

# Covid-19 Pandemic-Related Stress and Coping Strategies Among Adults with Chronic Disease in Southwest Ethiopia

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**Background:** The outbreak of the novel coronavirus disease 2019 (COVID-19) pandemic presented a great threat to the physical and mental health of the general population. Patients with chronic disease have always been vulnerable to stressful life conditions. Therefore, determining the perceived stress and coping strategies among chronic disease patients is crucial to minimize the mental health consequences related to the outbreak.

**Objective:** This study aimed to determine COVID-19-related stress and coping strategies among adults with chronic disease in southwest Ethiopia.

**Methods:** An institution-based cross-sectional study was conducted among 613 randomly selected adults with chronic disease in southwest Ethiopia. A multiple linear regression analysis was used to determine the relationship between the COVID-19-related stress score and coping strategy types, and independent sample *t*-tests and ANOVA tests were conducted. Statistical significance was accepted at *p*-values <0.05.

**Results:** More than two-thirds of study participants (68.4%) were moderately stressed, 13.9% were severely stressed, and 17.8% had low levels of perceived stress. Active coping ( $\beta=1.238$ , 95% CI: 0.0 to 2.477), denial ( $\beta=3.678$ , 95% CI: 2.44 to 4.915), behavioral disengagement ( $\beta=3.669$ , 95% CI: 2.193 to 5.146), self-blame ( $\beta=1.722$ , 95% CI: 0.146 to 3.297), and religion ( $\beta=3.443$ , 95% CI: 2.028 to 4.858) coping strategies positively predicted the COVID-19-related stress score. Only the acceptance coping strategy ( $\beta=-2.710$ , 95% CI: -3.926 to -1.493) negatively predicted the COVID-19-related stress score.

**Conclusion:** Significant numbers of participants suffered from moderate to severe perceived stress levels due to the COVID-19 outbreak. Both adaptive and maladaptive coping strategy types were significantly associated positively and negatively with perceived stress score among adults with chronic disease. There were significant differences in the mean scores of perceived stress and categories of variables such as family size, duration of disease, and age of the participants.

**Keywords:** COVID-19-related stress, coping strategies, chronic disease, southwest Ethiopia

## Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a newly discovered coronavirus, named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Coronaviruses are a large family of viruses that are common in people and many different species of animals, such as camels, cattle, cats, and bats. Sometimes, animal coronaviruses can infect people and then spread among them, as with Middle East respiratory syndrome coronavirus (MERS-CoV), severe acute respiratory syndrome coronavirus (SARS-CoV), and now SARS-CoV-2.<sup>1,2</sup> The

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COVID-19 pandemic is a worldwide public health emergency which has been affecting people both physically and psychologically. Hence, many people have been experiencing stress, anxiety, depression, low sleep quality, mood alterations, and high levels of post-traumatic stress disorder symptomatology.<sup>3-6</sup>

Stress has been defined as a process in which environmental demands exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place people at risk for disease.<sup>7</sup> Stress during an infectious disease outbreak can include fear and worry about one's health, worsening of chronic health problems, and increased use of substances.<sup>8</sup> Most people infected with the virus causing COVID-19 will experience mild to moderate respiratory illness and recover without requiring special treatment. However, older people and those with underlying medical problems, such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer, are more likely to develop severe illness, which may lead to death.<sup>1</sup> People at higher risk for severe illness are at increased risk of stress due to COVID-19 outbreaks. Chronic exposure to stressful conditions is associated with a failure to comply with medical regimens, resulting in disease exacerbation<sup>9</sup> and leading to comorbid serious health problems such as hypertension, heart attack and stroke, diabetes mellitus, and obesity.<sup>10</sup> Patients with chronic disease face lifestyle disruptions due to the COVID-19 outbreaks, to their physical activity, sleep, stress, and mental health, which need to be better addressed.<sup>11</sup> The mental health and psychosocial consequences of the COVID-19 pandemic may be more severe among people with chronic illness.<sup>12</sup> Studies in Greece and northeast Ethiopia showed high prevalences of distress during COVID-19 outbreaks among patients with chronic disease,<sup>13,14</sup> and moderate perceived stress was reported from the USA among patients with chronic disease and disability.<sup>15</sup> Their existing chronic conditions may place them at greater risk for developing more severe complications from COVID-19, which can increase perceived stress, and ultimately exacerbate problems with health and well-being among individuals with chronic conditions and disabilities.<sup>16</sup> Moreover, disruptions to ongoing health-care services for chronic disease patients will further worsen their health and perceived stress as a result of the shifting of health services to urgent COVID-19 patients.<sup>11</sup>

Coping strategies refer to behavioral and cognitive efforts that help to reduce the influence of a stressful

condition,<sup>17</sup> and are used when its demands exceed individual resources.<sup>18</sup> The relationship between stress and coping strategies has been a topic of previous studies,<sup>19,20</sup> because in critical situations stress affects many people, but individual responses vary according to their coping strategies.<sup>21</sup> People with chronic disease may find it difficult to cope with the perceived stress related to the COVID-19 pandemic owing to the additional burden on top of managing their existing health conditions.<sup>15</sup>

Even though studies have been conducted in different parts of the world, they have mainly focused on the general population and there is limited information on patients with chronic diseases.<sup>22</sup> Moreover, no studies have been conducted regarding these vulnerable groups in the study area. Determining the perceived stress and the types of coping strategy used by chronic disease patients is crucial for developing strategies for this at-risk population to minimize the mental health consequences related to the COVID-19 outbreak. Therefore, this study aimed to assess COVID-19-related perceived stress and coping strategies among adults with chronic disease in southwest Ethiopia.

## Materials and Methods

### Study Setting, Design, and Participants

An Institution-based cross-sectional survey was conducted. The study was conducted in March 2020, among adults with chronic disease in southwest Ethiopia. The study participants were adults with chronic diseases including HIV/AIDS, diabetes mellitus, chronic liver disease, hypertension, chronic mental disease (depression), asthma, tuberculosis, cancer, cardiac disease, and epilepsy, which were identified from their outpatient follow-up clinic registration cards at the health facility. The survey was conducted through interviews conducted during their health facility visits. All chronic disease patients aged 18 years and above, and who had registered for follow-up at the outpatients clinic in the public health facility, were included in the study. Those who had lived in the study area for less than 6 months and those who were seriously ill prior to the study period were excluded from the study.

### Sample Size Determination

The sample size was determined using Epi Info 7 software. As there were no similar studies related to coronavirus disease, the calculations were based on the assumption that the probability of having COVID-19 pandemic-

related perceived stress was 50.0%, with a 95% confidence interval, a limit of precision of 5%, a design effect of 1.5, and a 10% non-response rate. Finally, the calculated sample size was 634 patients with chronic disease who had registered for follow-up at the outpatients clinic in the public health facility of southwest Ethiopia.

## Sampling Technique

First, three districts were selected from the three zones using a simple random sampling technique, and then the health facilities from each selected district were selected again by a simple random sampling technique. After that, the calculated sample sizes were proportionally allocated to each randomly selected public health institution based on the number of people with chronic diseases attending in each health facility. Finally, a simple random sampling technique was applied using the clients' registration numbers to acquire study subjects from each unit of the health-care service.

## Data Collection Instruments and Procedures

COVID-19-related perceived stress levels were assessed using the Perceived Stress Scale (PSS), which was adapted from a previous study.<sup>15,27</sup> The PSS consists of 10 questions, where respondents rate themselves on a five-point scale (0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often). PSS scores were obtained by reversing responses (eg, 0=4, 1=3, 2=2, 3=1, and 4=0) to the four positively stated items (4, 5, 7, and 8). Total scores were obtained by summing all scale items. Finally, respondents were categorized as follows: low stress: those who scored 0–13 on stress questions; moderate stress: those who scored 14–26 on stress questions; and high perceived stress: those who scored 27–40 on stress questions.<sup>15,23</sup>

The types of coping strategy were assessed using the Brief COPE Inventory scale. The Brief COPE Inventory consists of 28 statements, across two scales, which identify 14 possible coping strategies for stress; however, because of a shortage of time, we used 14 questions. This scale is focused mainly on understanding the frequency with which people use different coping strategies in response to various stressors. Participants using the inventory score themselves from 1 to 4, with 1 being “I have not been doing this at all” and 4 being “I have been doing this a lot”. A higher score applies when the participant

gives a response of 3 or 4 for the given statement, and the individual is considered as strongly using the specific coping strategy as one of his or her core coping strategies. If an individual scores low – with a 1 or 2 – then we could not consider it as one of his or her core coping strategies.<sup>15,24</sup> The Brief COPE scores scale was computed with no reversals of coding, and it includes self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame coping strategies.<sup>15,24</sup>

Pretested questionnaires were used to ensure the quality of the data. The final versions of the questionnaires, which were prepared in English, were translated into the local language of the respondents (Amharic) and then translated back to English to check their consistency. Both the data collectors and facilitators were local language speakers. The data collectors and supervisors were given one-day intensive training by the principal investigator on the instruments, method of data collection, ethical issues, and purpose of the study. The principal investigator and supervisor carried out intensive supervision, and they checked the collected data for completeness, accuracy, and consistency throughout the data collection period. The principal investigators were responsible for overall supervision. The data were collected by well-trained health professionals using a structured interviewer-administered questionnaire. Socio-demographic variables of adults with chronic disease, including age, residence, ethnicity, religion, marital status, educational status, occupation, income, COVID-19-related perceived stress, and types of coping strategies related to the COVID-19 outbreak, were assessed.

## Data Analysis Methods

All of the data were checked for completeness, and internal consistency was also checked to assess the reliability of the PSS, which gave a Cronbach's alpha = 0.791, and the Brief COPE Inventory scale, which gave a Cronbach's alpha = 0.835, which showed good internal consistency for this study. After that, the data were coded, entered into the Epi Data 4.6.0.2 computer software package, and checked and cleaned for inconsistencies. For further analysis, the data were exported to SPSS version 21 software. The descriptive analyses of data were indicated using numerical summary measures, and the normal distribution of the studied variables was checked, showing that they were

normally distributed. The data were presented as frequency tables, figures, and graphs. A multiple linear regression analysis was used to determine the relationship between the COVID-19-related stress score and coping strategy types; and an independent samples *t*-test was conducted to determine the relationships and to compare the mean perceived stress score difference between socio-demographic and health-related variables which had dichotomized categories. The ANOVA test was used to determine whether any mean perceived stress score differences occurred between socio-demographic and health-related variables which had more than two categories. So, in the case of the ANOVA test, post-hoc analysis was performed for multiple comparisons between each pair of categories. Variables that showed statistical significance (*p*-value <0.05 cut-point) were used to quantify the associations among variables.

## Results

### Socio-Demographic Characteristics of Adults with Chronic Diseases

Out of 634 potential participants, 613 (96%) participated in the study. The majority (61.8%) were male and the mean age was 36.93 years ( $\pm 1.677$  SD). In total, 390 (63.6%) lived in urban regions, 161 (26.3%) belonged to the Amhara ethnic group, 200 (44.4%) were Protestants, 405 (66.1%) were married, nearly one-third (32.8%) could read and write, and 147 (24%) were farmers (Table 1).

### Health-Related Characteristics of Adults with Chronic Diseases

Fifteen of the respondents (2.4%) had a minimum of three chronic conditions. The most common chronic diseases among the respondents were HIV/AIDS (23.2%) and diabetes (17.0%). The majority of the participants, 580 (94.6%), were non-smokers. The main sources of knowledge were TV/radio (66.6%) and health professionals (66.4%) (Table 2).

### COVID-19 Pandemic-Related Stress Among Adults with Chronic Diseases

The mean perceived stress score of the respondents was 19.31 ( $\pm 7.212$  SD). The majority of (68.4%) respondents reported moderate stress levels, 17.8% reported low stress levels, and 13.9% reported severe COVID-19-related perceived stress levels (Table 3).

### Relationship Between COVID-19 Perceived Stress Scores and Socio-Demographic and Health-Related Variables

Regarding the relationship between the mean stress score and socio-demographic variables, there were no statistically significant differences in mean perceived stress score between males and females ( $19.27 \pm 7.745$  and  $19.38 \pm 7.173$ ), urban and rural residents ( $19.11 \pm 7.142$  and  $19.67 \pm 7.335$ ), or smokers and non-smokers ( $18.48 \pm 6.075$  and  $19.36 \pm 7.27$ ). However, respondents who had a family size of five or more had a significantly higher COVID-19-related mean stress score ( $20.37 \pm 8.254$ ) than those who had fewer than five family members ( $18.62 \pm 6.365$ ) ( $p=0.005$ ). The respondents with a chronic disease duration of less than 10 years had a significantly higher COVID-19-related mean stress score ( $19.51 \pm 7.114$ ) than the respondents with a duration of more than 10 years ( $15.14 \pm 8.091$ ) ( $p=0.002$ ) (Table 4). The effect of age was significant, according to post-hoc analyses. Post-hoc analyses, using the Tukey post-hoc criterion for significance, indicated that the average logarithmic COVID-19-related mean stress score was significantly lower in the age group 18–29 years ( $1.23 \pm 0.185$ ) than in the age group 30–49 years ( $1.29 \pm 0.190$ ) ( $p=0.007$ ) (Table 5).

### Coping Strategy Types Among Adults with Chronic Diseases

More than three-quarters (76.3%) of the respondents used a religious coping strategy type, the instrumental coping strategy was the second most used type, by 315 (51.4%), and 314 (51.2%) of the participants used an active coping strategy. The least used type of coping strategy was substance use, by 37 participants (6%) (Table 6).

### Association Between COVID-19-Related Stress and Coping Strategy Types Among Adults with Chronic Diseases

This study was conducted to understand how different coping strategies affect the individual response to COVID-19-related stress. It was hypothesized that using coping mechanism strategies of self-distraction, active coping, denial, substance use, use of emotional support, behavioral disengagement, venting, use of instrumental support, positive reframing, self-blame, planning, humor, acceptance, and religion would negatively predict the

**Table 1** Socio-Demographic Characteristics of the Study Participants in Southwest Ethiopia, 2020 (N=613)

Variables	Frequency	Percent (%)
Age (years)		
18–29	180	29.4
30–49	332	54.2
>50	101	16.5
Gender		
Male	379	61.8
Female	234	38.2
Residence		
Urban	390	63.6
Rural	223	36.4
Ethnicity		
Bench	104	17.0
Kaffa	160	26.1
Sheka	13	2.1
Menit	125	20.4
Amhara	161	26.3
Other	50	8.2
Religion		
Orthodox	268	43.7
Protestant	272	44.4
Muslim	63	10.3
Catholic	5	0.8
Other	5	0.8
Marital status		
Married	405	66.1
Single	135	22.0
Divorced	53	8.6
Widowed	14	2.3
Other	6	1.0
Educational status		
Cannot read and write	165	26.9
Read and write only	201	32.8
Primary school	95	15.5
Secondary school	83	13.5
Tertiary education	69	11.3
Occupation		
Student	54	8.8
Farmer	147	24.0
Merchant	95	15.5
Housewife	98	16.0
Governmental employee	119	19.4
Private employee	65	10.6
Daily laborer	18	2.9
Other	17	2.8
Income		
<3000	470	76.7

(Continued)

**Table 1** (Continued).

Variables	Frequency	Percent (%)
3000–5000	101	16.5
>5000	42	6.9
Family size		
1–4	372	60.7
≥5	241	39.3

**Abbreviation:** N, total number of study participants.

COVID-19-related stress score. To test this hypothesis, multiple linear regression was used. The results showed that 19.4% of the variance in COVID-19-related stress could be accounted for by the 14 predictors, collectively ( $F(14,598)=10.312, p<0.001$ ). Looking at the unique individual contributions of the predictors, the results show that

**Table 2** Health-Related Characteristics of the Study Participants in Southwest Ethiopia, 2020 (N=613)

Variables	Frequency	Percent (%)
Type of chronic disease		
Diabetes mellitus	104	17.0
Chronic kidney disease	71	11.6
HIV/AIDS	142	23.2
Chronic liver disease	35	5.7
Hypertension	101	16.5
Chronic mental disease	46	7.5
Asthma	84	13.7
Tuberculosis	60	9.8
Cancer	1	0.2
Cardiac	67	10.9
Other*	24	3.9
Duration of the disease		
1–10 years	28	4.6
>10 years	585	95.4
Smoking status		
Yes	33	5.4
No	580	94.6
Source of information		
TV/radio	408	66.6
Social media	172	28.1
Health professionals	407	66.4
Tele**	222	36.2
Other***	24	3.9

**Notes:** \*Epilepsy; \*\*telecommunication: SMS and/or voice message through mobile phone; \*\*\*books, brochures, and leaflets.

**Abbreviations:** N, total number of study participants; TV, television.

**Table 3** COVID-19-Related Perceived Stress Levels of the Study Participants in Southwest Ethiopia, 2020 (N=613)

Perceived Stress Level	Frequency	Percent
Low stress score	109	17.8
Moderate stress score	419	68.4
High stress score	85	13.9

**Abbreviation:** N, total number of participants.

the active coping ( $\beta=1.238$ , 95% CI: 0.0 to 2.477), denial ( $\beta=3.678$ , 95% CI: 2.44 to 4.915), behavioral disengagement ( $\beta=3.669$ , 95% CI: 2.193 to 5.146), self-blame ( $\beta=1.722$ , 95% CI: 0.146 to 3.297), and religion ( $\beta=3.443$ , 95% CI: 2.028 to 4.858) coping strategies

**Table 4** Comparison of Mean Perceived Stress Score Difference Among Adults with Chronic Disease in Southwest Ethiopia, 2020 (N=613)

Variable	Mean (SD)		Mean Difference (95% CI)	p-Value
Gender	Male n=379	Female n=234	-0.111 (-1.290, 1.067)	0.853
	19.27 (7.245)	19.38 (7.173)		
Residence	Urban n=390	Rural n=223	-0.560 (-1.750, 0.629)	0.355
	19.11 (7.142)	19.67 (7.335)		
Family size	1-4 n=372	$\geq 5$ n=241	-1.750 (-2.980, -0.520)	0.005
	18.62 (6.365)	20.37 (8.254)		
Duration of disease	1-10 years n=28	>10 years n=585	4.368 (1.648, 7.088)	0.002
	19.51 (7.114)	15.14 (8.091)		
Smoking status	Smoker n=33	Non-smoker n=585	-0.874 (-3.409, 1.662)	0.499
	18.48 (6.073)	19.36 (7.273)		

**Abbreviations:** N, total number of participants; SD, standard deviation; CI, confidence interval; n, number of participants.

**Table 5** Comparison of Mean Logarithmic COVID-19-Related Stress Scores Between Age Groups

Age Group (years)	N	Logarithmic Stress Score Mean (SD)	p-Value
18-29	180	1.23 (0.19)	0.007
30-49	332	1.29 (0.19)	
>50	101	1.27 (0.27)	

**Abbreviations:** N, number of participants; SD, standard deviation.

positively predicted the COVID-19-related stress score. Only the acceptance ( $\beta=-2.710$ , 95% CI: -3.926 to -1.493) coping strategy negatively predicted the COVID-19-related stress score (Table 7).

## Discussion

This study aimed to assess perceived stress and coping strategies among patients with chronic diseases during the COVID-19 pandemic in southwest Ethiopia. The COVID-19 outbreak has been declared a worldwide public health emergency and this crisis has had an impact on the mental

**Table 6** Description of Coping Strategy Types Used by the Study Participants in Southwest Ethiopia, 2020 (N=613)

Types of Coping Strategy	No. (%) Used	No. (%) Not Used
Self-distraction	180 (29.4)	433 (70.6)
Active coping	314 (51.2)	299 (48.8)
Denial coping	182 (29.7)	431 (70.3)
Substance use	37 (6)	576 (94)
Use of emotional support	161 (26.3)	452 (73.7)
Behavioral disengagement	115 (18.8)	498 (81.2)
Venting	249 (39.2)	373 (60.8)
Use of instrumental support	315 (51.4)	298 (48.6)
Positive reframing	163 (26.6)	450 (73.4)
Self-blame	98 (16)	515 (84)
Planning	179 (29.2)	434 (70.8)
Humoring	146 (23.8)	467 (76.2)
Acceptance	248 (40.5)	365 (59.5)
Religion	468 (76.3)	145 (23.7)

**Abbreviations:** N, total number of study participants; No., number of participants who used or did not use the type of coping strategy; %, percent of study participants who used or did not use the type of coping strategy.

**Table 7** Multiple Linear Regression Coefficients for Perceived Stress Score and Coping Strategy Types Among Adults with Chronic Diseases in Southwest Ethiopia, 2020 (N=613).<sup>a</sup>

Model		Unstandardized Coefficients		t	p-Value	95% Confidence Interval for B	
		B	Std. Error			Lower Bound	Upper Bound
1	(Constant)	15.402	0.582	26.456	0.000	14.259	16.545
	Self-distraction	-0.870	0.707	-1.230	0.219	-2.259	0.519
	Active coping	1.238	0.631	1.964	0.050	0.000	2.477
	Denial	3.678	0.630	5.838	0.000	2.440	4.915
	Substance use	-0.454	1.190	-0.381	0.703	-2.792	1.884
	Use of emotional support	0.750	0.703	1.067	0.286	-0.630	2.130
	Behavioral disengagement	3.669	0.752	4.880	0.000	2.193	5.146
	Venting	0.250	0.626	0.399	0.690	-0.979	1.479
	Use of instrumental support	0.032	0.631	0.051	0.960	-1.206	1.270
	Positive reframing	0.833	0.680	1.225	0.221	-0.503	2.170
	Self-blame	1.722	0.802	2.146	0.032	0.146	3.297
	Planning	-1.068	0.697	-1.533	0.126	-2.436	0.300
	Humor	-1.051	0.736	-1.428	0.154	-2.497	0.395
	Acceptance	-2.710	0.619	-4.375	0.000	-3.926	-1.493
Religion	3.443	0.721	4.778	0.000	2.028	4.858	

**Notes:** <sup>a</sup>Dependent variable: perceived stress score.

**Abbreviation:** N, total number of study participants.

health of the whole population. The World Health Organization (WHO) has promoted taking preventive measures to tackle the negative impact of the spread of COVID-19 on individual mental health and well-being.<sup>25</sup>

In this study, 82.3% of respondents were rated as having moderate to severe perceived stress due to the COVID-19 outbreak. This finding was similar to the result of an explanatory study from Turkey, where 60.1% of the population suffered from moderate stress.<sup>26</sup> But it is higher than the prevalences of perceived stress found in studies conducted in northeast Ethiopia among chronic disease patients (22.8%)<sup>14</sup> and health-care workers (51.6%),<sup>27</sup> and studies from Italy, where the prevalence of post-traumatic stress disorder symptomatology was 29.5%<sup>6</sup> among the general population, and China, which revealed that 8.1% of the general population suffered from moderate to severe stress.<sup>28</sup> These discrepancies may be explained by differences in the study populations, and

health-care workers having first-hand medical information about the outbreak, disease characteristics, and mechanisms of prevention. In addition to this, some studies have indicated that health care for chronic illness during COVID-19 outbreaks has been disrupted, which can be a constant source of stress.<sup>11,29</sup> On the other hand, this finding was lower than in a study conducted in India among patients undergoing hemodialysis, where the level of perceived stress was 97%.<sup>30</sup> The possible reason for this is that patients receiving hemodialysis may be threatened with more potential losses and changes in lifestyle compared with people with other chronic diseases.

This study found that survey respondents who had five or more family members had significantly higher COVID-19-related stress than those who had fewer than five family members. This result is supported by studies in Spain<sup>31</sup> and China.<sup>32</sup> This could be due to people's fear of infecting their family members and children increasing their

level of worry. Long-term confinement at home has an impact on the relationships between family members, and conflict may increase in this unusual and stressful situation.<sup>32</sup>

The survey respondents who had lived with chronic disease for less than 10 years had significantly higher COVID-19-related stress levels than those who had had chronic disease for more than 10 years. This may be due to long disease duration leading to patients developing resilience toward stressful situations. Long-term stress adjustment skills can help an individual to overcome the serious negative consequences of disease and other stressors.<sup>33</sup> However, this study finding is inconsistent with the results of a study from northeast Ethiopia, which revealed that patients with a longer duration of chronic disease were more likely to have psychological problems than patients with a shorter duration of illness.<sup>14</sup>

Younger age was found to be associated with lower levels of perceived stress. This finding is in line with studies in Ethiopia conducted among chronic disease patients, where patients older than 34 years were more likely than younger participants to develop psychological problems due to the current COVID-19 outbreak,<sup>14</sup> and in Chinese and Italian populations, where low psychological well-being was significantly higher among people younger than 50 years old.<sup>34–36</sup> In the current pandemic, older people may be more used to staying at home, so their daily routine may be less impacted by mandatory self-isolation measures. But the finding is inconsistent with the result of a study from China, which showed that as age increased the level of psychological distress decreased.<sup>37</sup>

The results of this study suggest that active, denial, behavioral disengagement, self-blame, and religion coping strategies were associated with an increase in COVID-19-related stress, while the acceptance type of coping mechanism was negatively associated with COVID-19-related perceived stress. Researchers have also suggested that a high score on the acceptance coping strategy is associated with better ability to cope with stressful situations.<sup>15,38</sup> This study showed that the COVID-19-related perceived stress score was associated with both maladaptive (ie, denial, behavioral disengagement, and self-blame) and adaptive (ie, active coping, acceptance, and religion) coping strategy types among patients with chronic disease. Anxiety, fear, and anger are positively associated with problem-focused and emotionally focused coping strategies, which mean “the more coping, the more panic” or “the more panic, the more coping”.<sup>39</sup>

The most frequently used coping strategy types for the management of COVID-19-related perceived stress were religion, use of instrumental support, and active coping strategies. Thus, 76.3% of participants used religious coping strategies, the second most used type of coping was the use of instrumental support, by 51.4%, and 51.2% used an active coping strategy to manage COVID-19-related perceived stress during the pandemic. This finding is inconsistent with studies conducted in the USA among individuals with disabilities and chronic conditions, who most frequently used acceptance and self-distracting methods to cope with COVID-19-related perceived stress,<sup>40</sup> and in Turkey, where the most frequently used coping strategy type was social support.<sup>26</sup> According to this study, substance use was the least frequently used type of coping strategy among chronic disease patients. This indicated that participants with chronic diseases were not very likely to use the substance use coping strategy for the COVID-19 outbreak. This finding is similar to a previous study conducted among people with chronic conditions and disabilities, where the substance use and denial types of coping were found to be rarely used,<sup>15</sup> and it is also consistent with WHO and Centers for Disease Control and Prevention (CDC) recommendations for coping with stress during the COVID-19 outbreak.<sup>8</sup> The literature on the impact of disease outbreaks on mental health shows that pandemics are extremely stressful events that force people to cope with totally unexpected and uncertain situations.<sup>41</sup>

## Limitations of the Study

This study was conducted in the early stages of the COVID-19 pandemic, and may therefore underestimate the prevalence of perceived stress. The absence of assessment of enrolled patients before the COVID-19 pandemic means that we cannot ascertain whether the perceived stress was elicited by the chronic illness or by the pandemic. Another limitation is the lack of validated and reliable tools for perceived stress and coping strategies in this vulnerable group of patients. However, some data quality control mechanisms were put in place to minimize the effects of this limitation on the study. A lack of previous studies was also a major limitation. Since this study used a cross-sectional study design, it is difficult to establish cause-and-effect relationships. This study was based only on a quantitative method, which lacked triangulation with other methods such as qualitative methods.

## Recommendations

The primary significance of the assessment of COVID-19-related perceived stress and coping strategy types is paramount at several levels. One of these is the ability to provide appropriate interventions for COVID-19-related perceived stresses and to equip patients with suitable strategy types for coping with COVID-19. Besides, it could provide sufficient data for any concerned body, including health professionals, psychologists, policymakers, and planners, in advising the most vulnerable populations on the prevention and control of physiological and psychological impacts of COVID-19, in a timely and appropriate manner.

To provide psychological support for patients with chronic illness, the government should establish a uniform and integrated mental health counseling platform. Health-care providers should provide psychosocial and mental health services alongside health-care services, and media channels should disseminate reliable information to minimize the mental health burden of patients with chronic illness. This could fill the information gaps in the study area and provide baseline information for other researchers to conduct similar studies by considering the limitations of this study.

## Conclusion

Significant numbers of participants suffered from moderate to severe perceived stress due to the COVID-19 outbreak in this study area. Coping strategy types such as active coping, denial, behavioral disengagement, self-blaming, and religion were positively associated with COVID-19-related perceived stress, but acceptance was the only coping strategy that was negatively associated with the COVID-19 outbreak.

The coping strategy types used most frequently by the study participants with chronic disease for the management of COVID-19-related perceived stress were religion, use of instrumental support, and active coping strategies, while the least used type of coping strategy was substance use.

## Abbreviations

COVID-19, coronavirus disease 2019; SARS-CoV, severe acute respiratory syndrome coronavirus; MERS-CoV, Middle East respiratory syndrome coronavirus; CI, confidence interval; WHO, World Health Organization; SNNPR, Southern Nations, Nationalities, and Peoples' Region.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Ethical Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki. Ethical clearance was obtained from Mizan-Tepi University research and community support offices, which have seven ethical committees (ref. no. MTU/47/1057/44/12). Before this survey, a formal letter was submitted to the heads of the respective zonal health offices and to each selected health facility. The study's objective, benefit, and risks were explained to the participants before data collection and written informed consent was obtained from all respondents. The study participants were assured of the attainment of confidentiality, and that the information they gave us would not be used for any purpose other than the study.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors reported no conflicts of interest for this work.

## References

1. WHO. Coronavirus disease 2019 (COVID-19) situation report – 95. April 24, 2020.

2. CDC. Situation summary of COVID-19. Updated April 19, 2020.
3. Québec. Stress, anxiety and depression associated with the coronavirus COVID-19 disease. April 9, 2020.
4. Casagrande M, Forte G, Tambelli R, et al. The coronavirus pandemic: a possible model of the direct and indirect impact of the pandemic on sleep quality in Italians. *Nat Sci Sleep*. 2021;13:191. doi:10.2147/NSS.S285854
5. Forte G, Favieri F, Tambelli R, et al. The enemy which sealed the world: effects of COVID-19 diffusion on the psychological state of the Italian population. *J Clin Med*. 2020;9(6):1802. doi:10.3390/jcm9061802
6. Forte G, Favieri F, Tambelli R, et al. COVID-19 pandemic in the Italian population: validation of a post-traumatic stress disorder questionnaire and prevalence of PTSD symptomatology. *Int J Environ Res Public Health*. 2020;17(11):4151. doi:10.3390/ijerph17114151
7. Cohen S, Kessler RC, Gordon LU. Strategies for measuring stress in studies of psychiatric and physical disorders. In: *Measuring Stress: A Guide for Health and Social Scientists*. 1995:3–26. New York: Oxford University Press.
8. CDC. Coronavirus disease 2019 (COVID-19) daily life and coping. April 16, 2020.
9. Cohen S, Williamson GM. Stress and infectious disease in humans. *Psychol Bull*. 1991;109(1):5. doi:10.1037/0033-2909.109.1.5
10. Gade S, Chari S, Gupta M. Perceived stress among medical students: to identify its sources and coping strategies. *Arch Med Health Sci*. 2014;2(1):80. doi:10.4103/2321-4848.133845
11. Kendzerska T, Zhu DT, Gershon AS, et al. The effects of the health system response to the COVID-19 pandemic on chronic disease management: a narrative review. *Risk Manag Healthc Policy*. 2021;14:575. doi:10.2147/RMHP.S293471
12. Fiorillo A, Gorwood P. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. *Eur Psychiatry*. 2020;63(1):1–2. doi:10.1192/j.eurpsy.2019.3
13. Louvardi M, Pelekasis P, Chrousos GP, Darviri C. Mental health in chronic disease patients during the COVID-19 quarantine in Greece. *Palliat Support Care*. 2020;18(4):394–399. doi:10.1017/S1478951520000528
14. Addis SG, Nega AD, Miretu DG. Psychological impact of COVID-19 pandemic on chronic disease patients in Dessie town government and private hospitals, Northeast Ethiopia. *Diabetes Metab Syndr*. 2021;15(1):129–135. doi:10.1016/j.dsx.2020.12.019
15. Umucu E, Lee B. Examining the impact of COVID-19 on stress and coping strategies in individuals with disabilities and chronic conditions. *Rehabil Psychol*. 2020;65(3):193–198. doi:10.1037/rep0000328
16. World Health Organization. *Disability Considerations During the COVID-19 Outbreak, in Detail/Disability-Considerations-During-The-Covid-19- Outbreak*; 2020.
17. Folkman S, Lazarus RS. If it changes it must be a process: study of emotion and coping during three stages of a college examination. *J Pers Soc Psychol*. 1985;48(1):150. doi:10.1037/0022-3514.48.1.150
18. Martínez JP, Méndez I, Ruiz-Esteban C, et al. Profiles of burnout, coping strategies and depressive symptomatology. *Front Psychol*. 2020;11:591. doi:10.3389/fpsyg.2020.00591
19. Phua D, Tang H, Tham K. Coping responses of emergency physicians and nurses to the 2003 severe acute respiratory syndrome outbreak. *Acad Emerg Med*. 2005;12(4):322–328. doi:10.1197/j.aem.2004.11.015
20. Khalid S, Hashmi I, Jamal Khan S, et al. Effect of metal ions and petrochemicals on bioremediation of chlorpyrifos in aerobic sequencing batch bioreactor (ASBR). *Environ Sci Pollut Res*. 2016;23(20):20646–20660. doi:10.1007/s11356-016-7153-8
21. Folkman S. *The Oxford Handbook of Stress, Health, and Coping*. Oxford University Press; 2011.
22. Zhong BL, Luo W, Hm L, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci*. 2020;16(10):1745–1752. doi:10.7150/ijbs.45221
23. Cohen S. Psychological stress, immunity, and upper respiratory infections. *Curr Dir Psychol Sci*. 1996;5(3):86–89. doi:10.1111/1467-8721.ep10772808
24. Carver CS. You want to measure coping but your protocol's too long: consider the brief cope. *Int J Behav Med*. 1997;4(1):92. doi:10.1207/s15327558ijbm0401\_6
25. Yao H, Chen J-H, Xu Y-F. Rethinking online mental health services in China during the COVID-19 epidemic. *Asian J Psychiatr*. 2020;50:102015. doi:10.1016/j.ajp.2020.102015
26. Altuntaş O, Tekeci Y. Effect of COVID 19 on perceived stress, coping skills, self-control and self-management skills. 2020.
27. Chekole YA, Yimer Minaye S, Mekonnen Abate S, et al. Perceived stress and its associated factors during COVID-19 among healthcare providers in Ethiopia: a Cross-Sectional Study. *Adv Public Health*. 2020;2020:1–7. doi:10.1155/2020/5036861
28. Wang C, Pan R, Wan X, et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain Behav Immun*. 2020;87:40–48. doi:10.1016/j.bbi.2020.04.028
29. Yasmeen B, et al. Coping strategies during chronic illness. *Prof Med J*. 2015;22(04):483–489.
30. Shinde M, Mane SP. Stressors and the coping strategies among patients undergoing hemodialysis. *Int J Sci Res*. 2014;3(2):266–276.
31. Odriozola-González P, Planchuelo-Gómez Á, Irurtia-Muñoz MJ, de Luis-García R. Psychological symptoms of the outbreak of the COVID-19 crisis and confinement in the population of Spain. 2020.
32. Vieira CM, Franco OH, Restrepo CG, Abel T. COVID-19: the forgotten priorities of the pandemic. *Maturitas*. 2020;136:38–41.
33. De Ridder D, Geenen R, Kuijjer R, et al. Psychological adjustment to chronic disease. *Lancet*. 2008;372(9634):246–255. doi:10.1016/S0140-6736(08)61078-8
34. Liu N, Zhang F, Wei C, et al. Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: gender differences matter. *Psychiatry Res*. 2020;287:112921. doi:10.1016/j.psychres.2020.112921
35. Xu J, Zheng Y, Wang M, et al. Predictors of symptoms of posttraumatic stress in Chinese university students during the 2009 H1N1 influenza pandemic. *Med Sci Monit*. 2011;17(7):PH60. doi:10.12659/MSM.881836
36. Favieri F, Forte G, Tambelli R, et al. The Italians in the time of coronavirus: psychosocial aspects of the unexpected COVID-19 pandemic. *Front Psychiatry*. 2021;12. doi:10.3389/fpsyg.2021.551924
37. Wang H, Xia Q, Xiong Z, et al. The psychological distress and coping styles in the early stages of the 2019 coronavirus disease (COVID-19) epidemic in the general mainland Chinese population: a web-based survey. *PLoS One*. 2020;15(5):e0233410. doi:10.1371/journal.pone.0233410
38. Elfstrom M, Rydén A, Kreuter M, et al. Relations between coping strategies and health-related quality of life in patients with spinal cord lesion. *J Rehabil Med*. 2005;37(1):9–16. doi:10.1080/16501970410034414
39. Huang L, Rong liu H. Emotional responses and coping strategies of nurses and nursing college students during COVID-19 outbreak. *MedRxiv*. 2020;15(8):e0237303.
40. Umucu E, Lee B. *Examining the Impact of COVID-19 on Stress and Coping Strategies in Individuals with Disabilities and Chronic Conditions*. American Psychological Association; 2020.
41. Mak IWC, Chu CM, Pan PC, et al. Long-term psychiatric morbidities among SARS survivors. *Gen Hosp Psychiatry*. 2009;31(4):318–326. doi:10.1016/j.genhosppsy.2009.03.001

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