[10].

Professional burnout is a main global health problem among physicians, nurses, and other healthcare providers[8]. Health professionals treating COVID-19 patients had been reported to develop extreme stress, which could lead to burnout and a decrease in effectiveness on their work [8].

Burnout is a main occupational problem among healthcare providers. During the corona virus disease (COVID-19) pandemic, the frontline health care providers was experiencing a high workload and many psychosocial stressors, which may have an impact on their mental and emotional health[11].

The prevalence of burnout in nurses is a real concern and a real problem to the health care system. Several studies around the world had been carried out ,and showed the high rates of burnout among nurses working in hospitals. In high-income country studies, the prevalence of burnout among HCWs was from 12.6% [12] to 29.9% [13].

The difficulty in predicting the nature of COVID-19 pandemic and the already alarming high incidence of healthcare workers infection with virus can have a significant impact on the psychological status of the staff. During the corona virus disease (COVID-19) pandemic the frontline health works were experiencing a high workload and multiple psychosocial stressors, which may have an impact on their mental and emotional health.

Health care works often feel inadequate and unprotected against COVID-19[8].

Physicians and nurses are at high risk when giving the treatment and care of COVID-19 patients and can develop intense stress. They are affected negatively by physical, mental, and social issues due to the problems they experience in the working environment and face the problem of burnout[8].Being Nurse, women, those working in Wuhan, and frontline workers reported more severe symptoms than other frontline health workers[14].

Several factors may contribute for the development of burnout. This includes personal factors such as socio-demographic [12], psychosocial condition[15], level of depression, substance abuse problems, and physical health problems such as low back pain[15]. There are also work-related factors such as role ambiguity, lack of experience [16], and team relationships [16]. Therefore, the magnitude of the problem needs due attention because of the critical impact and consequences on the HCW and health service during the COVID-19 outbreak.

1.2. Statement of the problem

The highly pathogenic and infectious nature of COVID-19, for which there is no known effective treatment, together with a relatively high rate of infection and death among healthcare workers can cause anxiety and stress in medical team[17]. This pandemic causes a substantial psychological impact on healthcare providers which is aggravated by lack of adequate PPE, social stigma & heavy workload.

Burnout can have serious consequences for both patients and the healthcare professionals which include poor physical and mental health outcomes, lack of motivation, absenteeism, low morale in the staff, and poor quality of patient care[17].

Many systematic reviews of the literature showed that high levels of burnout in health care workers were associated with a decrease in safety of patient care[18]. There is no published research done on health workers' burnout and associated factors during the COVID-19 pandemic in Ethiopia. Therefore, health management teams need more information on the level of this problem and its associated factors to better prepare for future infectious disease outbreaks.

This study was conducted on healthcare workers providing care for COVID-19 patients and aimed to explore the level of burnout among this population and also to examine factors associated with the development of this psychological sequel.

1.3. Significance of the study

The findings of the study would help us to know the magnitude of burnout and to identify the associated factors among frontline health workers during the COVID-19 pandemic.

It could also help institutions and policymakers to recognize factors related to burnout in health workers & aided them to take corrective measures during the pandemic outbreak.

Moreover; the findings would be used as a reference for other researchers who will have an interest in the area for further investigation.

2. LITERATURE REVIEW

First introduced by Freudenberger (1974) and Maslach (1976), the concept of burnout refers to prolonged occupational stress resulting from the difficult relationships that people have with their work. Maslach and Jackson (1981) defined burnout as "a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do people work" (p. 1). Emotional exhaustion is the key aspect of the syndrome and is viewed as its primary manifestation. It refers to the depletion of emotional resources, feelings of strain, and chronic fatigue, thus reflecting the stress component underlying the construct. Depersonalization refers to impersonal, negative, and uncaring responses towards the recipients of one's service, care, treatment, or instruction. By placing distance between the employee and the recipient, depersonalization makes job demands less manageable. Finally, low level of personal accomplishment refers to a sense of low self-efficacy, a decline in feelings of competence as well as a tendency to evaluate oneself negatively (Maslach & Jackson, 1981; Maslach, Jackson, & Leiter, 1996)[10]. Professional burnout (PB) is negative transformations of attitude, spirit, and behavior in confrontation with mental work-related pressures. This is made by severe occupational stress leading to various physical and mental diseases as well as a negative attitude toward professional activities and lack of appropriate communications with the patients. Signs of this syndrome are revealed when individuals' abilities are not enough for the demands in the work environment[10].

Cross-sectional survey Symptoms of burnout in intensive care unit specialists facing the COVID-19 outbreak among intensivists part of the European Society of Intensive Care Medicine in 2020 showed that the prevalence of symptoms of anxiety and depression or severe burnout was 46.5%, 30.2%, and 51%, respectively. Age (OR 0.98 [0.97–0.99]) and clinician's rating of the ethical climate (OR,0.76 [0.69–0.82] were independently associated with symptoms of severe burnout included [32].

Italian National Survey in 2019 on burnout among Anesthesiologists and Intensive Care Physicians reported that (10.2%) had a high degree of burnout (high EE, high DP, and low PA together).it also reported that 79.9% had moderate and 9.9% low level of burn out. On subscale analysis, 31% of the respondents had low PA, and 39.3% and 25.5% of the respondents had high scores for EE and DP respectively.

Age >40 and working at ICU was significantly associated with a high degree of EE and being male was significantly associated with high DP while working in ICU was significantly associated with low PA score [22]

A 2020, Italian , cross-sectional study on Social Stigma during COVID-19 reported that gender (women had high burn out),age(0.206**; $p < 0.01$) and length of service (burnout = 0.204**; $p < 0.01$; satisfaction = 0.202**; $p < 0.01$) was significantly positively related to burnout levels [20].

A Cross-sectional survey on burnout among healthcare professionals during the COVID-19 pandemic in Iran reported that 53.0% of health workers experienced high levels of burnout. The average score in emotional exhaustion, depersonalization, and lack of personal accomplishment was 26.6, 10.2, and 27.3, respectively. Gender was the only variable that was associated with high levels of all three domains of burnout. Being female and those without children were significantly associated with EE while aging>36 was associated with DP[17].

A Turkey cross-sectional study in 2020 on the Effect of COVID-19 pandemic on anxiety and burnout levels in emergency healthcare workers reported that the mean of the HCWs MBI-EE, DP & PA score was 10 (min:9, max: 45), 5.8 (min:5, max: 5-25) and 6.7 (min:8-max:40) respectively. Being Emergency staff and ambulance workers had a statistically significant association in MBI-EE score(p:0.001) [24].

33.8% of doctors had moderate to high levels of burnout from a cross-sectional study, in Pakistan done in 2019. The study also showed that 47.8%, 24%&25.4% had high EE, DP, &PA on burnout subscale scores respectively. Marital status, working hours per week, average on-call days per week, and level of expertise had a statistically significant correlation with overall burnout level [19].

Another cross-sectional survey in Japan on factors contributing to healthcare professional burnout during the COVID-19 pandemic reported that 51% of HCPs had a high level of burnout. Burnout was associated with work impacting household activities (RR =1.57, 95% CI = 1.39–1.78, $P<0.001$), feeling pushed beyond training (RR = 1.32, 95% CI =1.20–1.47, $P<0.001$), exposed to COVID-19 patients (RR = 1.18, 95% CI = 1.05–1.32, $P =0.005$), and mad life prioritizing decisions (RR = 1.16, 95% CI = 1.02–1.31, $P = 0.03$).Adequate personal protective equipment (PPE) was protective against burnout (RR = 0.88, 95% CI = 0.79–0.97, $P = 0.01$). Burnout was higher in high-income countries (HICs) compared to low- and middle-income countries (LMICs) (RR = 1.18; 95% CI = 1.02–1.36, $P = 0.018$)[6].

A cross-sectional, survey studied in china in 2020 on mental health outcomes among health care workers exposed to COVID-2019 showed that 50.4% of respondents had depression, 44.6% had anxiety,34.0% had insomnia and 71.5% had distress. Physicians (7.1%), women 5.8%), frontline workers (1.7%), and those in Wuhan(12. 6%) experienced more severe symptom levels of depression, anxiety, insomnia, and distress than nurses (4.9%), men (3.4%),(0.4%) and outside Wuhan (7.2%) second-line workers[14].

A large-scale cross-sectional study to assess front-line nurses' burnout, anxiety, depression,and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China reported that 50% of the nurses had moderate to high work-related burnout. The study also reported that 60.5% had high EE, 42.3% had high depersonalization and 60.6% had high personal accomplishment. The study also reported that 14.3%,10.7%, and 91.2% of nurses had moderate and high levels of anxiety, depression, and fear, respectively. Mental health outcomes were statistically negatively correlated with self-efficacy, resilience, social support, and frontline work willingness[27].

A questionnaire-based survey done in India on the level of burnout among front-line health workers at COVID-19 treatment center reported that 44.6% had a high level of overall burnout and 26.9% & 52.8% had work-related and pandemic-related burnout respectively. Younger age (21–30 years) had higher personal and work-related burnout. Being female was strongly associated with personal and work-related burnout($p < 0.01$).The doctors were 1.64 times, and the support staff was 5 times more likely to experience pandemic-related burnout[23].

Another cross-sectional study in a tertiary hospital in Singapore reported that the prevalence of burnout was 67.4% and, burnout was negatively associated with being in the age groups of 31 - 40 (AOR 0.39, 95% CI 0.16-0.93) and >40 years (AOR 0.30, 95% CI 0.10-0.87) and a low workload burden (AOR 0.35, 95% CI 0.23-0.52).Burnout was positively associated with a longer work experience of 3.5 years (AOR 5.27, 95% CI 1.44-20.93) and >5years (AOR 4.24; 95% CI 1.16-16.79)[26].

A systematic review in LMICs on health care providers burnout level in 2016 reported that the lowest level of emotional exhaustion was seen in rural health workers of Iran (27.4%) and the highest prevalence of emotional exhaustion was seen among nurses in South Africa (99.6%).

In depersonalization sub score lowest to moderate score was reported in Iran(13.3%) were as the highest was in South Africa(98%).

The lowest prevalence of 'moderate/ high' personal achievement was reported in primary health care providers(25.1%) in Lebanon and the highest (99.3%) was seen in South African nurses [25].

Another cross-sectional study was done on burnout amongst Doctors at the University Teaching Hospital in Lusaka, Zambia,2019 reported a high burn out the score of EE (54.4.%) and DP (44.8%) and low PA (66.4%). Demographic and individual work factors studied had no significant associations on the level of burn out[21].

There were some researches done in Ethiopia before the COVID -19 pandemic.

A cohort study on burnout among primary healthcare workers during implementation of integrated mental healthcare in rural Ethiopia in 2019 showed a non significant reduction in the burnout level between the two time points. In GEE regression models, high depression symptom scores (adjusted mean difference (aMD) 0.56, 95% CI 0.29, 0.83, $p < 0.01$), experiencing two or more stressful life events (a MD 1.37, 95% CI 0.06, 2.14, $p < 0.01$), being a community health extension worker vs. facility-based HCW (aMD 5.80, 95% CI 3.21, 8.38, $p < 0.01$), perceived job insecurity (aMD 0.73, 95% CI 0.08, 1.38, $p = 0.03$) and older age (aMD 0.36, 95% CI 0.09, 0.63, $p = 0.01$) were significantly associated with higher levels of emotional exhaustion longitudinally[30].

Another cross-sectional study to assess the magnitude of nurses' burnout and its associated factors in public hospitals of Amhara regional state, Ethiopia in 2017 showed significant association between burnout and educational status [AOR=3.66; 95% CI: (1.11, 12.01)], service year [AOR=1.94; 95% CI: (1.11, 3.38)], work load [AOR=0.43; 95% CI: (0.19, 0.99), intention to leave their work [AOR=0.41; 95% CI: (0.25, 0.67), health status [AOR=2.27; 95% CI: (1.18, 4.37)] and health problems [AOR=2.32; 95% CI: (1.14, 4.73)] [29].

A cross-sectional study on the prevalence of burnout syndrome among health care professionals working at Gondar University Hospital, Ethiopia in 2018 resulted in overall burnout of 13.7%. Most of the participants in the study had debility (52.8%), self-criticism (56%), and depressive symptoms (46%). BOS symptoms were significant with age ($P = 0.008$), number of patients treated per day ($P < 0.001$), and HCPs working in shifts ($P < 0.001$). Higher mean levels of emotional exhaustion (5.4 ± 1.2) and inefficacy (5.1 ± 1.7) were seen than cynicism (4.8 ± 2.0). Being male, single, and years of experience were significantly associated with all three subscales of BOS, whereas profession was significantly associated with EE ($P < 0.01$)[28].

A cross-sectional study on prevalence and associated factors of burnout among Debre Berhan University medical students, Amhara, Ethiopia in 2019, showed that 34.0% had symptoms of burnout. Regarding domains of burnout, 61.8% scored high on EE, 47.9% scored high on DP, and 59.7% scored low on PA. Dissatisfaction with practice lecturer (AOR = 3.8, 95% CI (1.3, 11.6)), moderate social support (AOR = 0.2, 95% CI (0.1, 0.8)), and satisfaction with their education (AOR = 0.1 95% CI (0.0, 0.7)) were associated with burnout[31].

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OBJECTIVES OF THE STUDY

3.1. General objective

To assess the Prevalence and associated factors of burnout among frontline health care providers at Eka Kotebe COVID-19 treatment center during COVID-19 outbreak in Addis Ababa, Ethiopia, 2020.

3.2. Specific Objectives

To assess the prevalence of burnout among frontline health care providers at Eka Kotebe COVID-19 treatment center during COVID-19 outbreak in Addis Ababa, Ethiopia, 2020.

To assess associated factors of burnout burn out among frontline health care providers at Eka Kotebe COVID-19 treatment center during COVID-19 outbreak in Addis Ababa, Ethiopia, 2020 .

4. METHODOLOGY

4.1 Study Area

The study was conducted at Eka kotebe general hospital a national COVID-19 treatment center ,in Addis Ababa, the capital city of Ethiopia. It began operation in 2017, the hospital has provided health services for 116, 029 patients, of which 25 percent are mentally disabled patients. But it was changed to a COVID-19 treatment center after March 2020.

4.2 Study Design and Period

An Institutional based cross-sectional study was designed to describe the prevalence of burnout and its associated factors among health workers working at Eka kotebe hospital (a national COVID-19 treatment center),Addis Ababa, Ethiopia from august to October 2020.

4.3 Population

4.3.1 Source Population

The source population was all health workers working at Eka Kotebe COVID-19 treatment center during the study period.

4.3.2 Study Population

The study population was all health workers working in Eka kotebe COVID-19 treatment center who met the inclusion criteria and able to participate in the study was my study population.

4.3.3 Study Unit

Individual health workers involved in the study.

4.4 Eligibility Criteria

4.4.1 Inclusion Criteria

All healthcare providers (i.e. physicians, residents, interns, nurses, midwives, and pharmacists) who had taken care of COVID-19 patients at any time during the outbreak.

4.4.2 Exclusion criteria

Health care providers with no patient contact during the outbreak who were on sick, study, or other leaves during the data collection period or those unwilling to participate were excluded from the study.

4.5 Study Variables

4.5.1 Independent Variables

Socio-demographic variables: age, gender, marital status, educational level, service years of experience, having children or not, having social support or not, health status, health problems, intention to leave work within the next 12 months

work-related factors: title of work, work area, shift work overload, duration as a frontline health worker, satisfaction with the delivery of care, training about COVID-19-19.

4.5.2. Dependent Variables

The level of burnout .

4.6 Sample Size and Sampling Procedure

4.6. 1. Sample Size Determination

The actual sample size for the study was determined using the formula of a single population proportion formula for a single proportion population.

$$n = \frac{Z_{\frac{\alpha}{2}}^{2} P (1 - P)}{d^{2}}$$

Where ni = Initial estimated sample size

Z = Confidence level (alpha, α)

P = prevalence

d = marginal error

To determine the sample size the following assumption was used.

Prevalence of health workers burnout during COVID-19 pandemic was taken from a previous related study in Iran which 53%[17].

A 95% confidence level, a margin of error (0.05).

So, $n = \frac{(1.96)^2 * (0.53)(1-0.53)}{(0.05)^2} = 382,$

Since the total population was 361 health workers which were less than 10,000, I was used the correction formula:

nf= n/1+ (n/N).

Where:

nf = the desired sample size when population is less than 10,000

n= the desired sample size when the population is more than 10,000=382

N = the estimate of the population size = 361…200 nurse +75 GP+24 resident+17 specialist+22 laboraory+23 pharmacy

The sample size nf = 382/ {1+ (382/361)} = 185

Minimum sample size were 185 participants.

With an addition of 10% for possible non-respondents, the final required adjusted sample size becomes 204 **(185+18.5)**.

4.6.2 Sampling Procedure

I selected Eka Kotebe COVID-19 general hospital to study my thesis because it was the first hospital to be used as a national COVID-19 treatment center. Since there were 361 frontline health workers during the study period, the sample size was calculated with a single proportion formula and it was 204.

Then the final sample was selected from each profession/ job using proportional to the size allocation formula

$$= \frac{n_f \times n_i}{N}$$

Where: ni= number of frontline health workers in each profession (job).

nf= final sample of the study

N = total number of frontline health workers

1, Nursing =204*200/361=113

2, GPs=204*75/361=42

3, Resident=204*24/361=14

4, Specialist=204*17/361=10

5,Other (laboratory + pharmacy)=204*45/361=25.

A simple random technique was used to select samples in each profession.

4.7 Data Collection Tools

To assess the prevalence of burnout among frontline health workers and its associated factors, Maslach_Burnout Inventory- Human Services Survey (MBI-HSS) was used, which comprises 22 items with 8 items for emotional exhaustion (EE), 5 items for depersonalization (DP), and 9 items personal accomplishment (PA).

Each item was answered on a 7-point which ranging from never (= 0) to daily (= 6).

The MBI-HSS was a self-administered questionnaire, which was reliable and valid.

To obtain socio-demographic data relevant to the study participants were also asked to provide information about their age, gender, marital status, educational level, the title of work, area of work, service years of experience, duration as a frontline health worker, work overload, health status, health problems, job satisfaction and finally intention to leave work within the next 12 months.

4.8 Data Quality Control

To assure the quality of data the following measures were taken. Quality and reliability were assessed using a pre-test which was conducted in Black lion hospital on 10% of the sample size. The training was given to three data collectors and one supervisor. The data collectors were anesthesiology residents who were working at Eka kotebe general hospital during data collection. The principal investigator and supervisors were actively involved in the supervision of the data collection.

The completed questionnaire was checked for missed values and completeness on daily basis. Data cleaning was done using Epi data version 3.7 by removing the instruments with missed values. Revisiting was done if respondents were not found in the first visit.

4.9 Data collection procedures

A self-administered structured closed-ended questionnaire was prepared and designed by reviewing different similar kinds of literature, on the magnitude of front line health care provider burnout and its associated factors and modified in such a way that could meet the objectives of this study. The questionnaire was consisting of all the variables that directly meet the objective of the study. The questionnaire includes individual factors, work-related factors, and organizational factors.

Non-respondents were encouraged to fill the questionnaire and were revisited at least twice and the respondents were encouraged to respond to all items in the questionnaire within the time they devoted as much as possible to minimize the large non-response rate

4.10 Data processing and analysis

Data was checked for its completeness and correctness. Data was also coded and analyzed using the SPSS version 26 software package. To explain the study population about relevant variables, descriptive statistics such as frequencies, and percentages were calculated.

For inferential statistics, logistic regressions were used to associate professional burnout with its associated factors in front-line health care providers during the COVID-19 pandemic. The result was presented in tables and charts. A P-value of less than 0.05 was considered to be statistically significant in all cases. All $p<0.25$ value in the bivariate analysis was inserted into a multivariate logistic regression analysis model.

4.11 Operational Definitions

Burnout: is a psychological syndrome characterized by EE, DP, or cynicism and low PA.

A health care burnout is defined as if a health care worker scores high in EE or DP.

Emotional Exhaustion:

Low; if an HCW scores less than or equal to 18 points in EE related items,

Moderate; if aHCW scores 19-26 points in EE related items and,

High; if an HCW scores greater than or equal to 27 points in EE related item questions.

Depersonalization:

Low; if an HCW scores less than or equal to points in DP related items,

Moderate; if an HCW scores 6-9 points in DP related items and,

High; if an HCW scores greater than or equal to 10 points in DP related item questions.

Personal accomplishment:

Low; if an HCW scores less than or equal to 31 scores in PA related items,

Moderate; if an HCW scores from 32 to 38 points in PA related items and,

High; if an HCW scores greater than or equal to 39 points I PA related item

4.12 Ethical issue

Letter of cooperation request was obtained from the Institution Review Board (IRB) of Addis Ababa University College Medicine, Anesthesiology, Critical Care, and Pain medicine (ACCPM). An official letter of co-operation was written to Eka Kotebe general hospital from the Department of ACCPM of AAU and permission was gotten from Eka Kotebe general hospital IRB board. After obtaining permission from the hospital directors, & unit coordinators, the IRB board of Eka Kotebe general hospitals informal (verbal) consents were obtained from the study participants, and participants were provided the information about the objectives and expected outcomes of the study. Information obtained from individual participants was kept secured and confidential. Names and other identifying data of respondents were eliminated throughout the study process to maintain confidentiality.

5. RESULT

5.1 socio-demographic characters

A total of 200 (113 nurses,46 GP,16 residents,10 specialists,12 pharmacists, and 13 laboratory technicians) frontline health workers participate in this study with a 98.04% response rate. The analysis of the socio-demographic profile of the frontline HCP population showed that there were 59(29.5%) male and 141(70.5%) female, and 136 (68%) of them were married. The mean age of the participants in the study was 28.61 (min:22,max:43). 119(59.5%) frontline HCP were≤28 years old whereas 81(40.5%) were >28 years old. overall 151(75.5%) had no children whereas 49(24.5%) had home living children.

About profession almost half of the frontline HCP 113(56.5%) were nurses,46(23.0%%) were GPs,16(8.0) were residents, 10(5.0%) were specialists and 15(7.5%) were laboratory technicians and pharmacists. The mean value of duration as a health care provider in years was 4.29±3.47. 189(94.5%) of the HCP had no history of chronic medical illness but 11(5.5%) had a chronic medical illness,2 DM,2 cardiac diseases,2 respiratory diseases and one had a psychiatric disorder.

Table1: Socio-demographic characteristics of front line HCP in Eka kotebe general hospital Addis Ababa Ethiopia,2020.

Variable	Respondents	Value, N(%)
Age in years	Mean ±SD (max:min)	28.61±3.78(22-43)
Gender, n (%)	Female	141 (70.5%)
	Male	59 (29.5%)
Marital status, n (%)	Single	136(68%)
	Married	64(32%)
Job category, n (%)	Nurse	113(56.5%)
	GP	46(23%)
	Resident	16(8%)
	Specialist	10(5%)
Had home living children	Yes	49(24.5%)

	No	151(75.5%)
Had chronic medical illness	Yes	11(5.5%)
	No	189(94.5%)
Working as a health worker for years	Mean ±SD	4.29±3.47

5.2 Work-related front line health care provider characteristics

The analysis of work-related factors affecting burnout showed that half of (50.5%) HCP were working in ICU, the majority (59.5%) of them were affiliated from other hospitals during the outbreak only (40.5%) were staff members, and almost half of the HCP (51.0%) have the intention to leave their current work within the next 12 months. Most of the participants 176(88%) in the study were nurses.

The average duration as frontline HCP in months were 4.47±2.00 and the average working hours per shift, day, week and month were 5.4±1.8,6.09±2.03,41.52±14.05 and 166.06±56.47 respectively.

Most of the study participants 155(77.5%) were trained about COVID-19.Some of 61(30.5%) front line health workers had acute infection after involved in the COVID-19 treatment center like common cold (17.0%),acute febrile illness(6.0%),pneumonia(1.5%),diarrhea(3.0%).One-third (33.5%) of the participants were tested for COVID-19 of which 6.5% were positive.9.0% of the study participants were reported that the acute illness caused difficulty in their professional service.

56.0% of the study participants were satisfied with their job but 55.5% of them had poor social support. Although 125(62.5%) of respondents were satisfied with the delivery of care in the hospital but (63.0%) were dissatisfied with the PPE delivered by the hospital.

Some of the participants 83(41.5%) developed minimal depression after involved in the treatment of COVID-19 patients.

Table 2: Work-related front line health care provider characteristics

Variable	Respondent	Value ,N(%)
Educational level, N(%)	Diploma	8(4.0%)
	Degree	176(88%)
	MSC	5(2.5%)
	Specialist	10(5.0%)
	Other	1(0.5%)
Service area ,n(%)	Ward	76(38%)
	ICU	101(50.5%)
	OR table	2(1.0%)
	Other (labor ward,lab,pharmacy)	21(10.5%)
Original workplace ,n(%)	Eka kotebe	81(40.5%)
	Affiliated with other hospitals	119(59.5%)
Working as a front line health worker in the month	Mean ±SD	4.47±2.00
Average working hours per shift	Mean ±SD	5.4(1.79)
Average working hours per day	Mean ±SD	6.09(2.03)
Average working hours per week	Mean ±SD	41.52(14.05)
Average working hours per month	Mean ±SD	166.06(56.45)
Had training about COVID-19	Yes	155(77.5)
	No	45(22.5)
Plan to leave the current job within 12 month	Yes	98(49.0)
	No	102(51.0)
Developed acute illness?	Yes	61(30.5)
	No	139(69.5)
Type of acute illness?	Common cold	34(17.0)
	Acute febrile illness	12(6.0)
	Pneumonia	3(1.5)
	AGE(diarrhea)	6(3.0)

	Nonspecific disease	6(3.0)
Tested for COVID-19?	Yes	67(33.5)
	No	133(66.5)
COVID-19Test result	Positive	13(6.5)
	Negative	54(27.0)
	indeterminate	1(0.5)
Job satisfaction score	Dissatisfied	88(44.0)
	Satisfied	112(56.0)
HCP satisfaction with PPE in the hospital	Dissatisfied	126(63.0)
	Satisfied	74(37.0)
Oslo social support score	Good	89(44.5)
	Poor	111(55.5)
HCP satisfaction with the delivery of care	Dissatisfied	75(37.5)
	Satisfied	125(62.5)

5.3. Prevalence of frontline health care provider burnout during COVID-19 pandemic

From a total of 200 participants, 170 (85.0%) suffered from professional burnout. Among those respondents 105(52.5%), 168(84.0%), and 188 (94.0%) of frontline health care providers scored the high level of Emotional Exhaustion, Depersonalization, and personal achievement (PA) sub-scales respectively, which showed that a significant proportion of HCPs were suffering from professional burnout during COVID-19 pandemic.

A front line health care provider had burnout if he/she had high scores in either emotional exhaustion or depersonalization sub-scales.

Table 3: Description of sub-scales of MBI-HSS in front line HCP burnout, Eka kotebe general.

Variable	Low, N(%)	Moderate , N(%)	High , N(%)
Emotional exhaustion	**41(20.5%)**	**54(27%)**	**105(52.5%)**
Depersonalization	**15(7.5%)**	**17(8.5%)**	**168(84%)**
Personal accomplishment	**5(2.5%)**	**7(3.5%)**	**188(94%)**

MBI-HSS: Maslach Burnout Inventory Human Service Survey

Table 4. Frequency of high burnout in different groups of participants (N=200)

Variable		High burn out level		, N(%) P-value
		Yes	No	
Age		170(85,0%)	30(15.9%)	0.122
Age group based on median	≤28	104(87.4%)	15(12.6%)	0.25
	>28	66(81.5%)	15(18.5%)	
Gender	Male	123(87.2%)	18(12.8%)	P=0.03
	Female	47(79.7%)	12(20.3%)	
Marital status	Single	116(90.6%)	12(9.4%)	
	Married	54(84.4%)	10(15.6%)	
Home living children	Yes	42(85.7%)	7(14,3%)	0.18
	No	128(84.8%)	23(15.2%)	
Working area	Ward	60(78.9%)	16(21.1%)	
	ICU	91(90.0%)	10(10.0%)	
	OR	2(100.0%)	0	
	Other	17(81.9%)	4(19.1%)	
Educational Level	Diploma	6(75.0%)	2(25.0%)	0.754
	Degree	149(84.7%)	27(15.3%)	
	MSC	5(100.0%)	0	
	Specialist	9(90.0%)	1(10.0%)	
	Other	1(100.0%)	0	
Job title	Nurse	97(85.8%)	16(84.8%)	0.270
	GP	39(84.8%)	7(15.2%)	
	Resident	15(93.8%)	1(6.2%)	
	Specialist	9(90.0%)	1(10.0%)	
	Other	10(76.9%)	3(23.1%)	
Serve as a frontline health worker in the month		170(85.0%)	30(15.0%)	0.401
Service years as a health care provider in year		170(85.0%)	30(15.0%)	0.023

Average working hour per shift		170(85.0%)	30(15.0%)	<0.01
Average working hour per day		170(85.0%)	30(15.0%)	<0.01
Average working hour per week		170(85.0%)	30(15.0%)	0.017
Average working hour per week		170(85.0%)	30(15.0%)	0.016
Do you acute illness over the past four weeks	Yes	58(95.1%)	3(4.9%)	<0.01
	No	112(80.6%)	27(19.4%)	
Have you tested for COVID-19?	Yes	62(92.5%)	5(7.5%)	
	No	108(81.2%)	25(18.8%)	0.034
Job satisfaction	Dissatisfied	68(77.3%)	20(22.7%)	<0.01
	Satisfied	102(91.1%)	10(8.9%)	
Health worker satisfaction with the delivery of care in the hospital	Dissatisfied	60(80.0%)	15(20.0%)	
	Satisfied	110(88.0%)	15(12.0%)	0.125

Table 5. Participants' level of burnout in each dimension by sociodemographic characteristics and job category, number (%).

Variable N(%)		Emotional Exhaustion				Depersonalization				Personal Accomplishment			
		Low	Moderate	High	P	Low	Moderat	High	P	Low	Moderate	High	P
Sex	Female	19 (32.2)	11 (18.6)	29 (49.2)	0.02	5 (8.5)	6(10.2)	48 (81.4)	0.80	2(3.4)	4(6.8)	53 (89.8)	0.22
	Male	22 (15.6)	43 (30.5)	76 (53.9)		10 (7.1)	11(7.8)	120 (85.1)		3(2.1)	3(2.1)	135 (95.7)	
Age	≤28	24 (20.2)	36 (30.3)	59 (49.6)	0.44	6 (5.0)	12 (10.1)	101 (84.9)	0.2	2(1.7)	3(2.5)	114 (95.8)	0.43
	>28	17 (21.0)	18 (21.0)	46 (56.8)		9 (11.1)	5(6.2)	67 (82.7)		3(3.7)	4(4.9)	74 (91.4)	
MARIT	Single	30 (22.1)	40 (29.4)	66 (48.5)	0.26	10 (7.4)	13(9.6)	113 (83.1)	0.74	2(1.5)	1(0.7)	133 (97.8)	0.03
	Married	11 (17.2)	14 (21.9)	39 (60.9)		5(7.8)	4(6.3)	55 (85.9)		3(4.7)	6(9.4)	55 (85.9)	
CWA	Ward	18 (23.7)	17 (22.4)	41 (53.9)	0.10	9 (11.8)	6(7.9)	61 (80.3)	0.62	0	4(5.3)	72 (94.7)	0.36
	ICU	15 (14.9)	30 (29.7)	56 (55.4)		4(4.0)	9(8.9)	88 (87.1)		5(5.0)	3(3.0)	93 (92.1)	
	OR	0	0	2(100)		0	0	2 (100)		0	0	2 (100)	
	Other	8(38.1)	7(33.3)	6(28.6)		2(9.5)	2(9.5)	17 (81.0)		0	0	21 (100)	
DH	Yes	8(16.3)	11 (22.4)	30 (61.2)	0.37	5 (10.2)	2(4.1)	42 (85.7)	0.34	3(6.1)	5(10.2)	41 (83.7)	0.002
	No	33 (21.9)	43 (28.5)	75 (49.7)		10 (6.6)	15 (9.9)	126 (83.4)		2(1.3)	2(1.3)	147 (97.4)	

	EDU	Diploma	2(25)	2(25)	4950)	0.18	0	2(25.0)	6(75.0)	0.7	0	0	8(100)	0.71
		Degree	38 (21.6)	48 (27.3)	90 (51.1)		14 (8.0)	15(8.5)	147 (83.5)		5(2.8)	6(3.4)	165 (93.8)	
		MSC	0	0	5(100)		0	0	5 (100)		0	1 (20.0)	4(80)	
		Specialist	0	4(40)	6(60)		1(10.0)	0	9(90.0)		0	0	10 (100)	
		Other	1(100)	0	0		0	0	1(100)		0	0	1(100)	
	CJT	Nurse	22 (19.5)	33 (29.2)	58 (51.3)	0.31	8(8.5)	9(9.6)	96 (94.9)	0.04	3(2.7)	6(5.3)	104 (92)	0.68
		GP	13 (28.3)	11 (23.9)	22 (47.8)		1(2.2)	5(10.9)	40 (87.0)		2(4.3)	0	44 (95.7)	
		Resident	1(6.3)	4(25)	11 (68.8)		1(6.3)	0	15 (93.8)		0	1(6.3)	15 (93.8)	
		Specialist	0	4(40)	6(60.0)		1 (10.0)	0	9(90.0)		0	0	10 (100)	
		Other	5(33.3)	2(13.3)	8(53.3)		4 (26.7)	3(20.0)	8 (53.3)		0	0	15 (100)	
	OWP	Eka Koteba	21 (25.9)	16 (19.8)	44 (54.3)	0.10	9 (11.1)	6(9.2)	66 (81.5)	0.26	2(2.5)	2(2.5)	77 (95.1)	0.81
		Other	20 (16.8)	38 (31.9)	61 (51.3)		6(5.0)	11(9.2)	102 (85.7)		3(2.5)	5(4.2)	111 (93.3)	
	TAC	Yes	36 (23.2)	43 (27.7)	76 (49.0)	0.12	13 (8.4)	13(8.4)	129 (83.2)		4(2.6)	5(3.2)	146 (94.2)	0.92
		No	5(11.1)	11 (24.4)	29 (64.4)		2(4.4)	4(8.9)	39 (86.7)	0.68	1(2.2)	2(4.4)	42 (93.3)	
	AWHPM	≤168.1	30 (23.1)	37 (28.5)	63 (48.5)	0.27	12 (9.2)	12(9.2)	106 (81.5)	0.37	2(1.5)	4(3.1)	124 (95.4)	0.44
		>168.1	11 (15.7)	17 (24.3)	42 (60.0)		3(4.3)	5(7.1)	62 (88.6)		3(4.3)	3(4.3)	64 (91.4)	

	AWHW	≤42	30 (22.9)	37 (28.2)	64 (48.9)	0.33	12 (9.2)	12(9.2)	107 (81.7)	0.40	2(1.5)	4(3.1)	125 (95.4)	0.42
		>42	11 (15.9)	17 (24.6)	41 (59.4)		3(4.3)	5(7.2)	61 (88.4)		3(4.3)	3(4.3)	63 (91.3)	
	AWHPD	≤6	30 (24.0)	35(28.0)	60 (48.0)	0.18	12 (9.6)	12(9.6)	101 (80.8)	0.24	2(1.6)	4(3.2)	119 (95.2)	0.54
		>6	11 (14.7)	19 (25.3)	45 (60.0)		3(4.0)	5(6.7)	61 (89.3)		3(4.0)	3(4.0)	69 (92.0)	
	AWHPS	≤5.5	21 (21.0)	26 (26.0)	53 (53.0)	0.95	7(7.0)	9(9.0)	84 (84.0)	0.94	2(2.0)	5(5.0)	93 (93.0)	0.47
		>5.5	20 (20.0)	28 (28.0)	52(52.0)		8(8.0)	8(8.0)	84 (84.0)		3(3.0)	2(2.0)	95 (95.0)	
	FHWM	≤4	6(10.9)	21 (38.2)	28 (50.9)	0.03	5(9.1)	3(5.5)	47 (85.5)	0.58	1(1.8)	3(5.5)	51 (92.7)	0.61
		>4	35 (24.1)	33 (22.8)	77(53.1)		10 (6.9)	14(9.7)	121 (83.4)		4(2.8)	4(2.8)	137 (94.5)	
	HCP Year	≤4	25 (21.0)	30 (25.2)	64 (53.8)	0.79	9(7.6)	12 (10.1)	98 (82.4)	0.62	2(1.7)	4(3.4)	113 (95.0)	0.66
		>4	16 (19.8)	24(29.6)	41(50.6)		6(7.4)	5(6.2)	70 (86.4)		3(3.7)	3(3.7)	75 (92.6)	
	HWSD	Not satisfied	15 (20.0)	23(30.7)	37(49.3)	0.66	11 (14.7)	3(4.0)	61 (81.3)	0.04	2(2.7)	2(2.7)	71 (94.7	0.88

		Satisfied	26 (20.8)	31 (24.8)	68 (54.4)		4(3.2)	14 (11.2)	107 (85.6)		3(2.4)	5(4.0)	117 (93.6)	
	OSS	Poor	25 (22.5)	34 (30.6)	52 (46.8)	0.20	8(7.2)	11(9.9)	92 (82.9)	0.72	2(1.8)	3(2.7)	106 (95.5)	0.61
		Good	16 (18.0)	20 (22.5)	53 (59.6)		7(7.9)	6(6.7)	76 (85.4)		3(3.4)	4(4.5)	82 (92.1	

MARIT-marital status,CWA-current working area,DH-do you have children?,EDU-educational level,CJT-current job title,OWP-original work place,TAC-having training about COVID-19,AWHPS-average working hour per shift, AWHPD-average working hour per day, AWHPW-average working hour per week, AWHPM-average working hour per month,HCP-work as health care provider in year,FHWM-work as frontline health worker in month,HWSD-health worker satisfaction with delivery of care,OSS-oslo social support.

5.4. Associations of frontline HCP Burnout at Eka Kotebe general hospital/national COVID-19 treatment center ,2020

Multivariate logistic regression was made among different variables. Gender, service year as a health care provider, development of acute illness after being involved in the COVID-19 treatment center,and level of job satisfaction had association with frontline HCP burnout in Multivariate logistic regression analysis.

Males were 31.3% [aOR=0**.313,**95% CI: **(0.12,0.84)**;] less likely for frontline HCP burnout than those females. Similarly, front-line HCPs who did not develop an acute infection in the hospital were **13.5% [a**OR=0.135;95% CI: **(0.03,0.55)**] less likely to burn out than those who did develop an acute infection.

One unit of increment of service year was associated with 1.3 times [aOR=**1.255;(1.02,1.54)**] high likely to develop burn out. Front line HCP who was satisfied with their Job was **15.7**% [aOR= .157; **(0.06,0.43)**] less likely to develop burn out.

Table 6: Factors affecting burnout among front line HCP in Eka Kotebe general hospital during Covid-19 pandemic, Addis Abab,2020.

Variable		**Frontline HCP burnout**		**Multivariate logistic regression**	
		Yes	**No**	**AOR(95%CI)**	**P-value**
Gender	**Male**	**123(72.4%)**	**18(60.0%)**	**.313(0.12,0.84)**	**0.021**
	Female	**47(27.6%)**	**12(40.0%)**	**1.00**	
	Total	**170(100%)**	**30(100%)**		
Do you have acute illness?	**yes**	**58(34.1%)**	**3(10%)**	**1.000**	
	no	**112(65.9%)**	**27(90%)**	**0.135(0.03,0.55)**	**<0.01**
	Total	**170(100%)**	**30(100%)**		
Level of job satisfaction	**Dissatisfied**	**68(40%)**	**20(66.7%)**	**1.000**	
	Satisfied	**102(60%)**	**10(33.3%)**	**0.157(0.06,0.43)**	**<0.01**
	total	**170(100%)**	**30(100%)**		
Service year as HCP		**170**	**30**	**1.255(1.02,1.54)**	**0.03**

6. DISCUSSION

6.1 Magnitude of front line health care provider burnout at Eka kotebe COVID-19 treatment center 2020.

The study showed that 85.0% of front-line health workers have had a high level of burnout (high score of either EE, DP), and 53.5%) of frontline health workers had a high score in both EE & DP subscale. This result was higher than studies done in Teheran, Iran in 2020 which studied the prevalence of burnout among health care professionals during the COVID-19 pandemic which reported a burnout level of 53.0%[17]. This study also showed a high prevalence of burn out than similar studies done in India 44.6% [23], USA study on health care professional burn out during COVID-19 pandemic which was 51.0%[6], china(50.0%) which studied nurse professional burn out during COVID-19 pandemic [27] and France (51.0%) which studied on the level of burn out on intensivists during COVID-19 pandemic. This high level of burnout may be due to may probably due to differences in workload, patient demand, and development levels among these countries, poor baseline job satisfaction level, adequate PPE, and payment.

This finding also indicates that the magnitude of burnout among Eka kotebe general hospital front line health care providers was higher than studies done before the COVID-19 pandemic which includes a level of burn out among Gonder University hospital health care provider in 2018 was (13.7%)[28], level of burn out among DBU medical students (34.0%) [31]**.** This indicates that the COVID-19 pandemic worsens the overall health care provider burnout level may be due to workload, decrease social support, and lack of preparation for an infectious disease pandemic.

This study also reported a higher prevalence of burn out to other studies done before covid-19 outside Ethiopia, as the level of burn out among Zambia doctors(54.4%)[21], level of burn out among health care workers of tertiary hospitals of Singapore(67.4%)[26], Pakistan doctors(33.8%) and Italian anesthesiologists and Intensivists (10.2%)[22]. The finding from this study shows that the magnitude of front-line health workers' burnout in Eka kotebe general hospital, Addis Ababa is higher than those above-listed countries; the difference may be possibly due to sample size difference, payment system, preparation for the pandemic, and time of study among these countries.

Among those respondents low, moderate and high 41(20.5%),54(27.0%) and 105(52.5%) in the emotional exhaustion subscale respectively. 15(7.5%),17(8.5%) and 168(84.0%) respondents had low, moderate, and high depersonalization subscale scores respectively, and5(2.5%),7(3.5) 188 (94.0%) of frontline health care providers scored the low, moderate and high level of personal accomplishment respectively. The mean score of EE, DP, and PA was 26.7±11.3,14.9±6.5 and 21.5±8.5 respectively.

Although the study lacked a control group comparison of our findings with other studies on burnout in our country before the COVID-19 pandemic shows a much higher level of burnout. A similar study was done in Gonder university hospital in Ethiopia on the prevalence of nurses' burnout before the covid-19 pandemic(2018) showed that among 369 participants, 186 (50.4%) suffered from professional burnout. Among those nurses (65.3%) had high in EE, (43.6%) DP and (44.4%) scored low PA.

A systemic review on prevalence and factors associated with burnout among frontline primary health care providers in low- and middle-income countries from 2014 to 2016 which includes 20 articles,15 used MBI, one used modified MBI, and others used other methods .15 studies analyzed the prevalence of EE level and reported that the mean score ranges from 2.3 to 31.5 of which the lost prevalence in high EE(score >14) was recorded among rural health workers of areas of Iran (27.4%) and the highest prevalence was recorded in South Africa (99.6%). 16 studies reported on the prevalence of depersonalization that average range from 0.7 to 17.8 and the lowest prevalence of highest depersonalization (score>6) was reported in rural health workers of Iran(13.3%) and the highest was among south African nurses (98.0%).16 studies also reported on the prevalence of personal accomplishment which showed the average range was from 3.9 to 39.6 and the lowest prevalence of highest PA (score<29) was reported among rural health workers of Lebanon(25.1%) and the highest was among south African nurses (99.3%)[25]. The results from South Africa are consistent with my results. This shows that if more researches done in Africa especially in low-income countries may correlate with my study. This high level of burnout may probably due to poor payment, work overload, poor resilience for the pandemic.

My study showed that gender [AOR=**.313 (0.12,0.84);**p=0.021) ,development of acute infection[AOR=**0.135(0.03,0.55)** ;P<0.01],low level of job satisfaction[AOR=**0.157(0.06,0.43);P<0.01) and service year as health care provider [AOR=1.255(1.02,1.54)** ;P=0.03] were strongly associated with overall burn out level during COVID-19 pandemic.

My study showed that service year as a health care provider had a statistically significant association with the level of burnout [OR=1.255(1.02,1.54);P=0.03]. A similar study was done in Amhara, Ethiopia before the covid-19 pandemic on the prevalence of nurses burn out reported service year of experience had a positive association with professional burnout. On working experiences, participants with 3-5 years were more prone to burnout than those with less than three years of work experience (p-0.02)[29].

Although my study showed poor baseline job satisfaction and development of acute infection after involved in the covid-19 treatment center had a statistically significant association but there was no data that support or disprove my study. Further study needs to be done to whether there is n association or not between the level of baseline job satisfaction and acute health condition with the level of health care provider burnout.

A similar study in Iran showed that younger age [OR=0.97(0.95, 0.99) ,P=0.010] and female gender [OR=1.00, P=0.015] [17]were predisposing factors for burnout .My study was failed to show a significant association between age and burn out level may probably due to less variation in age group in my study population. This study also showed that the level of burnout varied significantly by the site of practice and job category (with residents being the most vulnerable group) but my study failed to show this association may probably due to the small sample size in my study.

A similar cross-sectional study in India on the prevalence of burn out among health care workers level of burn out during covid-19 pandemic reported on the presence of strong and statistically significant association of level of burn out and being female, the odds ratio for experiencing personal and work-related burnout were 1.35 (95% CI 1.13–1.61, $p < 0.01$) and 1.24 (95% CI 1.01–1.50, $p < 0.03$), respectively, as compared to males[23].

The study also showed that gender (p=0.02) and duration as a frontline health care provider (P=0.03) were associated with emotional exuastional while Job title/profession (p=0.04) and health care provider satisfaction with the delivery of care by the institution (p<0.01) were associated with depersonalization level from the bivariate analysis. The study also showed that marital status (p=0.03) and having home living children (p<0.01) were associated with the personal accomplishment level of the health care provider.

7. STRENGTH AND LIMITATION OF THE STUDY

7.1 Strengths of the study

This is the first study in Ethiopia to assess prevalence and associated factors of burnout among frontline health workers during COVID-19 pandemic.

The instrument used in this study is well validated across geographical areas.

I had gotten adequate response rate

7.2 limitation of the study

Since the sample size was relatively smaller it was not sufficient to carry out a more detailed analysis of differences in workplaces and burnout across different hospitals and department units.

The study was also limited to Eka Kotebe general hospital and only during the covid-19 pandemic due to constraints of time and funds.

Since there was no control group it was difficult to conclude that the covid-19 pandemic creates an additional burden and increased the high level of professional burnout.

Although we tried to consider several personal and work-related parameters, the study might have failed to deal with all confounding factors.

I specifically referred to COVID-19 in my questions and a comparison with other clinicians or the general population had not been performed and could not conclude that this level of burnout is solely attributable to the COVID-19 pandemic.

Finally, the study was a cross-sectional study and can only reflect the experience of front-line health care providers at the time of assessment, and therefore, a causal relationship cannot be established between burnout and its predictors.

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

This study presents a significant proportion of front-line health care providers were suffer from professional burnout due to their jobs during the COVID-19 pandemic.

Statistically significant associations were identified between burnout and its associate factors: Gender, service year as a health care provider, development of acute infection and baseline level of satisfaction had statistically significant association with front line health care provider professional burnout during COVID-19 pandemic.

8.2. Recommendations

This was the first survey of HCW's level of burnout during the COVID-19 pandemic which I found a high level of burnout among HCWs. The female respondents had higher chances of getting a high level of burnout, and this may probably due to the dual role the females play in running the house, apart from working in the healthcare sector.

The most common concerns seemed to be fear of catching an infection, infecting the family members and were worried about dying due to the COVID-19 infection. Interventions at the organizational level such as promoting preemptive resilience strategies and providing a worker-friendly environment will go a long way in decreasing stress and burnout in HCWs.

Since baseline low level of Job satisfaction was strongly associated with level burn out institutional and organizational measurements like increase pavement, decrease workload, and promoting health care workers are important.

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ANNEXES

Annex 1- Consent form

My name is Dr. Denekew Assefa, final anesthesia resident at Addis Ababa University School of Medicine Department of Anesthesia, Critical Care and Pain Medicine. I am conducting a research on "Prevalence and associated factors of burnout among Eka koteb COVID-19 treatment center health care workers during COVID-19 out break.. I received permission from Addis Ababa University School of medicine department of Anesthesiology,critical care and pain medincine and Eka kotebe hospital IRB to conduct the study.

You are selected to participate in this study because you are currently working as a health care provider in this facility. Your participation in this study will only be based on your willingness to participate. You have the right to choose not to take part in this study. If you are willing, you have the right to stop at any time or withdraw without giving any reason which you will not be subjected to any ill-treatment. There will be no direct benefit by participating in this study but in future information gathered by this study will helps policy makers, programmers and researchers to give appropriate attention on issues of health care provider burn out during COVID-19 period.

The information that you provide will be kept confidential by using only code numbers and locking the data. Only the members of the study team will have the access to the non-coded data and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

If you need any further information or explanation regarding to the study, you can have this address to contact. Name: Dr. Denekew Assefa Tel- +251-977602460 Email- dnkwassf@gmail.com

Are you willing to participate in this study? A. Yes B. No

If yes, signature of the participant_____

Date : _____

Quesionnare ID:_____

Annex 2-Questionare
Section 1,Socio-demographic Data

1, Age (how old are you?)

2, Gender □ Male □ Female

3, Marital status □Single □Married □Divorced □Widowed □Married but not living together

4, Service area(where are you currently working?) □ Ward □ ICU □ OR table □ Other specify

5, What is your Monthly household income (birr/month)?

6, Do you have children ? □Yes □No

7, What is your current educational level? □Diploma □degree □MSC □ specialist □other

8, What is your proffesion (Job title)? □Nurse □GP □Resident □ specialist □ other

9, How long work as a health care provider in years ?

10, How long work as frontline health care worker during the COVID-19 outbreak in month ?

11, What is the average working hours: A, ----- per shift? B,----- per day? C----- per week? D,----- per month?

12, Is Eka koteb your original working place ? □Yes □No

13, Do you have training about caring patients with COVID-19 infection? □Yes □No

14, Do you have planned to leave your current work within the next 12 months? □Yes □No

Section 2, Physical health Questions

1, Over the past four weeks, have you experienced any acute illness (including common cold)? □Yes □No

2,If your answer to question no 1 is yes, please specify what was the illness ?----------

3, Have you ever tested for COVID-19? □Yes □No

4, If yes for question no 3 what was the result? □positive □negative □ indetrminat □other

5, Do you ever have any chronic illness ? □Yes □No

6, If your answer to question no 5 is yes, please specify what was the illness ?----------

7, Do you think your physical illness has caused difficulty on your professional service ? □Yes □No

Section 3, The Oslo 3-items social support scale

Circle or underline the correct answer that applies for you

No	Question	Answer	
1	How easy can you get help from neighbours if you should need it?	Very easy	1
		Easy	2
		Possible	3
		Difficult	4
		Very difficult	5
2	How many people are so close to you that you can count on them if you have serious problems?	Very easy	1
		Easy	2
		Possible	3
		Difficult	4
		Very difficult	5
3	How much concern do people show in what you are doing?	Very easy	1
		Easy	2
		Possible	3
		Difficult	4
		Very difficult	5

Section 4, Job Satisfaction Questionnaire

Please indicate how satisfied or dissatisfied you feel with each of these features of your present job by placing a tick or circle in the appropriate number

How satisfied or dissatisfied are you with:			
No	Question	Answer	
1	The physical working conditions?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
2	The freedom to choose your own method of working	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
3	Your fellow workers?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
4	The recognition you get for good work?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
5	Your immediate boss?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
6	The amount of responsibility you are given?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3

			4
		I'm not sure	5
		I'm moderately satisfied	6
		I'm very satisfied	7
		I'm extremely satisfied	
7	Your rate of pay?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
8	Your opportunity to use your abilities?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
9	Industrial relations between management and workers in your firm?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
10	Your chance of promotion?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
11	The way the organisation is managed?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
12	The attention paid to suggestions you make?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5

		I'm very satisfied	6
		I'm extremely satisfied	7
13	Your hours of work?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
14	The amount of variety in your job?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
15	Your job security?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7
16	The resources (PPE) in your hospital ?	I'm extremely dissatisfied	1
		I'm very dissatisfied	2
		I'm moderately dissatisfied	3
		I'm not sure	4
		I'm moderately satisfied	5
		I'm very satisfied	6
		I'm extremely satisfied	7

Section 5, Healthcare Workers reported satisfaction with delivery of care

The following questions attempt to understand how satisfied you are with the care you are providing. There is no right and wrong answer. Just circle the option that you feel expresses your view. Your responses will only be used to understand the best way to support you and your colleagues. Only put the unique identifying number you are given and not your name or where you are working

No	Question	Answer	
1	Overall, how satisfied are you with the care you are providing to your patients?	Not satisfied	0
		Somewhat satisfied	1
		Neutral	2
		Satisfied	3
		Very satisfied	4
2	Overall, how much do you think patients and attendants you provide care for are satisfied with the care you are providing them?	Not satisfied	0
		Somewhat satisfied	1
		Neutral	2
		Satisfied	3
		Very satisfied	4
3	Overall, how much do you think your colleagues are satisfied with the care you are providing to your patients?	Not satisfied	0
		Somewhat satisfied	1
		Neutral	2
		Satisfied	3
		Very satisfied	4

Section 6, Maslach Burnout Inventory

Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, circle the number that best describes your answer. If you have had this feeling, indicate how often you feel it by writing the number (from 1 to 6) that best describes how frequently you feel that way

How often			
No	Question	Answer	
1	I feel emotionally drained from my work	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
2	I feel used up at the end of the work day.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
3	I feel fatigued when I get up in the morning and have to face another day on the job.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
4	I can easily understand how my recipients feel about things	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
5	I feel I treat some recipients as if they were impersonal objects	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
6	Working with people all day is really a strain for me.	Never	0
		A few times a year or less	1

		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
7	I deal very effectively with the problems of my recipients	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
8	I feel burned out from my work.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
9	I feel I'm positively influencing other people's lives through my work	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
10	I've become more callous toward people since I took this job	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
11	I worry that this job is hardening me emotionally	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
12	I feel very energetic.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5

		Every day	6
13	I feel frustrated by my job.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
14	I feel I'm working too hard on my job.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
15	I don't really care what happens to some recipients	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
16	Working with people directly puts too much stress on me	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
17	I can easily create a relaxed atmosphere with my recipients	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
18	I feel exhilarated after working closely with my recipients	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
19	I have accomplished many worthwhile things in this job	Never	0
		A few times a year or less	1
		Once a month or less	2

		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
20	I feel like I'm at the end of my rope	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
21	In my work, I deal with emotional problems very calmly.	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6
22	I feel recipients blame me for some of their problems	Never	0
		A few times a year or less	1
		Once a month or less	2
		A few times a month	3
		Once a week	4
		A few times a week	5
		Every day	6