1 **Evaluating the buffering role of perceived social support and coping resources against the**
2 **adult mental health impacts of COVID-19 psychosocial stress: a cross-sectional study in**
3 **South Africa**
4
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13 Total text pages (23); tables (2); figures (3)
14 Running Headline: COVID stress buffering in SA
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23 Data Availability Statement: The data that support the findings of this study are available on
24 request from the corresponding author. The data are not publicly available due to privacy or
25 ethical restrictions.
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ABSTRACT

Objectives: Growing evidence has highlighted the global mental health impacts of the COVID-19 pandemic and lockdown, particularly in societies with pre-existing socioeconomic adversities and public health concerns. Despite the sudden and prolonged nature of many psychosocial stressors during the pandemic, recent studies have shown that communities utilized several coping mechanisms to buffer the mental health consequences of COVID-related stress. This paper examines the extent to which coping resources and social support buffered against the mental health effects of COVID-19 psychosocial stress among adults in South Africa.

Materials & Methods: Adult participants (n=117) completed an online survey during the second and third waves of the COVID-19 pandemic in South Africa (January-July 2021), which assessed experiences of stress, coping resources, social support, and four mental health outcomes: depression, anxiety, post-traumatic stress disorder, and bipolar disorder. Moderation analyses examined the potential buffering role of coping resources and social support against the mental health effects of COVID-19 stress.

Results: Adults reported elevated rates of psychiatric symptoms. Coping resources buffered against the poor mental health effects of COVID-19 psychosocial stress, whereas perceived social support did not significantly moderate the association between COVID-19 stress and adult mental health.

Discussion: These results suggest that adults in our sample utilized a variety of coping resources to protect their mental health against psychosocial stress experienced during the COVID-19 lockdown and pandemic in South Africa. Additionally, existing mental health conditions and strained social relationships may have attenuated the potential stress-buffering effect of perceived social support on adult mental health.

INTRODUCTION

The SARS-COVID-19 pandemic and subsequent lockdown severely disrupted everyday life and infrastructure across the world while introducing a wide variety of global-level stressors. Building on everyday stressors, many of the additional pressures COVID-19 brought were novel and abrupt, compounding negative effects. They were also broad reaching and deeply felt across sectors, impacting economic, social, interpersonal, and healthcare domains. Since its onset, COVID-19 has led to at least 6.55 million global deaths but also has caused upheaval through lost jobs, depletion of resources, and the cause of short-and long-term disability for an unquantified number of people. In particular, the ongoing COVID-19 pandemic has been disproportionately harmful to people at the margins already living in precarity. Several studies have demonstrated that individuals with pre-existing conditions were more likely to experience COVID-related hospitalization, ongoing morbidity, or mortality (Fang et al., 2020; Sanyaolu et al., 2020; Wang et al., 2020). Marginalized populations, particularly those that have experienced systemic and pervasive violence and trauma, have higher rates of morbidity and mortality, particularly during the COVID-19 pandemic (Brakefield et al., 2022; Braveman & Gottleib, 2014). In lower-to-middle income countries (LMIC), like South Africa, the pandemic has introduced further mental health threats compounding existing ones (Kim et al., 2022).

As of October 2022, 4.02 million cases of COVID-19 have been reported in South Africa, resulting in 102,000 deaths (Our World in Data, 2022). Like in many other parts of the world, in South Africa, the onset of the pandemic brought about violent and abrupt disruptions to economic and social resources, including travel, and gathering restrictions, as well as strain on an already burdened healthcare infrastructure. Further, as a highly contagious airborne disease, the containment and treatment of COVID-19 necessitated mandated social isolation, which has well-

98   documented negative impacts on mental health. In South Africa, a country recovering from the

99   violent legacies of apartheid and the subsequent downstream high rates of stress-related health

100   conditions (Coovadia et al., 2009; Kim et al., 2023), the additional stressors stemming from

101   COVID-19 created compounded stressors on an already overburdened healthcare system. This

102   struggling healthcare system, and the epidemic of non-COVID-related communicable and non-

103   communicable diseases, is an outcome of policies derived from colonial subjugation, apartheid

104   dispossession, and post-apartheid recovery. Across these periods, racial and gender

105   discrimination, the migrant labor system, the destruction of family life, vast income inequalities,

106   and extreme violence have shaped health and health services (Coovadia et al., 2009; Barbarin &

107   Richter, 2013; Kaminer & Eagle, 2010). These conditions have primed a population facing

108   inequality across multiple sectors, including in healthcare and disease incidence, to be

109   disproportionately impacted by COVID onset and recovery.

110   For many individuals, increased psychosocial stress has been a hallmark of this

111   pandemic. The pervasive and powerful impacts of stress on different aspects of human

112   functioning and well-being, particularly on mental health, have been well described in the

113   literature (Lupien et al., 2009; Lupien et al., 2018). Chronic psychosocial stress has powerful

114   effects on individual physiology including changes to sleep, metabolism, and immune function

115   (Russel & Lightman, 2019; Sanford et al., 2023). The ubiquitous stress of the pandemic has had

116   substantial downstream impacts on mental health in populations around the world (Hossain et al.,

117   2020; Manchia et al., 2022; Oyenubi et al., 2022; Subramaney et al., 2020). Chronic

118   psychosocial stress has also long been associated with negative mental health, including

119   increased incidence of depression, anxiety, burnout, pathological aging, and post-traumatic stress

120   disorders (Burke et al., 2005; Marin et al., 2011; McEwen, 2017; Meewisse et al., 2007; Metzger

121   et al., 2008; Steudte et al., 2013; Uchino, 2006; Yehuda et al., 2005). These effects of

122   psychosocial stress on mental health tend to be context-specific, where outcomes differ on an

123   individual basis and are shaped by factors such as severity, duration, or unpredictability of the

124   stressor. Further, untreated mental health issues can leave individuals more susceptible to future

125   mental health problems in times of crisis, creating compounded effects.

126   In global crises, the context in which individual stress response is often shaped by their

127   social world, and much of the COVID-19 experience has been characterized by social isolation.

128   It is well known that social isolation can have devastating effects on highly social animals like

129   humans – social isolation has been shown to transform stress response mechanisms and in the

130   last 25 years, has been recognized as a major risk factor for morbidity and mortality in humans

131   (Cacioppo et al., 2003; Cacioppo et al., 2015; Hostinar et al., 2015). Coping plays an important

132   role in processing negative experiences, particularly those related to social isolation, and can

133   shape physical and mental health (Cacioppo et al., 2003). The COVID-19 pandemic, like many

134   other global crises, led to an increased reliance on a variety of coping mechanisms

135   (Bhattacharjee & Ghosh, 2022; Polizzi et al., 2020). These coping mechanisms have included

136   support from family and friends, changes in attitude (i.e., a positive outlook or acceptance),

137   activities (i.e., staying occupied/busy, activities promoting relaxation, exercise), taking

138   medications, religious practices, counseling/therapy, or crying.

139   Social support, specifically, is a powerful and well-documented coping mechanism. In

140   settings of extreme stress, highly resilient individuals are particularly adept at forming supportive

141   social attachments (Charney, 2004). Socially supportive ties play two major roles in times of

142   stress: (1) helping individuals process and control emotional responses to stressful situations and

143   (2) keeping physiological, neuroendocrine, and immunologic responses to stress at lower levels

144   and/or by promoting faster recovery of these systems when responding to a stressor (Cohen &

145   Wills, 1985; Taylor, 2011). Early work by Uchino and colleagues demonstrated the positive

146   physiological effects of perceived social support/connectedness, including lower resting blood

147   pressure, better immunosurveillance, and lower levels of basal catecholamines (Uchino et al.,

148   1996; Hennessy et al., 2009; Taylor, 2011). Additionally, many mechanisms of social support,

149   including informational support (i.e., helping another to understand a stressful event and

150   available resources better), instrumental support (i.e., provisioning of tangible assistance, such as

151   services or financial assistance), and emotional support (i.e., providing warmth and nurturance),

152   likely ameliorate the adverse consequences of stress and trauma (Cohen & Wills, 1985; Taylor,

153   2011).

154   During disaster scenarios, particularly pandemics (e.g., HIV/AIDS, H1N1 influenza,

155   SARS, and Ebola), coping mechanisms are key. For example, increased social support has been

156   associated with lower rates of mental health problems in these settings (Asante, 2012; Chew et

157   al., 2020; Guilaran et al., 2018). This is also true for COVID-19. In a study with 405 students at

158   an American university, Szkody and colleagues report that when accounting for time in social

159   isolation, perceived social support buffered the association between concerns about COVID-19

160   and psychological health (Szkody et al., 2021). In South Africa, recent work suggests that

161   individuals embedded within care networks tended to weather the pandemic better – Steigler and

162   Bouchard showed that those confined with family members tended to be more optimistic than

163   those confined alone and were able to spend any leisure time doing family activities, thus staving

164   off boredom, anxieties, and rumination on the situation (Stiegler & Bouchard, 2020).

165   Here, we examined the relationship between COVID-19 stress and self-reported mental

166   health outcomes and the potential buffering effects of coping and social support in a cohort of

167   adults living through the COVID-19 pandemic across South Africa. We were interested in testing

168   if COVID psychosocial stress was associated with adult mental health, particularly the incidence

169   of symptoms for four main psychiatric conditions: depression, anxiety, bipolar disorder, and

170   post-traumatic stress disorder (PTSD). Further, using multivariate regression analyses, we

171   evaluated if coping and social support attenuated the relationships between COVID psychosocial

172   stress and adult mental health outcomes.

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190   **METHODS**

191   *Study sample*

192   This study was conducted using an online survey between January and July 2021 during

193   the second and third waves of the coronavirus pandemic in South Africa. The online survey

194   collected data on mental health symptoms, experiences of stress and social support, COVID-19

195   infection history, perceptions of COVID-19, and household conditions. The survey was

196   administered in English and distributed using online listservs, social media, community groups,

197   and non-profit organizations. Organizations working with resource-constrained communities

198   were targeted to increase representation of the sample and reduce selection bias, given the online

199   nature of the survey. Inclusion criteria were as follows: adults 18 years of age and older; English

200   proficiency; lived in South Africa for at least three weeks during the pandemic; and ability to

201   provide informed consent. Participants provided formal written consent. Individual participants

202   were not identifiable during or after the survey data collection process. All study procedures

203   were approved by the University of the Witwatersrand Human Research Ethics Committee.

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205   *Study measures*

206   Participants first completed surveys querying demographic and household information.

207   Socioeconomic status was assessed using an asset inventory of the following household items:

208   cell phone, computer, electricity, internet access, landline telephone, microwave, motor vehicle,

209   pay television, radio, refrigerator, television, video machine, and washing machine. Education

210   was assessed by querying participants to report the highest level of schooling completed.

211   COVID-19 psychosocial stress was assessed using an ethnographically derived survey

212   tool based on in-depth ethnographic interviews with 55 adults in the metropolitan Johannesburg

213   region, 12 adults living in rural Thohoyandou in Limpopo Province, and participant observation

214   for eight months during the COVID-19 pandemic in Johannesburg (Kim *in prep*). Interviews and

215   field notes were thematically analyzed and twenty of the most prevalent and salient stressors

216   were identified and converted into items for the COVID-19 psychosocial stress scale. Items

217   included stressors related to health (feeling unsafe, having a chronic or existing health

218   condition), socioeconomic adversity (unemployment, food insecurity, financial insecurity),

219   socialization (not being able to socialize, not being able to attend gatherings), and resource

220   deficits (lack of transportation, difficulty accessing healthcare), among others. Participants

221   reported the degree to which each item served as a source of stress based on a 4-point Likert

222   scale, which included the following responses: "Never, Seldom, Sometimes, Often, Very Often."

223   The Likert scale for each item ranged from 0-4. All items were summed to create a total score of

224   COVID-19 psychosocial stress. The internal reliability for this scale was acceptable ($\alpha = 0.79$).

225   Mental health outcomes were assessed using four Likert scale-based surveys, which

226   assessed symptoms of four separate psychiatric conditions: depression, anxiety, post-traumatic

227   stress disorder (PTSD), and bipolar disorder. The internal reliability for all measures passed the

228   threshold for acceptability ($\alpha > 0.7$). Depressive symptoms were assessed using the Patient

229   Health Questionnaire (PHQ-9), a nine-item survey that measures common symptoms of

230   depression, such as fatigue, irritability, melancholia, and trouble concentrating ($\alpha = 0.93$).

231   Anxiety symptoms were measured using the General Anxiety Disorder Scale (GAD-7), a seven-

232   item survey that assesses key symptoms of anxiety, including nervousness, rumination, and

233   restlessness, among others ($\alpha = 0.94$).

234   PTSD symptoms were assessed using the PTSD Checklist – Civilian Version, which

235   comprises 17 questions that query key disease symptoms ($\alpha = 0.96$). While PTSD diagnoses

236 typically query symptoms in response to a particular event, the PCL-C assesses PTSD symptoms

237 related to a set of "stressful experiences" experienced by the individual and can be viewed as a

238 screening tool for PTSD symptoms. Finally, bipolar disorder symptoms were assessed using the

239 Mood Disorder Questionnaire (MDQ), a screening tool for bipolar symptoms, including

240 increased energy, grandiosity, decreased need for sleep, and others. The first thirteen items of the

241 MDQ were summed to create a composite score of bipolar disorder symptomatology ($\alpha = 0.86$).

242 The following cut-off scores were used for the following measures: ≥ 10 (Patient Health

243 Questionnaire-9), ≥ 10 (Generalised Anxiety Disorder-7), ≥ 31 (PTSD Checklist - Civilian

244 Version), and ≥ 7 (Mood Disorder Questionnaire)

245   Social support was evaluated using the Multidimensional Scale for Perceived Social

246 Support (MSPSS). The MSPSS is a 12-item tool that measures perceptions of support from

247 family, friends, and significant others (Zimet et al., 1988). Finally, coping resources were

248 assessed using an ethnographically derived coping measure (developed through the same

249 procedure described above), which assessed the availability and use of a variety of psychological

250 skills, social practices, economic resources, and other tools utilized to cope with the pandemic.

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252 *Statistical analysis*

253   Data were analyzed using Stata 15.1 (College Station, TX). Bivariate associations were

254 conducted to estimate the relationships between COVID-19 psychosocial stress, all adult mental

255 health measures, social support, coping, and covariates. We then fitted linear regression models

256 to the data and ran four separate sets of analyses based on the specified mental health outcomes:

257 depression, anxiety, PTSD, and bipolar disorder symptoms. COVID-19 psychosocial stress was

258 the primary exposure variable of interest, and social support and coping resources were treated as

259   moderators of the association between COVID-19 psychosocial stress and adult mental health.

260   Psychological, household, and social factors that were thought to potentially confound the

261   relationship between COVID-19 psychosocial stress and adult mental health were included as

262   covariates: age, gender, assets, education, adverse childhood experiences, exercise, disease

263   status, and hours worked. Individuals missing relevant data needed for this analysis were

264   excluded through listwise deletion.

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282   **RESULTS**

283   Full data were available for n=117 individuals out of a total of n=395 who were eligible

284   for the study, provided informed consent, participated in data collection. Table 1 describes the

285   characteristics of our analytic sample. The average age was 36.8 years, 83% of the sample was

286   female, and a majority of the sample had some post-secondary education. The average number of

287   adverse childhood experiences was 2.4, and the average COVID-19 psychosocial stress score

288   was 22.7 (out of 80). The average score for depressive symptoms was 9.3 (PHQ-9), 8.6 for

289   anxiety symptoms (GAD-9), 39.1 for PTSD symptoms (PCL-C), and 3.8 for bipolar symptoms

290   (MDQ). The prevalence rates of probable psychiatric disorders across the following

291   psychopathologies in our sample are as follows: 38% for depression, 39% for anxiety, 57% for

292   PTSD, and 21% for bipolar disorder.

293   [Table 1]

294   Supplementary Tables 1 and 2 report forms of social support received from friends,

295   family, and significant others and the availability of coping resources. The most prevalent forms

296   of social support included the presence of "a special person with whom I can share my joys and

297   sorrows," "a special person who is a real source of comfort to me," "a special person in my life

298   who cares about my feelings," "a special person who is around when I am in need," and "friends

299   with whom I can share my joys and sorrows". The most common forms of coping were receiving

300   support from family, staying occupied/busy, sleeping, receiving support from friends, and having

301   a positive outlook.

302   All bivariate analyses between COVID-19 psychosocial stress and all four mental health

303   outcomes were positive (depression: b = 0.30; anxiety: b = 0.23; PTSD = 0.81; bipolar disorder:

304   b = 0.12) and highly significant $p<0.0001$. Fully adjusted models found that COVID-19 stress

305   remained directly associated with all four mental health outcomes, and all associations were

306   significant ($p < 0.01$) (depression: b = 0.21; anxiety: b = 0.17; PTSD: b = 0.54; bipolar

307   symptoms: b = 0.074) (not shown). Identification as female was positively associated with worse

308   depression, anxiety, and PTSD scores ($p < 0.05$). Older age was associated with lower anxiety

309   scores (b = -0.10; $p = 0.49$) while adverse childhood experiences (b = 2.4; $p = 0.001$) and the

310   number of chronic diseases (b = 5.7; $p = 0.021$) were associated with higher PTSD scores. Older

311   age (b = -0.065; $p = 0.022$) and educational attainment (b = -1.03; $p = 0.024$) were associated

312   with lower bipolar disorder scores and the number of hours worked was associated with higher

313   bipolar disorder (b = 0.052; $p = 0.01$).

314   Table 2a shows the moderating effect of social support on the association between

315   COVID-19 psychosocial stress and mental health. After adjusting for covariates, social support

316   did not significantly buffer the mental health effects of COVID-19 psychosocial stress

317   (depression: b = -.0010, $p = 0.75$; anxiety: b = -.000073, $p = 0.98$; PTSD: b = -0.0084, $p = 0.28$;

318   bipolar disorder: b = -0.0022; $p = 0.20$). The R^2 for each of the models is as follows: 35% for

319   depression, 32% for anxiety, 47% for PTSD, and 32% for bipolar disorder.

320   Table 2b reports the moderating effect of coping resources on the relationship between

321   COVID-19 psychosocial stress and mental health. In fully adjusted models, coping significantly

322   buffered against symptoms of depression (b = -0.014, $p = 0.043$; see fig 1), anxiety (b = -0.013, p

323   = 0.038; see fig 2), and PTSD (b = -0.030, $p = 0.044$; see fig 3), but not bipolar symptoms (b = -

324   0.0045, $p = 0.18$). The R^2 for each of the models is as follows: 37% for depression, 34% for

325   anxiety, 51% for PTSD, and 33% for bipolar disorder.

326   [Table 2]

327   [Figures 1, 2, & 3]

DISCUSSION

In this analysis of adults living under the COVID-19 pandemic in South Africa, coping resources buffered against the poor mental health effects of COVID-19 psychosocial stress, whereas perceived social support did not significantly moderate the association between COVID-19 stress and adult mental health. Specifically, greater use of coping resources attenuated symptoms of depression, anxiety, and PTSD due to COVID-19 stress. We also found elevated levels of poor mental health in this sample during the COVID-19 pandemic and lockdown. We highlight the fact that this sample is overly educated, largely female, and represents a group of adults with moderate to high socioeconomic status. Despite the difficult and prolonged conditions of the pandemic, our results suggest that adults effectively utilized resources to positively cope with the various stressors brought on by the pandemic.

The buffering role of coping resources is consistent with the larger literature on adult mental health during the pandemic and various other conditions of psychosocial stress. Specifically, our results build on past studies that show that coping behaviors buffer against symptoms of adult depression, anxiety, and PTSD due to psychosocial stress from the pandemic (Okafor et al. 2021; Senger 2023; Suhail et al. 2022). Past studies have shown that a variety of coping resources is valuable, including cognitive strategies (e.g., positive thinking, reappraisal), behavioral practices, (e.g., handwashing, information gathering), social capital (e.g., structural, instrumental), and spirituality (e.g., praying, connectedness, meaning-making) (Pankowski & Wytrychiewicz-Pankowska 2023). This important set of mental health-sparing behaviors protected numerous communities at high risk of COVID-19 infection and those with pre-existing vulnerabilities, including frontline healthcare workers, adults living with chronic diseases, and elderly populations (Hong et al. 2023; Lábadi et al. 2022; Tahara et al. 2021). Coping also

351   provided similar buffering effects against psychosocial stress among adults in past pandemics,

352   including Ebola (James et al. 2019) and HIV/AIDS (Seffren et al. 2018).

353   These results also add to the growing literature in South Africa that report the positive

354   mental health benefits of coping during the COVID-19 lockdown (Eloff, 2021; Engelbrecht et

355   al., 2021; Kim et al. 2022; Paredes-Ruvalcaba et al. 2023; Scheunemann et al. 2023; van der

356   Merwe et al., 2021; Visser & Law-van Wyk, 2021). While a majority of these studies focus on

357   healthcare workers or university students, rather than community-based adults such as those

358   included in our sample, the buffering effect of coping resources is consistent across analyses.

359   Engelbrecht et al. (2021) found that preparedness for care for COVID-19 patients, avoidance-

360   based coping, and current health status before COVID-19 predicted lower PTSD symptoms in

361   nurses deployed during the pandemic. In a qualitative study of community-based adults in

362   Gauteng, Paredes-Ruvalcaba et al. (2023) found that adults from diverse racial and

363   socioeconomic groups utilized a variety of coping strategies to overcome the stressors of the

364   pandemic, such as peer support, prayer, exercise, financial support, mindset reframing, natural

365   remedies, and following COVID-19 protocols. Notably, coping resources may have positive

366   impacts on mental health but poor, longer-term effects on physical health. For instance, Visser &

367   Law-van Wyk (2021) reported that South African university students engaged in substance use

368   to cope with the pandemic, despite early social policies prohibiting the sale of cigarettes and

369   alcohol in the country. Together, these studies and our results suggest that South Africans

370   utilized a variety of coping mechanisms to protect themselves against the negative mental health

371   impacts of COVID-19 psychosocial stress.

372   We also found that perceived social support did not significantly buffer against the

373   adverse psychological effects of the pandemic, which contradicts the larger literature that

374   highlights the positive mental health effects of adult social support (Harandi et al. 2017; Kessler

375   & McLeod 1985). Studies worldwide have repeatedly shown the protective and buffering effects

376   of social support against a wide range of poor mental health outcomes, including depression,

377   anxiety, and suicidal ideation (Casale et al. 2015; Chang et al. 2017; Olashore et al. 2021).

378   Additionally, studies in South Africa have described the importance of receiving social support

379   from family, friends, significant others, and coworkers. Paredes-Ruvalcaba et al. (2023) found

380   that South African adults utilized various means of virtual communication, such as video calls,

381   group texts, social media, and online services, to provide emotional support, process negative

382   cognitions, and stay hopeful. Scheunemann et al. (2023) described the vital role of social

383   relationships and active coordination between psychiatric healthcare workers in Gauteng to

384   provide more tangible, instrumental support among one another, including the organization of

385   online prayer groups, alternative work schedules to cover missing shifts due to pandemic-related

386   health problems and pooled financial resources.

387   Despite these past findings, we find that social support did not buffer against the poor

388   mental health effects of COVID-19 psychosocial stress. Given the state-enforced isolation and

389   disruption of infrastructural support systems, drastic changes in social behaviors and structures

390   during the pandemic may have altered the role of social support on health in this setting and may

391   explain these null findings. Past studies have shown that co-occurring emotional and

392   psychological experiences, such as feelings of loneliness, negative mood, and problematic social

393   relationships, can compromise the positive mental health effects of social support (Wang et al.

394   2018). For instance, conditions of depression and anxiety can negatively bias an individual's

395   appraisal of their social relationships, leading to altered evaluations of their interpersonal

396   contexts. Additionally, the Multidimensional Scale of Perceived Social Support may not fully

397   capture the social and interpersonal dynamics between the respondent and the relationships in

398   question (e.g., family, friends, and significant others). Past research has described many familial

399   and social relationships shifted during the lockdown, and greater strain in social relationships,

400   both familial and non-familial, predicted worse mental health outcomes during the pandemic

401   (Essler et al. 2021; Randall et al. 2021; Skinner et al. 2021).

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403   *Limitations*

404   Our study is not without limitations. Our findings are not generalizable to the entire

405   South African population as our sample represents a relatively wealthy, educated, and majority

406   female set of adults. The online nature of data collection likely biased our sample to those who

407   had access to the internet, computers, and other socioeconomic resources, leading to a privileged

408   sample. The cross-sectional design of our analysis may also subject our analysis to reverse

409   causality, limiting our ability to determine the true temporal ordering of events. Finally, different

410   forms of social support important for buffering against the effects of stress may not have been

411   captured by our social support measure.

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CONCLUSION

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421   In this online study of 117 adults during the second and third waves of the COVID-19

422   pandemic in South Africa, we found that the use of coping resources, but not perceived social

423   support alone, significantly buffered against worse symptoms of depression, anxiety, and post-

424   traumatic stress disorder. This sample of South African adults exhibited elevated levels of mental

425   health symptoms, with more than half of the sample reporting PTSD symptoms, over a third

426   exhibiting symptoms of depression and anxiety, and a fifth of adults reporting symptoms of

427   bipolar disorder. These data suggest that adults utilized a variety of coping resources to protect

428   their mental health against psychosocial stress experienced during the COVID-19 lockdown and

429   pandemic in South Africa.

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726 *Table 1. Demographic characteristics, social experience, and mental health*

Variables	n = 117	%	Range
Demographics			
Age	36.8 (11.7)		21-76
Gender			
Male	23	19.7	
Female	91	77.8	
Non-binary/Genderqueer	3	2.5	
Education			
Finished high school & matric	9	7.7	
Some university	15	12.8	
Graduated university	93	79.5	
Assets	10.5 (2.0)		1-13
Social experience & mental health			
COVID-19 psychosocial stress	22.7 (11.4)		1-55
Adverse childhood experiences	2.4 (2.1)		0-9
Perceived social support	61.0 (16.2)		15-84
Coping resources	28.2 (7.9)		6-49
Exercise (hours)	8.8 (11.2)		0-60
Average hours of work per week	34.7 (16.5)		0-72
Number of chronic conditions	0.35 (0.7)		0-3
Depressive symptoms	9.3 (7.3)		0-27
Depression caseness ($\geq$10)	45	38.5	
Anxiety symptoms	8.7 (6.5)		0-21
Anxiety caseness ($\geq$10)	46	39.3	
PTSD symptoms	39.1 (18.3)		17-85
PTSD caseness ($\geq$30)	82	57.3	
Bipolar disease symptoms	3.8 (3.5)		0-13
Bipolar caseness ($\geq$7)	24	20.5	

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Table 2a. Regression models predicting buffering role of social support on mental health impacts of COVID-19 psychosocial stress

	Depressive symptoms (PHQ-9)			Anxiety symptoms (GAD-7)		
	b	SE	95% CI	b	SE	95% CI
COVID-19 psychosocial stress	0.24	0.22	-0.19, 0.67	0.15	0.20	-0.24, 0.54
Social support	-0.078	0.090	-0.26, 0.099	-0.080	0.081	-0.24, 0.082
COVID-19 stress x social support	-0.0011	0.0034	-0.0079, 0.0057	-0.000073	0.0031	-0.0063, 0.0061
Age (years)	-0.087	0.057	-0.20, 0.027	-0.10*	0.052	-0.21, -0.0013
Female	2.58	1.36	-0.11, 5.27	2.41	1.23	-0.038, 4.85
Education	-1.15	0.93	-2.99, 0.70	-0.59	0.84	-2.26, 1.09
Assets	0.079	0.31	-0.53, 0.69	0.13	0.28	-0.42, 0.68
ACEs	0.30	0.31	-0.32, 0.91	0.32	0.28	-0.24, 0.88
Chronic disease	1.30	1.07	-0.83, 3.42	1.41	0.97	-0.52, 3.35
Exercise	0.024	0.055	-0.086, 0.13	-0.034	0.050	-0.13, -0.066
Hours worked	-0.019	0.042	-0.10, 0.06	-0.0083	0.038	-0.084, 0.067
Constant	19.7	11.6	-3.39, 42.8	15.2	10.6	-5.76, 36.1

Note: ACEs = Adverse childhood experiences; *b* = unstandardized regression weights; CI = confidence interval; * *p*<0.05; ** *p*<0.01; *** *p*<0.001

	PTSD symptoms (PCL-C)			Bipolar symptoms (MDQ)		
	b	SE	95% CI	b	SE	95% CI
COVID-19 psychosocial stress	0.99*	0.48	0.027, 1.95	0.20	0.11	-0.0096, 0.41
Social support	0.024	0.20	-0.37, 0.42	0.033	0.044	-0.054, 0.12
COVID-19 stress x social support	-0.0084	0.0077	-0.024, 0.0069	-0.0022	0.0017	-0.0055, 0.0012
Age (years)	-0.21	0.13	-0.47, 0.43	-0.063*	0.028	-0.12, -0.0070
Female	6.7*	3.05	0.66, 12.7	0.94	0.67	-0.38, 2.26
Education	-1.6	2.1	-5.75, 2.53	-0.90	0.46	-1.8, 0.0067
Assets	0.44	0.69	-0.92, 1.8	-0.049	0.15	-0.35, 0.25
ACEs	2.3**	0.69	0.89, 3.6	0.22	0.15	-0.078, 0.52
Chronic disease	5.2*	2.4	0.42, 10.0	0.89	0.53	-0.15, 1.9
Exercise	0.13	0.12	-0.12, 0.37	0.046	0.027	-0.0079, 0.010
Hours worked	0.016	0.094	-0.17, 0.20	0.046*	0.021	0.0050, 0.087
Constant	29.3	26.1	-22.5, 81.0	7.2	5.7	-4.1, 18.6

Note: ACEs = Adverse childhood experiences; *b* = unstandardized regression weights; CI = confidence interval; * *p*<0.05; ** *p*<0.01; *** *p*<0.001

Table 2b. Regression models predicting buffering role of coping resources on mental health impacts of COVID-19 psychosocial stress

	Depressive symptoms (PHQ-9)			Anxiety symptoms (GAD-7)		
	b	SE	95% CI	b	SE	95% CI
COVID-19 psychosocial stress	0.58**	0.19	0.20, 0.96	0.52**	0.17	0.18, 0.87
Coping resources	0.095	0.16	-0.22, 0.41	0.11	0.14	-0.18, 0.39
COVID-19 stress x coping resources	-0.014*	0.0066	-0.027, -0.00043	-0.013	0.0060*	-0.024, -0.00072
Age (years)	-0.073	0.056	-0.19, 0.039	-0.092	0.051	-0.19, 0.0097
Female	2.5	1.4	-0.21, 5.2	2.3	1.2	-0.14, 4.7
Education	-1.3	0.90	-3.1, 0.46	-0.68	0.82	-2.3, 0.93
Assets	0.14	0.30	-0.45, 0.73	0.21	0.27	-0.33, 0.74
ACEs	0.38	0.30	-0.22, 0.98	0.39	0.27	-0.15, 0.93
Chronic disease	1.1	1.1	-0.97, 3.2	1.3	0.96	-0.65, 3.2
Exercise	-0.020	0.058	-0.14, 0.095	-0.075	0.053	-0.18, 0.029
Hours worked	-0.0015	0.040	-0.081, 0.078	0.0030	0.036	-0.069, 0.075
Constant	11.8	10.4	-8.9, 32.5	6.3	9.4	-12.4, 25.0

Note: ACEs = Adverse childhood experiences; *b* = unstandardized regression weights; CI = confidence interval; * *p<0.05*; ** *p<0.01*; *** *p<0.001*

	PTSD symptoms (PCL-C)			Bipolar symptoms (MDQ)		
	b	SE	95% CI	b	SE	95% CI
COVID-19 psychosocial stress	1.4**	0.42	0.52, 2.2	0.20*	0.095	0.0093, 0.39
Coping resources	0.16	0.35	-0.54, 0.86	0.038	0.079	-0.12, 0.20
COVID-19 stress x coping resources	-0.030*	0.015	-0.059, -0.00089	-0.0045	0.0033	-0.011, 0.0021
Age (years)	-0.19	0.12	-0.43, 0.01	-0.060*	0.028	-0.12, -0.0051
Female	6.2*	3.0	0.23, 12.1	0.79	0.67	-0.54, 2.1
Education	-2.0	2.0	-6.0, 1.9	-0.97*	0.45	-1.9, -0.085
Assets	0.61	0.66	-0.70, 1.9	-0.037	0.15	-0.33, 0.26
ACEs	2.4**	0.67	1.1, 3.7	0.23	0.15	-0.062, 0.53
Chronic disease	4.8*	2.3	0.12, 9.4	0.87	0.53	-0.18, 1.9
Exercise	0.020	0.13	-0.23, 0.28	0.031	0.29	-0.027, 0.088
Hours worked	0.051	0.089	-0.13, 0.23	0.051*	0.020	0.011, 0.090
Constant	26.3	23.1	-19.4, 72.1	8.7	5.2	-1.60, 18.9

Note: ACEs = Adverse childhood experiences; *b* = unstandardized regression weights; CI = confidence interval; * *p<0.05*; ** *p<0.01*; *** *p<0.00*
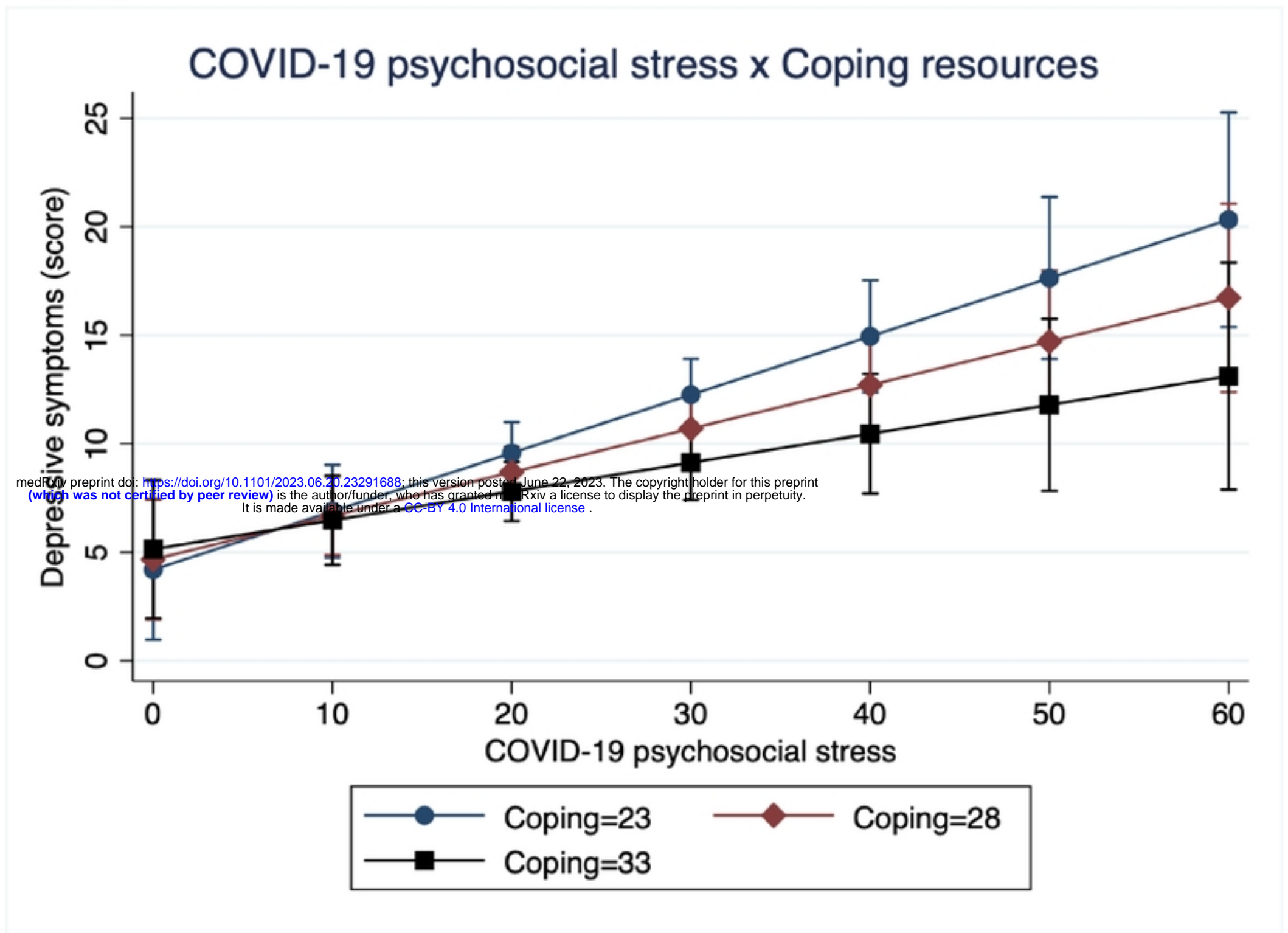
732

Figure 1. Interaction between COVID-19 psychosocial stress and coping resources predicting depressive symptoms.
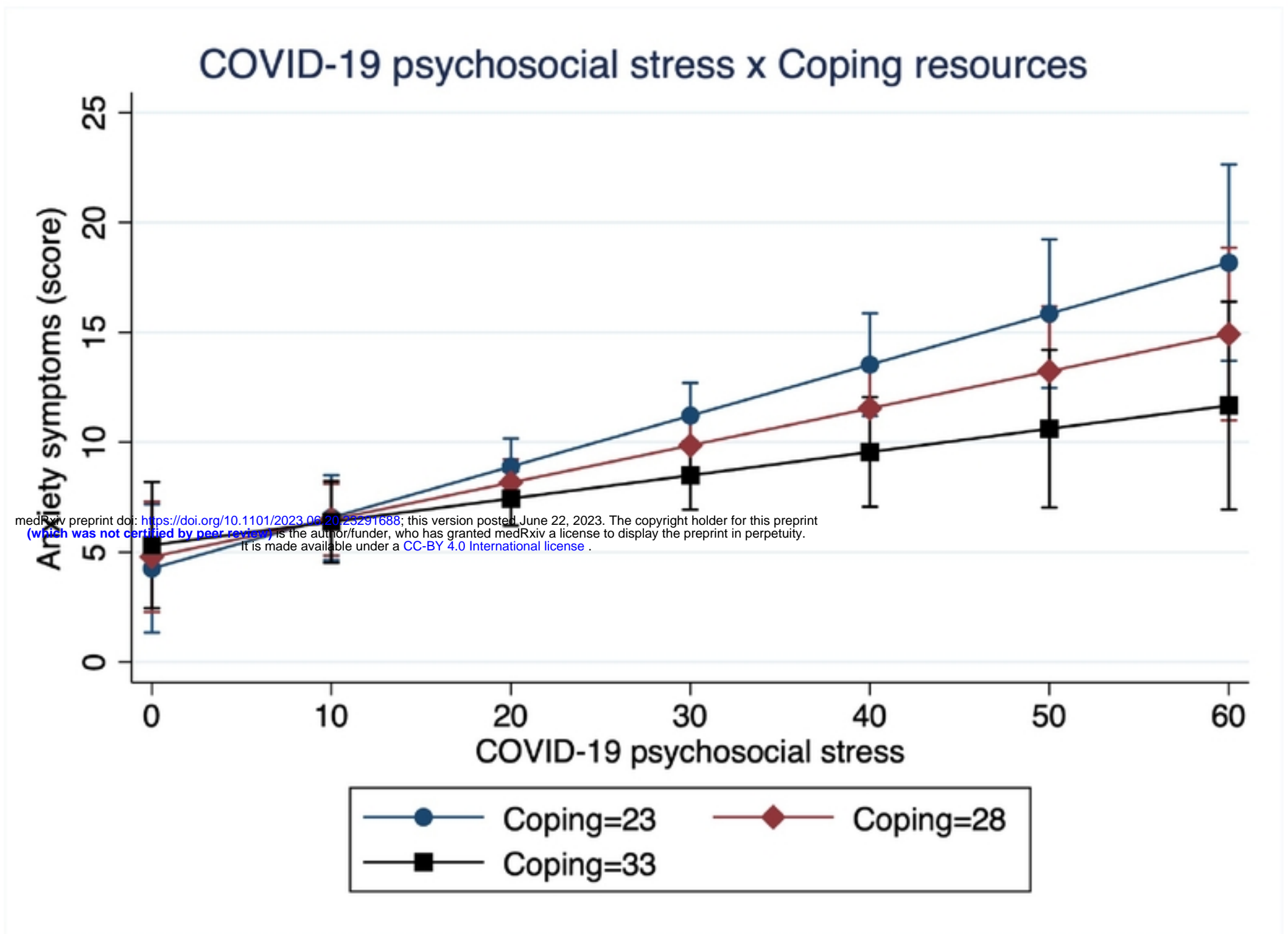
Figure 2. Interaction between COVID-19 psychosocial stress and coping resources predicting depressive symptoms.
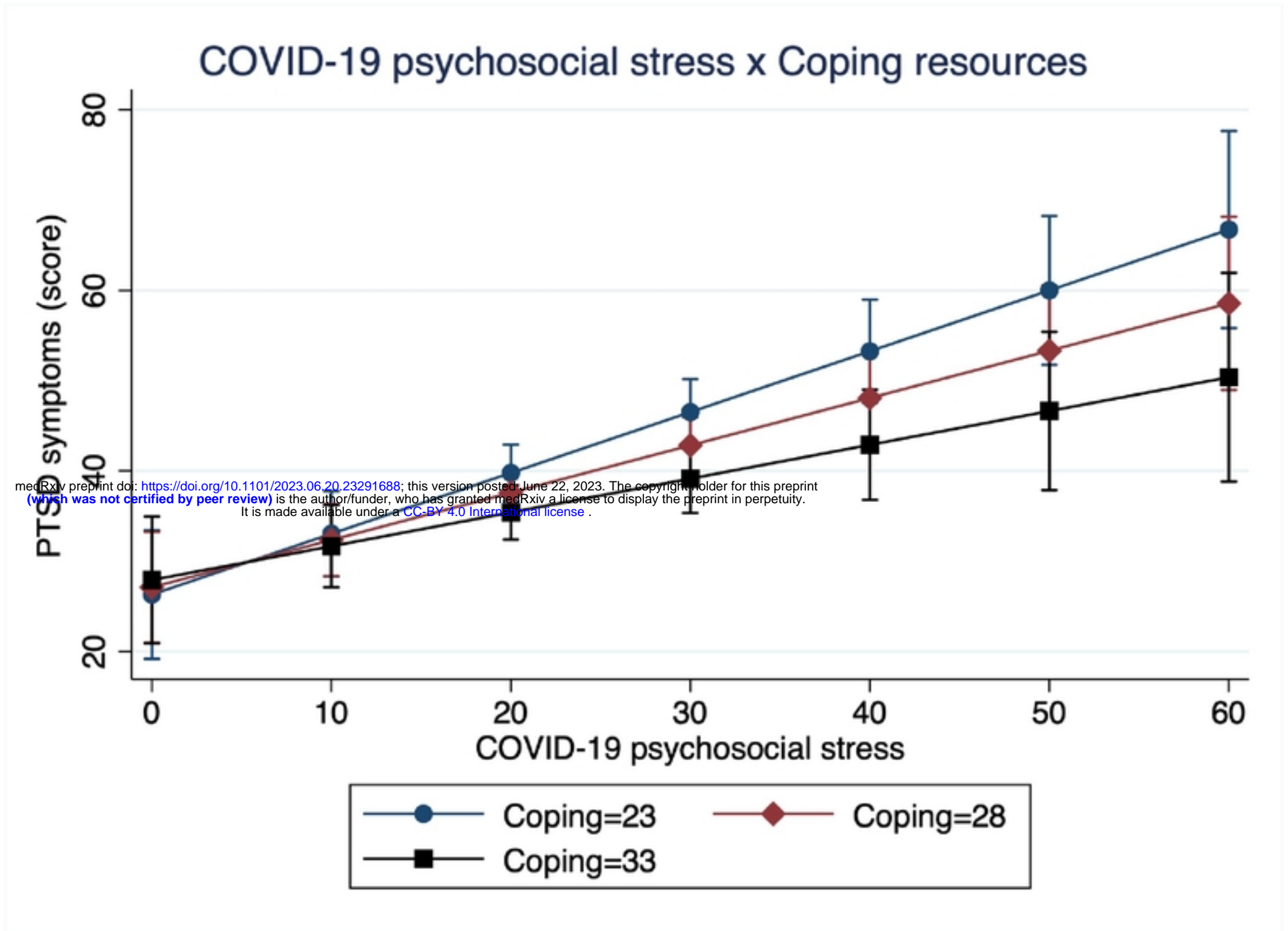
Figure 3. Interaction between COVID-19 psychosocial stress and coping resources predicting depressive symptoms.