

Prevalence and risk factors of perceived stress on COVID-19 among health care providers in Dilla Town Health institutions, Southern Ethiopia: A cross-sectional study

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Abstract

Background: The Coronavirus belongs to large groups of viruses that cause serious health problems including the mental health of the society particularly the health care providers. Understanding the mental health response after a public health emergency might help health care providers and communities to prepare for a population's response to a disaster.

Objective: This study aimed to assess the magnitude of perceived stress and risk factors of coronaviruses disease 2019 among healthcare providers in Dilla, Southern Ethiopia 2020.

Methods: This cross-sectional study was conducted among 244 samples selected with systematic random sampling technique. Data collection was carried out with validated perceived stress scale adapted from the World health organization. Data were coded and entered into Epi-info Version 7 and was exported and analyzed with SPSS version 20. Crude and adjusted OR were analyzed using logistic regression and the level of significance of association was determined at P-value <0.05.

Result: The magnitude of perceived stress of coronavirus disease 2019 among participants was 126 (51.6%). Being at the age range of 25-31 years (AOR=2.5, 95%CI, 1.07, 5.90), nurse professionals (AOR=7.8, 95%CI 2.15, 27.98) and pharmacist professionals (AOR=4.15, 95%CI, 1.01, 17.06) were variables found to have a strongly statistically significant association with perceived stress of Coronaviruses disease.

Conclusion: this indicates that early prevention, early identification and intervention of perceived stress of coronaviruses disease among healthcare providers. Particularly, more stress for the frontline healthcare worker nurses, pharmacists and age ranges of 25-31 years.

Introduction

Coronavirus disease 2019(COVID-19) is a mild to severe respiratory illness that is caused by a coronavirus (genus Beta coronavirus), is transmitted chiefly by contact with infectious material (such as respiratory droplets), and is characterized especially by fever, cough, and shortness of breath and may progress to pneumonia and respiratory failure(1, 2). Coronavirus disease (COVID-19) is a new strain that was first discovered in 2019 in Wuhan, China and has not been previously identified in humans(3, 4)It is distinct from other SARS, MERS, and influenza(5, 6). In the past two decades more than 10, 000 cumulative cases, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV happened worldwide (7-10). After WHO declared the current novel coronavirus as an epidemic of a Public Health Emergency of International concern On Jan 30, 2020, more than 1 million infections and more than 70,000 deaths worldwide recorded due to COVID-19 pandemics(11-13). The first COVID-19 case has been confirmed in Addis Ababa, Ethiopia on March 31, 2020.the recently COVID-19 cases are around 43 and are reported 2 deaths(12, 14). With the widespread disruptive effects of COVID-19, different countries have been taking different prevention and control measure like quarantining, closing and suspension of transportations, avoiding public gatherings and even holding different public service works including education. Because

of the above-mentioned measures students, workers, tourists and others have been now prevented from accessing their training institutions, workplaces, and homes(15-17). Psychological symptoms like anxiety/stress, panic buying, fear and paranoia about attending community events; and reduced autonomy and concerns about income, job, security, and so on have already been observed on a population. Such as being at home can place children at increased risk of, or increased exposure to, child protection incidents or make them witness to interpersonal violence if their home is not a safe place(18). Coronavirus pandemic fears prompt Government to activate emergency response and extend travel ban(18). In addition to the community members, health care providers are also at risk of higher psychological distress due to longer working hours and high risk of exposure to the virus. This may also lead to stress, anxiety, burnout, depressive symptoms, and the need for sick or stress leave, which would harm the capacity of the health system to provide services during the crisis(19). Even though the psychological impact of the coronavirus disease (COVID-19) pandemic must be recognized alongside the physical symptoms, the global response is a simple public health strategy such as hand washing, quarantine and social distancing(12, 20). If left untreated, these psychological symptoms may have long-term health effects health workers and require treatment adding to the cost burden of managing the illness(18, 21). To date, the Ethiopian government's focus has been on managing the medical needs of people during the pandemic, rather than providing resources to meet short- and long-term mental health implications. So this paper aims to assess the psychological burdens of COVID-19 and recommended possible mitigating strategies. Therefore, it is vital to assess the magnitude of perceived stress and risk factors of coronaviruses disease 2019 among healthcare providers in Dilla, Southern Ethiopia 2020.

Methods And Materials

Study setup

The study was conducted in Dilla Town which is found in Gedeo Zone on the main road from Addis Ababa to Kenya 360km South of Addis Ababa, 90km South of Hawassa (capital of SNNPR) and has a longitude and latitude of $6^{\circ}24'30''\text{N}$ $38^{\circ}18'30''\text{E}$ with an elevation of 1570 meters above sea level. There are four governmental health institutions in the study area and one of which is Dilla University referral hospital while the others are health centres. There about five hundred fifty health care providers.

Study design and period

This was an institutional-based cross-sectional study design conducted among health care providers in Dilla Town governmental health institutions from March to April 2020

Population

Source population: All health care providers living in Dilla Town Gedeo Zone during the study period

Study population: selected Health care providers with systematic random sampling technique were included.

Sample size and sampling technique

Sample size: The required sample size was calculated using a single proportion formula to obtain sample size needed to estimate the prevalence perceived stress among health care providers. The prevalence of perceived stress was unknown. Therefore proportion 50%, confidence interval = 95% and margin of error (d) = 5% was taken. Hence, the required sample size was 384. Since the source population is less than 10,000, the reduction formula was employed giving a sample size of 244 with a 10% non-response rate. The sample was obtained with the proportion allocation system among each health centres and one referral hospital based on the total number of health care providers in each institution.

Data Collection procedures and instrument

A structured questionnaire adapted from WHO validated for perceived stress was used to collect the information. We included in the questionnaire the following: socio-demographic data (age, sex, profession, qualification, income, religion, marital status, ethnicity and work experience); perceived stress was evaluated with 10 item version of perceived stress scale (PSS) which has a wide range of applications, of which the scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A short 4 item scale can be made from questions 2, 4, 5 and 10 of the PSS 10 item scale. A 5-point Likert scale is employed to evaluate each item (e.g. 0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often), yielding a totally original score ranging from 0 to 50. A total score of >20 points was considered as the cut off for experiencing perceived stress on COVID-19.

Data Quality Assurance

The pretest was done on 5% of the sample size. Data collectors and supervisors were trained on each item included in the study tools, objective, relevant of study. During data collection, regular supervision and follow up were made. Investigator cross-checked for completeness and consistency of data daily.

Statistical analysis and processing

After completeness of the data was crosschecked manually, it was entered into epi info version 7 computer programs and transported to SPSS version 22-computer program for further analysis and cleaning. Descriptive statistics were used to summarize tables and figures and statistical summary measures were used for presentation. Association of perceived stress-related variables and demographic characteristics were analyzed using chi-square, fisher's exact teste and binary logistic regression with odds ratio and 95% CI in the univariate analysis. Multivariate logistic regression analysis was used to determine the association of the combination of risk factors for the development of perceived stress. All variables with a $p < 0.20$ in the univariate analysis were entered in the logistic regression model. Odds ratios (OR) and 95% confidence intervals were then calculated. A p-value of less than 0.05 was considered significant.

Results

Socio-demographic characteristics of the respondents

A total of 244 participants were included in the study with a response rate of 100%. Among the respondents, the majority were males 161(66 %) while the majority of respondents were in the age range of 25-31 years 162 (66.4%). Of the total participants, 124(50.8%) of them were protestant religion follower, and 76 (31.1%) were Amhara in their ethnicity. The majority of the participants were single 140 (57.4%)

The qualification of participants indicated that 158(64.8%) of them were degree level while regarding their profession, 100(41.0%) of the participants were Nurses. The majority of respondents 130(53.3) had working experiences of in the range of 1-5 years and the majority of respondents 96 (39.3%) monthly income was ranging from 3000-5000 Ethiopian birr (Table 1).

Table 1: Sociodemographic characteristics of respondents in Dilla Town Government Health Institutions, Dilla, Southern Ethiopia, 2020

Variables Categories		Frequency	Percentage (%)
sex	Female	83	34.00
	Male	161	66.00
Age	18-24	48	19.7
	25-31	162	66.4
	>31	34	13.9
Marital status	Single	140	57.4
	Married	90	36.9
	Divorced/widowed	14	5.7
Religion	Orthodox	100	41.0
	Muslim	16	6.6
	Protestant	124	50.8
	Catholic	4	1.6
Ethnicity	Gedeo	72	29.5
	Oromo	36	14.5
	Amhara	76	31.1
	Gurage	20	8.2
	others**	40	16.4
Monthly income	<3000	50	20.5
	3000-5000	96	39.3
	5000-7000	50	20.5
	>7000	48	19.7
Qualification	Diploma	66	27.0
	Degree	158	64.8
	Masters and Above	20	8.2
Profession	Medical doctor	27	11.1
	Nurse	100	41.0
	Health officer	15	6.1
	Anaesthetist	10	4.1

	Midwifery	24	9.8
	Psychiatry	9	3.7
	Laboratory technology	24	9.8
	Pharmacist	23	9.4
	Others**	12	4.9
Work experience	<1 year	50	20.5
	1-5 years	130	53.3
	>5 years	64	26.2

Perceived stress of the respondents

The majority of respondents were very annoyed by things that happened outside very often while some others felt well fairly often. On the other hand, the majority of respondents were able to complete the important events in their life properly while others couldn't cope with all the things happened outside (Table 2).

Table 2: Perceived Stress Scale (PSS) among Health care providers in Dilla Town in Dilla, Southern Ethiopia 2020.

Items	Never	Almost Never	Sometimes	Fairly often	Very Often	Total
Something unexpectedly	52	32	70	54	36	244
Unable to control the important things in life	62	40	66	56	20	244
Felt nervous and stressed	46	42	68	58	30	244
Felt confident about your ability to handle your problems	44	42	72	58	28	244
Felt that things were going your way	34	30	76	76	28	244
Could not cope with all the things	44	56	74	52	18	244
Able to control irritations in life	38	28	68	72	38	244
Felt on top of things	32	42	54	88	28	244
Angered things on outside	32	42	70	58	42	244
Felt difficulties and not overcome	48	44	64	62	26	244

Perceived stress, among Health care providers, was very high. The highest perceived stress score was observed among Nurses, sixty-eight from hundred while the smallest was seen among anaesthetist and other health care providers (three from ten and three from twelve) respectively (Figure 1).

The magnitude of perceived stress on COVID-19 among Health care providers in Dilla Town in Dilla, Southern Ethiopia 2020.

The prevalence of perceived stress on COVID-19 among participants was found to be 126 (51.6%) with of the respondents in their life of the last month.

Risk factors of perceived stress on COVID-19 among Health care providers in Dilla Town

In bivariate binary logistic analysis variables; sex, age, marital status, monthly income, qualification, profession, and work experiences were found to have a p-value less than 0.25. These variables full-filled minimum requirements for further multivariate binary logistic regression.

From multivariate binary logistic regression, only variables; age in the range of 25-31 years, being nurse, and being pharmacist were statistically significant with perceived stress on COVID-19 at p-value less than 0.05.

The odds of having perceived stress on COVID-19 among respondents who were in the age range of 25-31 years was almost 3 times higher as compared to in the age range of 18-24 years of respondents (AOR=2.5, 95%CI, 1.07, 5.90). In this study participants who are nurses in their profession were almost 8 times more likely to have perceived stress on COVID-19 as compared with respondents who are doctors (AOR= 7.8, 95%CI 2.15, 27.98).

Participants who are pharmacists were also another factor associated with perceived stress on COVID-19. Participants who were pharmacist in their profession were 4 times more likely to have perceived stress on COVID-19 as compared with respondents who are Medical doctors (AOR=4.15, 95%CI, 1.01, 17.06).

Table 3: Bivariate and Multivariate analysis of factors associated with perceived stress on COVID-19 among Healthcare providers in Dilla Town, Southern Ethiopia 2020.

Variables		Perceived Stress		COR (CI)	AOR(CI)
		Yes	No		
Sex of participants	Female	44	39	1.09 (0.64 - 1.85)	0.92 (0.48- 1.77)
	Male	82	79	1	1
Age of participants	18-24	16	32	1	1
	25-31	91	71	2.56 (1.3- 5.04)	2.51(1.070 - 5.90)*
	>31	19	15	2.53(1.023- 6.26)	1.7 (0.53 - 5.4)
Marital status of participants	Single	68	72	1	1
	Married	48	42	1.21(0 .71 - 2.06)	0.9 (0.5 - 2.0)
	Divorced/widowed	10	4	2.65(0 .79- 8.84)	3.2 (0.7 - 14.1)
Monthly income of participants	<3000	22	28	0.93(0.42- 2.06)	0.45 (0.12 - 1.72)
	3000-5000	55	41	1.59(0.79 - 3.18)	1.02 (0.35 - 3.01)
	5000-7000	27	23	1.39(0.627- 3.07)	1.01 (0.33 - 3.06)
	>7000	22	26	1	1
Profession of participants	Medical doctor	10	17	1	1
	Nurses	68	32	3.61 (1.488 - 8.77)	7.75 (2.15- 27.98)**
	Health officer	8	7	1.94 (0.540 - 6.99)	2.61 (0.57- 11.98)
	Anesthetist	3	7	0.73 (0.153 -3.47)	1.06 (0.15- 7.39)
	Midwifery	12	12	1.70 (0.55 - 5.20)	2.76 (0.65- 11.67)
	Psychiatry	4	5	1.36 (0.295- 6.28)	0.91 (0.14- 5.78)
	Laboratory	4	20	0.34 (0.09 - 1.28)	0.36 (0.08- 1.74)
	Pharmacist	14	9	2.64(0 .84 -	4.15 (1.01-

				8.31)	17.06)*
	Others**	3	9	0.57(0.12 - 2.60)	0.71 (.11-4.59)
Work experience of participants	<1 year	20	30	0.43(0.20 - 0.91)	1.07 (0.34-3.34)
	1-5 years	67	63	0.68 (0.37 - 1.25)	0.78 (0.33-1.79)
	>5 years	39	25	1	1

*P-value is significant at $P < 0.05$ **P-value is significant at $P < 0.01$

Discussion

This cross-sectional study had tried to determine the magnitude of perceived stress and associated risk factors among health care providers of Gedeo Zone governmental Health institutions on COVID-19 using perceived stress scale (PSS).

The majority of health care providers were predominantly males 161(66.0%). The overall prevalence of Perceived stress among health care providers of Gedeo Zone governmental Health institutions was found to be 51.6%. The finding of this study was in line with the study conducted in China by Wang C, et al (53.8%) (24). On the other hand, a study done in china Wuhan by Dai Y, et al was lower as compared to this study(39.1% vs 51.6%) (25). The possible explanation might be due to sampling size, sampling technique (convenience sampling) and different tool where they used general Health questionnaire (GHQ-12).

In this study, the majority of respondents were males 161(66.0%), in the age range of 25-31 years 162 (66.4%) and single 140 (57.4%). On the contrary, a study conducted in China revealed that the majority of respondents were female (67.3%), in the age range of 21.4 to 30.8 years (53.1%) and married (76.4%) (24). The possible explanation for this difference might be due to the development of the country, the developed country involved women and marriage at a proper age due to their economical status of their people.

This study revealed that the majority of respondents were nurses 100(41.0%). This finding was consistent with other studies conducted in China 2,343(53.8%) (25) and 764(60.8%) (26). However, this study showed that the majority of health care providers' work experience was one to five years 130 (53.3%) unlike a study conducted in China which was six to ten years 1960(45%) (25). This discrepancy might be due to differences in the educational development system, economical status, sample size and work experience rubrics.

The study revealed that age and profession were independent predictors of perceived stress. The odds of having perceived stress on COVID-19 among respondents who were in the age range of 25-31 years were

3 times more likely as compared to in the age range of 18-24 years of respondents.

On the other hand, this study showed that participants who were nurses in their profession were 8 times more likely to have perceived stress on COVID-19 as compared to respondents who were doctors. This finding is in line with a study conducted in China on perceived stress on COVID-19 among health care workers (25). The possible explanation might be due to nurses are frontline healthcare workers, directly engaged in diagnosis, treatment and care of patients with COVID-19 and they are many as compared with other professions.

Participants who are pharmacists were also another factor associated with perceived stress on COVID-19. Participants who were pharmacist in their profession were 4 times more likely to have perceived stress on COVID-19 as compared with respondents who were doctors. The pharmacist is also involved directly to provide drugs for patients with COVID-19 and they are at high risk.

Limitations

The study was limited to assess barriers of preexisting mental illness and chronic medical condition and also the new occurrence of mental and physical illness of healthcare workers. Cross-sectional nature of the study design might not show the cause and effect relationships psychological impact and other variables

Conclusions

The magnitude of perceived stress on COVID-19 is half in the study among healthcare providers. Being at the age range of 25-31 years, nurse professionals and pharmacist professionals were variables found to have a strongly statistically significant association with perceived stress on COVID-19. Particularly, of great concern should be given for healthcare workers because they are risk of developing psychological impact and need supporting and interventions.

Abbreviations

AOR; Adjust Odd Ration; CI: Confidence Interval; COVID-19; Coronaviruses Disease 19; COR: Crude Odd Ratio; DU; Dilla University, EPI INFO; Epidemiological Information; GHQ: General Health Questionnaire; HCWs: Health Care Worker; MERS: the Middle East respiratory syndrome; SARS: Severe Acute Respiratory Syndrome; SNNPR: Southern Nation Nationalities and Peoples Regional; SPSS; Statistical Package for Social Science, PSS: Perceived Stress Scale; WHO; World Health Organization

Declarations

Ethical approval and consent to participate

Ethical clearance was obtained from the Institutional Review Board (IRB) of Dilla University. Written consent was obtained from each participant during data collection. All participants were well informed about the aims and purpose of the study, those participants were informed that as the right is given to the study participants to refuse and stop or withdraw from participation at any time during data collection without loss of any entitlement.

Consent to publication

Not applicable

Availability of the Data and Materials

The data will be available on request

Competing of Interest

The author declares that he has no conflicts of interest

Funding

Not applicable

Authors' Contribution

YA and SM conceived the research question, data collection, analysis, interpretation and critically reviewed the manuscript. SY and BM participated during the proposal development, analysis, interpretation of the data and contributed for manuscript preparation. All the authors read and approved the final manuscript

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Figures

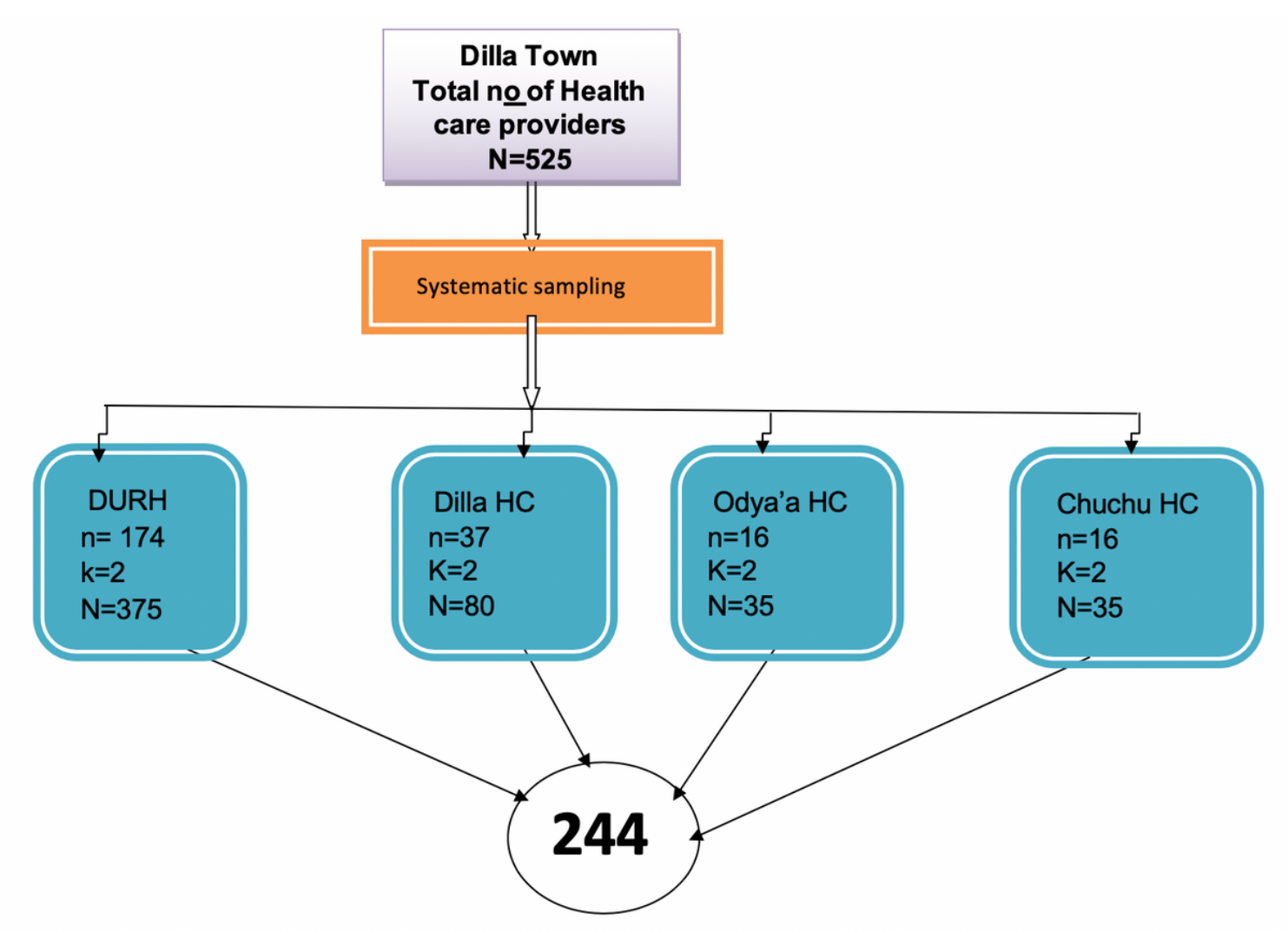


Figure 1

The schematic presentation of the sampling procedure employed to select participants in Dilla Town, 2020.

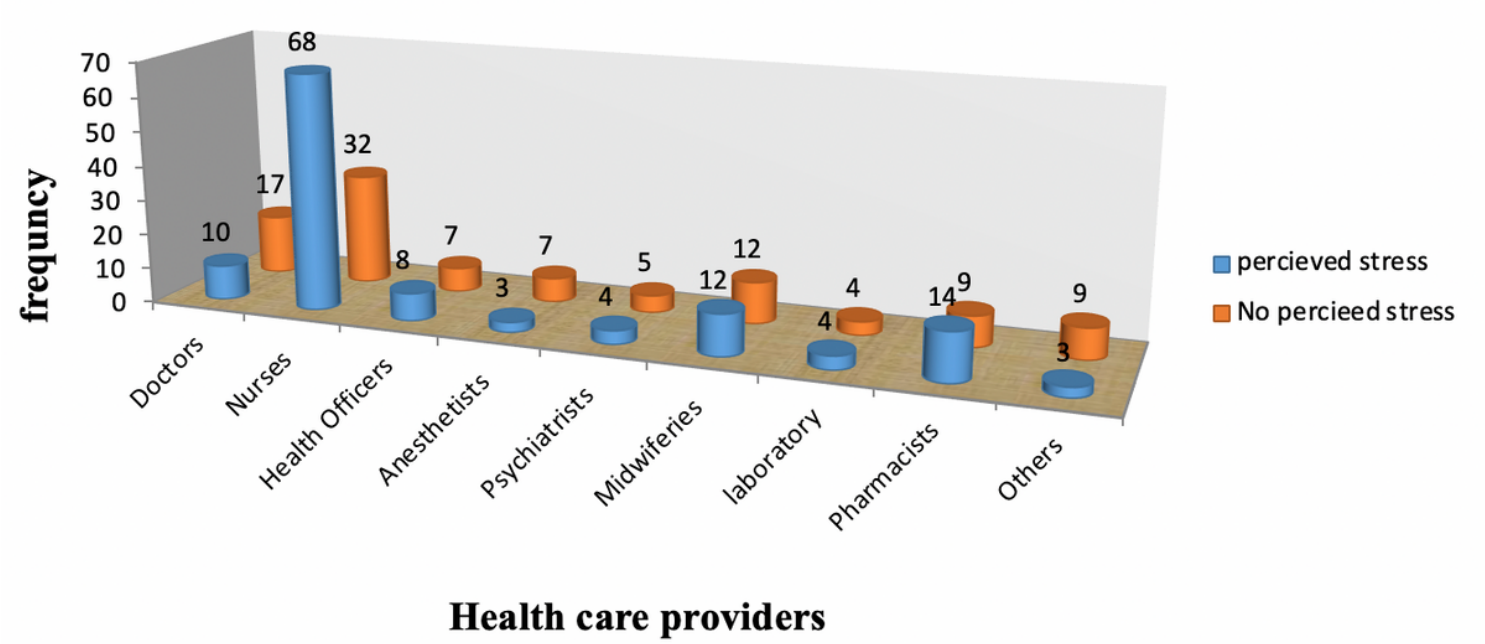


Figure 2

Perceived stress among health care providers of Dilla Town governmental health institutions, southern Ethiopia, 2020.