



**St. Paul's Hospital  
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**St. Paul Hospital Millennium Medical College  
Graduate Study Program**

Posttraumatic stress disorder magnitude and associated factors  
among nurses participated during COVID-19 pandemic.

By Tesfaye Sisay (BSc, CCNP candidate)

Addis Ababa, Ethiopia

August 2024



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**A thesis to be submitted to St' Pauls' millennium medical college, School of nursing; for the Partial fulfillment of the Requirements for the Degree of masters in critical care nursing.**

**Addis Ababa, Ethiopia.**

**August 2024**

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## Summary

**Introduction** – Post-traumatic stress disorder (PTSD) affects 38% of nurses, particularly those exposed to COVID-19. The severity of the pandemic has significantly impacted nurses, leading to mental illnesses like PTSD. It's crucial to recognize the emotional impact of nursing and advocate for supportive environments to prevent PTSD.

**Objective** – The study mainly aimed to investigate posttraumatic stress disorder magnitude, related factors and Coping outcomes among nurses participated during the COVID-19 pandemic.

**Methods:** The 8-item PTSD check list and brief cope inventory were used to assess PTSD and coping mechanisms among 320 nurses participated on covid-19 patient care during the pandemic, Data collection held from May 15 – June 14 2024. Data entered using Epi-Info and exported to SPSS version 26 for further analysis. A binary logistic regression model used to identify associated factors; a variance inflation factor (VIF) determined that there was no multi-co linearity. A p value < 0.25 on binary logistic regression analysis considered for multivariate analysis.

**Results:** The magnitude of PTSD among nurses were found to be 39.4%. In this study, factors such as Sex being male (AOR=.502 95% CI: .294-.856), being married (AOR= .357 95% CI: .194-.658), monthly income below 10000ETB (AOR=2.692 95% CI: 1.443-5.020), 1:1 nurse to patient ratio (AOR=2.901 95% CI: 1.325-6.352), avoidant and problem focused coping mechanisms with (AOR= .056 95% CI: .006-.453) and (AOR= .269 95% CI: .093-.779) respectively plus unidentified coping mechanisms (AOR= .265 95%CI: .126-.557) were significantly associated with PTSD among nurses.

**Conclusion:** Given the high prevalence of PTSD among nurses participated on covid patient care, initiation of participation and involvement of the Ethiopian Ministry of Health on monitoring mental health, expanding mental health services, and developing interventions based on identified factors to treat PTSD among nurses will decrease the higher magnitude of PTSD and its impacts.

**Keywords** - PTSD, COVID-19, Nurses, Pandemic, Ethiopia.

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## **Acronyms and Abbreviations**

A.A- Addis Ababa.

AOR – Adjusted odds ratio.

CI – Confidence interval.

COVID – Coronavirus Disease.

PCL-C – posttraumatic stress disorder check list- Civilian.

PTSD - posttraumatic stress disorder.

SARS – Severe Acute Respiratory Stress.

USA – United States of America.

VIF – Variance Inflation Factor.

# Introduction

## 1.1 Background

The COVID-19 pandemic has brought about unprecedented challenges for healthcare professionals, particularly nurses, who have been on the frontlines battling the virus<sup>(1)</sup>. These nurses have faced immense pressure, fear, and uncertainty while caring for patients and preventing the spread of COVID-19. As a result, many of these nurses are at risk of developing post-traumatic stress disorder due to the traumatic experiences they have endured<sup>(2)</sup>.

Post-traumatic stress disorder is a mental health condition that can develop after experiencing or witnessing a traumatic event. The ongoing COVID-19 pandemic has placed an unprecedented burden on healthcare workers, particularly nurses, who have been at the forefront of the response effort. The stress, fear, and constant exposure to the suffering and loss of life have taken a toll on the mental well-being of these dedicated professionals<sup>(3)</sup>.

COVID-19 is the disease caused by the severe-acute-respiratory-syndrome-related coronavirus (SARS-CoV-2) coronavirus. It spreads through close contact, world health organization (WHO) report suggested that 772,138,818 confirmed cases and 6,985,964 deaths were recorded starting from December 30 2019 to December 4 2023<sup>(4)</sup>.

Studies have found that the nursing staff experienced significant trauma-related stress during the COVID-19 pandemic nurses working in hospital are at risk of developing PTSD symptoms during a pandemic such as the COVID-19 pandemic<sup>(5)</sup>. researches were conducted in different parts of the world for to identify magnitude and related factors of PTSD among nurses for instance a systemic review of 28 thesis paper by Guojia Q et.al revealed that the pooled prevalence of PTSD among nurses was 38% additionally from United states of America (USA) (58.7%), Chania (26.4%) and Korea (36.7%) reports showed that the magnitude of PTSD among nurses is higher<sup>(6-8)</sup> After providing direct care to A COVID-19 patients, 18% of nurses experienced PTSD for more than five months<sup>(9)</sup>.

It is crucial to implement supportive measures to address the mental health needs of COVID-19 nurses suffering from PTSD. Providing access to mental health services, such as counseling and therapy, offering peer support groups, and enhancing organizational support and resources can all contribute to the recovery and well-being of these nurses. Additionally, raising awareness about PTSD, reducing stigma, and promoting self-care practices are essential steps in fostering a supportive environment for affected healthcare professionals. PTSD among COVID-19 nurses is a serious concern that requires attention and support <sup>(3)</sup>.

Meanwhile, previous studies found high levels of PTSD in survivors among the general population and healthcare workers one to-three years after the control of the SARS epidemic<sup>(10)</sup> Identifying PTSD symptoms in healthcare workers specially among nurses is crucial for ensuring that they receive the support, treatment and prevention of complications.

## 1.2 Statement of the problem

The effects of post-traumatic stress disorder on COVID-19 nurses are multifaceted and can significantly impact their personal and professional lives. Many nurses experience symptoms such as intrusive thoughts, flashbacks, hypervigilance, and emotional numbness, which can interfere with their ability to provide optimal care to patients. Furthermore, the persisting symptoms of PTSD can lead to heightened stress, burnout, and increased risk of substance abuse among affected nurses <sup>(11)</sup>. It is believed that the pandemic physical and mental influence among healthcare professionals have been conducted in different parts of the world including Ethiopia.

Moderate quality evidence finds the lifetime worldwide prevalence of PTSD in the general population is around 3.9%, in people known to have been exposed to trauma the rate increase by 1.4 <sup>(12)</sup>. The severity of COVID-19 exposure has been identified as a significant factor in the development of PTSD symptoms among healthcare workers, A study by Lee et al. in 2021 found that nurses who had direct contact with COVID-19 patients were more likely to experience PTSD symptoms compared to those with indirect exposure <sup>(13)</sup>. This suggests that the level of exposure to the virus may play a crucial role in the development of PTSD. However, none of the studies specifically examined the interaction between age, COVID-19 exposure, and PTSD among nurses <sup>(14)</sup>.

Ethiopia have faced the hardest impacts due to COVID-19 <sup>(15)</sup>, multiple researches during the pandemic have identified the presence of different types of mental illnesses and related factors among nurses including PTSD but it seems that there is limited number of updated studies which ae focused on PTSD magnitude, factor and progress identification toward mental health problem management. A cross sectional study conducted by Mohammed Ayalew et.al found that the prevalence of PTSD symptoms among Healthcare Workers including nurse was 56.8% Following COVID-19 Pandemic in Southern Ethiopia 2022 <sup>(16)</sup>. Which suggest that the prevalence have shown increment compared to studies conducted before 2022.

The COVID-19 pandemic has placed enormous pressure on healthcare workers, particularly nurses who are at the frontline of the fight against the virus. Mo et.al in 2020 highlighted the work stress experienced by Chinese nurses who were supporting Wuhan during the COVID-19 epidemic. The

study emphasized the importance of nurse leaders paying attention to the factors influencing nurses and offering solutions to retain their mental health <sup>(17)</sup>.

Cai et al. in 2020 conducted a study on the psychological impact and coping strategies of frontline medical staff in Wuhan during the COVID-19 outbreak in Hubei. The findings revealed that the outbreak resulted in increased stress for medical staff, and hospitals should focus on providing psychological support and training in coping strategies for nurses <sup>(18)</sup>.

There is a significant psychological distress among health-care workers, in addition to other moderating factors psychological distress was significantly predicted by coping level and social support <sup>(19)</sup>. Such studies can update current status of PTSD among covid nurses after the eradication of the pandemic, depending on factors associated to indirectly influence responsible organizations and personals to be part of solutions for further complication managements due to PTSD and raise awareness about the significant mental health impact of trauma on individuals. Additionally, a broad awareness of PTSD encourages the development of policies and resources to address and prevent trauma ultimately contributing to the overall well-being of communities.

### **1.3 Significance of the study**

The research will provide current situation about magnitude and associated factors of PTSD related to their coping strategies among COVID nurses served from 2019-2022 with the aspect of their coping strategies.

Specifically, this research will benefit the following levels:

**Nurses/Health care areas** – the study will provide evidence-based information, indirectly benefit them to manage the problem, its finding may encourage them to consider risk factors for PTSD and coping strategies.

**Academic institutions and administrators** - academic institutions and administrators may use this research to promote programs and which can improve PTSD factors among nurses.

**Mental health advocates** - the result of this research will provide valuable information for the advocates to further their activity on spreading awareness on how to deal with various mental health issues including PTSD.

**Researchers** – as the results update some knowledge gaps, researchers could use this as their reference or could perform related investigations toward the problem.

## **2.0 Literature review**

### **2.1 Global burden of PTSD among nurses**

The COVID-19 pandemic is associated with significant levels of PTSD among frontline nurses globally <sup>(7)</sup>. The pandemic had a traumatic impact on the psychological functioning of the public, particularly COVID-19 survivors, older adults, and healthcare workers, due to difficulties in coping with new realities and uncertainties <sup>(20)</sup>. Initially in 2020 after 8 months of the pandemic a cross sectional study from in Korea sated that 18.5% of nurses exhibited symptoms of PTSD <sup>(9)</sup>, latest study about PTSD normalization among nurses in China 2023 Using convenience sampling revealed that from 784 nurses the prevalence of PTSD was 26.4% which indicates PTSD remain prevalent <sup>(8)</sup>.

As an initial point a systematic review from China during the pandemic the prevalence of PTSD in general population was 15%<sup>(20)</sup>. Multiple studies have showed that the magnitude of PTSD among nurses participated in direct care for COVID-19 patients was high, A cross-sectional survey study which was conducted in University of Michigan, USA using a secure online survey distribution via social media suggested that from 298 participants 58.7% were found to be positive for Trauma Screening Questionnaire (TSQ) <sup>(7)</sup> A supportive result were also conducted in Switzerland which revealed that 22% of the participants experience PTSD <sup>(21)</sup>.

A survey conducted in Korea in 2020 and 36.7% of the participants were found to be at risk of developing PTSD <sup>(22)</sup>. A narrative review done in sub-Saharan Africa 2022 the magnitude of PTSD symptoms was found to be from 51.6–56.8% <sup>(10)</sup>.

Regarding Africa including Ethiopia different studies have been conducted to access the magnitude of PTSD among nurses during the COVID-19 pandemic, whereas limited number studies have been conducted to show the progress of PTSD among nurses after the pandemic.

In Ethiopia reports were gathered from different regions, A cross sectional study in 2020 from Dila revealed that half of the health care professionals developed perceived stress additionally showed that nurses in their profession were 8 times more likely to have perceived stress on COVID-19 as compared to respondents who were doctors <sup>(23)</sup>.

Additional data which suggested that PTSD magnitude among nurses study found that the prevalence of PTSD symptoms among Healthcare Workers including nurse was 56.8% Following COVID-19 Pandemic in Southern Ethiopia 2020 <sup>(20)</sup>.

## **2.2 Factors related to PTSD among COVID-19 nurses participated on direct patient care.**

The experience of healthcare workers including nurses during the covid-19 pandemic have been challenging and stressful, potentially leading to conditions like PTSD. Several sociodemographic factors can be associated with an increased risk of PTSD among nurses. It's important to note that individual responses to traumatic events vary, and these factors may not universally apply. Nevertheless, certain sociodemographic variables have been identified in research as potential contributors to the development of PTSD.

A report in 2017 suggested that the lifetime prevalence of PTSD is about 10–12% in women and 5–6% in men <sup>(24)</sup>. A metaanalysis from 26 countries in 2023 revealed that being female was found to be factor associated with PTSD<sup>(7)</sup>. Another supportive study were conducted using meta review of systematic review and identified female gender as one of the most significant factors for mental health issues among healthcare professionals including nurses during the COVID-19 pandemic This finding suggests that female nurses may be more vulnerable to developing mental health problems such as PTSD compared to their counterparts <sup>(25)</sup>. Additional study from Italy suggested that male health care professionals seemed to have less suffered the pandemic impact than their female colleagues <sup>(26)</sup>.

Findings suggests that a supportive work environment may help to mitigate the risk of PTSD among nurses, including female nurses during times of crisis, the nursing work environment, including nurse managers ability, leadership and support was associated with the risk of PTSD among nurses in 2022<sup>(27)</sup>.

Several studies have investigated the association between age and the development of PTSD among healthcare workers. A study in 2020 found that younger healthcare workers were more likely to experience symptoms of PTSD compared to older individuals <sup>(28)</sup>. While younger age has been associated with an increased risk of PTSD, some research suggests that older age may serve as a protective factor. A study in 2020 found that older nurses had lower levels of PTSD symptoms compared to their younger counterparts. The authors hypothesized that older nurses may have developed better coping mechanisms and resilience over time, which could explain the lower prevalence of PTSD symptoms <sup>(29)</sup>.

Regarding marital status research in 2020 found that marital status was significantly associated with PTSD symptoms among healthcare workers during the COVID-19 pandemic. The study revealed that married healthcare workers reported lower levels of PTSD symptoms compared to their unmarried counterparts <sup>(28)</sup>. This finding suggests that marital status may serve as a protective factor against the development of PTSD among COVID nurses.

A study from sub-Saharan Africa in 2021 found that social support from a spouse played a crucial role in mitigating the risk of PTSD among healthcare workers, including nurses, during the COVID-19 pandemic. The study highlighted that married individual had access to emotional and practical support from their spouses, which helped them cope with the stress and trauma associated with their work. This finding suggests that the presence of a supportive spouse may buffer the negative impact of COVID-related stressors and reduce the likelihood of developing PTSD among nurses<sup>(10)</sup>.

Research in 2020 indicates that single nurse may experience higher levels of stress and trauma compared to their married counterparts during the COVID-19 pandemic. The study found that single nurses reported feeling more overwhelmed and anxious due to the increased workload and exposure to the virus. This finding suggests that the absence of a marital partner may contribute to increased vulnerability to PTSD among COVID-19 nurses <sup>(30)</sup>.

A narrative review in 2022 from 14 observational studies cultural, social and economic differences significantly influenced the mental health condition of all healthcare workers involved. Whereas in 2020 results identified that No differences between groups in gender, age, marital status, education, working years, or previous anti-epidemic experience <sup>(31)</sup>.

A study in 2020 which was conducted on Jordanian nurses and found that a majority of them were experiencing acute stress disorder (ASD) due to the COVID-19 pandemic, putting them at risk for PTSD predisposition. Age was identified as a predictor of psychological distress, with younger nurses being more prone to experience distress. However, the study did not specifically mention age in relation to PTSD symptoms <sup>(32)</sup>.

In 2020 studies found that healthcare workers, including nurses, reported a substantial mental health burden during the COVID-19 pandemic, with increased depressive and PTSD symptoms compared to other healthcare workers <sup>(33)</sup>. However, age was not specifically mentioned as a factor related to PTSD symptoms in these studies.

The COVID-19 pandemic has placed a significant burden on healthcare workers, particularly nurses, who have been at the forefront of the response. This literature review aims to explore the clinical factors associated with PTSD among COVID-19 nurses. By synthesizing the findings from various studies, we can gain a comprehensive understanding of the factors contributing to PTSD among this population and identify potential areas for future research.

In the context of COVID-19, in 2021 found that 45% of staff working in intensive care units (ICUs) met the threshold for probable clinical significance on PTSD symptoms <sup>(34)</sup>. Moreover, the prevalence of SARS-CoV-2 infection among nurses has been examined in several studies. A living systematic review and meta-analysis, which reported that the prevalence of SARS-CoV-2 infection among nurses was 11% using RT-PCR and 7% using antibodies in 2020. Nurses working in hospitalization/non-emergency wards were found to be the most affected personnel. Interestingly, anosmia, fever, and myalgia were the only symptoms associated with SARS-CoV-2 positivity among nurses. It is worth noting that a significant proportion (40%) of RT-PCR positive nurses did not show symptoms at the time of diagnosis <sup>(26)</sup>. Which were suggestive result of that beside the direct care risk of developing the disease might have significant association for the development of PTSD.

### **2.3 common Coping mechanisms and related outcomes among nurses who were on frontline service for COVID-19 patients**

The COVID-19 pandemic has posed significant challenges for healthcare professionals, especially nurses, who have been at the forefront of managing the crisis. As a result, there has been growing concern about the mental health and coping strategies of nurses dealing with the traumatic impact of the pandemic, leading to an increased risk of PTSD.

In 2020 a study on healthcare workers in New York during the COVID-19 pandemic found that they experienced significant psychological distress. The study also highlighted various coping behaviors adopted by healthcare workers to manage the stressful environment <sup>(35)</sup>. The findings of this study shed light on the psychological challenges faced by nurses and the coping mechanisms they employ to deal with the traumatic nature of their work. the need for mental health care for medical staff and affiliated healthcare workers during the COVID-19 pandemic. studies highlighted the prevalence of PTSD symptoms among healthcare workers and the importance of addressing the mental health needs of frontline workers. This underscores the significance of developing targeted interventions to support nurses dealing with PTSD <sup>(36, 37)</sup>.

A study from USA in 2020 after a qualitative study based on content analysis found that nurses who care for patients with COVID-19, including trauma experienced during disasters, the use of substances to cope and the weakening of existing support systems <sup>(38)</sup>. Another cross sectional study from south Africa in 2021 found that avoidant coping strategy was found to be associated with PTSD among covid nurses<sup>(39)</sup> whereas a study which was conducted in 2020 revealed that positive coping strategies were correlated with less late-onset PTSD symptoms<sup>(40)</sup>. A study which were suggestive for that nurses require adequate mental health services.

## Conceptual Framework

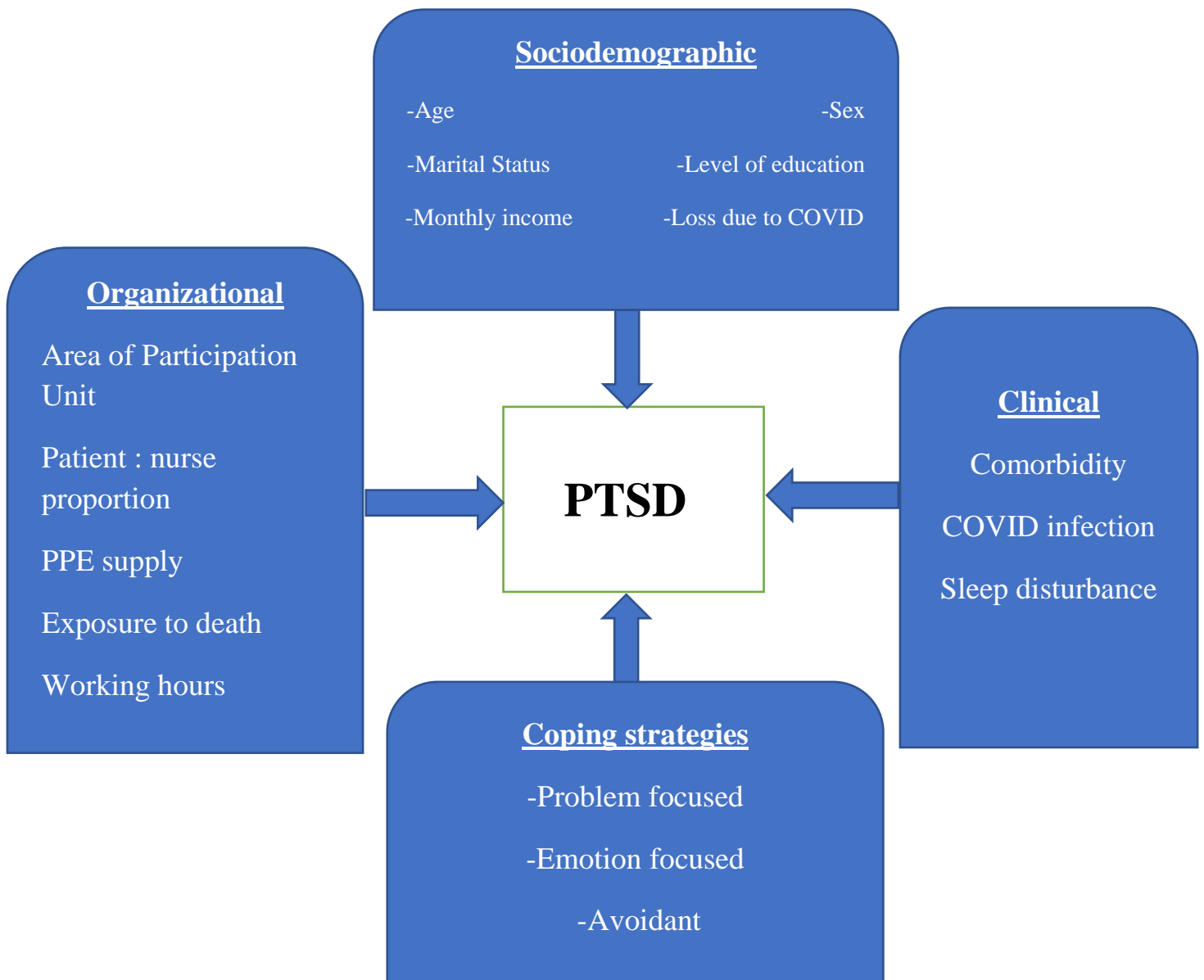


Figure 1. Conceptual frame work of PTSD and its independent variables. (Adapted from different literatures relevant for this study) <sup>(9, 10, 41, 42)</sup>.

### **3.0 Objectives**

#### **3.1 General Objective**

To identify magnitude and factors associated with PTSD among nurses participated on COVID-19 patients direct care from 2019-2022 in A.A, Ethiopia.

#### **3.2 Specific Objectives**

To describe magnitude of PTSD among nurses participated on COVID-19 patient direct care from 2019-2022 in A.A, Ethiopia.

To identify factors associated with PTSD among nurses participated on COVID-19 patient direct care from 2019-2022 in A.A, Ethiopia.

## **4.0 METHODOLOGY**

### **4.1 Study Area**

The study was conducted in selected governmental higher referral hospitals located in A.A, Ethiopia from May 15 – June 14 2024.

Data collection was multicentered which gathered from Eka Kotebe Hospital, St Peter Hospital and St Pauls' Hospital which are all selected purposively located in A.A, those hospitals served as major COVID centers with numerous numbers of health care professionals including nurses in A.A<sup>(43)</sup>. Depending on the information provided from each hospitals human resource office: -

Eka Kotebe Hospital inaugurated in 2019 with 150 beds for mental health services and 200 beds for general medical services. It then became the first hospital in the country to be fully dedicated to this cause, and after making all the necessary preparations, the major one being maximizing its capacity for inpatient service for 750 beds, it began admitting and serving only COVID-19–positive patients, 252 nurses provided direct care for those patients.

The current St. Peter 's hospital was established in 1963G.C as a TB treatment center in the nation. At the time of Haile Selassie I, with the charity and good will of Knojit Anbenet, wife of Ras Abebe, the residence of the war minister was given to Ministry of Health to serve as TB sanatorium. The report from the HR office showed that 302 nurses were participated during the COVID-19 pandemic.

St Pauls' hospital was built by Emperor Haile Selassie I in 1969 with the help of the German Evangelical Church. It aimed to serve the poor currently the hospital has 350 beds sees an annual average of 300,000. It has a catchment population of more than 5 million. During the pandemic 900 nurses were part of COVID-19 patient care.

### **4.2 Study design and period**

Institution based cross sectional study design was used and the data collected from May 15 – June 14 2024.

### 4.3 Target population

Nurses who were directly participating on direct care for covid-19 patient during the pandemic (from 2019-2022)

### 4.4 Source Population

Nurses, currently presented in selected referral hospitals and served directly on patient care during the pandemic (2019-2022) in A.A, Ethiopia.

### 4.5 Study population

Randomly selected 330 participants who are currently working in those selected hospitals were planned but 320 (97%) participants fully involved as the study population.

#### Eligibility criteria

##### Inclusion

- Nurses who were participated in direct COVID- 19 patient care from 2019-2022.
- Nurses who are currently presented and working in those selected referral hospitals

**Exclusion** – nurses who participated to coordinate the covid care.

### 4.6 Sample size determination

The sample size was determined by using single population proportion formula through the following assumptions: marginal error (d) that will be tolerated in either side of the true proportion to be 5%, using 95% confidence level,  $\alpha = 0:05$ , and based on the search engine accessed we were unable to find an article with similar topic for that matter we took the p value as 0.5.

$$n' = \frac{Z (\alpha/2) \sqrt{p (1-p)}}{d^2}$$

$$= \frac{(1.96)^2 * 0.5 (1-.5)}{(0.05)^2}$$

$$n' = 384$$

Using correctional formula,

Where  $n'$  (sample size) = 384

$$n = \frac{n'}{(1+n')/N}$$

$N$  (total population) = 1454       $n = 303$

By adding 10% for non-response rate the final sample size become 330

# *proportion* =  $\frac{n \cdot n_i}{N}$  where  $n$  = final sample size (330),  $n_i$  = total number of nurses in a single hospital and  $N$  = total number of nurses in those 3 selected hospitals (1454)

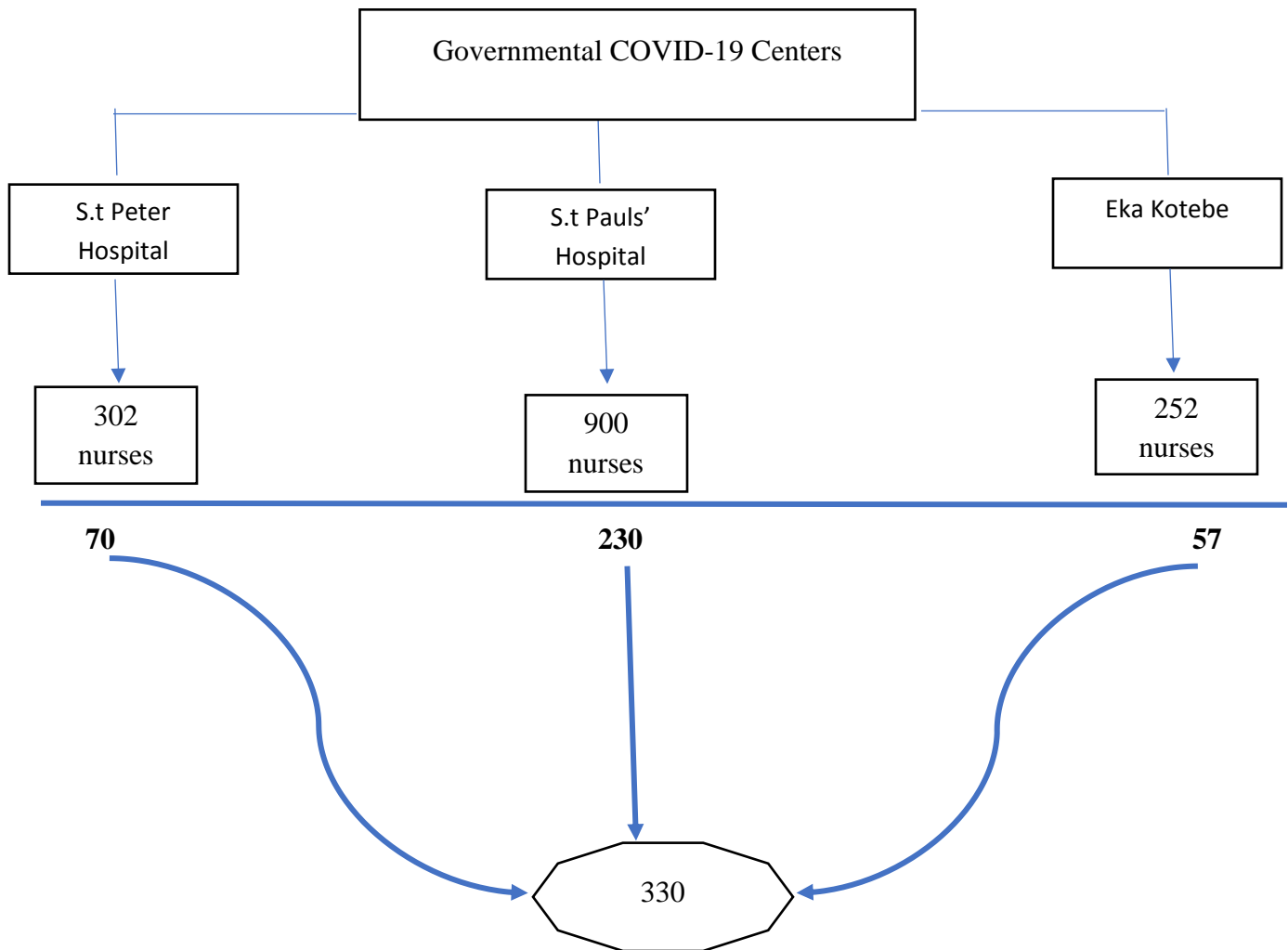


Figure 2: Schematic representation of study population and proportion for the study sample size.



focused strategies” (use of emotional support, positive reframing, acceptance, religion, and humor), “Problem-focused strategies” (active coping, planning, and use of instrumental support) and “Avoidant coping strategies” (venting, denial, substance use, behavioral disengagement, self-distraction, and self-blame) <sup>(44)</sup>. The 14 items are answered on a four-point Likert scale (‘not at all’ (1), ‘a little’ (2), ‘quite a bit’ (3), and ‘all the time’ (4)).

Socio-demographic information such as age, gender, professional title, work experience, education (based on certificates), average monthly income, marital status, degree of social support, training or learning methods protection knowledge were collected from selected participants. Prior to that Pretest was conducted at Zewditu hospital starting from April 5 2024 to April 12 2024.

## 4.9 Operational definitions of Terms

**PTSD positive** A total score of at least at the cutoff point <sup>(17)</sup> and above for the PTSD-8 checklist <sup>(45)</sup>.

**PTSD negative** A total score of below the cutoff point <sup>(17)</sup> for the PTSD-8 checklist <sup>(45)</sup>.

**Problem-focused coping** – A positives response for 2 or more of Item 2,6,9 and 10.

**Emotion-Focused coping** – A positive response for 3 and above for Item 5,8,11,12,13 and 14.

**Avoidant coping** – A positive response for at least 2 of Item 1,3,4 and 7.

**Mixed coping** – respondents with positive response for greater than one coping strategies.

**None** – respondents’ response which doesn’t fit the criteria for those listed coping strategies.

## 4.10 Data Quality Assurance

Quality of data was assured through the use of structured questionnaire, Basic training of data collectors consist of 3 BSc nurses through a simple orientation which was administered for 02 days to commencement of actual survey, Active participation of the principal investigator in the data collection process as well as regular supervision of other data collectors, Checking of questionnaires at the end of each day of data collection, for consistency, completeness, clarity and accuracy. Additionally, after 5% of the sample size participate on the pretest at Zewditu hospital

validity and reliability of the questionnaire was measured using test-retest reliability and validity measures.

#### **4.11 Data analysis and procedures**

Data was entered using Epi-Info and export to SPSS version 26 for further cleaning and analysis. Binary logistic regression model used to identify the associated factors. Co linearity diagnostic test was conducted to check for collinearity between independent variables and the highest collinearity, variance inflation factor (VIF) was determined the absence of multi co linearity. on bivariable analysis having a p value  $< 0.25$  considered for multivariate analysis to adjust the confounders. The strength and presence of statistical association assessed using Adjusted Odds Ratio (AOR) with 95% confidence interval (CI). Variables with a p value  $\leq 0.05$  in the final model considered as statistically determinant factors of PTSD.

#### **4.12 Ethical considerations**

This survey uses the form of a questionnaire, the proposal paper was submitted to those selected hospitals for review and approval, after that the participant were informed the purpose of this research and will be assured of their right to refuse to participate or to withdraw from the study at any stage. Researcher issued instructions about filling the questionnaire and a unified guidance language is used to explain the research purpose to the research subjects, thereby ensuring that there was decreased chance of ambiguity for answering the questions.

#### **4.13 Dissemination of results**

The result of these study will be submitted to SPHMMC, Eka Kotebe and St. Peter Hospitals, disseminated to Addis Ababa public health research directorate. then these findings will be presented in a session in the presence of the entire class, teachers and others. Then finally result will be proposed for publication in various journals.

## 5.0 Results

The study included a total of 320 nurses, with a high response rate of 97%. Of the respondents, 147 (45.9%) were male. The majority of participants were in the age group of less than 30 years, with approximately 209 (65.9%) being single and 58.4% having attained a degree. Notably, 74.4% of the participants had a monthly income of 10000ETB and above, while 28.4% reported experiencing family or friend loss due to COVID-19 infection. (See Table 1 for details.)

Table 1: Socio demographic data of nurses participated on COVID-19 patient care 2024.

Variables	Category	Frequency	Percentage
Age	Less than 30	201	62.8
	30 and above	119	37.2
Sex	Male	147	45.9
	Female	173	54.1
Educational status	Diploma	-	-
	Degree	187	58.4
	Masters and above	133	41.6
Marital status	Married	109	34.1
	Single	211	65.9
	Divorced	-	-
	Widowed	-	-
Current income	< 10000ETB	82	25.6
	10000 and above ETB	238	74.4
Family loss	Yes	91	28.9
	No	229	71.6

In terms of nurse-to-patient ratio, 57.7% of participants worked in a 1:1 proportion, while 57.2% spent 6-8 hours daily caring for COVID-19 patients, from these participants 55.9% of them served in covid patient care for 6 months or less. Nearly half (49.4%) had frequent exposure to patient deaths. Regarding COVID-19 infection history, 15% tested positive, and only 3.8% reported chronic illnesses. Social support among respondents was rated positively by 60%.

Among the study participants, the distribution of current work settings is as follows: 30.9% in ICU, 21.6% in Emergency, 17.2% in surgical units, 14.1% in medical wards, 10.9% in OPD, and 5.3% in other units. During the pandemic, the majority (48.1%) were working in critical care units, with 55.9% providing care to COVID patients for 6 months or less. Furthermore, 40.3% of participants underwent training before direct care involvement, and 60% felt that PPE supply for COVID care at their workplace was adequate.

Coping strategies among nurses involved in direct COVID-19 care varied, with 65% utilizing a mix of Emotion-based, Avoidant, or Problem-focused strategies. Some used only one type of coping strategy, while 18.4% did not employ any of the assessed strategies.

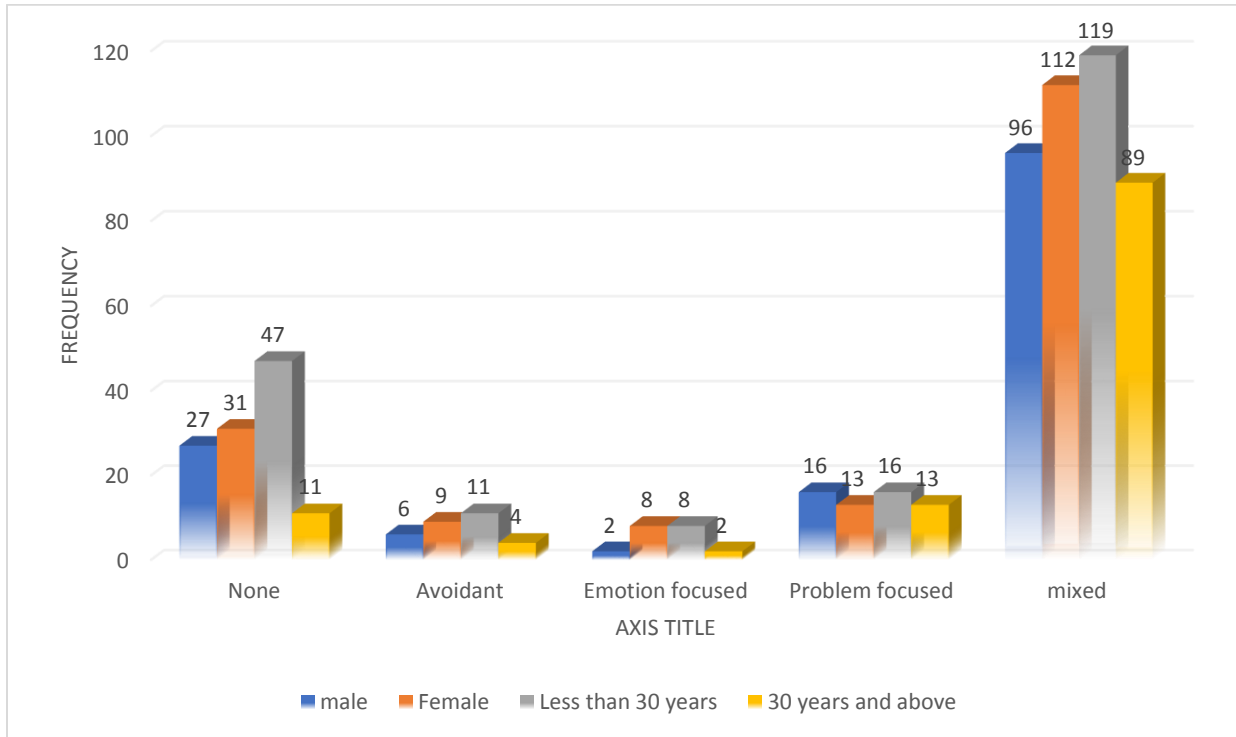


Figure 3: Clustered Bar of Age by coping strategies used by sex and age of respondents.

## 5.1 Magnitude of PTSD among nurses participated on COVID-19 patient care

From the total participants, 126 of them have score of  $\geq 17$  for 8 item PTSD checklist which makes the total prevalence of PTSD 39.4%.

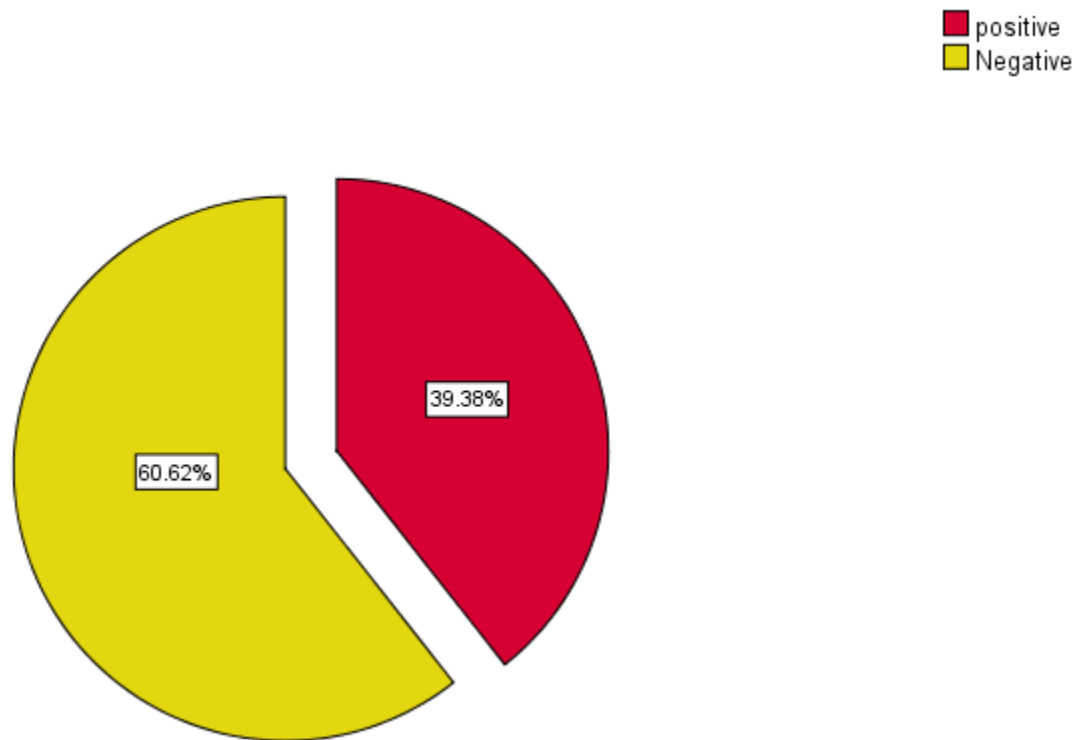


Figure 4: PTSD distribution among nurses participated on covid 19 patient care during the pandemic 2024.

## 5.2 Factors associated with PTSD among covid nurses

### 5.2.1 Sociodemographic factors

Age, sex, marital status and current income were found to be significant for binary logistic regression from these variables on multivariate logistic regression we found that females have increased risk for the development of PTSD by 49.8% plus PTSD development among covid nurses were found to be less likely by 35.7% among married participants (.357 [.194-.658]) compared to their counterparts whereas earning an income below 10,000 ETB increases the risk of developing PTSD by 2.691 compared to those who earns monthly income 10000ETB and above.

## **5.2.2 Organizational factors**

From those selected organizational variables area of participation, nurse to patient proportion and PPE supply during the covid care were found to be significant on binary logistic regression and out of these variables category of average nurse to patient proportion 1:1 during the pandemic increase the risk of developing PTSD among nurses by 2.691 with CI [1.443-5.020] otherwise the remaining variables have no significant associations with the development of PTSD.

## **5.2.3 Coping Strategies**

In addition to the above listed variables different types of coping strategies used by the nurses was accessed using brief cope inventory from those methods application of avoidant and problem focused coping strategies decreases the risk of developing PTSD by 5.6% CI [.006-.453] and 26.9% CI [.093-.779] respectively compared those who used mixed methods of coping strategies, whereas respondents with none of these coping strategies were found to have lesser risk of developing PTSD by 26.5% [.126-.557]. None of the clinical factors were found to be associated with PTSD among covid nurses.

Table 2: associated factors with PTSD among nurses participated on COVID patient care during the pandemic 2024.

Variable	Category	PTSD		Bivariate	P-value	Multivariate	
		+	-	COR (95% CI)		AOR (95% CI)	
Sex	Male	45	102	.501 (.316-.794)	0.011	.502 (.294-.856)	
	Female	81	92	Ref.		Ref.	
Marital status	Married	30	79	.455 (.276-.750)	0.001	.357 (.194-.658)	
	Single	96	115	Ref.		Ref.	
Current monthly income in ETB	< 10,000	44	38	2.203 (1.323-3.668)	0.002	2.691 (1.443-5.020)	
	10000 and above	82	156	Ref.		Ref.	
Nurse to patient proportion during the pandemic	1:1	82	102	.024 (.241-.903)	0.008	2.901 (1.325-6.352)	
	1:2	29	52	.298 (.318-1.420)		0.295	1.572 (.672-3.697)
	1:3 and above	15	55	Ref.		Ref.	
Coping strategies	None	23	35	Ref	0.000	.265 (.126-.557)	
	Avoidant	1	14	1.231 (.680-2.226)		0.007	.056 (.006-.453)
	Emotion based	3	7	11.322(1.462-87.690)		.088	.261 (.056-1.224)
	Problem focused	7	22	1.887 (.475-7.499)		.015	.269 (.093-.779)
	Mixed	93	115	3.100 (1.212-7.929)		Ref.	

Note: COR = crude odds ratio at 95% confidence interval; AOR = adjusted odds ratio at 95% confidence interval.

## 6.0 Discussion

The study showed that the prevalence of PTSD among covid nurses was 39.4%. The prevalence was higher than studies done in Korea (18.5%), Chania (26.4%) and Switzerland (22.0%)(8, 9, 21) the result is comparable with another study from Korea (36.7%)(46). However, it was lower than the studies done in, USA (58.7%) and southern Ethiopia (56.8%)(7, 16). The difference might be due the fact that variations in socio demographic, economic and cultural difference exist(2).

Being male were found to be protective this might be due to that Findings suggest that gender have multiple ways of affecting PTSD, including gender roles, genetic predisposition, and hormonal influences. These factors work together to put women at a particular risk of developing PTSD(47), this finding was consistent with the study conducted in USA and Italy(26, 48). The finding of this study also showed that those participants with average monthly income below 10000 ETB were highly associated for the development of PTSD. This might be due that Across the lifespan, residents of impoverished communities are at increased risk for mental illness, chronic disease, higher mortality, and lower life expectancy(49).

According to marital status results being married were associated with PTSD (AOR=.357 (.194-.658) which represented that marital status of being married have less risk for developing PTSD compared to the counterparts. This might be due to that married individual had access to emotional and practical support from their spouses, which help them to cope with the stress and trauma associated with their work, this result was consistent with the study done in Sub-Sahara Africa(10) whereas it was inconsistent with the study done in southern Ethiopia(16).

Regarding nurse-to-patient proportion the PTSD were found to be 2.901 times higher among nurses who were working on 1:1 proportion compared to those who were serving patients with 1:3 and above proportion. This might be due to that the risk of developing COVID infection significantly higher among ICU nurses which probably can be determined by both exposure level and protection practices(50).

In terms of coping strategies avoidant and problem focused coping strategies were found to be associated as protective variables for the development of PTSD among covid nurses, this result was consistent with the study conducted in South Africa whereas it was inconsistent with the study conducted in Chania.

## **6.1 Conclusions and Recommendations**

This study has identified a high prevalence of PTSD among nurses participated on direct covid patient care. Being female, single, average monthly income below 10,000ETB and 1:1 nurse to patient proportion were found to be factors for increased risk of PTSD, coping mechanisms including avoidant, problem focused and those unidentified coping mechanisms were found to be protective variables of PTSD development. Development of methods to screen the mental health issues and implementations of the program before, during and after exposure to such kind of disaster by responsible organizations will be useful to improve these mental health outcomes nurses in A.A, Ethiopia. In addition, Integrated work between Ethiopian nursing association, Hospitals and mental health services to mitigate the adverse effects of PTSD on nurses in A.A, Ethiopia. Further studies could be conducted to check the impact of interventions on mental health improvement. Additionally using the cope inventory some respondents coping strategies was not identified for that matter other researchers could work up to explore further.

## **6.2 Strength and limitations**

Standard tool was used to assess the magnitude of PTSD among nurses participated on covid patient care, The study used a representative sample from different and multiple sites that the result can be generalized to nurses participated on direct covid patient care in A.A. However, the study has some limitations only the magnitude of depression was assessed rather than its severity and variables were not assessed using different standards, since the study was conducted self-administered questioners there may be possibility of social desirability bias and there might be possibilities of recall bias as some of the factors were assessed based on the past history.

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## 8.0 ANNEX

### Informed consent

**Researcher Name:** Tesfaye Sisay (BSC Nurse, MSc in critical care nursing candidate)

**Title:** Posttraumatic stress disorder magnitude, related factors and Coping outcomes among nurses participated during the COVID-19 pandemic.

I'M asking your voluntary participation in my research. please read the following information about the research, if you would like to participate, please sign in the space provided.

**Purpose of the research:** - to identify the magnitude and factors associated with PTSD and coping outcomes among nurses Participated on direct COVID-19 patient care from 2019-2022 in Addis Ababa, Ethiopia.

Basically, the questionnaire focusses on assessing socio demographic, risk assessment and evaluation of PTSD.

**Risk:** - if you have any sensitivity toward the questions provided you might experience emotional stress.

**Benefits:** - your participation indirectly helps to rule out the magnitude and factors of PTSD among the populations you are representing. that could help to manage the problems and attract responsible organizations including your organization.

The information you provide for the research is fully confidential, it doesn't require your identity for presentations or analysis of the data.

If you have any questions or recommendations about this study, feel free to contact data collectors or at Email - [sistes38@gmail.com](mailto:sistes38@gmail.com) phone number 0925254844

By signing this form, I am attesting that I have read and understand the information above and I freely give my consent to participate.

signature \_\_\_\_\_

Date \_\_\_\_\_



20. To which drug you are addicted    A. Alcohol                    B. Cigarette                    C. chat
- D. other(specify)\_\_\_\_\_                    E. I don't have any addiction

**Section 2: PTSD checklist (event experience represent the pandemic season )**

	Not at all	Rarely	Sometimes	Most of the time
1. Recurrent thought or memories of the event.				
2. Feeling as though the event happening again.				
3. Recurrent nightmares about the event.				
4. Sudden emotional or physical reaction when reminding the event.				
5. Avoiding activities that remind you of the event.				
6. Avoiding thought or feeling associated with the event.				
7. Feeling jumpy, easily startled.				
8. Feeling on guard.				

### Section 3 Coping Checklist

	Not at all	Little bit	Medium amount	Doing a lot
1. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.				
2. I've been concentrating my efforts on doing something about the situation I'm in.				
3. I have been repeatedly telling myself that this situation is not real.				
4. I've been using addictive behaviors or substances to make myself feel better.				
5. I've been getting emotional support from others.				
6. I've been trying to get advice or help from other people about what to do.				
7. I've been giving up trying to deal with it.				
8. I've been saying things to let my unpleasant feelings escape.				
9. I've been trying to see it in a different light, to make it seem more positive.				
10. I've been trying to come up with a strategy about what to do.				
11. I've been making fun of the situation.				
12. I've been accepting the reality of the fact that it has happened.				
13. I've been trying to find comfort in my religion or spiritual beliefs.				
14. I've been blaming myself for things that happened.				

**Declaration**

I declare that this research proposal entitled posttraumatic stress disorder magnitude, related factors and Coping outcomes among nurses participated during the COVID-19 pandemic is my own work that have not been addressed in the study area as far as my knowledge touched and all the source I used has been indicated and acknowledged as complete references.

Name of investigator	signature	Date
Tesfaye Sisay (BSc, CCNP candidate)		

Name of Advisors

1. Altayework Mekonnen (Assistant professor) \_\_\_\_\_
2. Zerihun Alene (CCNP) \_\_\_\_\_

Name of Invigilator

1. \_\_\_\_\_
2. \_\_\_\_\_