

# Psychological Challenges and Coping Strategies during COVID-19 in 2020: A Systematic Review

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**Abstract:** *The COVID-19 pandemic has been found to have a major negative impact on mental health. This systematic review aims to synthesise the research findings on the psychological challenges faced by adults during the early part of the COVID-19 pandemic with a specific interest in the coping strategies used. The following electronic resources were searched: (PubMed, COCHRANE, APA PsycINFO, and MEDLINE) in August 2020. Two researchers independently screened 63 potentially relevant full-text articles. Following the PRISMA systematic screening guide, 26 articles consisting of 23 quantitative studies, 2 qualitative studies, and 1 mixed-method study met the inclusion criteria that were set and were subsequently selected for the final review. A high prevalence of anxiety (16.92% - 65%), depression (11% - 72.6%), stress (10% - 24.67%), and sleep disorders (20.6%- 88.34%) was reported among the public due to various causes related to the outcome of the pandemic. Considerable heterogeneity in methods of prevalence reporting was seen. The coping strategies used by healthcare workers (n=8), the general population (n=16), and college students (n=2) to mitigate the psychological challenges were grouped into three main categories namely, adaptive (n=17), maladaptive (n=11), and general (n=4). This review suggests that the COVID-19 pandemic was associated with high levels of psychological challenges. The coping strategies used varied from person to person. Hence, more studies need to be conducted to identify how effective the coping strategies used are in the long term.*

**Keywords:** Psychological Challenges, Coping Strategies, COVID-19, Mental Health, Well-being.

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## 1. Introduction

Coronavirus – 2019, colloquially known as ‘COVID-19’ is a respiratory disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The virus, first detected in Wuhan City, Hubei Province of China in December 2019, gave rise to a formidable pneumonia-like outbreak affecting people at large<sup>1</sup>. The virus spread worldwide quickly, necessitating the World Health Organization (WHO) to raise the pandemic alarm on March 11, 2020<sup>1</sup>. With no definitive treatment in sight, preventive measures were a priority to stop the spread of SARS-CoV-2. WHO recommended implementing lockdown policies besides other preventive measures such as hand hygiene and social distancing<sup>1</sup> to curb the virus spread. The lockdowns aimed to serve as a short-term measure to prepare clinical resources and protect the over-exhausted healthcare workers<sup>3</sup>. Almost four billion people from 90 countries experienced

the COVID-19 lockdown<sup>4</sup>. To date, this outbreak has affected approximately 116 million people worldwide with a death toll standing at 2 million. These numbers have been increasing exponentially with the emergence of the different variants<sup>5</sup>. Although the virus was contained considerably by instituting stay-at-home directives, this measure led to devastating economic and social disruption, adversely impacting people's mental health and well-being in general. Overall during COVID-19, there was an increase in the prevalence of psychological challenges among the public<sup>6,7,8,9,10</sup>.

Psychological challenges as discussed in this review refer to the mental health difficulties that people face due to changes in the internal or external environment that is perceived as a potential threat. A poorly resolved conflict could potentially cause or worsen the state of one's mental health. When a conflict arises, the varying ways of coping with them are termed 'coping strategies'. Coping is a basic process integral to adaptation and survival, which depicts how people detect, appraise, deal with, and learn from stressful encounters. Activities such as exercising, getting enough rest and sleep, consuming alcohol, and excessively using digital media have been widely used to combat stressors<sup>11</sup>. These activities fall into either adaptive behaviours or maladaptive<sup>12,13,14</sup>.

Adaptive coping strategies include cognitive and behavioural efforts to manage conflicts that may or may not result in a good outcome in the long term. However, maladaptive coping strategies are usually associated with poorer mental health outcomes<sup>12,14</sup>. A positive approach such as exercising is an illustration of an adaptive coping strategy, while a maladaptive coping strategy would be utilising alcohol or drugs to get out of a situation. General coping strategies in the context of this review refer to the strategies that lie in a grey area between adaptive and maladaptive.

Existing research has revealed a wide range of psychological challenges during outbreaks of infectious diseases in the past<sup>15</sup>. For example, following the SARS CoV-1 outbreak in 2003, people who were quarantined and had pre-SARS trauma exposure were predictors of high levels of depressive symptoms three years after the outbreak<sup>16</sup>. However, none of these contagious diseases called for a national lockdown, unlike the present COVID-19 pandemic. Hence, there is a scarcity of literature published on the impact of the lockdown on psychological challenges and how adults have coped in such situations<sup>4</sup>. To date, epidemiological data on the mental health problems that are associated with COVID-19 is on the rise and more research on this data has been called upon in recent literature<sup>1,4</sup>. This literature shows that at the beginning of 2019, 11% of adults in the United States reported symptoms consistent with diagnosable anxiety or depressive disorder. By July 2020, it increased to 40%<sup>17</sup>. Three critical actions were recommended including a whole-of-society approach to promote, protect, and care for mental health; ensure widespread availability of emergency mental health and psychosocial support, and support recovery from COVID-19 by developing mental health services for the future. At this point, it is crucial to identify what coping mechanisms are being used to address these psychological challenges.

Identifying the burden of psychological challenges and the associated coping strategies are important to come up with effective primary preventions and to modify the public health measures in policy making<sup>4</sup>. This allows policymakers to balance the pros and cons of a lockdown, to provide clear guidelines to the public for a time-bound policy evaluation in preventing the negative outcomes post-pandemic, and to establish preparedness for future outbreaks<sup>4</sup>.

Therefore, this systematic review aims to synthesise the research findings focusing on the psychological challenges during COVID-19 and identify coping strategies used to deal with the respective psychological challenges.

## 2. Methodology

This systematic review has been approved by the Perdana University Institutional Review Board (IRB) (PUIRBHR0269). We developed and submitted a review protocol to PROSPERO, [Registration ID (CRD42021200958)]. We adopted the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for this systematic review.

### 2.1 Search Strategy

Specific keywords were used to search electronic databases: PubMed, COCHRANE, APA PsycInfo, and MEDLINE. We filtered papers that were published between January 2020 and August 2020, to retrieve data that is representative of the psychological challenges and the respective coping strategies during COVID-19. A defined search string was used to collect papers focusing on indices of (i) psychological challenges, (ii) coping strategies, and (iii) the COVID-19 timeline. To yield more accurate findings, Boolean operators such as ‘AND’ and ‘OR’ or a combination of both were used. This searching technique aided in improving the completeness of the results and sizing down to the relevant papers. The complete list of the search string is depicted in Table 1.

**Table 1: Number of Articles Found in Different Databases Using Specific Search String**

SEARCH STRING	DATABASES	RESULTS FOUND
("mental health challenge*" OR "mental health illness*" OR "mental health limitation*" OR "psychological challenge*" OR "psychological disorder*" OR "psychological problem*" OR "mood disorder*" OR stress* OR anxiety* OR "emotional distress*" OR depression * OR ptsd OR "post-traumatic stress disorder*" OR "psychiatric disorder*" OR "psychiatric symptom*" OR "psychological symptom*" OR "psychological distress*") AND ("coping strategies*" OR "defence mechanism*" OR "adjusting mechanism*" OR "coping mechanism*" OR "coping skills*" OR "coping way*" OR "coping method*" OR adapt*) AND (covid-19* OR Sars-coV-2* OR 2019-ncov)	PubMed	54
	COCHRANE	02
	APA PsycInfo	09
	MEDLINE	50

### 2.2 Study Selection

All retrieved papers were exported onto a reference manager (EndNote) which was consecutively imported into Covidence, to assist with the title and abstract as well as the full-text review. We screened the titles and abstracts to shortlist relevant papers. Successively, full texts were assessed for aptness.

### 2.3 Eligibility Criteria

Suitable publications were picked for the final analysis based on predetermined inclusion and exclusion criteria. Inclusion criteria included studies that were published in English, in 2020, have clear descriptions of psychological difficulties, coping mechanisms, and related clinical outcomes, participants were 18 years old and older, and the papers have been peer-reviewed. No restrictions were imposed on the locality of the participants. We excluded papers that were

published in languages other than English as well as those focusing on target participants below 18 years old.

## **2.4 Data Extraction**

Specific keywords were used to perform a primary query in the digital library: PubMed, COCHRANE, APA PsycInfo, and MEDLINE. Two reviewers filtered papers that were published between January 2020 to August 2020, to retrieve data that is representative of the psychological challenges and the respective coping strategies during COVID-19. A defined search string was used to collect papers focusing on indices of (i) psychological challenges, (ii) coping strategies, and (iii) the COVID-19 timeline. Since this review was conducted during the infant stage of the pandemic, there were not many publications related to the topic of interest. Therefore, papers of all types of study methods were included. The search process was further refined by applying several inclusion and exclusion criteria (as shown in 2.3). All retrieved papers were exported onto a reference manager (EndNote) which was consecutively imported onto Covidence, to assist with the title and abstract as well as the full-text review. The titles and abstracts of the papers were screened, and the relevant papers were shortlisted. Successively, full texts were assessed for aptness according to the inclusion and exclusion criteria. Data extraction was performed manually using a collaborative spreadsheet to input relevant information so that both researchers are abreast with the research progress. The fields extracted include study titles, authors, objectives, settings, methodologies, psychological challenges, coping strategies/intervention, presence of comorbidities, outcomes, and conclusions. A comparison of information was made to identify significant differences between each paper. Each of the selected papers complied with the information relevant to the study objectives.

We conducted a thematic analysis for coping strategies following the Braun and Clarke guidelines<sup>18</sup>. To begin with, we extracted coping strategies from all 26 papers reviewed (hereafter, the number of papers will be referred to as 'n'). Following that, we identified the common themes and sub-themes from the papers. We then grouped the strategies into broad themes namely adaptive, maladaptive, and general. We reviewed the themes to ensure they accurately represented the data collected. While some papers (n=7) readily mentioned the coping themes as adaptive or maladaptive, others did not (n=19). Hence, we used the former as a reference point to perform a thematic analysis for the latter. Coping strategies that were in silos from the no-theme papers were extracted and mapped onto the adaptive and maladaptive themes. Other strategies that did not fit into the 2 main broad themes were grouped as general (No specific categorisation).

## **2.5 Quality Assessment**

The Mixed Method Appraisal Tool (MMAT) was applied to appraise the quality of all selected papers. Four qualifying criteria were used to verify the eligibility of the papers with each 'YES' equivalent to 25%. A score of more than 50% proved that the paper was of acceptable quality. The decision to exclude a paper was not based on the quality assessment process.

## **3. Results**

### **3.1 Study Selection**

The initial electronic search yielded a total of 115 papers. Within this, 52 duplicates were removed. The remaining 63 articles were screened for relevancy of the title and abstract. Ten papers were found to be irrelevant and hence, excluded. Upon full-text review, 53 papers were further assessed to ensure they met the inclusion criteria. Of these, 26 were found to be

accurately reporting in relevance to the study objectives hence, included in the review. The flow diagram for study selection was constructed in compliance with the PRISMA guidelines as depicted in Figure 1.

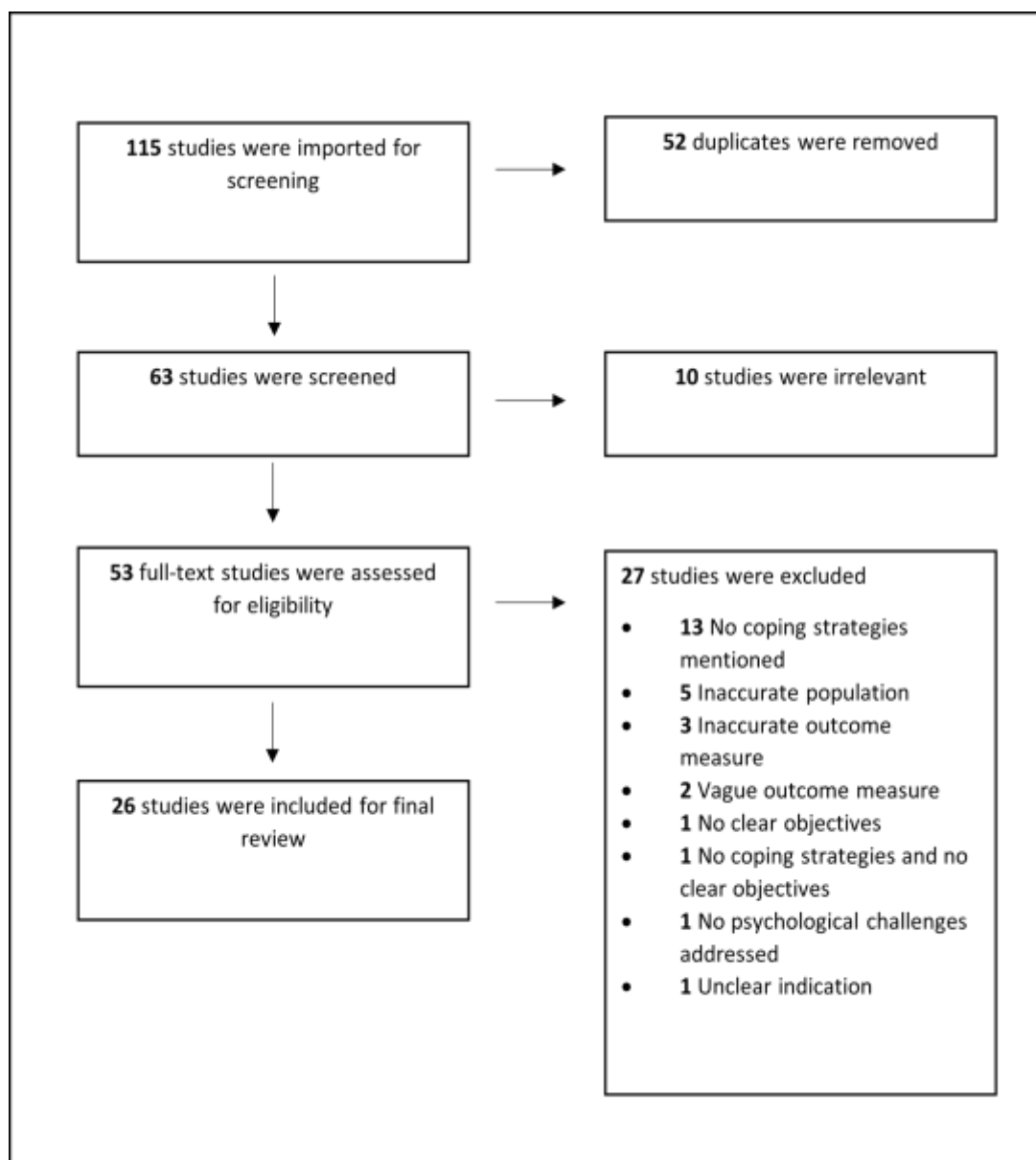


Figure 1: PRISMA Flow Diagram illustrating the search and study selection process

### 3.2 Comprehensiveness of Quality Assessment

The study design comprised cross-sectional quantitative (n=23), qualitative (n=2), and mixed method (n=1). With reference to the MMAT checklist, four methodology quality criteria were used to assess both the qualitative and quantitative papers while three criteria were used for the mixed method paper. This quality screening pointed out 22 papers with a score of 50% and above for eligibility. Of these, 4 were of high quality (scored 100%) as they accurately reported the methodological standings (Refer to Table 2).

### 3.3 Characteristics of Included Studies

The locality of the studies was the United States (n=6), Europe (n=12), and Asia (n=10). The study populations consisted of healthcare workers (HCW) (n=8), students (n=2), and the general public (n=16) who were within the age group of 18 to 94 years. The sample size ranged



between 115 - 6854 for quantitative (n=23), 20-23 for qualitative (n=2), and 685 for the mixed-method (n=1) design. The sample consisted of participants of homogenous nationality (n = 22) and multi-nationality (n=4).

### 3.4 Psychological Challenges Faced by the Studied Populations

Psychological challenges faced by the studied populations were grouped according to main parameters such as anxiety (n=12), depression (n=12), stress (n=8), and sleep disorders (n=5). All included papers regardless of their targeted population reported anxiety (16.92%-65%) and depression (11%-72.6%) as the most prevalent psychological challenges encountered during the pandemic. Other incidences such as sleep disorders (30.60%-88.34%) and stress (10%-24.67%) were also identified. Apart from that, Post-Traumatic Stress Disorder (PTSD) (79.6%), worry (67%), mood disorders (58.40%), negative emotions (29.8%), and having suicidal thoughts (10.71%) were the less commonly reported psychological challenges. One study reported that approximately 50.6% of the studied population was affected by at least one mental health problem during the pandemic<sup>8</sup>.

One of the qualitative papers further reported HCWs experiencing ambivalence during the early stage, emotional exhaustion during the middle stage, and energy renewal during the late stage of the COVID-19 timeline<sup>35</sup>. It was also found that nurses reported negative emotions during the early stage which gradually declined. The prevalence of psychological challenges as reported in the papers is shown in Table 3.

**Table 2: Characteristics of Included Studies**

STUDY AUTHOR	STUDY DESIGN	STUDY POPULATION	SETTING	NUMBER OF PARTICIPANTS	AGE OF PARTICIPANTS (YEARS)	MMAT SCORE (%)
Wu et al. (2020) <sup>14</sup>	Quantitative non-randomized (Cross sectional)	Healthcare/ Frontline Medical Staff	Designated hospital for COVID-19	120	(≤25 to ≥59)	50%
Dong et al. (2020) <sup>10</sup>	Quantitative non-randomized (Cross Sectional) - Convenience Sampling	Healthcare/ Second Line Medical Staff [ nurses, doctors, technicians & health administrators]	China	4618	(≤25 to ≥59)	50%
Munk et al. (2020) <sup>8</sup>	Quantitative non-randomized (Cross sectional)	General Population and Members of Justus-Liebig University of Giessen	Germany	949	≥18 Average = 28.9	50%
Rettie et al. (2020) <sup>20</sup>	Quantitative non-randomised (Cross sectional)	General population	United Kingdom	842	≥18	50%
Park et al. (2020) <sup>21</sup>	Quantitative non-randomised (Longitudinal study)	General population	United States	1015	≥18	25%
Rodriguez et al. (2020) <sup>13</sup>	Quantitative non-randomized (Cross Sectional)	General population	United States	754	≥18	75%
Umucu et al. (2020) <sup>22</sup>	Quantitative non-randomized (Cross Sectional)	General population	United States	269	≥18, Mean = 39	25%

Savitsky et al. (2020) <sup>9</sup>	Quantitative non-randomised (Cross sectional)	Healthcare/ Nursing students (1st year - 4th year)	Israel	244	≥18, Median = 25	50%
Salopek-Žiha et al. (2020) <sup>23</sup>	Quantitative non-randomized (Cross Sectional)	Healthcare Workers (Nurses and Physicians)	Croatia	124	≥18 (≤30 to ≥61)	75%
Suso-ribera et al. (2020) <sup>24</sup>	Quantitative non-randomized (Cross Sectional)	General population	Spanish	2683	≥18, Mean = 34.86	75%
Asmundson et al. (2020) <sup>6</sup>	Quantitative non-randomized (Cross sectional)	General population	United States and Canada	6854	≤18 to ≥94	75%
Chodkiewicz et al. (2020) <sup>25</sup>	Quantitative non-randomised (Longitudinal Study)	General Population	Poland	443	≥18	25%
Fullana et al. (2020) <sup>26</sup>	Quantitative non-randomized (Cross sectional)	General Population	Spain	5545	≥18, 35-40 years old for women & ≥50 years old for men	50%
Fu et al. (2020) <sup>27</sup>	Quantitative non-randomized (Cross sectional)	General Population	China	1242	≥18	50%
Guo et al. (2020) <sup>28</sup>	Quantitative non-randomized (Cross sectional)	General Population	China	2993	≥18	75%
Huang et al. (2020) <sup>29</sup>	Quantitative non-randomized (Cross sectional)	Radiology department healthcare workers	China	600	≥18	75%
Kang et al. (2020) <sup>30</sup>	Quantitative non-randomized (Cross sectional)	Medical and Nursing Staff	China	994	≥18	100%
Lee (2020) <sup>7</sup>	Quantitative non-randomized (Cross sectional)	General Population	America	775	≥18 Combined mean age = 32.72 (SD=9.35) years old	75%
Man et al. (2020) <sup>31</sup>	Quantitative non-randomized (Cross sectional)	Medical staff (COVID-19 versus non-COVID-19 departments)	Romania	115	≥18 Median age = 42 (Youngest = 25 and Eldest = 65)	75%
Taylor et al. (2020) <sup>32</sup>	Quantitative non-randomized (Cross sectional)	General Population	United States and Canada	6854	≤18 to ≥94	50%
Zacher et al. (2020) <sup>33</sup>	Quantitative non-randomized (Cross sectional)	General Population	Germany	979	≥18	100%
Balhara et al. (2020) <sup>34</sup>	Quantitative non-randomized (Cross sectional)	College Students	India	393	≥18 Average age = 19.6	75%

Zhang et al. (2020) <sup>35</sup>	Qualitative descriptive study	Nurses	China	23	≥18 Average age = 31.5	100%
Sun et al. (2020) <sup>36</sup>	Qualitative (Colaizzi's Phenomenological )	Healthcare Workers (Nurses)	First Affiliated Hospital of Henan University of Science and Technology, China	20	Average = 30.60 (Range ≥18 to ≥49)	100%
Innocenti et al. (2020) <sup>37</sup>	Commentary – Cross Sectional	General Population	Italy	1035	≥18	25%
Pahayahay et al. (2020) <sup>38</sup>	Mixed Methods - Survey	International Population	United States, Canada, Brazil, Europe, Turkey, Egypt, Ukraine, India, Sri Lanka, Thailand, Malaysia, Indonesia	685	≥18 to >65 years old	100%

**Table 3: Prevalence of Psychological Challenges**

NUMBER OF PAPERS (n=number of papers)	LIST OF STUDY TOOLS USED	PSYCHOLOGICAL CHALLENGES	PREVALENCE RANGE
12 <sup>[6,9,10,14,20,22,23,27,30,32,34,38]</sup>	<ul style="list-style-type: none"> <li>● Coronavirus Anxiety scale (CAS)</li> <li>● Depression Anxiety Stress Scales (DASS-21)</li> <li>● German version of the Short Health Anxiety Inventory</li> <li>● Huaxi Emotional-Distress Index (HEI) German version of the Primary-Health-Questionnaire</li> <li>● Patient Health Questionnaire-4 (PHQ-4)</li> <li>● Self-rating Anxiety Scale (SDS)</li> <li>● Seven-item General Anxiety Disorder (GAD-7)</li> </ul>	Anxiety	16.92% - 65%
12 <sup>[6,10,14,20,22,23,26,27,28,30,32,34]</sup>	<ul style="list-style-type: none"> <li>● Depression Anxiety Stress Scales (DASS-21)</li> <li>● Huaxi Emotional-Distress Index (HEI)</li> <li>● German Version of the Beck-Depression-Inventory</li> <li>● Patient Health Questionnaire-4 (PHQ-4)</li> <li>● Patient Health Questionnaire (PHQ-8)</li> <li>● Patient Health Questionnaire-9 (PHQ-9)</li> <li>● Self-rating Depression Scale (SAS)</li> </ul>	Depression	11% - 72.60%



8 <sup>[6,13,21,23,25,29,31,33]</sup>	<ul style="list-style-type: none"> <li>● Cohen's, Kamarck's, and Mermelstein's Perceived Stress Scale (PSS10)</li> <li>● Depression Anxiety Stress Scales (DASS-21)</li> <li>● The Chinese Perceived Stress Scale</li> <li>● Profile of Mood States</li> <li>● Perceived Stress Questionnaire-8 (PSQ-8)</li> </ul>	Stress	10% - 24.67%
5 <sup>[14,27,28,30,37]</sup>	<ul style="list-style-type: none"> <li>● Pittsburgh Sleep Quality Index (PSQI)</li> <li>● 7-item Insomnia Severity Index (ISI)</li> <li>● The Athens Insomnia Scale (AIS)</li> </ul>	Sleep Disorder	30%- 88.34%
2 <sup>[14,28]</sup>	<ul style="list-style-type: none"> <li>● PTSD Checklist-Civilian Version (PCL-C)</li> <li>● Post-Traumatic Stress Disorders (PTSD) Checklist</li> </ul>	Post-Traumatic Stress Disorder (PTSD)	79.6%
1 <sup>[6]</sup>	Patient Health Questionnaire-4 (PHQ-4)	Mood Disorder	58.40%
2 <sup>[23,31]</sup>	Depression Anxiety Stress Scales (DASS-21)	Worried	67%
1 <sup>[27]</sup>	The Patient Health Questionnaire (PHQ-9)	Negative Emotions	29.8%
3 <sup>[7,10,25]</sup>	Goldberg General Health Questionnaire (GHQ-28)	Suicidal Thoughts	10.71%
1 <sup>[8]</sup>	Goldberg General Health Questionnaire (GHQ-28)	At least 1 mental disorder	50.6%
1 <sup>[9]</sup>	Qualitative Descriptive Study	Early Stage – Ambivalence  Middle Stage – Emotional Exhaustion  Late Stage – Energy Renewal	-
1 <sup>[36]</sup>	Qualitative Phenomenological (Colaizzi's)	Fatigue, discomfort, helplessness, fear, and anxiety	(n=20) reported a significant number of negative emotions in the first week which peaked when they entered the negative pressure ward for the first time, which then gradually declined.

### 3.5 Coping Strategies/ Themes

All reported coping strategies were grouped into three broad themes namely adaptive, maladaptive, and general. A total of 22 papers reported adaptive coping strategies which comprised multiple focused sub-themes such as emotion (n=10), problem (n=7), appraisal (n=5), avoidant (n=2), social (n=2), active (n=3), and passive (n=2). A total of 11 papers included maladaptive coping strategies as well. Gaming, self-blaming, ingestion of sleeping pills, and building resilience were used as coping strategies in four different papers; however, these did not fit into the two main themes<sup>14,22,29,34</sup>. Thus, these were grouped under the general theme.

HCWs applied adaptive methods specifically problem-focused (n=5), and emotion-focused coping strategies (n=5) to manage the psychological challenges. The general population resorted to adaptive, mostly emotion-focused strategies (n=5) as well as maladaptive coping strategies (n=9). Tertiary students mainly resorted to maladaptive strategies (n=2). The details of the coping strategies used are provided in Table 4.

**Table 4: Summary of the Coping Strategies and Themes**

STUDY POPULATION	COPING THEMES (n=number of papers)	COPING STRATEGIES
Healthcare Workers <sup>[10,14,23,29,30,31,35,36]</sup>	<b>ADAPTIVE</b> <ul style="list-style-type: none"> <li>● Problem Focused (n=5)</li> </ul>	<ul style="list-style-type: none"> <li>● Exercising</li> <li>● Healthy lifestyle</li> <li>● Healthy food intake</li> <li>● Resting/Sleep</li> <li>● Supplements/Herbs usage</li> <li>● Positive mindset</li> <li>● Use a strategy of a planned and analytical approach to the problem (stressor)</li> <li>● Use medical knowledge</li> <li>● Ways to alleviate their psychological reactions</li> <li>● Ways to help others alleviate their psychological reactions</li> <li>● Ways to seek help from psychologists or psychiatrists</li> </ul>
	<ul style="list-style-type: none"> <li>● Emotion Focused (n=5)</li> </ul>	<ul style="list-style-type: none"> <li>● Positive reassessment/refocusing</li> <li>● Media Usage</li> <li>● Self-Control</li> <li>● Acceptance</li> <li>● Writing diary and letters</li> <li>● Breathing relaxation</li> <li>● Meditation</li> <li>● Emotional expression</li> <li>● Venting</li> <li>● Self-Care</li> </ul>
	<ul style="list-style-type: none"> <li>● Appraisal Focused (n=1)</li> </ul>	<ul style="list-style-type: none"> <li>● Humor</li> </ul>
	<b>GENERAL</b> (n=2)	<ul style="list-style-type: none"> <li>● Resilience <ul style="list-style-type: none"> <li>- Optimistic</li> <li>- Toughness</li> <li>- Strength</li> </ul> </li> <li>● Self-blame</li> </ul>
General Population <sup>[6,7,8,13,20,21,22,24,25,26,27,28,32,33,37,38]</sup>	<b>ADAPTIVE</b> <ul style="list-style-type: none"> <li>● Problem Focused (n=2)</li> </ul>	<ul style="list-style-type: none"> <li>● Cognitive coping behaviours</li> <li>● Prosocial coping behaviours</li> <li>● Threat appraisals</li> </ul>
	<ul style="list-style-type: none"> <li>● Emotion Focused (n=5)</li> </ul>	<ul style="list-style-type: none"> <li>● Positive reappraisal/reframing/ looking on the bright side/ certainty appraisals</li> <li>● Acceptance</li> <li>● Resilience</li> <li>● Planning</li> <li>● Distraction</li> <li>● Religious support</li> <li>● Use of emotional support</li> <li>● Use of instrumental support</li> <li>● Crying</li> <li>● Being angry</li> <li>● Yelling</li> <li>● Drinking</li> <li>● Smoking</li> <li>● Self-blame</li> </ul>
	<ul style="list-style-type: none"> <li>● Active (n=3)</li> </ul>	<ul style="list-style-type: none"> <li>● Taking actions to improve the situation</li> </ul>

		<ul style="list-style-type: none"> <li>● Healthy diet</li> <li>● Following a routine</li> <li>● Take the opportunity to pursue hobbies/Participating in activities</li> <li>● Reading</li> <li>● Exercise</li> <li>● Participating in activities</li> <li>● Talking with others about worries</li> </ul>
	● Appraisal (n=3)	● Humour
	● Avoidant Focused (n=2)	<ul style="list-style-type: none"> <li>● Not reading news/updates on COVID-19 very often</li> <li>● Denial</li> <li>● Substance Use</li> <li>● Humour</li> </ul>
	● Passive (n=2)	<ul style="list-style-type: none"> <li>● Sitting/laying</li> <li>● Text messaging</li> <li>● Internet surfing</li> <li>● Seeking COVID-19 information</li> <li>● Watching TV/series/movies</li> <li>● Escapism</li> <li>● Smoking</li> <li>● Depending on others</li> </ul>
	● Social Focused (n=2)	<ul style="list-style-type: none"> <li>● Spending time connecting with people</li> <li>● Media usage (Facebook &amp; Twitter)</li> <li>● Emotional Support</li> <li>● Religion</li> <li>● Talking with others about worries</li> <li>● Not talking to relatives/ friends very often (Negative Social Coping)</li> </ul>
	<b>MALADAPTIVE</b> (n=9)	<ul style="list-style-type: none"> <li>● Self-Distraction</li> <li>● Increased alcohol consumption</li> <li>● Venting</li> <li>● Denial</li> <li>● Substance use</li> <li>● Self-blame</li> <li>● Behavioural disengagement</li> <li>● Overeating</li> <li>● Negative religious coping</li> <li>● Extreme hopelessness</li> <li>● Passive suicide ideation</li> </ul>
	<b>GENERAL</b> (n=1)	● Sleeping Pills
College Students <sup>[9,34]</sup>	<b>ADAPTIVE</b>	● Humour
	● Appraisal Focused (n=1)	
	<b>MALADAPTIVE</b> (n=2)	<ul style="list-style-type: none"> <li>● Usage of alcohol</li> <li>● Sedative drugs</li> <li>● Excessive eating</li> </ul>
	<b>GENERAL</b> (n=1)	● Gaming

#### 4. Discussion

This systematic review aims to synthesise the research findings on the psychological challenges faced by adults during COVID-19 as well as the coping strategies used. The psychological challenges faced by adults during COVID-19 in 2020 have been documented considerably. However, publications addressing the corresponding coping strategies were scarce[23,24]. Hence, this review was conducted to further comprehend the psychological challenges and the coping strategies used to overcome the challenges among HCWs, general population, and college students. It was found that anxiety, depression, stress, and sleeping disorders were the

four most common and highly reported psychological challenges among the three population groups studied. PTSD was reported in some isolated cases.

A high prevalence of anxiety (16.92% - 65%), depression (11% - 72.6%), stress (10% - 24.67%), and sleep disorders (20.6% - 88.34%) was reported among the public due to various causes related to the outcome of the pandemic. Similar findings were discussed in a systematic review looking at the global prevalence of psychological challenges faced during the early pandemic from 32 countries<sup>39</sup>. In this review, it was found that 50.6% reported at least one mental disorder. This is consistent with the review by Thavorn, K. et al which had a global prevalence estimate of 28.0% for depression; 26.9% for anxiety; 24.1% for post-traumatic stress symptoms; 36.5% for stress; 50.0% for psychological distress; and 27.6% for sleep problems. Due to the pandemic, a study conducted in the United Kingdom comparing mental health pre and during lockdown was shown to increase from 18.9% to 27.3%<sup>16</sup>. This implies the rising trend in mental health problems among the adult population post-lockdown.

Some causes that contributed to these psychological challenges were identified across different population groups. Among HCWs, fear, risk of infection, lack of and discomfort in using personal protective equipment (PPE) for a long duration, and sleep deprivation were common causes increasing the psychological challenges<sup>14,31,35</sup>. In the general population, extensive use of media and social withdrawal contributed to their psychological challenges<sup>6,8,32</sup>. Papers focusing on tertiary students found that the uncertainty of the adverse impact of COVID-19 on their future academic and career prospects<sup>9,33</sup> posed considerable mental health challenges to them. Fear was one of the frequently identified driving factors of psychological challenges among the population studied in this paper.

Overall, the results obtained provided some preliminary evidence that COVID-19 related psychological challenges were contextual. Variation in the prevalence of psychological challenges was noticed due to socio-cultural backgrounds, genders, and education levels<sup>9,23,27,28,29</sup>. As most studies were conducted in China (n=8), the sociocultural background appeared as a limitation as the findings were partly specific and not representative of the worldwide population<sup>10,14,23,28,32,34,37</sup>. Alongside that, it was found that the term 'stress' was perceived differently according to cultural backgrounds which predisposes the findings to be irreplicable<sup>33</sup>. For example, in parts of Southeast Asia, such as Korea or Japan, academic success is given high importance as compared to Western countries. This is reflected in the degree of educational stress suffered by Southeast Asian students correlated to the reporting of students committing suicide because of poor educational performance. This is further worsened by the lockdown and online self-learning causing more distress for the younger generation of students. Hence the pandemic can be seen to have affected different countries to varying degrees caused by different stressors.

In some papers, the prevalence of mental health challenges was derived from self-reports rather than clinical evaluation, which may introduce bias to the collected data<sup>6,9,10,22,38</sup>.

In order to manage the foregoing psychological challenges, HCW mainly resorted to problem-focused and emotion-focused methods of adaptive coping strategies<sup>10,14,23,29,30,31,35,36</sup>. Exercising and acquiring a positive mindset were the commonest problem-focused strategies while positive reassessment and acceptance were the usual emotion-focused strategies used<sup>23,31</sup>. The general public, on the other hand, resorted to emotion-focused strategies of the adaptive theme, mainly by accepting the situation and through positive reappraisal<sup>22,31,33,36</sup>. They also resorted to maladaptive strategies such as self-distraction and increased alcohol

consumption<sup>7,13,25,32</sup>. Tertiary students used maladaptive strategies such as overeating, consuming alcohol and increasing intake of sedative drugs<sup>9</sup>. Some of the strategies above were found to contribute both positively and negatively in alleviating psychological challenges.

The most consistent findings disposing an individual to psychological challenges was having an increased fear of being infected by the virus across different populations. Females were more subject to psychological challenges compared to the male due to the overrepresentation of the gender<sup>9,27,29</sup>. Females used more emotion-focused coping strategies due to their negative outlook of the pandemic<sup>21,31</sup> as compared to men who used problem-focused coping strategies. The presence of pre-existing mental health issues was found to increase mental health challenges<sup>6,26</sup>.

This review has some limitations that could be addressed in future research. The timing of the snapshot is not assured to be representative of the sample as this review was conducted during the early stage of the pandemic, making the results obtained slightly premature. Moreover, there was significant variability in the methods of retrieving data in the reviewed papers (Self-Report and Recall Biases) due to cross-sectional design, lack of standardized psychometric tools, and the methods of participant recruitment (Convenience Sampling). It is recommended to conduct a longitudinal study to yield more concrete findings and reproducible data on the topic of interest. The psychological challenges faced by people from different socio-economic strata were not reported in the reviewed papers and are considered as one of the gaps present. Inequality between the rich and poor should be emphasised as the challenges and coping strategies faced by both social classes differ during the pandemic. There are no accurate reports on the prevalence of psychological challenges concerning gender which is also considered a research gap. Lastly, another gap identified in this review is the presence of considerable heterogeneity in methods of prevalence reporting and tools for reporting depending on each country. This is because a golden standard for the collection of data for mental health disorders has not been established<sup>41</sup>. Added the fact that the true prevalence of mental health is usually underestimated considering the underreporting and underdiagnosis of mental health problems<sup>6</sup>. The main idea of the research is to help predict the pattern of the future healthcare burden on mental health challenges in the coming days. This can aid the healthcare industry to foresee the needs of the population and have better aid to help overcome them. This data also helps policy makers to plan and allocate appropriate resources to reduce the burden on the healthcare sector.

## 5. Conclusion

There is a handful of documentation on psychological challenges faced by adults aged 18 and above during the pandemic. However, these publications did not address the coping strategies as well. Hence, it necessitates conducting a comprehensive search that is inclusive of both psychological challenges and coping strategies during COVID-19. This finding will contribute to the healthcare system in terms of planning and executing a modus operandi in addressing this raised issue. This study would also be useful to identify effectual coping strategies, especially for adults undergoing psychological constraints due to COVID-19. The psychological challenges caused by the pandemic are devastating to people from all walks of life. This review reported anxiety, depression, stress, and sleeping disorders as the commonly observed psychological challenges among people during COVID-19. Managing the challenges effectively is solely reliant on the type of coping strategies adapted and the resilience of the individual. People resorted mostly to adaptive (Emotion-Focused and Problem-Focused) and maladaptive strategies to cope with psychological challenges encountered. Further research

should aim to identify how effective the coping mechanisms are in dealing with psychological challenges.

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