



# Impact of COVID-19 on Depressive Symptoms Among Patients with Low Vision and Blindness

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**Background:** Disability is globally recognized as a key cause of depression. Likewise, the COVID-19 pandemic has significantly increased the vulnerability of patients with low vision to health and health-related issues, especially mental health. This study aimed to examine the association between the impact of COVID-19 and depressive symptoms in patients with low vision and blindness.

**Methods:** This cross-sectional study was conducted between February and July 2022 and involved face-to-face interviews. Patients with low vision and blindness diagnosed with depression were excluded. The following items were included in the questionnaire: sociodemographic information, Multi-Dimensional Scale of Perceived Social Support (MSPSS), the impact of COVID-19, and The Center for Epidemiological Studies-Depression (CES-D). Hierarchical linear regression analysis was used to examine the association between the impact of COVID-19 and depression.

**Results:** The prevalence of depression among patients with low vision and blindness was 43.0%. Three factors were associated with depressive symptoms: compliance with COVID-19 prevention strategies ( $\beta = 0.16$ ,  $p < 0.01$ ), anxiety during COVID-19 ( $\beta = 0.24$ ,  $p < 0.001$ ), and social support ( $\beta = -0.16$ ,  $p < 0.01$ ).

**Conclusion:** The findings indicated that COVID-19 significantly increased depressive symptoms among patients with low vision and blindness. The psychological effects of the COVID-19 pandemic have been considered critical and emergent public health issues. Stakeholders, particularly public health organizations, need to urgently implement preventive and protective measures to help patients with physical and mental disabilities.

**Keywords:** COVID-19, depressive symptoms, low vision, blindness

## Introduction

The COVID-19 pandemic was declared a global crisis by the World Health Organization (WHO) due to its widespread impact globally.<sup>1,2</sup> The pandemic has had serious physical effects on people and has resulted in an increase in depression and anxiety globally.<sup>3</sup> According to the WHO, there has been a 25% rise in the prevalence of mental health disorders. The impact of the pandemic has been felt across society, particularly in terms of health, economics, and social aspects. To control the pandemic, preventive and protective measures such as nationwide lockdowns, self-isolation, social distancing, and remote work were implemented.<sup>4</sup> Although these measures were necessary to control the spread of the virus and maintain high standards of care for all, they have unavoidably affected the physical and mental health of individuals to an extent.<sup>5-7</sup>

In Thailand, the Ministry of Public Health requires that people susceptible to mental distress are provided counseling and mental health care access. Provincial program managers should be watchful and ready to take action on mental health disorders caused by COVID-19 such as anxiety, depression, and suicidal ideation.<sup>4</sup>

During the COVID-19 pandemic, Thai people experienced difficulties navigating their normal daily lives especially during the periods of mandatory quarantine and isolation.<sup>8</sup> In addition, shortage of masks and medical protective

equipment, limited access to information about COVID-19, limited access to hospital services and treatments, restriction of movement, and death of family members or relatives all affected their mental health.<sup>8,9</sup> Previous studies indicated that approximately half of the participants had moderate to severe psychological effects during the COVID-19 outbreak. The prevalence of moderate to severe depression, severe anxiety, and moderate to severe stress of the participants were found to be 16.5%, 28.8%, and 8.1%, respectively, and their poor self-rated health was significantly related to a greater psychological effect of COVID-19.<sup>10</sup>

A study reported that patients with disability or impairment had a higher risk of COVID-19 than those without.<sup>11</sup> Approximately 253 million people a risk of COVID-19 globally.<sup>12</sup> The measures against COVID-19, such as national lockdown, reduced social engagement, and social distancing, had effects on patients with visual impairment to the extent that their physical and mental health will be significantly affected in years to come.<sup>13</sup>

COVID-19 can increase the vulnerability of patients with low vision to general health and mental health issues. Older people with visual impairment are susceptible to a greater risk of depression than the general population.<sup>14,15</sup> The WHO reported that people with depression can have low spirit, anhedonia, and tiredness and unnecessary worry, irritability, and exhaustion with anxiety.<sup>16</sup> Moreover, people with low vision have a low level of social contact which can lead to more of depression and anxiety. A previous study reported that patients with blindness have a greater risk of contracting COVID-19 than those with mild or without visual impairment. Regarding healthcare accessibility, a study reported that participants who were blind had worries about the difficulty in receiving healthcare and support.<sup>17</sup>

There is currently limited evidence on the impact of COVID-19 on depression among Thai patients with low vision. Therefore, the present study aims to examine the association between the impact of COVID-19 on depressive symptoms in patients with low vision and blindness.

## Materials and Methods

### Participants and Setting

This was a cross-sectional study. The face-to-face interviews were conducted between February 2022 and July 2022 at the eye center, King Chulalongkorn Memorial Hospital, Bangkok, Thailand. Participants were selected using convenience sampling, and they consisted of 284 patients with low vision and blindness who were aged 18 years and above and were willing to participate. Participants with severe psychological illness, auditory deficits, and cognitive impairment were excluded. The WHO defines low vision as best-corrected visual acuity worse than 6/18 to 3/60 in the better eye and blindness as visual acuity worse than 3/60.<sup>18</sup>

### Measurements

#### Sociodemographic Variables

The sociodemographic variables included age, gender, religion, level of education, monthly income, employment status, marital status, and eye diseases.

#### The Impact of COVID-19 Questionnaire

The questionnaire used in this study to explore the impact of COVID-19 on visual impairment was developed to suit the Thai culture and local context. It used the Thai language and was based on the patient questionnaire used in the study of the impact of COVID-19 on visual impairment.<sup>17</sup> The 23 items for the questionnaire on the impact of COVID-19 on visual impairment belong to five domains including compliance with COVID-19 prevention strategies, accessibility to service or treatment, visibility with COVID-19, visual service and treatment, and anxiety during COVID-19. The responses were scored using a five-point Likert scale from “not at all” to “completely”. The total score ranged from 23 to 115. ([Appendix 1](#)). Higher scores indicated a greater impact of COVID-19. In our study, the Cronbach’s alpha internal consistency coefficient was 0.82.

## Multi-Dimensional Scale of Perceived Social Support

We employed the Thai version of the Multi-Dimensional Scale of Perceived Social Support (MSPSS) to quantify the degree of social support from family, friends, and others.<sup>19</sup> The questionnaire contains 12 items ranked on a seven-point Likert-type scale varying between 1 (very strongly disagree) to 7 (very strongly agree). ([Appendix 2](#)). In this research, the Cronbach's alpha internal consistency coefficient was 0.88.

## The Center for Epidemiological Studies-Depression (CES-D)

The Thai version of the Center for Epidemiological Studies-Depression (CES-D) questionnaire<sup>20</sup> used in this study includes 20 items for assessing depressive symptoms. Depression refers to a common mood disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, tiredness, and poor concentration with everyday life.<sup>21–23</sup> The study participants were invited to provide information about the frequency of depression symptoms during the previous week. The answers were reported using a five-point Likert scale, where 0 indicated rarely or never and 3 indicated almost all the time. Additionally, the CES-D scores were rated from 0 to 60 with a cut-off point at 16. ([Appendix 3](#)). In this research, the Cronbach's alpha internal consistency coefficient was 0.89.

## Data Analysis

SPSS version 28.0 was used to analyze the data. Descriptive analyses were used to establish the characteristics of patients with low vision and blindness and assess the prevalence of depression. Hierarchical linear regression analysis was performed with depressive symptoms as the dependent variable and two models of predictors. The first model included five domains for the impact of COVID-19 (anxiety during COVID-19, compliance with COVID-19 prevention, accessibility to service or treatment, visibility with COVID-19, visual service, and treatment). Social support was included in the second model. To illustrate the effect size changes when adjusting the model's various variables, we have provided the regression coefficients (standardized  $\beta$ ). Statistical significance was set at p-values of <0.05.

## Results

### Descriptive Statistics

This study involved 284 patients with low vision and blindness, with ages ranging between 18 and 96 years with a mean age of 59.7 years (SD 17.67). Most participants were aged 60 years and above (57.0%), female (58.5%), Buddhist (89.0%), unemployed (63.7%), and married (47.5%). For most patients, the level of education was lower than the bachelor's degree (79.6%), and they perceived their income to be insufficient (64.1%). For eye diseases, 20.1%, 35.9% and 47.9% of the patients had glaucoma, macular degeneration, and cataract, respectively ([Table 1](#)).

### Simple Linear Regression Analysis

Simple linear regression analysis showed that the impact of COVID-19 on anxiety during COVID-19 was the strongest predictor of depressive symptoms with standardized  $\beta = 0.246$  and  $R^2 = 0.060$ . A negative correlation was found between social support and depressive symptoms with standardized  $\beta = -0.141$  and  $R^2 = 0.020$  ([Table 2](#)).

### Hierarchical Linear Regression Analysis

[Table 2](#) shows the strengths of the crude and adjusted associations from the simple and hierarchical linear regression analyses of the covariates and depressive symptoms. The hierarchical linear regression analysis incorporated two blocks of predictors for depressive symptoms as a dependent variable. The final Model II showed that the impact of COVID-19 on anxiety was significantly and positively associated with depressive symptoms (standardized  $\beta = 0.240$ ,  $P < 0.001$ ). Compliance with COVID-19 prevention was also significantly and positively associated with depressive symptoms (standardized  $\beta = 0.164$ ,  $P = 0.005$ ). Perceived social support was significantly and negatively associated with depressive symptoms (standardized  $\beta = -0.160$ ,  $P = 0.005$ ).

**Table I** Demographic Characteristics of the Participants (n = 284)

Characteristic	Total n	Depression		p-value <sup>a</sup>
		No n (%)	Yes n (%)	
<b>Age (years)</b>				0.089
< 60	122	63 (38.7)	59 (48.8)	
≥ 60	162	100 (61.3)	62 (51.2)	
<b>Gender</b>				0.674
Female	166	97 (59.5)	69 (57.0)	
Male	118	66 (40.5)	52 (43.0)	
<b>Religion</b>				0.306
Buddhism	257	145 (89.0)	112 (92.6)	
Non-Buddhism	27	18 (11.0)	9 (7.4)	
<b>Education level</b>				0.202
< Bachelor degree	226	134 (82.2)	92 (76.0)	
≥ Bachelor degree	58	29 (17.8)	29 (24.0)	
<b>Perceived of income</b>				0.539
Sufficiency	102	61 (37.4)	41 (33.9)	
Insufficiency	182	102 (62.6)	80 (66.1)	
<b>Employed status</b>				0.202
Employed	103	54 (33.1)	49 (40.5)	
Unemployed	181	109 (66.9)	72 (55.9)	
<b>Marital status</b>				0.876
Single	82	44 (27.0)	38 (31.4)	
Married	135	80 (49.1)	55 (45.5)	
Widowed	53	31 (19.0)	22 (18.1)	
Divorced	14	8 (4.9)	6 (5.0)	
<b>Degeneration of macular</b>				0.700
No	182	106 (65.0)	76 (62.8)	
Yes	102	57 (35.0)	45 (37.2)	
<b>Cataract</b>				0.032*
No	148	76 (46.6)	72 (59.5)	
Yes	136	87 (53.4)	49 (40.5)	

(Continued)

**Table 1** (Continued).

Characteristic	Total n	Depression		p-value <sup>a</sup>
		No n (%)	Yes n (%)	
<b>Glaucoma</b>				0.266
No	227	134 (82.2)	93 (76.9)	
Yes	57	29 (17.8)	28 (23.1)	
<b>Covid vaccination</b>				0.894
No	24	14 (8.6)	10 (8.2)	
Yes	260	148 (91.4)	112 (91.8)	

Notes: <sup>a</sup>Chi-square; \*p < 0.05.

**Table 2** Hierarchical Linear Regression Analysis for Predicting Depressive Symptoms

Variable	Simple Linear Regression		Hierarchical Regression	
	Standardized Beta	R <sup>2</sup>	Standardized Beta	
			Model I	Model II
Impact of COVID-19				
Anxiety during COVID-19	0.246**	0.060	0.219***	0.240***
Compliance with COVID-19 prevention	0.152*	0.023	0.167**	0.164**
Accessibility to service or treatment	0.138*	0.019	0.102	0.096
Visibility with COVID-19	0.128*	0.016	0.035	0.028
Visual service and treatment	0.046	0.002	−0.68	−0.084
Social support	−0.141*	0.020		−0.160**
R <sup>2</sup>			0.094	0.119

Notes: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

## Discussion

This study was designed to examine the association between COVID-19 and depressive symptoms in patients with low vision and blindness. Our findings indicated associations between perceived social support and depressive symptoms. Notably, we confirmed an association between COVID-19 and depressive symptoms.

In this study, 43.0% of patients with low vision and blindness had experienced depression; 57.0% had not. This was compared to the percentages reported by a study of disabled Ethiopians before COVID-19 (38.3%),<sup>24</sup> visual impairment among patients with cataracts in Australia (31.2%),<sup>25</sup> older adults with visual impairment in England (29.6%),<sup>26</sup> older people with visual impairment in Spain (27.5%),<sup>27</sup> older persons with vision loss in Netherlands (26.5%)<sup>28</sup> and older adults with visual impairment living in residential care in India (20.9%).<sup>29</sup> The prevalence of depression in our study was lower than those reported during the COVID-19 pandemic for older patients with visual impairment in Bangladesh (58.1%)<sup>30</sup> and patients with visual impairment in Brazil (53.9%).<sup>31</sup>

It is well recognized that depression is a key cause of disability globally and contributes to the global burden of disease.<sup>32</sup> The risk factors of depression are obvious; however, only a few people clearly understand what makes patients

recover, let alone what gives them immunity against depression. A study concluded that social support is important in managing depression.<sup>33</sup> Generally, social support includes the perceived and received forms, which refer to the support given to depressed individuals in specific situations and periods. Nonetheless, social support can also be perceived negatively.

Our findings suggested that perceived social support was significantly and negatively associated with depressive symptoms. The findings are supported by reports that greater negative social support and lower positive social support in adults with visual impairment are strong predictors of depression.<sup>34</sup> Moreover, our study results are consistent with the reports of previous studies in that satisfaction with available perceived social support is negatively related to depression.<sup>35</sup> An earlier study involving adults with visual impairment also indicated that negative social support can lead to higher levels of depression although the severity of vision loss and functional disability are regulated.<sup>36</sup>

It is well-known that low vision and blindness are key causes of disability. In addition, people with visual challenges are more likely to contract COVID-19 than those with normal vision.<sup>11</sup> The current study showed a significantly positive association between COVID-19 and compliance with COVID-19 prevention strategies, anxiety during COVID-19, and depressive symptoms in patients with low vision and blindness. The findings also showed that patients with visual impairment have various shortcomings that potentially make them susceptible to poorer quality of health.<sup>37</sup> Moreover, concurrent disabilities were reportedly found in approximately 40% of people with visual challenges; 60% of whom were contracted to COVID-19.<sup>38</sup> However, the scope of challenges and effects that may be experienced by people with low vision and visual impairment, especially related to their physical and mental health consequences in the long term, have not been established.<sup>13</sup>

Among patients with visual impairment, the lack of adequate knowledge about COVID-19 related to its cause, transmission, and strategies for prevention resulting from limited accessibility and lack of suitable media for information access for patients with visual impairment can cause overwhelming stress leading to mental health problems such as depression.<sup>13,17</sup> COVID-19-related announcements designed for the general public are not suitable for individuals with visual impairment. Moreover, these patients have challenges in obtaining COVID-19-related information on websites. A study found that visually impaired and blind people have to depend on touch screen technology and physical sensations in their daily life activities, which can increase their risks of COVID-19.<sup>13</sup>

This study showed that anxiety during COVID-19 was significantly and positively associated with depressive symptoms. The outbreak of COVID-19 has been a significant concern globally. Governments and organizations immediately developed preventive measures, policies, and strategies to address and tackle this new outbreak.<sup>39</sup> However, these measures inevitably led to stress related to confusion, fear, anger, insomnia, and anxiety as psychological responses to the impact of COVID-19.<sup>40</sup> Additionally, anxiety and depressive disorders, which are common psychiatric illnesses, have frequently been found to co-exist. A global survey reported that approximately 45.7% of patients with lifetime depression have a lifetime history of one or more anxiety disorders.<sup>41</sup> Therefore, psychological counseling is recommended to provide affected patients mental care service and decrease the psychological effects of COVID-19.<sup>42,43</sup>

The two key limitations of our study are as follows. First, as a cross-sectional design was adopted, we inferred association between the predictor variables and depressive symptoms. It has to be acknowledged that the risk factors and outcomes are measured concurrently in a cross-sectional survey. Therefore, the order of exposure and disease is not easy to determine. Nonetheless, under certain circumstances a cross-sectional design can be applicable when studying potential associations. For example, if the exposure is assumed to be stable over time, a cross-sectional design may be valid. Second, the convenience sampling technique was used to enlist participants; consequently, our samples may not be representative of the population. Convenience sampling involves stopping people at random, which means that not everyone has an equal chance of being selected depending on the place, time, or day the data are collected. We acknowledge that using convenience sampling approach does not allow us to generalize the result to a larger population. However, in some cases, it is the only feasible option that can be employed. Moreover, it may sometimes be the only viable method when a researcher cannot obtain contact details for individuals in a large population. In this case, convenience sampling was the viable option.



## Conclusion

Our study showed that COVID-19 significantly increased depressive symptoms among people with low vision and blindness. Because the mental health effects of COVID-19 are recognized as evolving public health issues, preventive measures should be developed and mental health care provision should be improved. A key strategy for tackling this problem is the efficient collaboration between public health service providers and organizations to provide care for individuals mentally and physically affected by the pandemic.

## Data Sharing Statement

Data is available upon request to the corresponding author.

## Ethics Approval and Informed Consent

This study was approved by the Institutional Review Board (IRB) Human Research, Faculty of Medicine, Chulalongkorn University (COA No. 1638/2021) on November 8, 2021. To protect the identities of the participants and maintain confidentiality, written consent was obtained before the interview. For those unable to read owing to their vision, the interviewer read the research objectives and details of the consent form. Those who agreed to participate provided the verbal consent bearing a witness signature. This study has been performed in accordance with the principles stated in the Declaration of Helsinki.

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## Disclosure

The authors report no conflicts of interest in this work.

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