

**Interventions to Mitigate COVID-19
Related Mental Health Risks for Those
with Pre-Existing Chronic Health
Conditions:**

**A Knowledge Synthesis Based on the
English and Chinese Language Literature**

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Project Team Members:

Simon Carroll, Department of Sociology, University of Victoria
Jasmine Chen, Health Science Program, Kwantlen Polytechnic University
Richard Cheung, Health Science, McMaster University
Benjamin Collins, department of Anthropology, University of Manitoba
Jake Colautti, Health Science, McMaster University
Carla D'Andreamatteo, University of Manitoba
Karen Davison, Health Science Program, Kwantlen Polytechnic University
Marcie Dolce, Patient Advisor
Esme Fuller-Thomson, Factor-Inwentash Faculty of Social Work, University of Toronto
Brandon Hey, Mental Health Commission of Canada
Kyobin Hwang, Health Science, McMaster University
Misha Ishtiaq, Health Science, McMaster University
Marya Jaleel, Mental Health Commission of Canada
Krystal Kelly, Mental Health Commission of Canada
Helena Kim, Health Science, McMaster University
Sophy Lin, Health Science Program, Kwantlen Polytechnic University
Shen (Lamson) Lin, Factor-Inwentash Faculty of Social Work, University of Toronto
Maura MacPhee, School of Nursing, University of British Columbia
Laura Mullaly, Mental Health Commission of Canada
David Murray, Psychology, Kwantlen Polytechnic University
Shaheer Nadeem, Health Science, McMaster University
Ian Patton, Patient Advisor
Arun Ravindran, Campbell Family Mental Health Research Institute, The Centre for Addiction and Mental Health
Ron Remick, Lookout Housing and Health Society and Mood Disorder Association of British Columbia
Zachary Rezler, Health Science, McMaster University
Lynda Robson, Patient Advisor
Breshna Saidi, Health Science, Kwantlen Polytechnic University
Vicki Smye, Arthur Labatt Family School of Nursing, Western University;
Lorna Stabler, Cardiff University
Lori Stuart, Patient Advisor
Vidhi Thakkar, Health Science, Kwantlen Polytechnic University
Chaoqun (Cherry) Xu, Health Science, McMaster University
Sammah Yahya, Health Science, McMaster University

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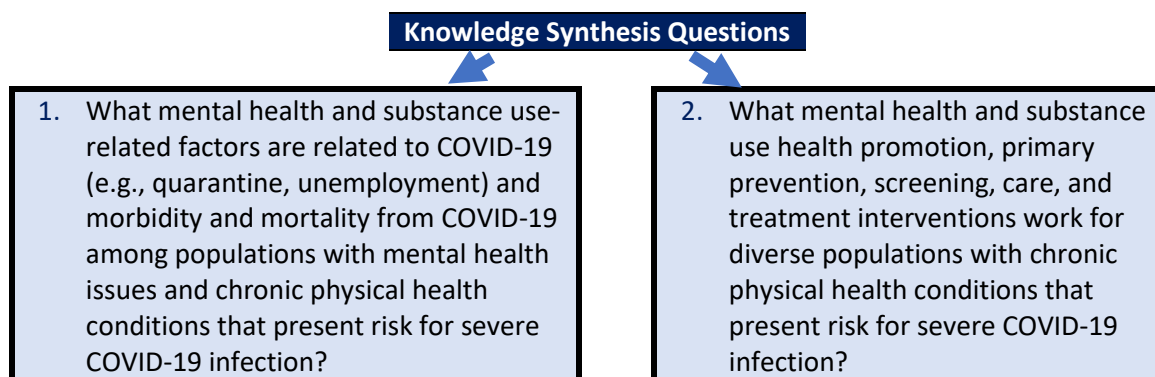
Glossary of Selected Key Terms

Chronic condition self-management	Self-management program is a structured program applied at the individual or group level that explicitly aims to improve the way individuals self-manage their chronic conditions, optimize their health, and live well. They may be delivered in a number of ways including face-to-face, by telephone, or on a computer. ¹
Collaborative care	Multi-professional approaches, that employ structured management, scheduled follow-up, and enhance inter-professional communication. ²⁻⁴
Comorbidity	Refers to the co-occurrence of at least one mental and at least one physical disease or disorder in the same person, regardless of the chronological order in which they occurred or the causal pathway linking them. ⁵
Digital health	This is a broad term used to refer to the information technology/electronic communication tools, services, and processes used in health services delivery.
Diverse populations:	These are populations that may need different health services and supports to foster their physical and mental health. They include immigrant, refugee, ethnocultural and racialized communities, First Nations, Inuit and Métis, 2SLGBTQ+, individuals living in rural or remote communities, those earning limited income, and older adults.
Frailty	The Canadian Frailty Network defines frailty as a medical condition of reduced function and health in older individuals. It often includes several features such as inactivity, poor nutrition, social isolation or loneliness, and the use of multiple medication.
Non-communicable diseases (NCDs)	NCDs, often referred to also as chronic diseases, last for at least 3 months, are not passed between people, and are progressive.
Mental health problems or illnesses:	Mental health problems or illnesses include a broad range of conditions that affect one's mood, thinking, and/or behaviour. This report includes information about depressive and anxiety disorders, bipolar and related disorders, schizophrenia spectrum and other psychotic disorders, trauma- and stressor-related disorders, substance use and addictive disorders (see separate definition), and eating disorders. In addition, common mental health symptoms or problems such as depression and anxiety are discussed.
Social prescribing	Social prescribing is term used to describe the referring people, usually with chronic health conditions, to different types of community support, including social events, fitness classes, and social services. This may be done by primary health care providers to supplement the delivery of care.
Substance use/ misuse and substance use disorders	Substance misuse is defined as the use of a substance for a purpose not consistent with legal or medical guidelines. ⁶ The criteria for substance use disorders are defined in the American Psychiatric Associations Diagnostic and Statistical Manual, 5 th Edition (DSM-5), and may be generally defined as symptom patterns that result from the use of a substance that one continues to take, despite experiencing problems as a result. ⁷

Project Summary

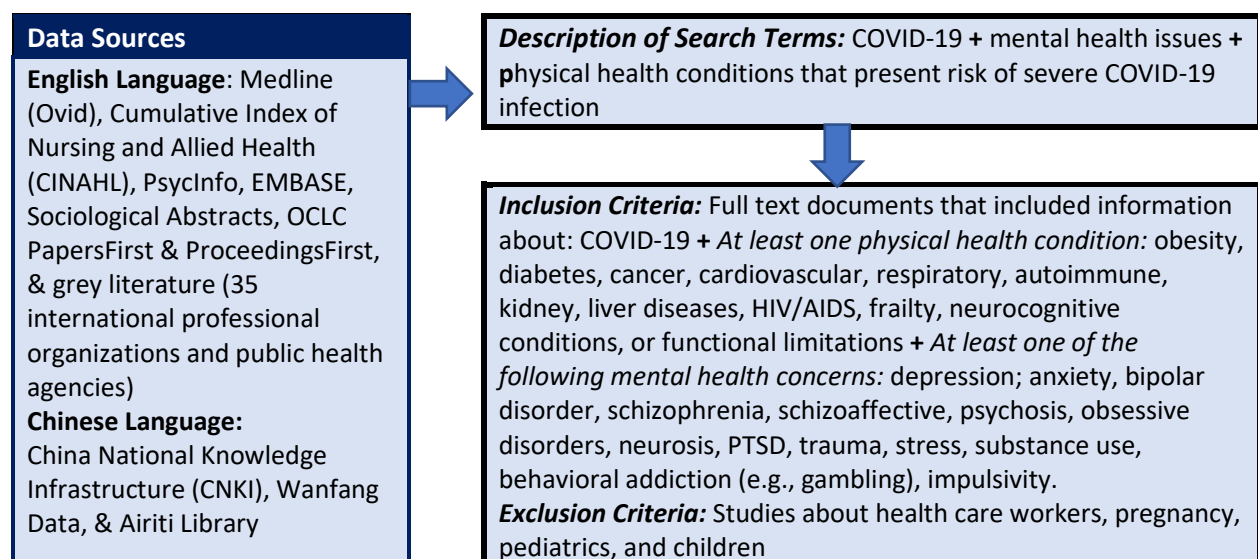
1. Background and Knowledge Synthesis Questions

In the absence of a readily available vaccine or cure for novel coronavirus pneumonia (COVID-19), it is of utmost importance to address the public mental health challenges associated with the pandemic. In particular, the COVID-19 pandemic has highlighted the need to assess the impact of factors such as quarantine and social distancing, altered health care access, social isolation, extended emergency state, unexpected unemployment, and complicated grief. These knowledge needs are particularly critical for those with pre-existing physical health conditions who are at elevated risk of severe infection from COVID-19. To help address the needs of various knowledge users, an integrated scoping and rapid realist review was conducted to capture evidence about what interventions could help to mitigate mental health and substance use responses among those with pre-existing health conditions, including vulnerable subgroups facing social and economic barriers, in the context of the COVID-19 pandemic.



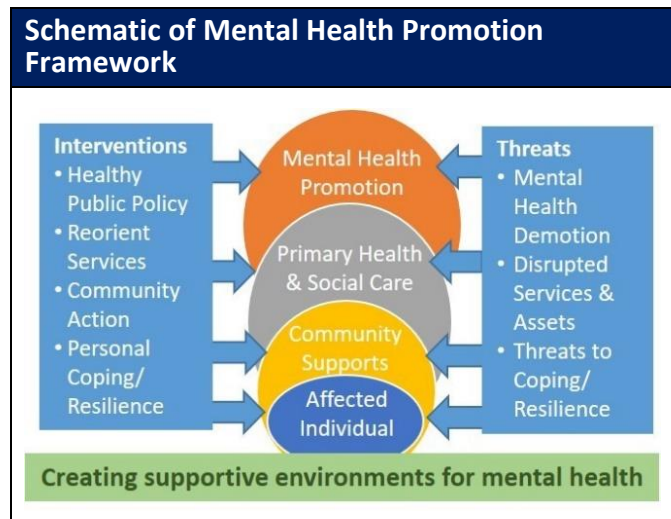
2. Approach

A scoping review to gather information about mental health and substance-use related concerns associated with COVID-19 among populations with different physical health conditions was undertaken based on the following strategy:



Data Extraction: Literature sources from all database searches were reviewed in Covidence. Abstracts and full texts were screened by two reviewers. The rigour and relevance of the studies were assessed by applying standard quality appraisal tools.

Realist Approaches: Members of the team reviewed the extracted literature in the context of broader writings about mental health promotion. As a guide, a socio-ecological mental health promotion framework (see schematic) constructed by the project team was applied to help determine what appeared to be key mechanisms that link micro, meso, and macro-levels of the socio-ecology of mental health promotion. Using completed extractions from the scoping review, Context-Mechanism-Outcome configurations (CMOs) were constructed to better understand and explain why interventions work, or not, and to generate guiding principles.



3. Findings from the Scoping Review

The English literature searches yielded a total of 4821 articles of which 65 were deemed eligible for full data extraction. The Chinese literature searches yielded a total of 410 articles of which 46 underwent full data extraction and 19 were deemed to be of sufficient quality to include in the scoping review.

Overview of Scoping Review Results: Given that mental health results from the interplay of various factors, efforts in which to mitigate mental health or substance use responses must be multi-faceted. Examples from the scoping review included:

Policy and Education Targets

- Examining policies that address the various determinants of health such as income, employment, and education to better support human capacity, coping, and resilience
- Further developing health literacy to help people have the skills to critically assess different forms of health information disseminated through various media channels

Health Care Delivery Targets

- Developing and implementing different forms of service delivery including telehealth
- Conducting mental health screening using appropriate tools in different populations
- Offering social prescribing as a complement health care services that can help foster self-efficacy and personal sense of control
- Establishing more integrated and collaborative care models with stepped care approaches that can adapt to crisis situations such as medical pandemics
- Examining service delivery alternatives such as grouped medical visits for those with the same health conditions. This could be done in online environments to expand service capacity
- Providing flexible services such as home visits and extended hours

- Developing health care plans based on individual and family centred care as well as shared decision-making
- Augmenting standard care with self-care and lifestyle interventions, peer support, and psychological first aid-oriented approaches offered by para-professionals
- Offering digital applications. Exemplars included videoconferencing, text messaging, smartphone-based applications, health education delivered in online platforms, mobile apps as an adjunct to telehealth to monitor symptoms related to trauma, insomnia and cognition, and use of social media platforms by paraprofessionals, peer helpers, and professional organizations
- Exploring digital reality applications such as virtual reality to help foster more of a sense of psychological presence during sessions with practitioners that are done remotely
- Adapting patient navigator programs to help individuals with physical and mental health needs to easily interact with the health system as well as provide social and economic supports
- Offering psychological interventions to those with mental health problems such as cognitive behavioural therapy, mindfulness-base stress reduction, narrative therapy, and dialectical behaviour therapy

Health Care-Related Training Targets

- Fostering competency across practitioners to deliver mental health supports and trauma-informed care
- Training key people such as first responders or human resource managers to develop skills to identify individuals experiencing mental health issues, such as suicide ideation

While there were various suggested strategies to address mental health needs of those at risk of severe infection from COVID-19, there was limited evidence about their utility in the context of the pandemic.

Overview of Realist Approaches: In the specific context of the COVID-19 pandemic, five mechanisms (simple rules) were identified as necessary for the operation of many of the interventions highlighted in the scoping review. These mechanisms (simple rules) are trust and feedback, accountability and responsibility, power, resilience, and social connectedness. These mechanisms do not necessarily operate apart from each other, with some being necessary for the triggering of others.

4. Limitations and Recommendations

Limitations of the scoping review included:

- Most interventions discussed were not directly embedded in evidence specific to COVID-19
- Limited interventions to address the needs of diverse populations (e.g., immigrants, ethnocultural and racialized communities, First Nations, Inuit and Métis, 2SLGBTQ+ groups, individuals with disabilities, homeless and underhoused)
- Many studies included heterogeneous populations with multi-morbidities
- Literature emphasized reactions or responses during the COVID-19 pandemic to address mental health and substance use responses, rather than identifying proactive measures

As this knowledge synthesis has highlighted, there are many opportunities to move forward with different program, service delivery, policy, and investigative options that could better meet the mental health needs of those with pre-existing chronic physical health conditions that present risk of severe infection from COVID-19. Furthermore, these interventions which may be offered at different levels, from individual to broader societal inputs, need to be meaningfully adapted to the needs of diverse populations. The constructed socio-ecological mental health promotion framework used to guide the

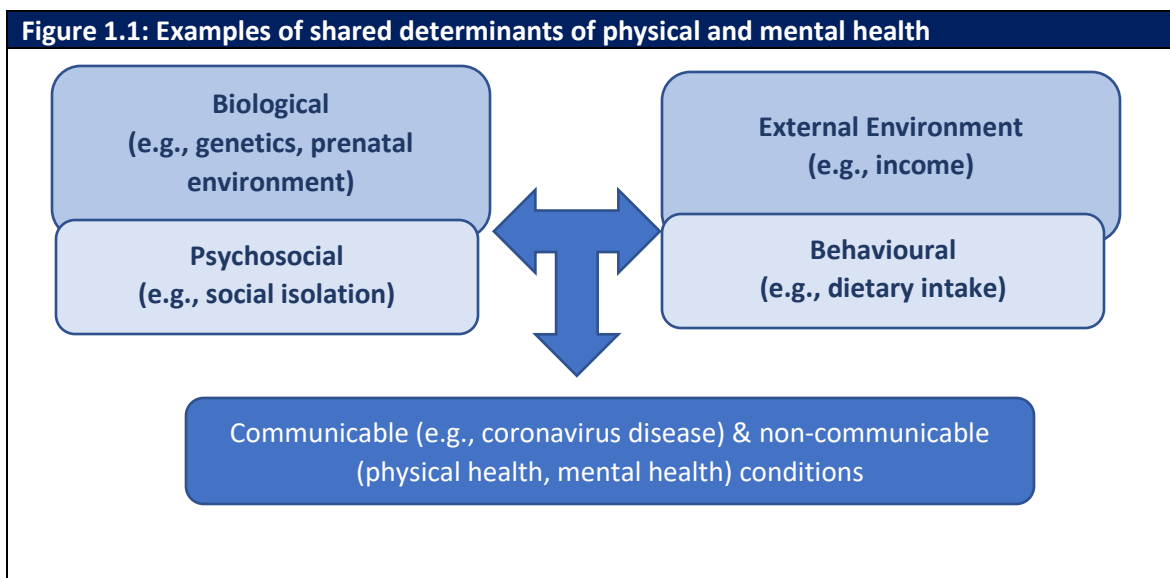
realist component of this knowledge synthesis helps to ascertain what interventions may work in specific contexts and for certain populations. Future research needs to be aimed at developing more robust multi-pronged interventions that may be evaluated in different contexts and among different populations, particularly those who may be most susceptible to mental health and substance use risks during public health crises, including medical pandemics. In particular, there is a need to advance understanding of the shared etiology of mental and physical health concerns to help develop more targeted interventions, evaluating the effectiveness of digital health applications, and determining what components of the collaborative care are most effective at addressing both physical and mental health needs, including substance use problems, in public health crises. Finally, any interventions which may be investigated should ideally be co-constructed with those that have lived experience, their families, and caregivers.

1. Background

In the absence of a vaccine or cure for novel coronavirus pneumonia (COVID-19), it is of utmost importance to address the public mental health challenges associated with the pandemic. In particular, the COVID-19 pandemic has elevated the need to address the various mental health impacts. Circumstances which may contribute to poor mental health include the impacts of quarantine, social distancing, altered health care access, social isolation, being in an extended and uncertain emergency state, unexpected unemployment, economic despair, and complicated grief.^{8,9} These knowledge needs are critical for those with pre-existing health conditions who are at elevated risk for both severe infection and mortality from COVID-19¹⁰ which has significance for mental health stressors and sequelae.¹¹⁻¹³ In particular, a need exists for strategies that can mitigate the mental health risks associated with preventative measures and acute / rehabilitative care for COVID-19.

Previous literature about means in which to reduce the psychological impact of pandemics is limited. The Economic and Social Research Institute in Dublin produced a working paper⁷ which considers pro-social behaviours, communication, risk perception, and the impacts of isolation on health behaviours. A survey conducted during the H1N1 influenza pandemic indicated the importance of precise information about control measures for reducing anxiety.¹⁴ A rapid review focusing on the impact of quarantine reported that voluntary quarantine contributes to less distress and long-term complications.¹⁵

While there are many shared determinants such as socioeconomic factors, health behaviours, psychological factors, and environmental factors that contribute to poor mental health, substance use, non-communicable and communicable diseases (Figure 1.1),¹⁶⁻¹⁸ little is known about which are distal or proximal indicators and their independent or interdependent relationships. Furthermore, there are knowledge gaps about these relationships and how they differ across diverse populations. A better understanding of types of supports that could be put in place to promote mental health for different individuals with pre-existing medical conditions would be helpful in shaping effective program and policy interventions that can foster population health, coping, and resilience.^{19,20}



Despite similarities with other pandemics and a rapid response by the health sector to reduce its impact, it is evident that there are knowledge gaps about how to effectively address mental health and substance use risks for those with pre-existing health conditions that increase vulnerability to severe COVID-19 infection. To help address the needs of various knowledge users (e.g., policy makers, program planners, health organizations and providers, end-users), an integrated scoping and rapid realist review was conducted to capture evidence about what interventions could reduce mental health and substance use risk among those with pre-existing health conditions, including vulnerable subgroups facing social and economic barriers.

2. Knowledge Synthesis Questions

The following questions formulated by the project team were used to guide the knowledge synthesis:

- i. What mental health and substance use-related factors are related to COVID-19 (e.g., quarantine, social distancing, unexpected unemployment) and morbidity and mortality from COVID-19 among populations with mental health issues and chronic physical health conditions that present risk for COVID-19 infection?
- ii. What mental health and substance use health promotion, primary prevention, screening, care, and treatment interventions work for diverse populations with chronic physical health conditions that present risk for COVID-19 infection?

3. Approach

This knowledge synthesis involved two approaches. First, a scoping review was completed to gather information about mental health and substance-use related concerns associated with COVID-19 among the identified populations (Obj. 1). Second, scoping review methods were integrated with rapid realist approaches to gather information about the context and processes that link mental health and substance use concerns related to pandemic mitigation measures and COVID-19 (Obj.2-3). Realist review approaches encourage iterative searching that begins with a broad direction, is refined through progressive focusing, and responds flexibly to emerging findings relevant to inform mental health and substance use response to COVID-19.²¹

3.1 Search Strategy

The literature search aimed to locate English and Chinese Language studies since December 2019 when the Wuhan Municipal Health Commission in China, reported a cluster of cases of pneumonia in Wuhan, Hubei Province that were later identified as severe acute respiratory syndrome (SARS-CoV-2) coronavirus 2. This knowledge synthesis process was iterative and involved collaborative discussions with all team members on a regular basis. The search strategy is summarized as follows.

3.1.1 Database Searches

English Language Literature Data Sources:

Academic	Grey Literature Sources	
<ul style="list-style-type: none">• MEDLINE (Ovid)• Cumulative Index of Nursing and Allied Health (CINAHL)• PsycInfo• Sociological Abstracts• EMBASE	<ul style="list-style-type: none">• OCLC PapersFirst and OCLC ProceedingsFirst• Action Hepatitis Canada• Alzheimer's Society of Canada• Anxiety Disorders Association of Canada• Asthma Canada• Canadian AIDS Society• Canadian Association of Psoriasis Patients• Canadian Frailty Network• Canadian Liver Foundation• Canadian Lung Association• Canadian Mental Health Association• Canadian Nurses Association• Canadian Psoriasis Network• Canadian Psychological Association• Cardiac Health Foundation of Canada• Crohn's & Colitis Canada• Epilepsy Canada• Equally Well• Getty Publications	<ul style="list-style-type: none">• Heart and Stroke Foundation of Canada• International Credential Evaluation Service (ICES)• Medical Psychiatry Alliance• Mental Health International• Mental Health Foundation• MIND• Mood Disorders Society of Canada• Obesity Canada• Obsessive and Compulsive Disorder (OCD) Canada• Organization for Economic Co-operation and Development• Provincial/territorial health ministries (n=13)• Project Muse and Infobase• Saskatchewan Health Quality Council• Schizophrenia Society of Canada• Te Pou Matakana Whanau• University of California Press• World Health Organization

As part of the English literature search, other strategies which included cited reference checking (reference mining), communicating with personal contacts, particularly knowledge users, and reviewing existing COVID-19-related data (e.g., Outbreak Updates).

Chinese Language Literature Data Sources: The scoping review of the Chinese language studies relied on three bibliographic databases: including two largest databases from Mainland China: 1) China National Knowledge Infrastructure (CNKI); 2) Wanfang Data; and one database from Taiwan; and 3) Airiti Library.

3.1.2 Search Terms

Guided by the Arksey & O'Malley methodology for scoping reviews,²² a comprehensive literature search was undertaken that include the following terms:

English Language	Chinese Language
<p>Search terms related to COVID-19, mental health issues, and comorbid physical conditions (COVID-19 coronaviruses AND (Obes* or Diab* or Neoplas* or tumor or cancer or malignan* Cardiovasc* or heart* or coronary* or myocar* or stroke* or cerebrovas* or ischem* or Respir* or asthma or lung dis* Or pulmon* or chronic obstructive lung or chronic obstructive pulmonary or COPD or dyspnea or emphys* or bronchitis or Rheumatoid arthritis or systemic lupus erythematosus or multiple sclerosis or Guillain-Barre syndrome or demyelinating polyneuropathy or psoriasis or inflammatory bowel disorders or IBD or colitis or ulcerative colitis or crohn's or Kidney dis* or urol* or neph* or renal dis* or liver disease or hepatitis or HIV or AIDS or frailty or Neurocogn* or neurol* or dementia or amnestic or Alzheim* or Parkin* or epilepsy) AND (Depress* or Anxiety or Bipolar, Mania or Schizophr*, Schizoaff* or Psychot*, Psychos* or Obsess*, Neurosis or Post-traumatic* or PTSD or Trauma or Stress or Substance* or addict* or compuls* drug abuse or drug dependence or Disrupt*, Impulse* or Conduct).</p>	<p>Search terms related to COVID-19, mental health issues, and comorbid physical conditions: 新型冠状病毒肺炎 (COVID-19) AND (心理健康 (mental health) AND 慢性病 (chronic illness) or 肿瘤 (tumour) or 糖尿病 (diabetes) or 心脏病 (heart disease) or 哮喘 (asthma) or 神经 (nerve) or 关节炎 (arthritis) or 肠病 (enteropathy) or 肾病 (kidney disease) or 艾滋病 (AIDS) or HIV (HIV) or 衰弱症 (frailty) or 肥胖症 (obesity) or 基础疾病 (underlying disease) or 既往疾病 (past disease)).</p>

It was assumed that information specific to diverse populations (e.g., immigrants, women) would be captured in the broad literature search. However, the project team believed that information about those who were homeless or underhoused would not be captured. Therefore, a separate literature search based on terms related to homelessness and COVID-19 was conducted. Those who are underhoused are frequently reported to have physical and mental health conditions.

3.1.3 Inclusion/Exclusion Criteria

For both the English and Chinese literature searches the following criteria were applied.

Inclusion criteria:

- i. English and Chinese-language articles from any country
- ii. full-text available
- iii. adults age 18 years+
- iv. must make reference to COVID-19 and:
 - a. *At least one of the following physical health conditions:*
Obesity; Diabetes; Cancer (similar terms tumor, neoplasm, malignancy); Cardiovascular disease (similar terms heart disease, coronary disease, myocardial infarction, stroke, cerebrovascular accident, transient ischemic attack, ischemic heart disease); Respiratory disease (terms such as asthma, lung disease, pulmonary disease, or chronic obstructive lung or chronic obstructive pulmonary or COPD or dyspnea or emphysema or bronchitis); Autoimmune conditions (Rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, Guillain-Barre syndrome, demyelinating polyneuropathy, psoriasis, inflammatory bowel disorders, IBD, colitis, ulcerative colitis, crohn's); Kidney disease (terms such as urological, renal, nephritis); Liver disease (terms such as alcoholic hepatitis, cirrhosis); Hepatitis; HIV or AIDS; Frailty; Neurocognitive conditions (terms such as neurological, dementia, amnesia, Alzheimers, Parkinsons, epilepsy); Functional limitations

Plus

- b. *At least one of the following mental health conditions or issues:*
Depressive Disorders, Depression; Anxiety Disorders, Anxiety; Bipolar Disorder, Mania; Schizophrenia, Schizoaffective; Psychotic Disorder, Psychosis; Obsessive Disorders, Neurosis; PTSD, Trauma, Stress; Substance use or addiction or compulsive drug abuse or drug dependence; Behavioral addiction (e.g., gambling); Disruptive, Impulse-Control and Conduct Disorders, impulsivity

Exclusion criteria:

- i. studies that focused on health care workers
- ii. studies that focused on pregnancy, pediatrics, and populations less than 18 years
- iii. studies that did not include the health conditions outlined in the inclusion criteria or COVID-19

3.1.4 Literature Search Dates

The English and Chinese literature searches were done at two time points. They were initially conducted between June 11-13, 2020. The search was updated on October 11, 2020 to include new articles from Oct 2020-present. Similar to the English literature search, the Chinese literature searches were initially conducted between June 29-July 07, 2020. The search was updated on October 17, 2020 to include new articles from July to October.

3.2 Screening, Data Extraction, and Quality Assessment

Screening: The files from all database searches were imported to Covidence.²³ English literature abstracts and full texts were screened by two reviewers and when there was disagreement a senior research (KD, VT, SL) made the final decision. For the Chinese language literature, abstracts and full texts were screened by two reviewers (research assistants) who could read and speak Chinese fluently. When there was disagreement regarding the inclusion/exclusion between two reviewers, a senior researcher (KD, SL) made the final decision.

Quality Assessment: The rigour and relevance of the studies were assessed by applying quality appraisal tools for each identified study that underwent full text screening. Studies were assessed using relevant quality appraisal frameworks to determine if the data contributed to understanding about mental health and substance use-related factors related to COVID-19 and interventions that would prevent or mitigate mental health effects among those at risk for infection due to an indicated physical health condition. A number of recognized tools were used to assist with grading the quality of evidence, sorting, and grouping the research studies, and extracting the required data. For cohort studies, the STROBE checklist was used.²⁴ For RCTs, systematic reviews, and meta-analyses, the MOOSE checklist was applied.²⁵ For studies that used mixed methods, the Mixed Methods Appraisal Tool (MMAT) was used.²⁶

For all Chinese literature studies, the Mixed Methods Appraisal Tool (MMAT) checklist was used. The MMAT can be used to appraise qualitative, quantitative, and mixed method studies. The checklist consists of 22 items and starts with two screening questions to filter out the non-empirical studies that are not suitable for this appraisal tool. The remaining criteria are separated into 5 categories of study design: (1) qualitative; (2) quantitative randomized controlled trials; (3) quantitative non-randomized; (4) quantitative descriptive; and (5) mixed methods. The design of each empirical study was determined by team members based on the description provided by the MMAT user guide. Team members then rated the five criteria under each study design category as 'Yes,' 'No' or 'Can't tell' and calculated the study quality using percentages. Articles that met more than half of the criteria were considered to have sufficient quality for participation in the study. The first two screening questions of the MMAT should, however, always be answered positively. To evaluate grey literature sources, the AACODS (authority, accuracy, coverage, objectivity, date, significance) checklist²⁷ was used.

Data Extraction: Extracted primary evidence included systematic reviews, randomized controlled trials (RCTs), pseudo RCTs, comparative studies, case studies, epidemiological studies, qualitative research studies, expert opinion papers, descriptive studies, consensus articles, and relevant commentaries identifying interventions. After quality assessment, data extraction was conducted where information relevant from the article were entered into an Excel spreadsheet that was laid out using the PICOTS (Population, Intervention, Comparator, Outcome, Time, Setting) framework²⁸ and included other categories detailing quality assessment information. The data extraction was conducted by trained research assistants with oversight from senior research team members (KD, SL, VT).

3.3 Realist Approaches

For literature sources identified from the scoping review which provided in-depth information about how interventions interact with contexts and mechanisms to influence the effectiveness of strategies aimed at managing mental health comorbidities for those with physical health conditions that place them at risk of COVID-19 infection, rapid realist review methods²⁹ were applied. Members of the team

(SC, MM, LS, BC) reviewed the extracted literature in the context of broader writings about mental health promotion and guided the broader team's literature search activities.

To ensure consistency and transparency, specified definitions of important realist concepts (Table 3.1) were used to unpack and operationalise terms like 'context', 'mechanisms', and 'interventions' and how these interrelate.³⁰ Using completed extractions, Context-Mechanism-Outcome configurations (CMOs) were constructed to better understand and explain why interventions work, or not, and to generate guiding principles.

Table 3.1: Definitions of Realist Concepts Applied	
Intervention	interventions' implemented activities, strategies, and resources ³⁰ (e.g., health behaviour module)
Mechanism	what 'triggers' participants to want to participate, or not, in an intervention. Mechanisms usually pertain to cognitive, emotional, or behavioural responses to intervention resources and strategies, (e.g., participant feels enabled from skills development)
Context	an intervention's background or setting. Context includes the pre-existing organisational structures, cultural norms, history of the community, the nature and scope of pre-existing networks, and geographic location effects ^{31,32} (e.g., previous experience of organization co-conducting interventions with community partners)
Outcome:	intervention outcomes that can be either intended or unexpected ³⁰ (e.g. macro-level: well integrated services; meso-level: participants' engagement in health and social services; or micro-level: participants' health outcomes)

3.3.1 Mental Health Promotion Framework

The rapid realist review was guided by a Mental Health Promotion Framework (Figure 3.1) previously developed by members of the current team from a knowledge synthesis they conducted that focused on physical and mental health comorbidities in the context of their shared etiology, prevention, screening, and treatment. The framework provided guidance about which interventions work, for whom, how, to what extent and in which contexts. The levels of the framework are described in the following.

Level 1: Healthy Public Policy for Mental Health: Mental Health Promotion/Mental Health in All Policies (MHiAP)

People suffering from mental and physical health conditions have the potential to live a flourishing, joyful life and efforts must be instituted to promote and strengthen health assets, including structurally (social, economic, cultural) supportive environments, community resilience, and life coping skills.

A Program Theory for Mental Health in All Policies (MHiAP)

A MHiAP strategy → Intersectoral governance for mental health → Changes in policies (usually signaled by some sort of strategic document/plan) → policy actions (legislative, regulatory, budgetary/investment tools) to promote mental health → Impact on social determinants of mental health → Improved mental health outcomes (e.g. increased well-being, happiness, improved coping and resilience, reduced mental stress, reduced incidence of mental illness, reduced harms from substance misuse, reduced incidence of suicide).

Agenda Setting for a MHiAP Strategy

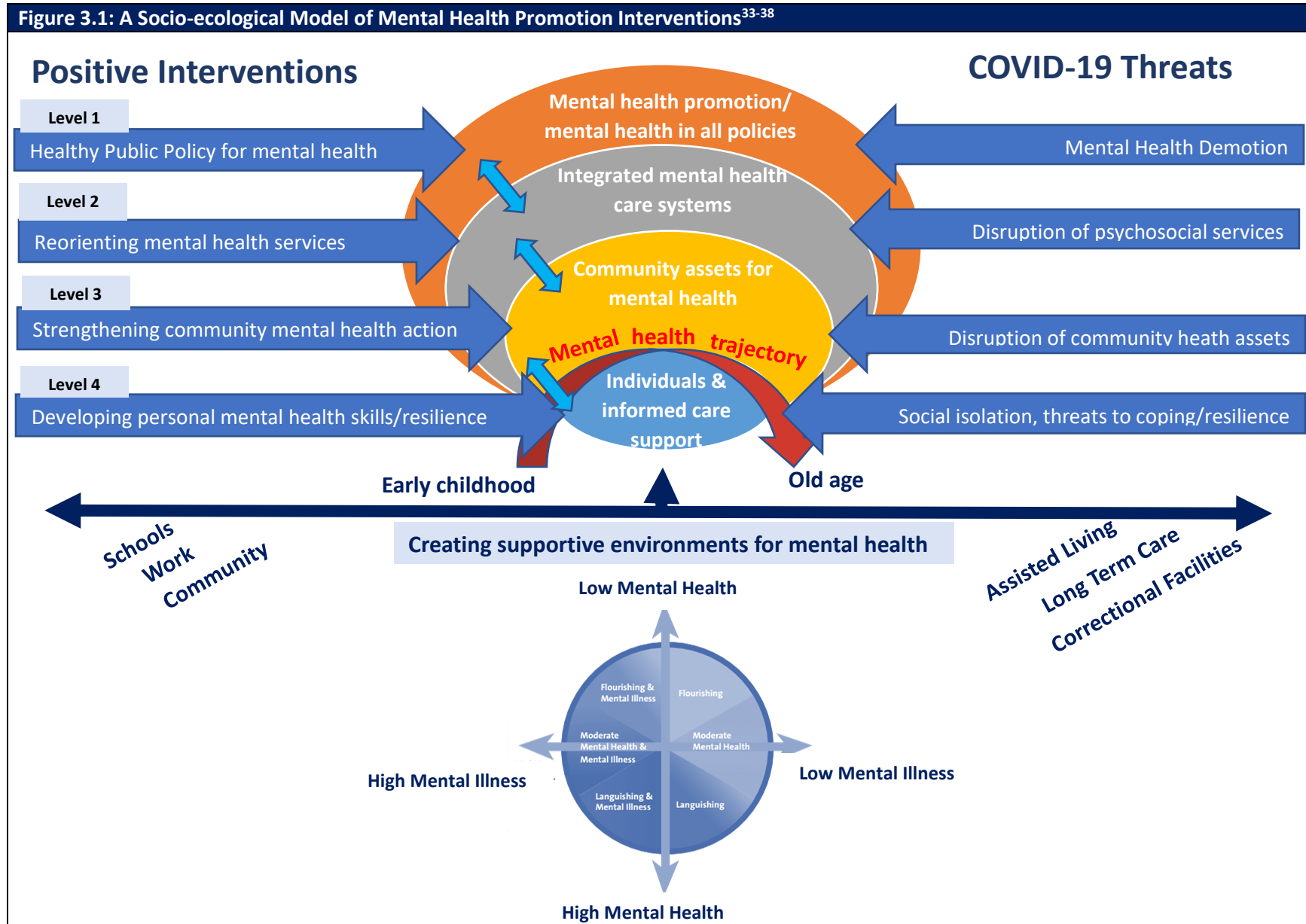
A 'Health in All Policies' (HiAP) approach to intersectoral collaboration has been gaining ground globally as a policy-level agenda aimed at addressing the wider social determinants of health. Advocates of HiAP highlight the importance of mental health promotion as central to successful HiAP approaches, and as a means to contribute to addressing health equity and inequality;^{33,34} conversely, advocates of mental health promotion have identified HiAP as a key policy framework for advancing mental health and physical health.^{35,36}

Based on a review of the literature on HiAP adoption and implementation, five simple rules for successful HiAP initiation are proposed:³⁷

1. Developing a shared language and fluency around a broader understanding of 'health' to include well-being and happiness, and general welfare;
2. Linking evidence for how HiAP initiatives are able to contribute to sustainable economies and sustainable health systems (both theoretical and empirical);
3. Having an 'entry point' to initiate an HiAP agenda;
4. Developing 'win-win' scenarios, goals and objectives across sectors;
5. Building and fostering long-term collaborative partnerships and engagement with intersectoral stakeholders.

In the Canadian context, not only is mental health well placed to be included in any HiAP policy agenda, it may in fact be the key entry point for raising the awareness and urgency of a HiAP approach at the federal and provincial levels. First, with the help of key policy elites, such as Senators Kirby and Wilson, and with the establishment of the MHCC, much of the foundational work in boosting awareness has already taken place. In this collective work, Canadian researchers, practitioners, policy-makers and people with lived experience have worked on developing a more inclusive, shared language around mental health, that by its nature tends to be less 'deficit-focused' and more positive and strengths-based.

Figure 3.1: A Socio-ecological Model of Mental Health Promotion Interventions³³⁻³⁸



Level 2: Reorienting Mental Health Services: Integrated Health and Social Services

Beyond the HiAP approach, a key role for public policy is to provide the regulatory, legislative, and financial context for the transformation of health and social services more broadly in society. For Canadians, ‘health reform’⁴² is an ongoing reality, that is complex and multi-faceted, with varying objectives across provinces, and widely differing governance strategies and outcomes. However, a common recurrent theme is the need to develop *integrated, collaborative systems of health and social care* to address the increasingly complex needs of an ageing population, with the concomitant multimorbidity of chronic diseases, both physical and mental being the driving force of this complexity. While these efforts require many transformational changes at the health and social service/organizational level, there is a strong role for high-level policy in successfully moving towards the ideal system. It is generally acknowledged, based on decades of research evidence,⁴³ that comprehensive primary health care, as originally outlined in the Alma Ata Declaration,⁴⁴ is the overarching framework for efficiently, effectively, and equitably organizing health and social services in order to produce optimum health in populations.

The **program theory** at this level is: by providing *universal financial coverage, under government control and regulation, with equitable distribution of services, comprehensive coverage, and with low or no co-payments*, then you attain “*greater first contact access and use, more person-focused care over time, greater range of services available and provided when needed, and coordination of care.*”⁴³ (p. 20).

Integrating care via simple rules allows relatively autonomous actors to use their contextual knowledge to come up with creative implementation solutions. At the integrated care level, there are some important contextual factors to consider. In order for clients to have a voice in decision-making (e.g., priority physical and social/mental needs), power differentials need to be ‘smoothed.’ Differential power dynamics impede effective collaborative practice among different service providers,⁴⁵ but they also relegate clients to a marginalized role with respect to decisions around their care needs. Physicians are considered the top of the healthcare hierarchy, and this conceptual approach can break the success of any reform program or change initiative.

Level 3: Strengthening Community Mental Health Action: Community Assets for Mental Health

At this systems level, community “assets” for mental health are the chosen foci, as they bring together three important theoretical approaches to mental health: mental health promotion;⁴⁶ the two-continuum approach;⁴⁷ and, the Canadian Mental Health Association’s framework for support approach.⁴⁸

The **program theory** at the community level is: by helping to *co-create, strengthen and sustain community mental health assets*, people can be supported to live happy, joyful, flourishing lives, whether or not they are suffering from mental or physical illness *and* they can be empowered to help co-produce and shape the mental health services they receive in community through context-appropriate co-produced mental health service planning.

Level 4: Developing Personal Health Skills/Resilience: Individuals, Families, and Informal Supports

This level examines the personal resources individuals utilize to help them develop resilience, hope, confidence, and well-being. There are many resources and interventions that aim at strengthening individual coping skills and resilience to bolster mental health and prevent the worst impacts of mental illness (e.g., self-aid, mutual aid, peer support networks).

The framework and review focused on applications in health and social services provided at macro, meso, and micro intervention levels (e.g. policy, design, implementation, delivery of services).

4. Results: English Language Literature

The results of the English language literature searches that were conducted in two phases are outlined in Figure 4.1.

4.1 Findings from the English Language Literature

The results of literature search in June included 873 articles from Embase, 192 articles from Medline, 1856 articles from CINAHL, 19 articles from PsycInfo, and 4 articles from Sociological Abstracts. The results of literature search in October 2020 included 230 articles from Embase, 974 articles from Medline, 609 articles from CINAHL, 60 articles from PsycInfo, and 4 articles from Sociological Abstracts.

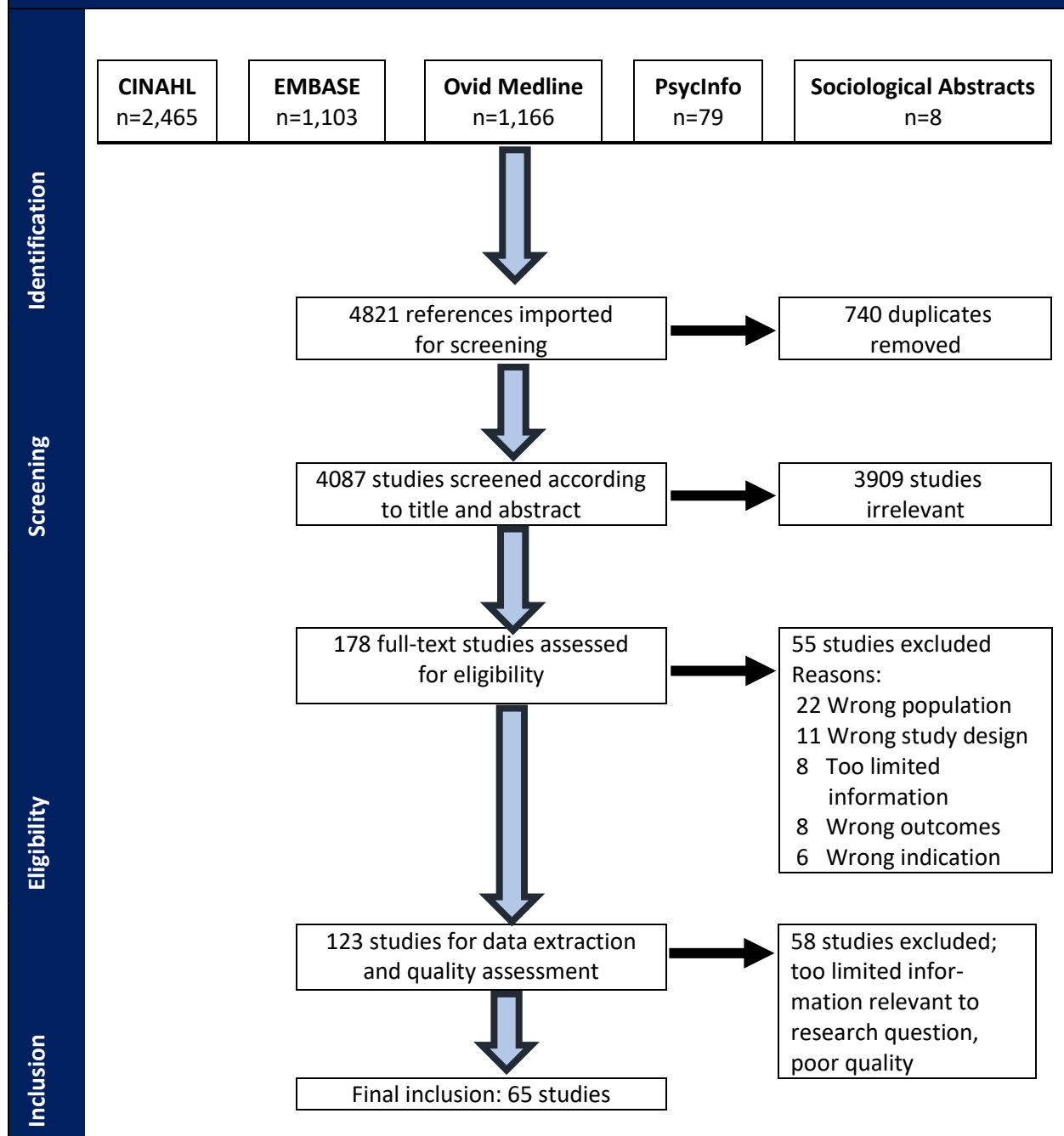
Of the 4821 references imported to Covidence for screening, 740 duplicates were removed. After abstract and title screening, 178 studies were subsequently selected to undergo full text screening. About one-third (n=55) of the articles were deemed ineligible due to reasons such as incorrect population, study design, outcomes, or indication. The number of studies that underwent quality assessment was 123 and slightly over 50% (n=58) were excluded as they provided too limited information pertaining to the research questions. A total of 65 articles were extracted.

Most of the English literature searches found were of lower quality evidence. Examples of quality issues included selection bias, social desirability bias, heterogeneity in the samples included, limited sample sizes, lack of control for confounders and effect modifiers, and use of convenience samples. The physical health conditions most frequently discussed included respiratory conditions, cardiovascular disease, Parkinson's disease, dementia, cancer, arthritis, obesity, epilepsy, HIV, and multiple sclerosis. The most frequent mental health issues discussed included depression, anxiety, post-traumatic stress, and stress. There were very few studies that focused on substance use.

The studies included a broad base of study designs and originated from 17 countries. The study designs included three systematic reviews (one with meta-analysis), one randomized controlled trial, 24 case-control, retrospective, mixed methods, or cross-sectional studies, three consensus statements, and 34 general reviews, commentaries, case studies, and opinion/perspective papers. Most studies were from the United States (n=18; 28%), followed by China (n=8; 12%), Italy (n=7; 11%), Spain (n=5; 8%), Canada (n=4, 6%), and India (n=3, 5%). Germany, Iran, and Poland each had two studies included. Egypt, Ukraine, France, Australia, Brazil, Ireland, and Greece each had 1 study included. One study was an international consensus that included several countries.

The data extraction tables summarizing the information derived from the 65 articles are located in Appendix A.

Figure 4.1: PRISMA Diagram of English Literature Search Results



4.2 Knowledge Synthesis Question 1: English Language Literature Results

Question: What mental health and substance use-related factors are related to COVID-19 (e.g., quarantine, social distancing, unexpected unemployment) and morbidity and mortality from COVID-19 among populations with chronic physical health conditions that present risk for COVID-19 infection?

The literature provided several insights about mental health and substance use related factors that are related to preventative measures for COVID-19. For example, many articles focused on the societal impacts of unexpected unemployment, social distancing, and quarantine with notable impacts on the economy. Cost estimates of changes in the community health workforce in England described in the literature suggested that it could entail losses of about \$2.2 billion.⁴⁹ The economic implications of COVID-19 have had a major mental health impact on the population including increased levels of substance use and anxiety.⁵⁰ Anxiety and depression were commonly reported to be comorbid in individuals who were diagnosed with COVID-19,^{51,52} as well as those with COVID-19 plus diabetes,⁵³ obesity,⁵⁴ multiple sclerosis,⁵⁵ and cardiovascular disease.^{56,57}

The results of a cross sectional study of 1074 Chinese individuals aged 14 to 68 years that compared the prevalence of anxiety and depression in Hubei, where the COVID-19 pandemic originated, with other regions of China,⁵⁸ suggested that mental health responses may vary by regions. Moderate and severe depression, as measured by the Beck Depression Inventory, were significantly more prevalent in participants from Hubei (18.1% and 11.4%, respectively) than in those from elsewhere in China (17.2% and 5.3%, respectively; $p=0.008$), although the prevalence of anxiety was not significantly different between the regions.

Depression appeared to vary by regions in China. It was reported to occur in those diagnosed with COVID-19 that had comorbid conditions such as diabetes, obesity, multiple sclerosis, and cardiovascular disease

In a systematic review⁵⁷ that examined long-term clinical outcomes in survivors of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) coronavirus infections after hospitalization reported pooled estimates of psychological comorbidities that included 38.8% (95% CI 30.9-47.3%) for PTSD, 33.2% (95% CI 19.8-50.1%) for depression, and 30.0% (95% CI 10.4-61.3%) for anxiety. However, it was unclear what proportion of this sample had physical or mental health concerns prior to diagnosis of SARS or MERS.

In reviews that focused on means to foster mental health among those with mental health concerns as well as common chronic physical conditions, the role of psychiatrists in diagnosing short-term effects were highlighted as well as the necessity to provide integrated health care.^{58,59} Recommended interventions included education and management of common symptoms of stress (e.g., sleep hygiene, relaxation), promoting precautionary measures to prevent COVID-19 infection, limiting exposure to misinformation disseminated in the popular media, promoting self-efficacy by problem solving, and advocating against stigmatization and marginalization.^{60,61}

In the following, the literature about the mental and physical health comorbidities in relation to COVID-19 is discussed according to types of mental health conditions or issues followed by substance use-related concerns.

4.2.1 Anxiety

Within the literature, anxiety was a common mental health concern that was associated with several physical health conditions such as multiple sclerosis, cardiovascular disease, Parkinson's disease, ischemia, respiratory conditions, cancer, and type 2 diabetes.⁵³⁻⁶⁴ In a retrospective cohort study reporting about anxiety among women accepting treatment for breast cancer in the context of COVID-19,⁵⁶ it was reported that there were significantly higher rates of procedure and surgical refusals ($p=0.0208$, $p=0.0065$ respectively) post COVID-19 when compared to pre COVID-19 that was attributed to heightened anxiety. However, the study could not account for potential confounders such as residency area. Understanding the reasons why individuals with breast cancers refused treatment for cancer is vital in addressing their needs about delays in treatment and screening.⁶⁰

In an article authored by the International Geriatric Radiotherapy Group,⁶⁰ it was noted that cancer patients, especially those who are older, may be denied supportive care because of their shorter life expectancy. The authors further noted that special considerations should be taken to prevent infection of older cancer patients and to provide them with adequate social support during their cancer treatment. Finally, to help prevent depression and anxiety among those with cancer, it was recommended that close monitoring through phone calls and telecommunication as well as to foster ways in which the family can provide psychological support.⁶⁰ In a cross-sectional study of Spanish patients diagnosed with COVID-19 and experiencing psychological distress and anxiety, risk factors such as age, socioeconomic status, and gender were described.⁵²

Some research studies discussed the impact of anxiety for those with conditions such as diabetes and obesity in the COVID-19 pandemic.^{49,61} For example, in a study by Nachimuthu et al.⁵³ researchers conducted an online-based pilot survey to study how people with type 1 and type 2 diabetes were coping with their diabetes during a COVID-19 lockdown. Among 100 participants, results showed that 92% had type 2 diabetes and 54% were males older than 65 years. More than two-thirds (65%) of the participants who were taking oral medications and insulin were not testing their blood sugar levels regularly. However, 80% mentioned they were exercising regularly and following dietary recommendations. Almost half of the respondents (40%) had mentioned they were anxious about the COVID-19 situation. This modest level of anxiety may also be due to the fact that most (73%) believed the current situation would improve in the very near future. Furthermore, about 8% of the study participants had known cardiac and kidney complications; details about their mental health were not reported.

In contrast to the survey of those with diabetes, results of an online survey among individuals who were waiting to have bariatric surgery or who had had the surgery ($n=800$), indicated much higher levels of anxiety (74.5%).⁶⁵ Most (72.3%) were aware that obesity was an important risk factor that could contribute to heightened symptom severity from COVID-19 infection. About one-third (~30%) of respondents had experienced weight gain, significantly more in the group of preoperative patients (43.8% vs. 22.7%; $p<0.001$). It is possible that high levels of anxiety were reported as only 20.9% had a possibility of continuing direct bariatric care. Among the sample, it was reported that 67.3% could have remote contact with a bariatric specialist via online consultations, teleconsultations, and social media meetings.⁶⁵ Severe anxiety was recorded in 25.5% of the cases and 4.8% of controls. Furthermore, 60.0% of the caregivers had anxiety with 4.2% demonstrating severe anxiety.

Several studies discussed different neurological conditions such as multiple sclerosis, Parkinson's disease, Alzheimer's dementia, epilepsy, dementia, cerebrovascular accidents, and cognitive impairment

and their association with increased levels of anxiety in the context of the COVID-19 pandemic⁶⁶⁻⁷¹ A survey that examined levels of anxiety among those affected by Parkinson's disease (PD), reported that there were higher rates of anxiety in this group (25.5%) compared to age and gender matched controls (4.8%).⁶⁶ Increased anxiety was also reported among those with more education. Although severity of anxiety was not correlated with duration of disease, a strong correlation between severity of anxiety in PD patients and fear of being diagnosed with COVID-19 was reported that was also significantly higher than the control group. Higher anxiety levels were also reported among those who were concerned about drug availability during the lockdown as well as in those with comorbid chronic medical conditions. In a qualitative study based on semi-structured telephone interviews of individuals with PD and controls that examined the adherence to preventative measures for COVID-19 it was reported that although most indicated they understood the preventive measures about 30% had an insufficient level of knowledge about the virus, a result that seemed independent of educational level, cognitive disorders, or depression.⁶⁸ Consistent with many studies this study reported effects on their physical health due to the pandemic such as reduced mobility and access to treatment, however, there was no exploration of how this impacted their mental health.

A promising intervention used for individuals with Alzheimer's disease who were experiencing behavioural problems was the use of FaceTime to interact with family members.⁶⁹ Results showed that these individuals enjoyed facetime sessions and seemed less anxious and agitated in terms of pacing less, had improved appetite, and that the sessions helped to create a sense of connectedness. In another study that examined a TV-AssistDem (Television-based Assistive Integrated Service to Support European adults living with mild Dementia or mild cognitive impairment) trial for older adults with mild cognitive impairment/dementia and anxiety, indicated that those with the TV-AssistDem trial demonstrated greater potential for cognitive stimulation.⁷⁰ TV-AssistDem provides for transmission of data and video-interaction with health professionals and provides services like reminders, health monitoring and cognitive stimulation. Further research studies are needed to evaluate the impact and positive health benefits and cost-effectiveness of these telehealth programs.

In a case-control study conducted in China by Hao et al.,⁷¹ predictors of psychological distress, as measured by the 6-item Kessler Psychological Distress Scale, among people with epilepsy (n=252) and controls (n=252) was investigated. Individuals with epilepsy had significantly higher K-6 scores than healthy controls and spent significantly more time following the COVID-19 outbreak (p 's<.001). Results of multivariate logistic regression analysis identified time spent paying attention to COVID-19 (odds ratio [OR] = 1.17, 95% CI 1.07-1.28) and diagnosis of drug-resistant epilepsy (OR = 0.28, 95% CI 0.13-0.62) as independent predictors of epilepsy. The authors suggested that those with epilepsy be encouraged to engage in other activities instead of extensively following media coverage about the COVID-19 outbreak.

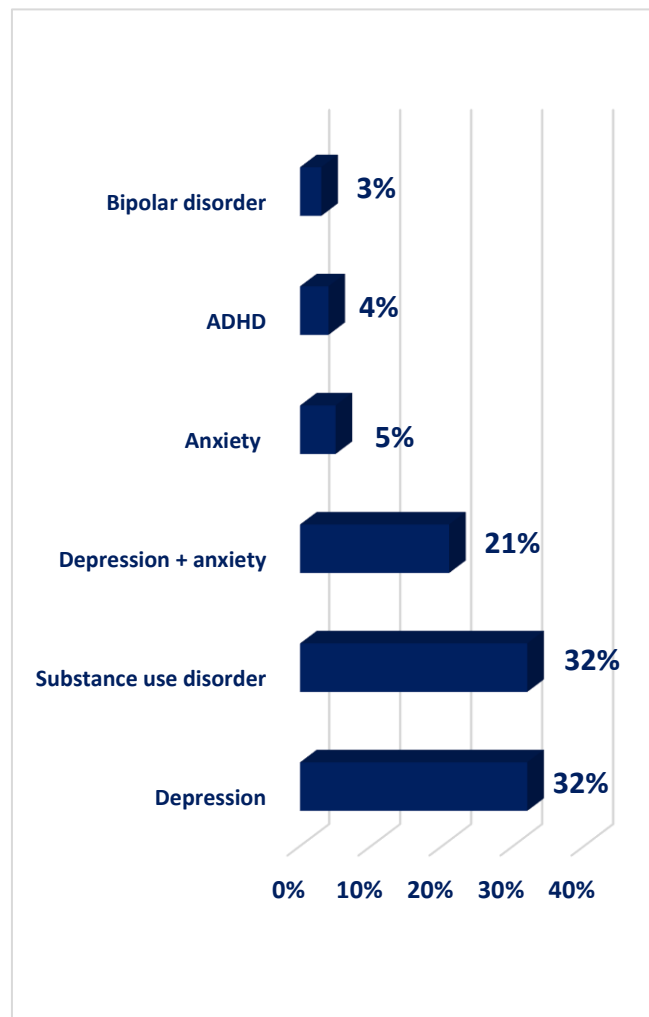
One study surveyed people diagnosed with genitourinary cancers in Germany regarding their perspectives about telehealth use during and after the pandemic.⁷² Of the 101 sampled, 92 responded to questionnaire and these individuals also had underlying conditions such as cardiac disease, diabetes, renal disease, obesity, pulmonary disease, or a compromised immune system. For most participants, their anxiety about cancer superseded that of contracting COVID-19 infection (p <0.001). Most opposed interruptions to their treatment and rated the use of telehealth during the current crisis highly. They also indicated a lack of preference for the use of telehealth beyond the pandemic. Most did not believe they were more susceptible to COVID-19 compared to the general population. This study suggests that telehealth interventions are valuable in helping provide mental health services in a pandemic and need to be further evaluated.⁷²

4.2.2 Depression

Many articles located in the English literature review focused on depression and comorbid physical health conditions such as HIV, cardiovascular disease, hypertension, obesity, respiratory conditions, asthma, Parkinson's disease, and peripheral inflammation.⁷²⁻⁸¹

In a study by Armbuster et al.,⁸¹ a multidisciplinary team providing care for those with HIV at the Johns Hopkins Intensive Primary Care clinic chronicled structural and logistic approaches used to address the social determinants of health that negatively impacted 76 youth impacted by HIV during the pandemic. Many were identified as being racial/ethnic, sexual, and gender minorities that had socioeconomic challenges. They also had a range of mental and behavioural health comorbidities that included depression (32%), anxiety (5%), depression and anxiety (21%), bipolar disorder (3%), schizophrenia (1%), ADHD (4%), autism (1%), intellectual delay combined with anxiety/depression (3%), or substance use disorder (32%). To help address the mental health needs of this diverse, the team instituted various procedures that included increased phone check-ins from the social worker and medical case worker to explain changes in clinic flow, rescheduling mental health appointments and assessing/addressing mental health and social needs, increasing the role of the social worker phone triage and management of heightened patient stress, anxiety and depression, as well as transitioning in-person mental health visits to telemedicine and flexible appointment times. The youth welcomed the increased availability to access a clinical staff readily by phone and were able to engage in youth advisory board meetings, however, it was identified by staff that there were challenges associated with missing those with acute needs due to the discontinuation of walk-in visit.⁷⁷

Figure 4.2: Prevalence estimates of mental health concerns in a sample of youth with HIV⁷⁷



ADHD=Attention Deficit Hyperactivity Disorder

In a study conducted by Umucu and Lee,⁷⁶ it was reported that perceived stress related to COVID-19 in a sample of adults (n=269) who had a disability or chronic condition was positively correlated with self-distraction, denial, substance use, behavioural disengagement, venting, planning, religion, and self-

blame. Results from the hierarchical regression analysis indicated that active coping, denial, use of emotional support, humour, religion, and self-blame were associated with well-being after controlling for demographic and psychological variables. Results of this study suggest that focusing efforts on positive coping may help mitigate stress associated with the COVID-19 pandemic among those with chronic conditions and disabilities.⁷⁶

According to results of a survey conducted in China, factors associated with greater psychological impact of the outbreak and higher levels of stress, anxiety, and depression included female gender, student status, and specific physical symptoms.⁷⁹ Poor or very poor self-rated health status was significantly associated with a greater psychological impact of the outbreak ($B=0.76$, 95% CI 0.02-1.49), and higher Depression Anxiety Stress Scale (DASS) measures on the stress subscale ($B=0.45$, 95% CI 0.02 to 0.88), anxiety subscale ($B=0.90$, 95% CI 0.22 to 1.58), and depression subscale ($B=0.65$, 95% CI 0.10 to 1.20) compared to those with very good or good self-rated health status. Among the 1210 survey respondents, 7.6% had a history of chronic illness which was significantly associated with higher Impact of Event Scale – Revised (IES-R), DASS stress subscale, DASS anxiety subscale, and DASS depression subscale scores.

4.2.3 Post-Traumatic Stress Disorder (PTSD)

Several sources from the literature search examined the impact of post-traumatic stress disorder (PTSD) and co-morbid physical health conditions in those that have COVID-19. In a study by Dell et al.,⁸² researchers aimed to inform social workers of psychosocial needs of older adults with serious mental health conditions such as PTSD during the COVID-19 pandemic as well as interventions to meet these needs. Access to support (social networks, social workers, mental and physical healthcare) were identified as strategies to mitigate the impact of the pandemic for older adults with severe mental health conditions such as PTSD, including those in which their mental health conditions were complicated by comorbid chronic conditions such as diabetes and cardiovascular disease.

In a perspective paper, researchers indicated strategies for individuals with anxiety and PTSD that would help individuals make meaning, build distress tolerance, increase social support, foster a view of deep human interconnectedness, and take goal-directed value-driven actions in midst of the COVID-19 pandemic.⁸³ Another article that discussed individuals with PTSD, panic attacks, and sleep disturbance in Guangdong, China suggested interventions that included psychological counseling-based therapies (tele-medicine, counseling sessions, cognitive behaviour therapy) and pharmacological treatments were highlighted. The authors did not evaluate the impact of these interventions.

4.2.4 Disordered Eating and Other Mental Health Concerns

In a consensus statement by Baker-Davies et al.,⁸⁴ an overarching series of recommendations for rehabilitation post COVID-19 were detailed. The intended target audience were active populations, including military personnel and athletes, with the desire to optimise recovery and human performance in occupational settings. A series of clinical guidelines were created to help optimize the function of various body systems (e.g., musculoskeletal, cardiac, pulmonary). The statement highlighted the need for psychological rehabilitation interventions such as providing effective communication, social contact (although remotely), and an information sheet about the psychological sequelae of COVID-19 for people admitted to acute care, review of individuals in the recovery phase of COVID-19 infection to identify those who may have adverse psychological outcomes, active monitoring for those with subthreshold

psychological symptoms, and referral to psychological services and consideration of trauma focused cognitive behavioural therapy, cognitive processing therapy, or eye movement desensitisation and reprocessing for those with moderate to severe symptoms of acute stress disorder.⁸⁴

Access to healthcare services and speciality neurological and mental health services have also been severely impacted by the COVID-19 pandemic and studies identified that future crisis situations need to consider the importance in continuing these services. For example, in a study by Bikson et al,⁷⁵ researchers facilitated the re-establishment of access to non-invasive brain stimulation (NIBS) clinical services and research operations during the current COVID-19 pandemic and possible future outbreaks. The focus was on Transcranial Magnetic Stimulation (TMS) and low intensity transcranial Electrical Stimulation (tES) - including transcranial Direct Current Stimulation (tDCS), and transcranial Alternating Current Stimulation (tACS). Results showed that there was an evident need to maintain NIBS operations through the COVID-19 pandemic. Researchers created a framework for balancing the importance of NIBS operations with safety considerations, while addressing the needs of all stakeholders. The framework had an initial focus on communication with research stakeholders and prompt transition to alternative study methods (i.e., telephone conferencing) to continue research followed by a tiered return to research and clinical activities in the context of public health guidance. The proposed structured strategy was developed as a means to address the current and anticipated future challenges of disease outbreaks while maintaining scientific rigour and managing risk.⁷⁵

In a review by Sockalingam and colleagues,⁸⁵ it was noted that individuals undergoing bariatric surgery may experience increased levels of emotional distress leading to eating psychopathology and mental health exacerbation which could impact treatment adherence and long-term health outcomes. To help address these challenges strategies such as remote delivery of care using virtual care models and offering mobile and online modalities were offered as suggestions.

4.2.5 Substance Use and Physical Health Comorbidities

A narrative review reported that purchases of liquor have soared in both Canada and the US during the pandemic.⁸⁶ Several publications retrieved from the literature search identified the heightened risks of substance use and misuse during the pandemic but with limited reflection on those with underlying physical health conditions. In a study in the Ukraine⁸⁷ that focused on individuals with HIV, authors examined the impact of social supports as a way for the retention in care during COVID-19 pandemic in older adults with HIV and substance use disorder. A phone survey was undertaken that provided responses from 123 older people with HIV and substance use disorder. Results showed that while older adults with HIV and substance use disorder did maintain therapy throughout the COVID-19 lockdown, social support is critical for avoiding treatment interruptions. Therefore, future research should focus on determining telehealth support interventions that can optimally maintain connections with older adults living with HIV.

4.3 Knowledge Synthesis Question 2: English Language Literature Results

Question: What mental health and substance use health promotion, primary prevention, screening, care, and treatment interventions work for diverse populations with chronic physical health conditions that present risk for COVID-19 infection?

4.3.1 Health Promotion and Primary to Tertiary Prevention to Mitigate Mental Health Responses

Within the extracted literature, none of the studies specifically discussed health promotion strategies for those with physical health conditions to mitigate mental health responses to the COVID-19 pandemic. Most of the research focused on discussion about strategies to reduce common symptoms such as depression and anxiety. Using systematic literature search methods, Barker-Davies et al.⁸⁴ developed a consensus statement that outlined several recommendations for individuals that are undergoing rehabilitation after COVID-19 infection to optimize functioning across different body systems (e.g., pulmonary, cardiac) and psychological recovery. Though oriented towards athletes and military personnel, the recommendations were considered to also apply to those with physical health conditions prior to COVID-19 infection. The most evidence-based recommendations (1a on the Oxford Levels of Evidence scale) included conducting referrals to psychological services, trauma-focused cognitive behavioural therapy, and active monitoring of those with subclinical psychological symptoms.⁸⁴ Lower quality recommendations (level 5 on the Oxford Levels of Evidence scale) included providing effective patient communication, remote social contact, and reviewing mood and well-being of patients without psychological symptoms.⁸⁴ A similar published clinical practice guideline aligned with the World Health Organization's advice for those in isolation that included maintaining connection to their social networks and daily routines, finding ways to relax, exercise, sleep, and eat regularly, and limiting exposure to stressful or potentially false information.⁸⁸ This guideline also recommended that primary care physicians conduct social prescribing as well as guiding the prescription of meditation, singing in a virtual choir, dancing, yoga, online drawing classes, and physical activity to individuals experiencing adverse psychological events during the COVID-19 pandemic. The evidence underlying these recommendations were not reported.

Several articles discussed ways in which to respond to mental health crises. One article highlighted recommendations to provide Psychological First Aid⁸⁹ during the pandemic for those experiencing a mental health crisis.⁷⁷ The authors provided an overview of factors elicited in response to COVID-19 and their impact on immunity, physical health, mental health, and well-being. They recommended "Psychological First Aid (PFA)" as a useful technique to help people in this time of crisis. PFA is a potential, widespread model intended to support individuals who are experiencing/ have experienced distress due to a recent crisis (e.g., COVID-19). It focuses on methods that everyone can use to help reduce distress in a time of fear, anxiety, and uncertainty and can be practised by professionals and non-professionals. Basic training in PFA is warranted to prepare for other inevitable disasters, ensure effectiveness, and to reduce the risk of any adverse outcomes. PFA is referred in this article as a cost-effective approach to addressing mental health and individual wellbeing in social and healthcare community and residential settings. Further research studies are needed to evaluate its specific impacts. Other experts recommended psychoeducation, cognitive behavioural therapy, and exposure-based therapy to alleviate and prevent depression, anxiety, and posttraumatic stress during the COVID-19 pandemic, although the evidence used to support those recommendations is limited.⁸⁶

A large-scale consensus statement outlined several recommendations for the diagnosis and management of Alzheimer's disease and related dementias in the context of the COVID-19 pandemic. Frequent physically distant check-ins and social activities with symptomatic, community-dwelling patients, clear goals of care for hospitalized Alzheimer's patients, and modifications to Alzheimer's research methods that balance the need for continuity in clinical research with participant safety are among the recommendations of this statement.⁴⁷ Padala et al.⁶⁵ reported that FaceTime social engagement with family improved the quality of life of an individual with Alzheimer's disease, although the case-report nature of this publication limits generalizability. An opinion piece about service needs for older individuals diagnosed with severe mental health conditions recommended educational programs to limit stigma of old age and mental illness, as well as more advanced psychosocial skills training, mindfulness, and social engagement training for social workers who work with this population.⁸⁷ In another study,⁸⁸ authors shared information on the adaptation of the model of dementia care in response to the COVID-19 pandemic. They suggested that the successful transition from in-person to telemedicine could be facilitated by designing a detailed contingency plan that would include offering increased consultations without an appointment, offering scheduled visits to families, using videoconferencing, and shifting continuous education sessions for practitioners to online platforms.

One small intervention study of 26 patients (18-65 years) hospitalized due to COVID-19 infection included nine (34.6%) people with underlying diseases: four (15.4%) had hypertension, two (7.7%) had liver disease, and one (3.8%) each had gastric ulcer, coronary heart disease (CHD), and acquired immune deficiency syndrome (AIDS). Participants were screened using the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) to rule out psychological distress. Subsequently, they were randomized to either receive an internet-based relaxation and self-care intervention that included breath relaxation training, mindfulness (body scan), "refuge" skills, and butterfly hug method or supportive care only. All subjects in the intervention group were guided to listen to a 50-minute audio recording via their mobile phones and follow the instructions for intervention training at a fixed time every day for two weeks. Those in the intervention group had significantly decreased Hamilton Depression and Hamilton Anxiety scores compared to the control after a single week (mean depression score 2.381 points lower in treatment, $p=0.026$ and mean anxiety score 2.263 points lower in treatment, $p=0.033$) and two weeks (mean depression score 3.09 points lower in treatment, $p=0.005$ and mean anxiety score 3.75 points lower in treatment, $p=0.001$) of study.⁸⁹ Internet based self-care interventions may be effective in reducing symptoms of anxiety and depression in individuals with COVID-19 infection, including those with physical comorbidities.

4.3.2 Health Promotion and Primary to Tertiary Prevention to Mitigate Mental Health Responses Among Diverse Populations

Ethnocultural and Racialized Communities

Individuals of ethnocultural and racialized communities are and will be disproportionately affected by the COVID-19 pandemic.^{46,90,91} Multiple researchers highlight that systemic racial discrimination and stigma, particularly within communities of colour (e.g. African American and Hispanic communities), increase vulnerability to the negative effects of COVID-19.^{46,90,91} Fortuna et al.⁹⁰ highlighted data from the Centers for Disease Control and Prevention that Black Americans account for 34%

In some ethnic groups, vulnerability to the negative impacts of COVID-19 may be due to factors such as:

- *biological differences (e.g., ACE2 activity)*
- *health disparities (e.g., higher prevalence of vascular and respiratory conditions)*
- *stigma*

of the SARS-CoV-2 cases despite only making up 13% of the United States population; similar data was presented for other communities of colour.

Ajilore and Thames⁹¹ also cite statistics from the United Kingdom demonstrating that Black individuals represented a four-fold increase in COVID-19 hospitalizations compared to their Caucasian counterparts. This was thought to be due to factors such as potential biological disparities (e.g., reduced Angiotensin I Converting Enzyme 2 {ACE2} activity) that may result in lung pathology, health disparities (e.g., increased prevalence of vascular-related and respiratory diseases in communities of colour), and the mental and physical health impacts of systemic racism and stigma. This, in turn, contributes to responses such as chronic stress, cortisol reactivity, and HPA dysregulation which can further exacerbate COVID-19-related stress and anxiety.⁹¹

A study by Armbruster et al.⁷⁷ focused on a population of youth with HIV aged 13-24 years of which most (93%) were non-Hispanic and black, faced socioeconomic challenges, and had mental and behavioural health comorbidities (e.g., depression, anxiety, substance use disorder). The paper discussed HIV clinical guidelines that have been adapted for use in the COVID-19 pandemic such as telemedicine (TM) visits. Program evaluations and feedback from youth were provided concerning program advantages and challenges.⁷⁷ Advantages included increased visit attendance, positive feedback regarding the accessibility of TM visits, an interest in continuing the TM program after the pandemic, decreased patient wait times, and improved clinic optimization. However, reported challenges included technological disparities that have prevented individuals from completing TM visits, decreased care engagement and medical adherence, and individuals feeling that the switch from in-person to TM visits signified their health concerns are of lesser importance.⁷⁷ These measures require continual program evaluations to ascertain how to better adapt these programs to maintain a high level of care, reduce transmission of COVID-19, and minimize the mental health impact (e.g., increased anxiety) observed in the population. Additional recommendations for underserved communities of colour have included addressing technological disparities, providing trauma-informed care and mental health services, ensuring healthcare access, and directing resources towards vulnerable youth.⁹²

Individuals with Disabilities

Ceravolo et al.⁶⁹ conducted a systematic rapid “living” review to determine the rehabilitation needs resulting from the COVID-19 pandemic. Specifically, restricted mobility due to COVID-19 infection or lockdown may warrant early rehabilitation (e.g., physiotherapy, exercise programs) for individuals with chronic disabilities.⁶⁹ Further recommendations included telehealth and telerehabilitation programs.^{69,80} A consensus statement by Barker-Davies et al.⁸⁰ recommended that telehealth programs include cognitive rehabilitation based on a needs assessment for individuals dealing with cardiac complications and disabilities resulting from COVID-19 infection. Overall, these programs aim to address the mental health impacts (e.g., anxiety, depression, loneliness) that result from social isolation and reduced mobility while reducing the risk of COVID-19 transmission.

Middle Adulthood

In a review by Javelot et al.,⁹⁶ authors studied the links between COVID-19 and “respiratory” panic disorders in patients in China. The review discussed articles about screening and treatment. It was reported that patients suffering from a panic disorder that can be described as “respiratory” should be the subject of appropriate therapeutic monitoring. The use of psychotropic drugs may prove to be

counterproductive or even dangerous in the course of anxiety pathology. It is important to screen for these types of disorders during virtual visits and to provide interventions that will minimize symptoms.

Older Adulthood

Two case studies reported by Mehra et al.⁷⁰ described older adults (age 60 and 72) with physical comorbidities (one with hypertension, the other with hypertension plus type 2 diabetes mellitus) who experienced exacerbated depressive symptoms in light of the COVID-19 pandemic. As cited by others,⁹⁷ the authors suggest that limiting exposure to media, particularly that which disseminates fear eliciting information about the elevated risk of COVID-19 in those with physical comorbidities, may be an effective strategy to prevent adverse psychological events in those with such comorbidities.⁷⁰

In a viewpoint article by Mills et al.,⁹⁸ the authors discussed the clinical, psychosocial, and public health considerations of COVID-19 in the aged population, specifically those with medical comorbidities. The authors indicated that people with type 2 diabetes were impacted by the psychosocial effects of social isolation. There were higher rates of severe outcomes, such as ICU admission, and death in older patients with COVID-19, as well as those with comorbidities including diabetes mellitus, cardiovascular disease, immunocompromise, chronic lung conditions, and renal disease. The article also explored the psychosocial effects of social isolation with policy considerations for virtual lectures/ sessions for seniors to mitigate social isolation and also developing disaster preparedness plans for pandemics.⁹⁹

Oren et al.⁹⁹ aimed to identify and address the potential contributors to cardiometabolic disease in the elderly who are placed in physical isolation. Their article included information about substance use that was comorbid with physical health conditions such as obesity, diabetes, hypertension, and mental health conditions. The authors claimed that clinicians should assess the individual cardiovascular risk that includes both the conventional factors and sociodemographic aggravators (e.g., not being able to afford medications, being uninsured). They suggested that home blood pressure monitors should be disseminated, ideally with full coverage by health insurance companies. Guideline-endorsed recommendations for blood pressure control should be emphasized. Adults at high risk of smoking or smoking complications should be identified and provided education regarding the importance of limiting nicotine use. An approach utilizing home-adapted exercise regimes, promotion of healthy dietary habits, medication adherence, and stress-reduction, leveraging telehealth technologies (to support virtual encounters with internists, endocrinologists, and dietitians) and health applications could be the cornerstone of cardiovascular health containment during the COVID-19 pandemic.

Many researchers highlighted the need to address the social circumstances (e.g., social isolation) that affect older adults with comorbidities during the COVID-19 pandemic. Among the elderly living with Alzheimer's Disease and Related Dementias (ADRD), the COVID-19 pandemic has reduced social interactions, physical activity, and access to care, ultimately resulting in greater feelings of loneliness, anxiety, and a lower quality of life.^{74,100} Brown et al.¹⁰⁰ have recommended alternative at-home social and physical activities as well as telehealth programs for this population. Though telehealth can provide care remotely and minimize COVID-19 infection, it is important to acknowledge that virtual care, either via telephone or video conferencing, may not be able to properly provide the physical and cognitive examinations required to diagnose and treat individuals with ADRD. Therefore, program evaluations of telehealth initiatives specific to individuals with ADRD should be conducted to provide useful insight into the barriers faced by this population and potential solutions. A letter by Dell et al.⁸² highlighted that social workers can play a critical role in addressing the needs of the elderly with schizophrenia, bipolar, and major depressive disorders in addition to chronic diseases, such as diabetes and cardiovascular,

during the pandemic. Dell et al.⁸² suggest that social workers collaborate with clients to address loneliness and chronic stress and develop chronic disease self-management skills. In acute- and long-term care home settings, formal evaluations of these programs are recommended to ascertain the mental health benefits (e.g., reduced loneliness and anxiety) of older adults with physical and mental health conditions.

For older adults with cancer, Nguyen et al.⁶⁴ have recommended personalized care and frailty assessments to determine which individuals should undergo hypofractionation of radiotherapy treatments to reduce potential exposure to COVID-19. Telehealth was emphasized for mental and social support to prevent anxiety and depression.⁶⁴ These measures may prove useful in reducing COVID-19 transmission and adverse mental health responses in the population.

More generally, for older adults with both chronic physical and mental illnesses, recommendations from the literature range from the use of electronic media to increase social interaction, such as video calling platforms, to online consultations with psychological counsellors and healthcare professionals.^{69,92,93} For example, Padala et al.⁶⁹ provided evidence that Facetime with a family member improved mental health outcomes in an 81-year-old nursing home resident with Alzheimer's dementia who suffered from increased anxiety and depression following the pandemic. Since these interventions aim to address the negative mental health outcomes (e.g., anxiety, depression) that appear to result from COVID-19-related lockdown, research regarding the applicability of different technologies for use by older adults can provide insight on how to best provide these resources to the population. Moreover, though the majority of older adults seem to understand COVID-19 preventative measures, scholars call for more accurate COVID-19 education for seniors to reduce anxiety and misinformation among the population.^{66,101,102} Emphasizing and adapting educational tools for older individuals with neurocognitive conditions, such as AD/AR, can aid in reducing the risk of transmission among these populations.¹⁰² Ultimately, further rigorous research studies, including randomized trials, are needed to examine the impact of the aforementioned interventions, specifically those using technology, on the mental health of older adults to improve their health and well-being during the COVID-19 pandemic.

Women

A cross-sectional study by Gómez-Salgado et al.⁵² focusing on Spanish populations over the age of 18, suggests that women and those with a poor assessment of health are at a greater risk of psychological distress (e.g., feelings of stress and depression) due to the COVID-19 pandemic. Mental health resources, such as mental health prevention programs, may help minimize the observed mental health impact in this population and provide applicability to potential future pandemics. Funding supports for interventions and ongoing evaluations of mental health prevention programs and psychological and emotional recovery programs should be undertaken to help identify the most appropriate mental health mitigation strategies to reduce psychological distress for this population.

Vanni et al.⁶⁰ conducted a retrospective study to observe the refusal rate of breast cancer treatment in female breast cancer patients aged 45-80 years before and after the COVID-19 pandemic. It was observed that following the start of the pandemic, the rate of refusal among patients significantly increased; the majority of patients indicated that COVID-19 was the reason for refusal. Psychological support to combat COVID-19-related anxiety as well as consultations with surgical oncologists to discuss the risks associated with refusing treatment (e.g., advanced breast cancer) are recommended for this group. Subsequent program evaluations and clinical trials should be conducted to establish the efficacy of these clinical adaptations.

Youth with HIV

In a study by Armbruster et al,⁸¹ authors aimed to create structural and logistic approaches to proactively address the social determinants of health in youth with HIV and anxiety. Authors screened HIV positive youth for anxiety and provided them with mental health services through telehealth to increase communication and address routine and COVID-19 related issues. The article describes a modification to an existing program and toolkits developed in light of the COVID-19 pandemic to continue to provide care to the youth and those with HIV. It was identified that many measures enacted to address food and economic insecurity during the pandemic are unavailable to those who have aged out of school-based services (e.g., food distribution, Wi-Fi, mobile learning).

2SLGBTQ+ Individuals

2SLGBTQ+ individuals are likely to be disproportionately affected by the pandemic in areas of health that concern substance abuse, mental health responses, and, where applicable, access to HIV testing and treatment.^{67,81,103} Telemedicine initiatives both for mental health assessments and HIV-related care were believed to be beneficial in this population.^{67,81,103} As previously indicated, a study by Armbruster et al.⁷⁷ highlighted the advantages and disadvantages of TM programs to provide the services of an HIV clinic. Specifically, TM offers increased accessibility to individuals without high-speed Internet. However, 2SLGBTQ+ individuals who face technological disparities due to socioeconomic barriers may be unable to access these services which may present challenges for engagement and treatment adherence. The authors highlighted the need for continual program evaluations to ascertain which program adaptations will remain a standard of care during the pandemic and which aspects will be adjusted to better serve the population's unique financial, social, and mental and physical health disparities.

Rogers et al.⁶⁷ highlighted adaptations that were made to programs at two STI (sexually transmitted infection) clinics that provide evidence-based psychotherapy, HIV testing, substance use treatment, and other services geared toward individuals identified to be of sexual minority. Similarly, these programs transitioned their services to a virtual format that included teletherapy.⁶³ At one site, every individual was able to transition and, in fact, increase their number of weekly sessions. However, this transition proved to be unsuccessful at the other site; the serviced population consisted of individuals who lacked stable housing and therefore could not access the clinic's services due to their reduced hours and technological disparities.⁶³ The program thus moved towards a peer-based recovery model where peer recovery coaches work with clients, providing greater flexibility of meeting times, delivery of care (e.g., in-person, via Facebook), and community resources; these methods were reported to be successful.⁶⁷ As individuals of the 2SLGBTQ+ community living with HIV face both social and physical stressors, further research should focus on measures geared towards mitigating this population's vulnerability and risk of COVID-19 transmission.⁵⁰ Specifically, Sanchez et al.⁵⁰ conducted a rapid online survey on men who have sex with men (MSM), aged 15 or older, that demonstrated the negative effects of the pandemic on access to HIV treatment and care, anxiety, and social connections. With respect to the adaptations made to the HIV and substance use clinics in response to the pandemic, it was recommended that program evaluations be conducted to determine the positive and negative outcomes that these changes have on the mental health of this population. These evaluations will allow for population-specific adaptations that maintain a high level of care, while mitigating the risk of COVID-19 transmission and negative mental health responses in these vulnerable populations.

4.3.3 Health Promotion and Primary to Tertiary Prevention to Mitigate Substance Use-Related Responses Among Diverse Populations

Results of a large cross-sectional study of 1074 Chinese individuals aged 14 to 68 years reported a prevalence estimate of 33.5% for hazardous drinking (defined as a score between 8 and 15 on the Alcohol Use Disorder Identification Test or AUDIT).¹⁰⁴ Hazardous drinking, based on the AUDIT, is defined as ≥ 16 drinks/week for men and ≥ 12 drinks/week for women.¹⁰⁵ The investigators recommended strategies such as limiting media exposure, online counselling, aggressive rehabilitation, and specialized care for certain populations (healthcare workers, persons with a history of substance use disorders) to mitigate the impact of stress and substance use related to COVID-19.⁵¹ The study also reported significant differences in harmful drinking among different regions where a 11.1% point prevalence estimate (defined as a score between 16 and 19) was found in Hubei province, where COVID-19 originated, compared with 21.5% prevalence of hazardous drinking and 1.9% prevalence of harmful drinking found elsewhere in China ($p < 0.001$).⁵¹

A narrative review discussed the impacts of social isolation, anxiety, and limited access to support services may exacerbate alcohol use disorder in some patients and suggests that telehealth services, which are inherently limited by patient initiative and technological access, be supplemented by multidisciplinary clinics to ensure essential medications are available and to provide harm reduction counselling to patients with alcohol use disorder.¹⁰⁶ Another review reported similar impacts of the pandemic for those with substance use disorders and advised public health agencies to closely monitor this subpopulation and invest more in interventions to mitigate them.⁷⁴

In a study by Ahmed et al.⁵⁷ authors collected survey data from individuals (14-68 years) in Hubei, China with mental health concerns (depression, anxiety) and excess alcohol consumption. In this cross-sectional study, the Alcohol Use Disorder Identification Test (AUDIT) and Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) were administered. Results indicated that anxiety and depression were increased and mental well-being decreased during the pandemic. Alcohol consumption stayed relatively the same. Several recommendations and interventions were discussed including restriction of media exposure, the provision of psychological training and increased updates to healthcare workers regarding treatment plans for COVID-19, using online-counseling for screening and treatment, increased care for vulnerable populations, and rehabilitation services. Further research is needed to evaluate the impact of these interventions in individuals who have substance use disorder.

In a study by Da et al.,¹⁰⁴ authors examined the vulnerability that individuals with Alcohol Use Disorder (AUD) and Alcohol-associated Liver Disease (metabolic syndrome) have in relation to the COVID-19 pandemic. Researchers recommended the use of telehealth and secure messaging services for 24/7 care related to alcohol counseling, surveillance for those at risk of relapse, screening, and addiction treatment. Mobile applications such as EncephalApp to evaluate for cognitive dysfunction related to hepatic encephalopathy were also suggested to augment telehealth visits.¹⁰⁶ Practical strategies offered included ensuring refills are available for essential medications, reinforcing alcohol abstinence to those with ALD, harm reduction, and counseling. Finally, the authors identified that specialized treatment centers should plan for multidisciplinary, integrated alcohol clinics to prepare for the expected increase in AUD and ALD.

2SLGBTQ+ Individuals

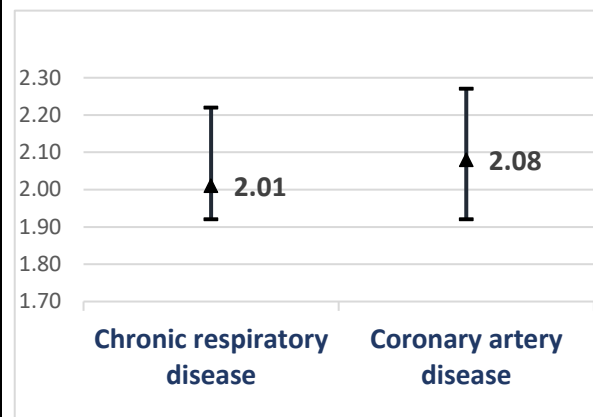
In a study by Sanchez et al.,⁵⁰ researchers assessed the COVID-19 related impacts on the sexual health of men who have sex with men (MSM) that were also diagnosed with having substance use disorder and HIV. Participants were eligible to participate if they were age 15 years or older, male sex at birth, resided in the US, and reported engaging in oral or anal sex with a man at least once at any time in the past. The survey assessed general wellbeing; sexual and substance use behaviour, HIV and STI prevention, and HIV treatment. Participants were asked to report on their local area's COVID-19 mitigation plans, how well they adhered to them, any recent symptoms, risks, and COVID-19 diagnoses. When asked about compliance with local COVID-19 measures, 20.1% reported 100% adherence, 71.4% reported greater than 50% but less than 100% adherence, and 8.5% reported less than 50% adherence to the measures (n = 190 did not answer this question). Most participants had decreased quality of life, increased anxiety (73.4%), and decreased connection to friends due to COVID-19. Several participants had also experienced problems with basic resource needs (e.g., difficulty buying food, paying rent). These problems were more likely in younger participants. Within the sample, 8.2% of MSM aged 15-24 reported an increase in use of recreational drugs compared to 7.8% in MSM aged 25 or older. A similar trend was observed for alcohol consumption; 31.3% of MSM aged 15-24 reported an increase in alcohol consumption compared to 24.6% in MSM aged 25 or older. Many participants reported problems accessing HIV or STI testing and STI treatment due to COVID-19 or the plans to manage it (more prevalent in younger participants); 97.9% of participants were willing to collect specimens at home and mail them in to diagnostic testing services. Based on their findings, the authors suggested interventions such as increasing the use of telehealth, mailing self-collection of specimens for HIV and STI testing, and reducing health disparities by instituting large-scale seroprevalence studies to better understand HIV and SARS-CoV-2 comorbidity.

In a study reported by Rogers et al.,⁶⁷ the authors described changes in response to COVID-19 made to a substance use treatment program in New England (USA) for people at risk or living with HIV, primarily for men who have sex with men (MSM) who reported using stimulants and/or opioids. There were several interventions that were outlined including telemedicine, psychotherapy, and stress management. In terms of telemedicine, most psychotherapy services were transitioned to electronic means following standard professional guidelines. Clinical psychologists were trained in telemedicine, remote therapy guidelines were developed around privacy and etiquette, and appropriately secure software was procured. This transition decreased access to care to those who did not have electronic means - none of the clients previously treated at the community-based site (rather than the STI site) continued to receive treatment. Pandemic specific psychotherapy was developed and administered through electronic means, such as recommendations to clients about keeping routine, stress management, and sleep hygiene. While in-person psychotherapy ceased, the community-based site continued to offer basic needs and harm reduction supplies. Less formal support ("peer-recovery") was administered through Facebook, text, or in person as it is not subject to the same strict privacy regulations as telemedicine. The effectiveness of these interventions were not reported.

Middle-aged Adults

In a retrospective cohort study by Slaunwhite et al.,¹⁰⁷ authors aimed to quantify the prevalence of risk factors associated with mortality due to COVID-19 for persons who have non-fatal overdose between 2015-2017 compared with those who do not have such an overdose. The results indicated that of the 1,041,536 participants included in the study, 19,005 experienced ≥ 1 non-fatal overdose during the study period. 50.0% were male and the mean age was 39 years. 56.0% (10,649) had received social assistance during the study period. Previous non-fatal overdose increased the odds of having the comorbid conditions investigated: chronic respiratory disease (OR 2.01, 95% CI 1.92-2.11, $p < 0.001$) diabetes (OR 1.24, 95% CI 1.16-1.32), coronary artery disease (OR 2.08, 95% CI 1.92-2.27, $p < 0.001$), and Elixhauser Comorbidity Index (ECI) score > 2 (OR 18.05, 95% CI 17.19-18.96, $p < 0.001$). There was no significant difference in the prevalence of hypertension among those who overdosed and those who did not.

Figure 4.3: Odds ratios (95% confidence intervals) of physical health conditions in individuals reporting previous non-fatal overdose compared to those who did not¹⁰⁷



For those reporting previous non-fatal overdose, there was an 18 times increased likelihood of having Elixhauser Comorbidity Index (ECI) scores > 2 (OR 18.05, 95% CI 17.19-18.96, $p < 0.001$)

Individuals with High BMIs

In a cross-sectional study conducted in Poland, Sidor et al.¹⁰⁸ assessed whether nutritional and consumer habits (e.g., substance use) of those with substance use disorder and high BMI (e.g., overweight, obesity) have been affected during the nationwide COVID-19-related quarantine. It was reported that 43.5% of those surveyed reported eating more during quarantine, and 51.8% admitted to snacking between meals more frequently. Increased food consumption and snacking was more prevalent in individuals with higher BMI. Almost 15% (14.6%) of respondents reported increases in alcohol consumption; 45.2% reported that the amount they smoked increased. Interestingly, 48.7% of the group reported a fear of contracting SARS-CoV-2 during grocery shopping, with significantly more women than men indicating this. The authors suggested that proactive strategies be implemented the widespread phenomenon of unhealthy lifestyle-related behaviours.

5. Results: Chinese Language Literature

The results of the Chinese literature searches that were conducted in two phases are outlined in Figure 5.1.

5.1. Findings from the Chinese Language Literature

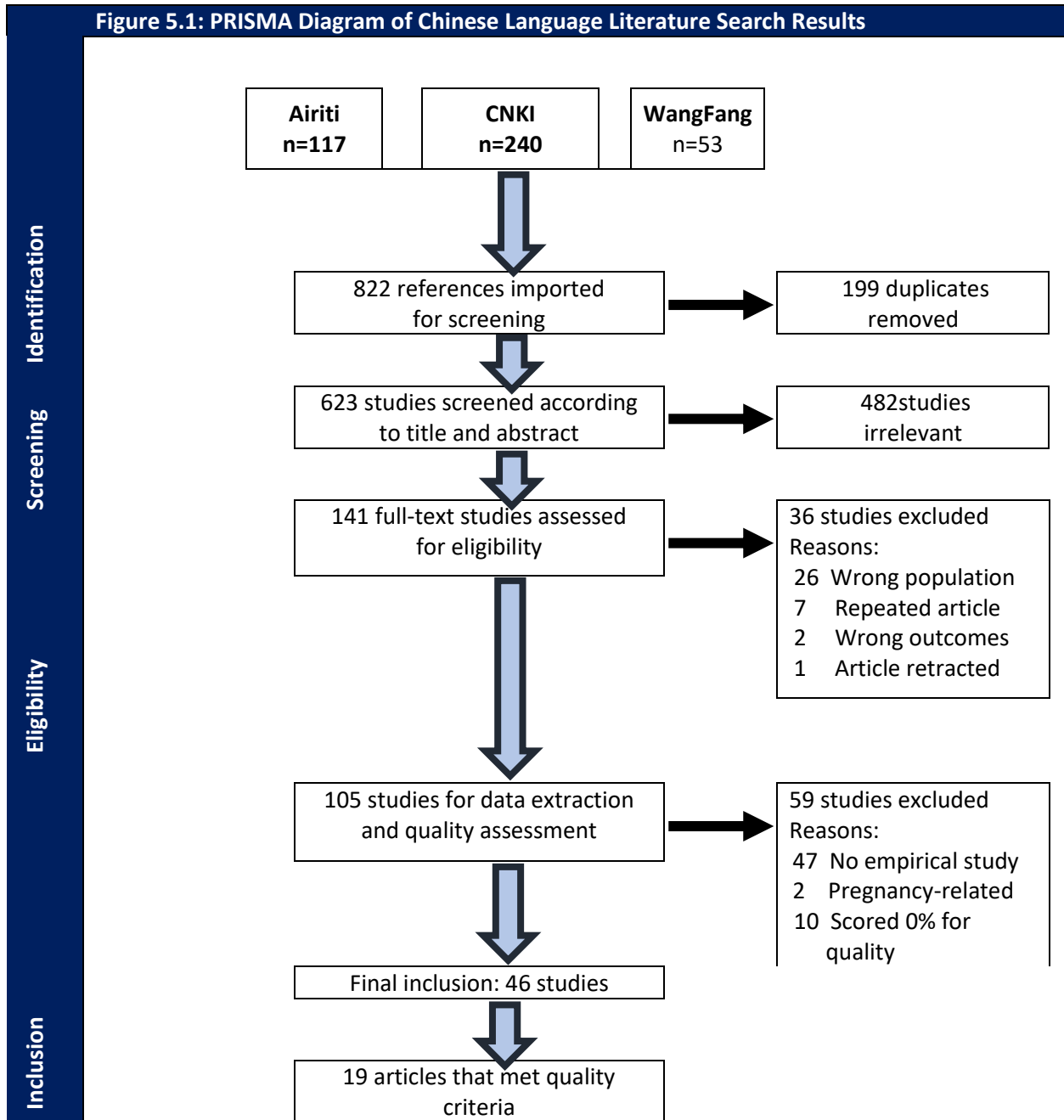
The combined search from June to October returned 822 studies (CNKI n= 240; Wangfang data=465; Airtiti Library n=117). In the first selection phase, 199 duplicates were removed. In the second phase of title and abstract screening, we screened 623 studies, of which 469 were irrelevant to our research question voted by two reviewers. When there was disagreement regarding the inclusion/exclusion between two reviewers, a senior researcher (KD, SL.L) made the final decision.

After the stages of abstract and full-text screening, qualified studies were then extracted by team members. The Mixed Methods Appraisal Tool (MMAT) checklist was used to assess the quality of Chinese literature studies. The MMAT can be used to appraise qualitative, quantitative and mixed method studies. The checklist consists of 22 items and starts with two screening questions to filter out the non-empirical studies. The design of each empirical study was determined by team members based on the description provided by the MMAT user guide.¹⁰⁹ Team members then rated the five criteria under each study design category as 'Yes,' 'No' or 'Can't tell' and calculated the study quality using percentages. Articles that met more than half of the criteria were considered to have sufficient quality for participation in the study.

In the third phase of full-text screening, the two reviewers then independently screened 141 full-text articles, excluding 36 for the following reasons: 16 no risk factor specified, 7 repeated article, 6 no mental health conditions specified, 2 investigated inappropriate outcomes, 4 provided inadequate information, 4 studied healthcare workers and 1 article retracted. 105 studies that were relevant to our research question and that met our inclusion and exclusion criteria remained and were included in the data extraction and quality assessment for our review. Following the selection process, 46 unique papers were included (Figure 5.1). The 46 selected articles include quantitative descriptive studies (N=13), quantitative non-randomized control studies (N=17), qualitative studies (N = 14) and mix-method approach (N=2).

The outcome of the quality assessment and the focus and outcomes yielded 21 articles that underwent full data extracted (Appendix B). Percentages of MMAT outcomes were calculated to compare the methodological quality of the included articles: these ranged from 20% to 100%. Almost 83% of the selected articles had an MMAT percentage of 60%. There were no articles that discussed substance use-related responses among those with physical health conditions that presented risk for COVID-19 infection.

Figure 5.1: PRISMA Diagram of Chinese Language Literature Search Results



5.2 Knowledge Synthesis Question #1: Chinese Language Literature Results

Question: What mental health and substance use-related factors are related to COVID-19 (e.g., quarantine, social distancing, unexpected unemployment) and morbidity and mortality from COVID-19 among populations with chronic physical health conditions that present risk for COVID-19 infection?

Several mental health conditions were studied in association with COVID-19, similar to the English literature, the most common were anxiety and depression. Mental health was more of a concern in those with a weaker physical health, often due to a pre-existing disease. The physical health conditions studied in literature included type 2 diabetes, cancer/tumour, asthma, chronic kidney diseases, digestive disorders, and cardiovascular conditions. Other physical health factors included frailty in old-age. The current literature proposes that patients with these comorbidities are at higher risk for COVID-19.¹¹⁰

5.2.1 Anxiety

Anxiety was one of the most studied mental health concerns. In a cross-sectional study by Zhang et al.¹¹¹ researchers recruited and surveyed 86 seniors diagnosed with COVID-19. The results showed that out of all participants, there were 20, 53, and 12 cases of mild, moderate, and severe anxiety, respectively.¹¹² The paper reported that more than 50% of individuals with COVID-19 infection have pre-existing chronic conditions and are older adults.¹¹¹ Cao et al.¹¹² investigated COVID-19 patients' psychological status. The study controlled for confounding and provided training for all five investigators who conducted survey interviews,¹¹² and therefore interviewer bias was minimized. Out of the 144 carefully selected participants, 20.3% and 1.4% had mild and moderate anxiety, respectively. Regression analysis revealed that feelings of isolation, worrying about family members' health, and fear of not recovering were leading causes of anxiety.¹¹²

Zhao et al.¹¹³ conducted a study centered on the psychological impact of the pandemic for individuals with cancer diagnosis. The report indicated that 70% of the participants diagnosed with any type of cancer, had some level of anxiety.¹⁰⁹ The key contributing factors included gender, marital status, hospitalization, and knowledge of preventive measures ($p < 0.05$).¹¹³ Another study, conducted by Chen et al.,¹¹⁴ also highlighted the mental health concerns faced by those diagnosed with cancer. The researchers sampled individuals who had a tumour that were from five hospitals and assessed their mental health using the Kessler Psychological Distress Scale (K-10). Of the 189 participants, 50.8% exhibited signs of psychological distress.¹¹⁴ The results of the analysis showed that the more impact that COVID-19 had on their surgery and treatment schedule, the higher distress level. Almost one-quarter (22.8%) of participants reported that they could not see a doctor per the usual frequency of visits which suggested that the possible delay in treatment was the main source of anxiety.¹¹⁴ Xu et al.¹¹⁵ conducted a cross-sectional survey, which supported previous results about cancer and increasing anxiety concerns during the pandemic. Out of 368 valid questionnaires received, 40-75% of those with lung cancer struggled with nervousness, anxiety, and/or quality sleep.¹¹¹ Interestingly, most reported that they had confidence in defeating COVID-19, however, their anxiety levels did not lower when they held these beliefs.¹¹⁵

To study the anxiety levels of individuals with digestive disorders whose treatment options such as digestive endoscopy were altered during the pandemic, Zhou et al.¹¹⁶ selected 118 patients admitted to emergency due to digestive disorders. Their results revealed that 80.5% were worried about their

delayed check-ups and the effect it would have on their condition, however, 76.3% willingly pushed back the date of their endoscopy check-up.¹¹⁶ Family support decreased anxiety levels. Additionally, the results indicated that educational level had an effect on State-Anxiety Inventory (S-AI) results ($P<0.05$); specifically, educated individuals had lower S-AI scores corresponding to lower anxiety.¹¹⁷

Individuals diagnosed with COVID-19 infection have an increased susceptibility to anxiety. In a qualitative study conducted by Han et al.,¹¹⁶ all individuals with confirmed or suspected COVID-19 infection showed some level of anxiety at hospitalization. At two-days of hospitalization, 45.9% were mildly anxious, 27.8% were moderately anxious, and 12.5% were severely anxious. This study also revealed how hospitalization had a significant influence on mental health and changes with length of admission. The mental health evaluation at five-days of hospitalization showed an improvement, where cases of severe anxiety dropped to 5.6%, moderate anxiety was 34.7% and mild anxiety was 41.7%.¹¹⁷

5.2.2 Depression

Depression was often reported in extracted literature. In the same cohort studied by Cao et al.,¹¹² 31.1%, 17.6% and 1.4% of COVID-19 patients were found to have mild, moderate, and severe depression, respectively. Regression analysis reported that sleep was a major impacting factor for depression onset ($P<0.05$).¹¹² In another investigation by Zhang et al.,¹¹⁰ possible barriers to maintaining a healthy mental health during the pandemic was examined individuals with diabetes.¹¹⁰ The results indicated that the area of residence, presence of diagnosed cases of COVID-19 around the patient, whether there is sufficient mask supply, and diabetic medication were statistically significant contributing factors to mental health sequelae. Interestingly, their ability to follow medical doctor's advices also impacted their mental state.¹¹⁰ When unable to adhere to advice, their depression level was increased ($P<0.05$).¹¹¹ The paper emphasized that diabetes accounted for 20% of COVID-19 patients comorbid with some type of chronic disease.¹¹¹ Since people with diabetes may have elevated blood glucose, low circulating insulin, and disordered metabolism, their immune system is compromised, which makes them high risk for contracting COVID-19.¹¹⁰ Meanwhile, the rapid spread of COVID-19 with no effective cure, among other uncertainties are all factors that contributed to the development of mental health concerns, such as anxiety and depression.¹¹⁰

The literature seemed to suggest that older adults with poor physical health tended to be a group that were highly vulnerable to depression during the pandemic. For example, Wang et al.¹¹⁷ distributed an online survey that was available to older adults for 17 days in February 2020. The results indicated that 18.5% had severe depression and 10.7% had symptoms of moderately severe depression. Physical health status was identified as the major contributing factor for depression and anxiety ($p<0.01$).¹¹⁷ In a study with a similar objective, telephone interviews were conducted to assess the mental health status of 217 older adults. The researcher reported 23 cases of depression (10.6%), with 11 cases of both depression and anxiety (5.1%).¹¹⁸

5.2.3 Post-Traumatic Stress Disorder (PTSD)

One study examined post-traumatic stress disorder (PTSD) in confirmed and suspected cases of COVID-19. Wu et al.¹¹⁹ used an online survey to gather information from individuals with confirmed ($n=2$) and suspected ($n=6$) cases. PTSD symptoms were assessed according to the criteria of the fifth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5). After screening, PTSD was diagnosed in an individual with confirmed COVID-19 infection and one who was suspected of having the

communicable condition.¹¹⁹ However, invasive PTSD-related symptoms presented in 5 cases. It is worth noting that the sleep quality of all 8 individuals were affected to varying degrees and mainly manifested as sleep difficulty at night and early awakening. Disrupted sleep cycles worsened symptoms of anxiety, PTSD, and depression, with severe cases leading to suicidal thoughts.¹¹⁹

5.3 Knowledge Synthesis Question #2: Chinese Language Literature Results

Question: What mental health and substance use health promotion, primary prevention, screening, care, and treatment interventions work for diverse populations with chronic physical health conditions that present risk for COVID-19 infection?

5.3.1 Health Promotion and Primary to Tertiary Prevention to Mitigate Mental Health Responses

Similar to the outcomes of the English literature search, there were no specific sources that discussed mental health promotion. Three papers appeared to be aimed at some level of prevention. In a paper about cancer and those with tumours, a 7-step prevention strategy to protect people from psychological stress was proposed as follows:¹²⁰

- i. Accept that stressed emotions at this moment is a normal response to cancer and the COVID-19 epidemic
- ii. Trust the doctor and build a harmonious doctor-patient relationship
- iii. Maintain a stable life routine, be positive and optimistic
- iv. Communicate with relatives and friends; don't deliberately conceal the illness and COVID-19 spread status
- v. Arrange appropriate recreational activities every day and perform aerobic exercises when your physical condition allows. Recommended activities include yoga and Traditional Chinese-Based aerobic activities such as Tai Chi and Baduan Jin to balance qi (circulating life force)
- vi. Establish a healthy sleep cycle and avoid using mobile phone in bed
- vii. When self-regulation cannot relieve anxiety, depression, and other emotions, seek professional help from a psychiatrist or psychologist

In a previously discussed study by Zhao et al.,¹¹³ who also proposed the 7-step strategy, the authors were not optimistic about the prevention and control of mental health in those with hematological cancer.¹¹⁴ The authors discussed three components for prevention control: mental health education, life guidance, and personality development.¹¹³ Similarly, Yuan et al.¹²¹ reported the use of an online platform in preventing mental health issues. The hospital took advantage of the Internet to provide mental health education, led by experts in psychology. In addition, the platform included oncology and infection specialists for online counselling regarding physical health.¹²¹ The latest accurate COVID-19 news was also made available in order to foster a fear-minimized environment, as well as encourage a positive and optimistic attitude.¹²¹

In a quantitative descriptive study by Zhang et al.,¹¹⁰ the mental health of people with diabetes was investigated in the context of the COVID-19 pandemic. In order to prevent mental health problems from arising, accurate information about COVID-19, especially information about the prevention of COVID-19 that is targeted to those with diabetes, should be provided in a timely manner to reduce uncertainties.¹¹⁰ The study proposed an online portal for people with diabetes as an avenue for mental health counseling. From one viewpoint, these individuals can access timely and accurate information

about preventive measures to alleviate their panic;¹¹⁰ conversely, the platform can build an exclusive space for support workers to detect psychological problems early and provide psychological assistance in time.¹¹⁰

In the study about protective strategies for psychological stress in those diagnosed with cancer, Zhang et al.¹²⁰ explored and identified the following effective interventions: cognitive behavioural therapy (CBT), mindfulness-based stress reduction (MBSR), and narrative therapy. The authors reported that CBT intervention during denial stage after diagnosis of a tumour could help prevent vicious cycle of emotional, behavioural, and physical response related to distorted beliefs.¹²⁰ By using the person's own behaviour as an example or using examples of others' behaviour to challenge the distorted beliefs and negative thoughts using CBT was thought to be helpful to reduce depression symptoms as it helped to establish positive coping styles and reduce stress responses.¹¹⁶ MBSR, which is based on the principle of focusing on the present, directs the person's attention to the immediate experience in order to better capture the current mental activity, to be curious about the current situation, and to develop an accepting attitude. The authors identified that results of a meta analysis reported that MBSR effectively improves the anxiety and depression symptoms faced by those who have malignant tumours. Lastly, the authors described narrative therapy as "a post-modernist psychotherapy based on narrative theory".¹²⁰ They propose that "everyone is their own problems' expert" and "problems are a social construct".¹²¹ As feelings of exclusion from society often accompanies tumour treatment, the narrative therapy intervention aims to foster a sense of security, inclusion, and motivation.¹²⁰ Zhao et al.¹¹³ also supported the use of the narrative therapy, hotline assistance, and group counselling as intervention measures for individuals diagnosed with hematological cancer that was comorbid with mental health concerns.

For individuals diagnosed with hematological cancer, interventions recommended to foster mental health include:¹¹⁷

- *Cognitive behavioural therapy*
- *Mindfulness-based stress reduction*
- *Narrative therapy*
- *Hotline assistance*
- *Group counselling*

In order to effectively reduce psychological pressures in individuals with chronic kidney disease who need dialysis, a hospital in Wuhan established a "five in one" mental health framework.¹²² The steps are largely accomplished online, providing guidance and support for those during isolation. The components include:¹²²

- i. Strengthen health education related to COVID-19 through the WeChat platform
- ii. Increase information transparency to reduce anxiety, especially to correct misunderstanding about the pandemic from unreliable sources
- iii. Strengthen doctor and family member support. Depression is the most common mental health concern for those who undergo dialysis treatments. Through receiving external support, they can build a stronger hope in combating COVID-19
- iv. Provide nutrition guidance. Proteins are especially crucial, as the process of dialysis leads to a loss of proteins
- v. Guide individuals to use the professional mental health channel, as established by the hospital through the WeChat platform

5.3.2 Health Promotion and Primary to Tertiary Prevention to Mitigate Mental Health Responses Among Diverse Populations

Older Adults

In the previous discussed study by Huang et al.,¹²³ the authors investigated anxiety among seniors during the pandemic and provided intervention suggestions to protect their mental health. The authors urged community social workers to periodically check-in on the households, paying close attention to those who live alone and/or have lost their spouse.¹²³ In addition, family members were encouraged to check-in about digital devices. If the person is ever anxious, family members were identified to be the first-line supporters.¹²³ If the anxiety is not relieved, it is recommended that the person call the “psychological assistance hotline” for professional help.¹²³ Finally, it was recommended that older adults with chronic diseases should strengthen their self-management skills through contact with their physician.¹¹⁹

In light of the pandemic, many older adults have requested “at-home care” instead of going into the hospital.¹²⁴ Prior to at-home care, nurses call to evaluate for any family member contact history with COVID-19. While visiting with the older adult, the nurse teaches the individual and their family how to perform proper basic care, including physical and psychological support.¹²⁴ At the same time, the nurse collects information about the pandemic’s effect on the mental health of the individual and their family. Lastly, the nurse assesses the ability of family members to care for the patient. These approaches are intended to act as preventive measure for psychological concerns.¹²⁴

Zhang et al.¹¹¹ studied the psychological impact of the pandemic on older adults who lived at home. The authors stated that the proportion of severe symptoms and mortality in those infected with COVID-19 are higher, which may cause a series of negative emotions and even psychological problems. In addition, older adults are more likely to be diagnosed with a comorbidity. The authors cite relevant studies which reported that the proportion of anxiety or depression when suffering from one chronic disease was 16.1%, and the proportion of anxiety or depression when suffering from 2 chronic diseases was 30.6%. Therefore, evaluation, assistance, treatment, and services to foster the mental health of older adults during the COVID-19 pandemic should be among health service priorities. Examples provided included providing timely and accurate COVID-19 information and instituting protective measures and psychological counseling if poor mental health persists. Once mental health concerns are discovered, the authors recommended that there be timely response.

Interestingly, the study by Zhang et al.¹¹¹ also reported that the area of residence was a main factor affecting the anxiety and depression status of older adults. For those who lived in the city, they were significantly more likely to develop symptoms of anxiety and depression than those who lived in a smaller town. Moreover, older adults who lived in towns were significantly more likely to develop anxiety and depression than those who lived in rural areas.¹¹¹ The authors suggested that because those who live in rural areas have a higher degree of freedom and are in a more comfortable and relaxed living environment pressures of the COVID-19 crisis are lessened.¹¹¹

In a study by Chen et al.,¹²⁵ the authors proposed screening recommendations for older adults as they were biologically more susceptible to the virus. As an individual ages, the baseline levels of pro-inflammatory cytokines in the tissues and circulation increase with age, especially interleukin (IL)-1 β , IL-6 and tumor necrosis factor- α (TNF- α), a phenomenon referred to as “Inflammatory aging”.¹²¹ In conjunction with inflammatory aging processes of slower immune response to pathogenic threats or

tissue damage referred to as "immune aging" also occurs.¹²⁵ The function of innate immunity and adaptive immunity both decreases with age.¹²⁶ The ability for recognition, chemotaxis, and phagocytosis of macrophages deteriorates.¹²⁶ This is because the natural killer cells, and neutrophils decrease along with the diversity of T cell receptors (TCR) that recognizes viruses. The thymus, mainly responsible for producing naive T cells, is typically replaced by adipose tissue by the age of 60.¹²⁵ This results in the accumulation of memory T cells and effector T cells, and the reduction of naive T cell reserves. At the same time, the ability of B cells to secrete antibodies decreases with age, which may lead to a decline in immune response.¹²⁶ Inflammatory aging and immune aging make individuals more prone to severe symptoms of COVID-19¹²⁵ which call for the need to screen for the condition. Furthermore, the activities of inflammatory and immune aging particularly for those with physical health conditions, make them more vulnerable to poor mental health¹²⁶ which also points to the need to screen for symptoms suggestive of mental ill health.

6. Discussion and Recommendations from Scoping Review

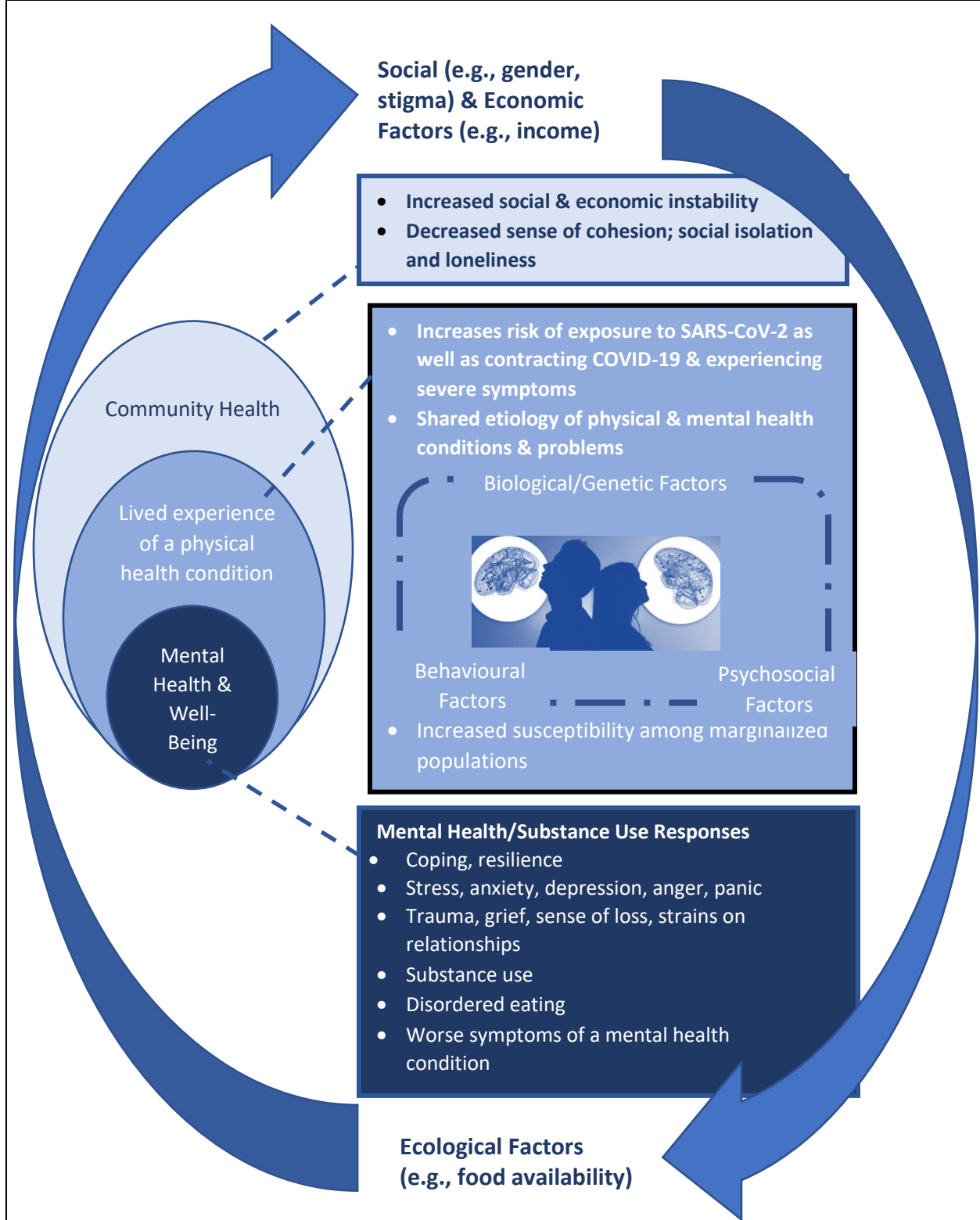
The main objective of the scoping review was to capture evidence about what interventions may reduce mental health and substance use-related responses among those with pre-existing health conditions that present risk for contracting COVID-19 and experiencing severe symptoms from the disease. Where possible, evidence specific to vulnerable subgroups facing social and economic barriers was also highlighted. Much of the published literature highlighted the various mental health and substance use implications related to the COVID-19 pandemic. To the best of our knowledge, there were no reported interventions that targeted mental health symptoms for those with physical health conditions that present risk of COVID-19 infection. In this section, the accumulated evidence is contextualized within the broader literature about physical and mental health comorbidities and means in which to target mental health promotion across the health care continuum and in future research, particularly in public health crisis situations.

6.1 Factors Contributing to Mental Health and Well-Being

Figure 6.1 provides an overview of the multiple intersecting individual, community, and broader societal factors that can contribute to mental health and well-being among those who have a chronic physical health condition that places them at risk of severe COVID-19 infection. It is well established that chronic physical health conditions such as obesity, diabetes, cancer, cardiovascular disease, chronic respiratory diseases, chronic kidney and liver diseases, autoimmune conditions, HIV, hepatitis, and frailty present risk for severe COVID-19 infection.¹¹ Furthermore, mental health problems and conditions such as major depression, schizophrenia spectrum conditions, psychosis, anxiety disorders, and bipolar affective disorders are commonly comorbid among various chronic physical health conditions including diabetes, cancer, cardiovascular disease, chronic respiratory diseases, arthritis, and inflammatory bowel disorders.¹²⁴⁻¹³³ The co-occurrence of physical and mental health issues are known to be due to an interplay of biology, illness experience, behavioural risk factors (e.g., poor diet, physical inactivity, substance use) and various health determinants (e.g., income, housing). The factors intersect and increase the likelihood of someone living with a physical health condition developing mental health symptoms or having a co-existing mental health condition or vice versa.¹²⁻¹⁴

Given that mental health and well-being results from the interplay of various factors, efforts in which to mitigate risk of poor mental health or substance use as well as improve any existing mental health-related concerns must be multi-faceted, as outlined in the Socio-ecological Model of Mental Health Promotion Interventions (Figure 3.1). In the remainder of this section, the findings of the scoping review are contextualized within the literature related to current best practices about physical and mental health comorbidities and how this may be relevant within the COVID-19 pandemic. The following organizes the discussion within mental health promotion and policy, across the health care continuum that encompasses prevention through to treatment and rehabilitation. As well, the discussion explores how health education and research may help to serve as means in which to move towards mitigating mental health and substance use-related responses during public health crises such as the current COVID-19 pandemic.

Figure 6.1: An overview of the individual, community, and societal factors impacting mental health and well-being in the context of the COVID-19 pandemic



6.2 Mental Health Promotion and Policy

Various studies drawn from the scoping review highlighted the various determinants that impact both physical and mental health, however, there did not appear to be explicit discussion about health and social policies aimed at modifiable targets such as income as a means to foster mental health promotion. As Horton suggests,¹³⁷ SARS-CoV-2 is interacting with an array of non-communicable diseases (NCDs) and these conditions are clustering within subpopulations according to patterns of deeply embedded inequality. Furthermore, the syndemic nature of the COVID-19 threat points to the need for proactive and nuanced approaches to protect the health of communities.

In a perspective piece by Polizzi et al.,¹³⁸ recommendations based on review of natural disasters (e.g., earthquakes, hurricanes, floods) were provided that included behavioural activation coping activities and application of the “3 Cs” model focusing on control, coherence, and connectedness,¹³⁹ to foster resilience (Figure 6.2). Control refers to the belief that one has to access personal resources to achieve valued goals. Cited examples include taking medicines as prescribed, self-care, and accessing factual information regarding the virus. Coherence refers to the deep human desire to make sense and meaning of the world. Here acceptance-based coping (ABC) may be applied to change responses (e.g., fear, worry) to stressors or to uncontrollable events by becoming nonjudgmentally aware of the flux of internal states that arise in response to them (e.g., fears, doubts, self-blame) in an accepting and playful manner. Connectedness serves to address needs for human contact and support; a broad empirical evidence base indicates that social support as an impactful and consistent resilience factor.¹⁴⁰

Figure 6.2: Fostering Resilience: “3 Cs” Model of Control, Coherence, and Connectedness¹³⁹



Mental health-related policies have the potential to better shape contextual factors and create supportive environments that can foster population mental health which encompasses addressing both the mental health and mental illness needs of different groups. Traditionally mental health services aimed at prevention and treatment have been poorly resourced. Policy interventions such as those aimed at fostering healthy child development, mental health screening, and addressing the social determinants such as income, education, literacy, as well as reducing inequities and socio-economic inequalities are all mechanisms in which to elevate mental health broadly.^{141,142} In addition, directives towards ensuring consistent and appropriate access to mental health services, including specialist services, can help maintain mental health and well-being especially in times of public health crisis.

Recent literature has suggested the risks for suicide are significantly increased in the current pandemic suggesting that policies that aim restrict the access to suicidal means should be reinforced.¹⁴³ For example, an increase of medication stockpiling may occur as people may fear possible shortage.¹⁴⁴ Similarly, increased firearm purchases may occur due to worries about an increase in crime.¹⁴⁵ Governments, at all levels are therefore advised to restrict and increase monitoring of sales of lethal means for suicide as well as place temporary restrictions on the amount purchased of some medications (e.g., analgesics). Finally, psychosocial crises that occur during the pandemic may trigger alcohol abuse, that in turn may contribute to impulsivity, aggressiveness, loneliness, and hopelessness.¹⁴⁶ Strategies which can monitor alcohol consumption during the pandemic are recommended with restriction of access being permitted as needed to mitigate risk of abuse. Furthermore, policy targets aimed at reducing risk factors for substance use such as unemployment,¹⁴⁷ may help to mitigate substance use-related responses during public health crises such as disease outbreaks.

6.3 Health Education and Literacy to Mitigate Mental Health and Substance Use Responses

There were several health education-related interventions recommended in the extracted literature, many of which have been substantiated by previous research. One of the main impacts of the COVID-19 pandemic has been the dissemination of rumours and health misinformation through media and social networks¹⁴⁸ which has the potential to lead to reactions that can worsen psychological health.^{149,150} As identified by researchers and other decision makers parallel to the current pandemic has been a massive “infodemic” of rapidly spreading misinformation through social media platforms and other outlets¹⁴⁷ which needs to be addressed by the public health community who can educate and support social and conventional media to positively deliver information from, health, medical, and scientific communities.⁹⁰

This issues of addressing health information also point to the need to foster individual health literacy, defined as the extent to which people have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.¹⁵² Lower levels of health literacy are associated with both poorer physical and mental health.^{153,154} Drawing upon the recommendations of a Canadian Health Literacy Expert Panel,¹⁵⁵ several policies and programs could help to reduce the effects of low health literacy both on physical and mental health as well as foster coping and resilience in the context of pandemics and similar health crises. These recommendations included aids to improve self-management of chronic diseases, focusing on at-risk groups such as seniors, recent immigrants, those with lower levels of education and low language proficiency, people with lower incomes, and Aboriginal peoples. In the scoping review, it was identified that mental health responses to the COVID-19 pandemic varied by region, particularly in China.⁵¹ Other writings about health literacy also suggest characteristics needs vary across the lifespan. For example, older adults may have cohort-specific educational experiences.¹⁵⁴ This information points to the need to have varying degrees of efforts across

regions, as needs and health literacy proficiency differs across the country.¹⁵⁴ Furthermore, policies and programs are required to reduce the individual and systemic barriers to health literacy and to addressing different types of literacy including general literacy, e-literacy, and literacies specific to various diseases and to mental health. The Health Literacy Expert Panel's recommendation to develop a comprehensive, coordinated, cooperative, and integrated Pan-Canadian Strategy on Health Literacy could be a consideration in efforts to minimize the mental health impact of disease outbreaks.

A barrier to both optimal physical and mental health among those with health conditions are the stigmas which may be connected with their conditions. Physical health conditions such as obesity, lung cancer, arthritis, may be prone to associated stigmas,¹⁵⁵ with reported negative effects including anxiety,¹⁵⁶ stress,¹⁵⁷ depression,¹⁵⁸ and reduced self-esteem/self-efficacy.¹⁵⁹ Studies also suggest that, as physical health worsens, the risk of experienced discrimination increases.¹⁶⁰ Public health campaigns aimed at reducing health condition-related stigma can help shaped more positive attitudes about illness and subsequently minimize burden for those diagnosed with a physical or mental health condition. Coordinated, interdisciplinary, and well-conceptualized efforts across the health care continuum have the potential to reduce the barrier of stigma and increase quality of life¹⁶¹ which in turn may ameliorate mental health effects experienced by those with physical health conditions, particularly during times of heightened stress.

6.4 Health Services and Practices to Mitigate Mental Health and Substance Use Responses

Interventions to mitigate mental health responses among those with chronic physical health conditions that present risk for severe COVID-19 infection need to consider existing models of care. Furthermore, it is recommended that there be examinations of how these models of care may be more responsive to the mental health needs of diverse populations and foster resilience during times of national crisis. There was considerable discussion about digital health applications but no reported interventions that demonstrated their effectiveness in this context. Mental health screening was also highlighted as part of care delivery, but no specific measurement tools had been assessed. These factors as well as others pertaining to health services and practices are discussed further.

6.4.1 Health Care Delivery

Prior to the pandemic it was identified that there was a need for more integrated physical, mental, and social health-related services which can mitigate morbidity, prevent premature death, ease transitions across the health care continuum, improve health care access, sustainability, and stability, as well as improve community health.¹⁶² In many countries, the collaborative care model, broadly defined as multi-professional approaches that employ structured management, scheduled follow-up, and inter-professional communication, is recognized as a best practice to provide for optimal management and integration of physical and mental health.¹⁶³⁻¹⁶⁵ However, this evidence-based model of care has faced challenges related to being inadequately resourced, which has become more apparent in the context of the current pandemic. As part of the collaborative model of care, many international evidence-based clinical guidelines, such as those of the National Institute for Health and Clinical Excellence, include stepped care approaches, which starts with providing end-users interventions of low intensity first (e.g., problem solving, psycho-education) and, where needed, progresses them to more intensive treatment options.¹⁶⁶⁻¹⁶⁸ To build appropriate capacity for more resilient and flexible collaborative health services that can effectively respond to public health crises will require both increases in human resources and enhancements in technology that facilitate sharing information across functional boundaries securely.¹⁶⁹

Other recommendations for delivery of care from the literature beyond transitioning to digital health included reinforcing crisis helplines to help identify and intervene in emerging psychosocial crises,¹⁴⁴ having the option of in-person visits for those most in need, and expanding the roles of social workers and case managers to help monitor individuals, particularly those who may be more vulnerable to poor mental health. The activities of the social workers and case managers could include at home visits where feasible.¹¹⁹

Other recommendations also include the provision of social prescribing by primary health care practitioners. Social prescribing is a mechanism that general practitioners can use to help promote the health and wellbeing of those who are lonely, need help with their mental health, or have complex social needs affecting their wellbeing.¹⁷⁰ These individuals may be linked to a worker who will connect them to appropriate community groups and social activities. In Ontario, the Alliance for Healthier Communities recently instituted a pilot project to help “systemically address social impacts of COVID-19 measures”.¹⁷¹ With the recent launch of the National Academy for Social Prescribing (NASP), there is major potential to investigate this promising practice to mitigate mental health responses in the context of the pandemic.¹⁷²

It has been identified that primary care could better integrate services such as mental health promotion, screening, and treatment,¹⁷² which will promote both physical and mental well-being,¹⁷³ and foster resilience. Ideally services, such as those aimed at mental health promotion and screening, must align with policy-level directives to create equitable, accessible, and appropriately resourced primary health care.¹⁷⁴ For example, issues such as access to social workers, psychiatrists, psychologists, and substance use disorder experts need to be addressed, particularly for those who face additional barriers to receiving specialty health services.¹⁷⁵ Care that is collaborative, integrated, tailored, and flexible (e.g., home visits, extended hours, provide online service delivery) is likely to be better positioned to more responsive in the context of public health crises. Strategies that have been identified to facilitate integrated care include:¹⁷⁶⁻¹⁷⁸

- having registries of people with complex needs to track preventative care, disease/illness management, and referrals to secondary and tertiary care
- providing health care system navigation supports
- implementing shared decision-making approaches
- adequately resourcing secondary and tertiary mental health services
- supporting competency development among practitioners to deliver high-quality health care to people with mental health problems and illnesses
- training practitioners in the recovery model, including stigma and discrimination, illness perceptions, trauma-informed care, positive communications, and social support interventions
- evidence-based and clear screening guidelines, pathways to management, and integration with social services

Chain of care integrated models where, for example, primary care, hospitals, and community services are interconnected through local agreements to create pathways for the identification, treatment, and management of specific conditions, is recommended to ensure a continuous and functioning chain of care, with adequate follow-up of individuals who may be at risk for poor mental health.^{179,180} Similarly the promotion of treatment engagement is recommended using strategies such as post-discharge follow-up contacts, including phone calls, postcards, letters, and technology-based methods (e.g., e-mails and texting) to promote mental health.¹⁸¹ Finally, training of volunteer workers in mental health

and offering programs such as Psychological First Aid⁸⁹ that may be delivered by trained para-professionals may be beneficial supplements to health care delivery.

Though not discussed in the extracted literature, alternative models of care such as group medical visits (GMVs) may help to improve access to health care and be an efficient way of caring for individuals who share the same chronic condition both as usual care and in the context of public health crises. Usually after an initial screening visit with a practitioner, individuals are invited to attend these group sessions to receive care, education, and advice within a supportive group environment. These visits may also include other practitioners such as nurses, dietitians, and social workers. This model of care has also been offered as an outpatient service for individuals with mental health conditions and reported to be a cost effective alternative to individual psychiatric outpatient care or health authority mental health centre care for individuals with moderate or severe illness.¹⁸² Furthermore, both the end-users, who have complex medical and social needs, and practitioners indicated they are very satisfied with the GMV model of care. As an option, this model of care could be offered online, however to the best of our knowledge this has not been evaluated.

In an expert review by Nguyen and colleagues,⁶⁴ patient navigators were recommended to help guide individuals with cancer through the health system related to their treatment needs. While the definitions of patient navigators vary, they are generally defined as trained personnel who help patients overcome modifiable barriers to care and achieve their care goals by providing a tailored approach to addressing individual needs.¹⁸³ Patient navigators may be nurses, social workers, lay health workers, or peers. These types of programs were originally established to reduce gaps in timely cancer care among marginalized populations.¹⁸⁴ Depending on the barriers, specific tasks may include one or more of: disease education,¹⁸⁵ health system education,¹⁸⁶ removal of medical system barriers,¹⁸⁷ addressing financial barriers,¹⁸⁸ aiding in care coordination,¹⁸⁶ and providing emotional support.¹⁸⁸ These programs have been reported to be used for people with HIV/AIDS, cardiovascular disease, chronic kidney disease, dementia and individuals with comorbidities.¹⁸⁸ Though most of the research in this area have focused on acceptance of service and process, one RCT where 432 of women with a chronic health condition were either assigned to a public health nurse case management plus Medicaid intervention or a wait-control group and assessed at 3, 6, and 9 months, it was found that depression and functional status improved over time in the intervention group ($p=0.16$).¹⁸⁹ While more studies are needed to determine if there is mental health benefit, this service delivery model may prove useful in medical pandemics where the navigators can assist people through the adapted health system, potentially using digital applications.

6.4.2 Digital Health Applications

mHealth which refers to the use of different mobile and wireless technologies to support the achievement of health objectives¹⁹¹ were discussed in many of the articles of the scoping review. Integrated mobile apps that monitor both physical and mental health symptoms may improve efficiencies in care provision in public health crises. Potential m-health interventions identified in the literature include video teleconferencing, text messaging, and smartphone-based applications. Social media platforms may increase agility in responding, strengthen community and individual resilience, and enhance geographic reach of care to more rural and remote areas where mental health infrastructure may be lacking.¹⁹¹ Furthermore, enhancing delivery of mental health care, mobile phone interventions may increase the effectiveness of paraprofessionals, peer helpers, and mutual aid organizations.¹⁹² To

help monitor those at risk of relapses related to substance use, mobile applications such as EncephalApp may be useful to augment telehealth visits.¹⁰⁶

One of the most widely investigated m-health applications used in the context of widespread crises such as wars and natural disasters has been PTSD Coach which may have application in medical pandemics. A pilot randomized controlled trial with 49 community trauma survivors with elevated PTSD symptoms showed that PTSD Coach was feasible, acceptable, and resulted in modest treatment effects after one month of use relative to a waitlist control.¹⁹³ A full-scale RCT of PTSD Coach was also conducted with 120 community trauma survivors¹⁹⁴ which reported significantly greater improvements in PTSD and depression severity, as well as psychosocial functioning relative to a waitlist control condition after three months of use. PTSD Coach has also been integrated in Veteran Affairs (VA) primary care settings with clinician support for use and a pilot RCT evaluating this approach with 20 VA primary care patients found clinically significant reductions in PTSD symptoms and increased acceptance of referral to specialty mental health.¹⁹⁵ Since these types of apps lend themselves to incorporation of the same therapeutic components (e.g., skills training, demonstration/modeling, individualized assessment, goal setting, self-monitoring) they may be effective in reducing distress, and it has been reported that Internet interventions for PTSD are significantly more effective than passive controls.¹⁹⁶ In the United States, a variety of web-based interventions for combat veterans experiencing posttraumatic stress difficulties have successfully reduced PTSD symptoms, depression, and/or alcohol use.¹⁹⁷⁻¹⁹⁹

PTSD Coach, a m-health application created by the US's Veteran Affairs National Center for PTSD and Department of Defense's National Center for Telehealth & Technology has been shown to be effective for use in wars and natural disaster. The tool provides:

- *education about PTSD*
- *information about professional care*
- *self-assessment for PTSD*
- *opportunities to find support tools to help manage stresses of daily life with PTSD (e.g., relaxation skills, positive self-talk, anger management); and*
- *self-guided safety plan for suicide prevention.*

Smartphone apps may also be used to increase engagement and adherence to evidence-based interventions. For example, the PE Coach app²⁰⁰ has been designed to enable individuals to understand psychoeducational content associated with the Prolonged Exposure intervention, record their trauma narrative, complete and self-monitor in vivo and imaginal exposure homework assignments, master breathing retraining, measure PTSD symptom change, and schedule upcoming sessions. The U.S. VA has built a number of apps that support prominent treatments, including CBT-I Coach for Cognitive-Behavioral Therapy for Insomnia, CPT Coach for Cognitive Processing Therapy, ACT Coach for Acceptance and Commitment Therapy, and Stay Quit Coach for Integrated Care for Smoking Cessation.²⁰⁰ There is ongoing development in this area that may provide useful resources to mitigate mental health and substance use-related concerns for those with chronic physical health conditions.

It has been previously identified that many health-related mobile applications tend to lack integration of services that meet the needs with both physical and mental health needs. For example, it was recently identified that apps that monitor weight, physical activity, psychological wellness, cognitions, and emotions separately generally show favourable outcomes for each component. However, among the

apps investigated, none integrated all of these features to enable simultaneous management of overweight/obesity and depression/anxiety.²⁰¹

More recently, digital reality applications such as virtual reality (VR) are being tried to help foster more of a sense of psychological presence and improve mental health. For example, at Cedars-Sinai Medical Center in Los Angeles, VR is being applied during the COVID-19 pandemic to deliver mind-body treatments in three-dimensional worlds for people in their homes.²⁰² Although digital applications are recognized as viable alternatives to health care delivery, particularly during the pandemic, there are several issues that need to be considered. For example, disparities in digital access exist. In addition, it is recognized that safety protocols to protect mental health (e.g., to manage suicidal ideation remotely) will be needed.

6.4.3 Mental Health Screening and Assessment

Mental health screening among those with physical health conditions are a recommended standard of practice. In line with these standards, various online self-assessment tools have emerged to enable individuals to monitor their mental health during the pandemic.²⁰³ Though mental health screening has been identified to be a need in the context of the COVID-19 pandemic, studies show that there was considerable heterogeneity of measures that were used, some which have also not been validated for use in different populations. For example, mental health screening tools that have been applied to individuals with inflammatory rheumatic diseases have included the Hospital Anxiety and Depression Scale (HADS), General Anxiety Disorder-7 (GAD-7), and Patient Health Questionnaire-9 (PHQ-9), however, these have not been validated in these populations²⁰⁴ and may not be accurate due to varying symptom profiles. Tools to assess mental health for those with chronic physical health conditions and that are at risk of communicable disease should include screening for symptoms, stress, quality of life, risk factors, and protective factors. Brief screening tools such as the two-item PHQ may be feasible for use during virtual visits or as part of testing for COVID-19. If more comprehensive assessment is needed, people can be scheduled for an assessment with standardized instruments validated for their particular circumstances (e.g., health condition).

Gatekeeper training, which involves training of key people such as first responders or human resource managers to identify individuals experiencing mental health issues such as suicide ideation, may be another means in which to do mental health screening in the community.²⁰⁵ In the context of the pandemic, it may be helpful to train gatekeepers in the general population (e.g., teachers). Some examples of the adapted standard gatekeeper are the Alliance Project²⁰⁶ that offer brief online trainings. In addition, The Australian Mental Health First Aid has been shown to be effective in improving knowledge, attitudes, and helping behaviours towards adults with mental health problems.²⁰⁷

6.4.4 Psychological, Lifestyle, and Peer Approaches

A recurring theme for recommendations to promote mental health in the context of the COVID-19 pandemic was self-care and standard mental health interventions such as cognitive behaviour therapy (CBT) as warranted. While CBT is considered a cornerstone of mental health care, the literature does not demonstrate its efficacy for individuals with different chronic physical health conditions, such as those with cardiovascular disease.²⁰⁸ Brief interventions, focused on the identification of warning signs, coping skills, social support, professional help and crisis planning, have been shown to be effective in preventing suicidal thoughts and behaviour.²⁰⁹ The brief intervention and contact examined in the WHO

Multisite Intervention Study on Suicidal Behaviours (SUPRE-MISS) randomized controlled trial showed a significant decrease in suicide after 18-month follow-up in comparison with usual care.¹⁷⁷

Similar to the psychosocial intervention literature, there was limited discussion about lifestyle and peer-based interventions. Lifestyle interventions such as physical activity, diet, and mindfulness-based meditation techniques that are provided as adjuncts to the care for those with chronic physical health conditions that are at risk of COVID-19 may help promote mental health,²⁰⁶ however this has not been specifically studied. While peer support approaches are a recommended model for mental health care,²⁰⁷ particularly for those facing mental health problems and illnesses, evidence is lacking about its potential for those with chronic physical health conditions and as a means to improve mental health as well as its utility during public health crises.

6.4.5 Addressing Contextual Factors and the Needs of Diverse Populations

The extracted literature provided limited findings that were specific to varying contexts, such as recommended services to mitigate substance use related responses, as well as addressing the needs of specific populations such as new immigrants, refugees, or those in non-traditional families. Interestingly, none of the literature extracted from the Chinese Language literature database discussed substance use. This may be a reflection of the more restrictive substance-use related policies in China.

Other studies have identified that race and ethnicity may influence individuals coping with stressors²⁰⁸ and that alternatives such as integrative therapy (e.g., tai chi, yoga) and community-oriented approaches (e.g., Aboriginal ceremonies and rituals) may be better adopted by those from diverse backgrounds to help foster mental health. LGBTQ populations, may be particularly vulnerable during public health crises such as the COVID-19 pandemic as previous studies suggest they tend to have physical and mental health concerns.²⁰⁹ Effective interventions for populations such as these need to consider factors such lifetime victimization, stigma, and distinct social support networks.²¹⁰ Pandemic specific services identified in the literature for these populations referred to delivery of psychotherapy through electronic means with directives to clients about keeping routine, stress management, and sleep hygiene.⁶³ Less formal support ("peer-recovery") may also be offered through social media such as Facebook, text, or in person as it is not subject to the same strict privacy regulations as telemedicine. The lack of evidence to indicate whether these practices are effective or not points to the need for research of interventions among diverse populations with specific needs.

6.4.6 Health Research

There are various interventions that may foster mental health for those with chronic physical health conditions in the context of disease outbreaks that need to be investigated. While there are various online screening tools available for the general population to assess for mental health, evidence-based mental health screening tools specific for those with chronic physical health conditions need to be assessed for appropriateness across diverse populations. A better understanding of the shared etiology of mental and physical health could also lead to more targeted and personalized approaches to care. Better knowledge about integrated care implementation and outcomes are needed, and innovations such as mobile health.

There has been limited investigative work related to digital health applications, there is imperative need for studies aimed at determining efficacy of m-health interventions that should also focus on the

identification of active elements and core processes of change, determination of effective ways of increasing adoption and engagement, and explore ways of combining the various capabilities of mobile technologies to maximize their impact. As part of this investigative work researchers and clinicians should routinely assess the frequency and intensity of adverse effects of these interventions. A recent study indicated that, in four large clinical trials, 9.3% of patients receiving mental health-related web interventions reported some type of negative effect.²¹⁵

While there is evidence that the collaborative care model is effective in addressing both physical and mental health needs, including substance use problems,²¹⁶ it remains unclear what components of the model are necessary for success, particularly during crisis situations. This knowledge synthesis focused on chronic physical health conditions, a future consideration would be to consider those with multi-morbidities and assessing multi-integrated interventions. Finally, any interventions which may be investigated should ideally be co-constructed with those that have lived experience, their families, and caregivers.

7. Results: Rapid Realist Approaches

7.1 Background

In following the socio-ecological mental health promotion framework (Figure 3.1), the project team decided to focus on what seem to be the key mechanisms (or ‘simple rules’) that link levels of the socio-ecology of mental health promotion, from overarching policy frameworks, such as Health in All Policies (HiAP), to major health systems level initiatives (e.g., integrated care systems), to community asset/capacity building programs (often run by community-based organization sponsored by both government and non-governmental organizations as mediators/facilitators), down to the level of individual families/informal care systems that wrap around individuals that live with or are at risk from living with co-morbidity of mental and physical health conditions. We are aware that some mechanisms will be more associated with actions and interventions primarily focused in one of the levels; yet, we wanted to bring attention to those key elements that enabled (or constrained) the complementary and coordinated functioning of the different levels of the framework in concert. We think it is particularly important, as we review many novel interventions and emergency measures tailored to respond specifically to COVID-19 and its threat to mental health, that we don’t lose sight of the fact that the underlying foundations of the effective implementation of these diverse interventions, especially with populations who are relatively vulnerable to higher risks to their mental health and lower access to needed services, are built upon the fundamental, multi-level societal resources and institutional capacities for mental health flourishing identified in the framework.

The realist approach is less interested identifying the ‘best buy’ of shelf-ready interventions, and more interested in the underlying way that the diverse resources interventions offer are reacted to, and taken up by, those key social actors (including, but not limited to the ultimate beneficiaries) that actually ‘make’ or ‘cause’ things/outcomes (be they positive or negative in terms of intervention success) to happen. We know very well that how the key actors react or take advantage of intervention resources has much to do with the different layers and scales of social context that impact on their capacities, readiness, and willingness to do what the intervention designers expect and need them to do. What we see with many COVID-19 interventions aimed at supporting mental health for people living with comorbidities, is that they rely on several key mechanisms that operate across contextual/system levels.

Effective health promotion requires these ‘links’ across systems levels—from the individuals to policy-makers. Traditional ‘routes’ of moving information and making decisions takes time, and in many instances, policy begins top-down and never includes the voices at other systems levels. During COVID-19, it is especially important to consider how mental health promotion can happen at each systems level, and then look for the mechanisms or drivers that link them together. In this section, we will focus on evidence of those mechanisms associated with mental health promotion for individuals, communities and primary care providers.

Our definition of health promotion is derived from Rootman, Dupere, Pederson and O’Neill (p. 23).²¹⁷ They describe health promotion as “planned change of health-related lifestyles and life conditions.” Using a realist approach, we have presented figures that depict the evidence for links between systems levels for each mechanism. Other evidence exists, but we have included some key examples for each mechanism in this section that focuses on individuals-communities-primary care. As this is a ‘rapid’ realist review, it is not expected that the presented evidence is exhaustive, rather it should be used as examples of how important mechanisms might operate across levels to support intervention efforts.

Health promotion is associated with several mid-range theories. One well-known one is family theory or family-centered care, where individuals are more apt to take up interventions that meet their needs and are designed with their input.²¹⁶ This means that community resources and primary care clinics need to use collaborative decision-making to ensure individuals' voices are heard—their needs are the centre of intervention design and delivery.²¹⁸ In order to take control and to manage one's own health, individuals need to actively participate in decisions related to improved mental health outcomes.

A common method of mental health promotion is based on health literacy and sharing information with individuals. A problem for many vulnerable individuals, from diverse populations, is that health literacy is often a challenge. Individuals cannot act effectively on their own behalf if they are not aware of critical information to inform mental health decision-making, and if they do not value this information. We have learned that the social determinants of health, such as food, shelter, employment take precedence over abstract information. Improvement in individuals' health status does not depend on information—it depends on access to the social determinants of health. Health promotion at the individual level, therefore, depends on access to necessary resources through primary care clinic social prescribing and community outreach: These interventions are more effective during these challenging times than message broadcasts.²¹⁹ Andermann²²⁰ proposes efforts at all systems levels address the social determinants of health “early and broaden the scope of interventions to make entire families and communities healthier” (p. 2).

Policy-makers are beginning to understand the importance of wrap-around services for individuals, structuring primary healthcare centres that address medical and social care needs.²²¹ Primary care providers often are best positioned to screen for individual needs and to make the necessary connections to community resources, including legal aid and vocational training.²²¹ There are number of family-centered care assessment tools being used that prompt primary care providers to consider the holistic needs of their patients, and to foreground concerns for vulnerable populations, particularly the social determinants of health. Ideally, wrap-around services include teams of providers with expertise in relational inquiry, equity and social justice.²²² One example is the Calgary Family Assessment Tool which may help to assess a family with a goal of resolving issues among the family where needed.²²³

There is some evidence of the importance of political engagement for those who have the means to advocate for health promotion interventions that reach everyone in the community. In many instances, important health movements have originated through collaborative grassroots action between individuals, community partners and providers.²²⁴

This introduction sets the stage for successful interventions that we will describe for key mechanisms at individual, community, primary care, policy levels—fueled by the mid-range theories of family-centered care and relational practice theory.

7.2 Findings

In the specific context of the COVID-19 pandemic, five mechanisms (simple rules) were identified as necessary for the operation of many of the interventions highlighted in the scoping review. These mechanisms (simple rules) are trust and feedback, accountability and responsibility, power, resilience, and social connectedness. These mechanisms do not necessarily operate apart from each other, with some being necessary for the triggering of others.

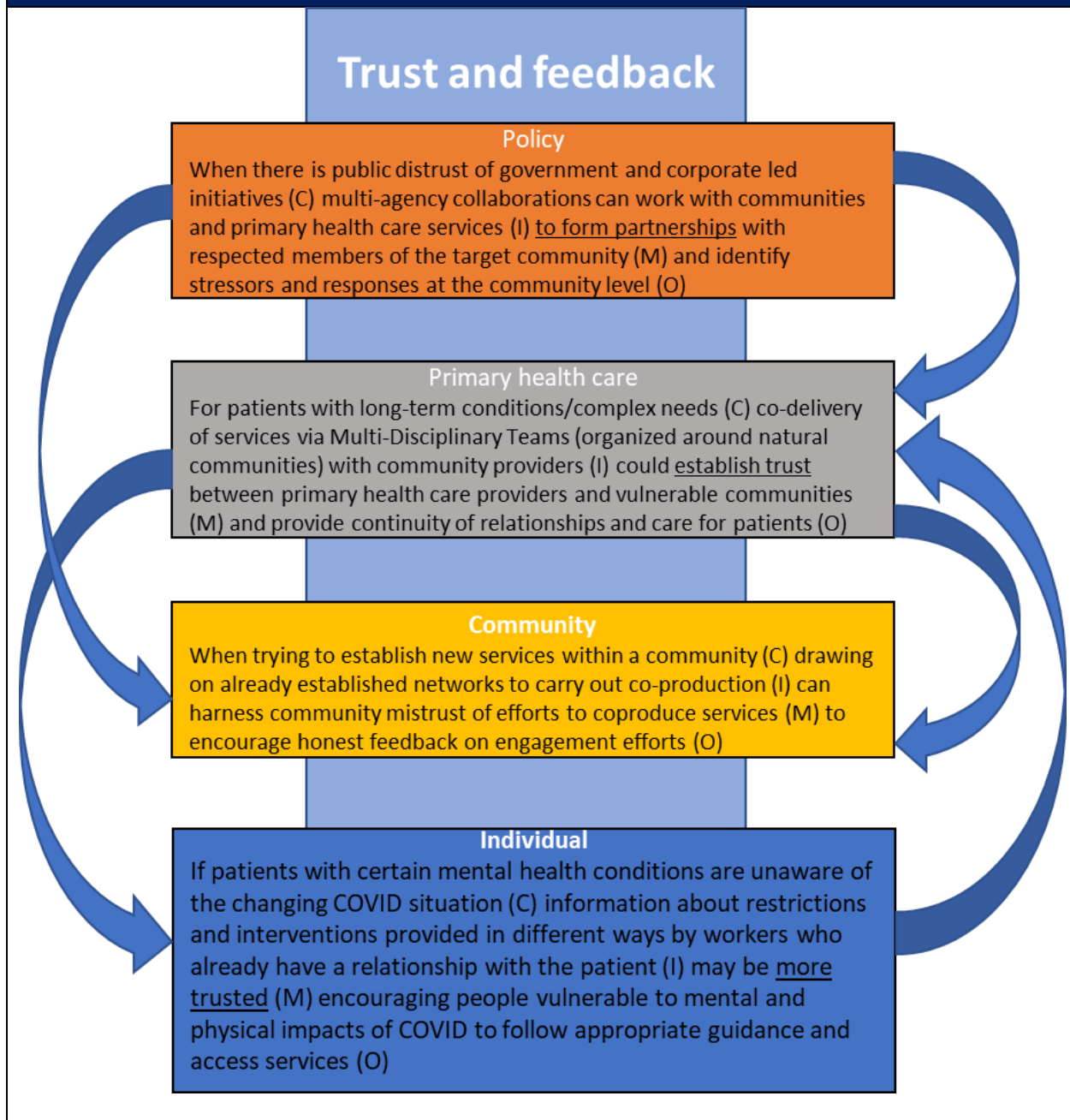
This section will introduce these mechanisms and highlight examples of interventions identified in the scoping review where these mechanisms are evident. Diagrams illustrate how these key mechanisms may operate, and how they might work across the four socio-ecological levels highlighted in the Mental Health Promotion Framework (Figure 3.1). These examples can be used to develop an understanding of if and how an intervention might be working, or why it might not work in some contexts or for some populations.

7.2.1 Trust and Feedback

In the context of delivering interventions to the populations who are the focus of this review, trust and feedback refers to the establishment and maintenance of relationships between people and organisations that are open and honest, as well as the role of history and pre-context.²²⁵ The idea is that trust in this context enables people at all levels of the socio-ecological system to offer ideas, information and feedback that can indicate what is needed, and if it is working, to allow the establishment of flexible and responsive services that can meet the needs of people with complex needs during the pandemic. However, trust is not established quickly, and interventions that need trust likely need to rely on relationships that already exist rather than the development of new relationships during the pandemic.

Interventions identified in the scoping review where trust may be a key mechanism include specialised care and active monitoring for vulnerable individuals utilizing pre-existing caring relationships for patients. For example, for older patients with serious mental health conditions, there may be barriers to communication with and access to health care services. Social workers could play an important role by drawing on the relationships they already have, and their skills in care coordination, delivery of evidence-based practices, and knowledge of community resources to collaborate with individuals to develop appropriate support, and also help mental health professionals to develop their skills.⁷⁸ In addition, trust and feedback may be important on other levels (Figure 7.1) to identify where there are gaps in services, or additional intervention and support may be needed.

Figure 7.1: How trust and feedback responsibility operate at different socio-ecological levels



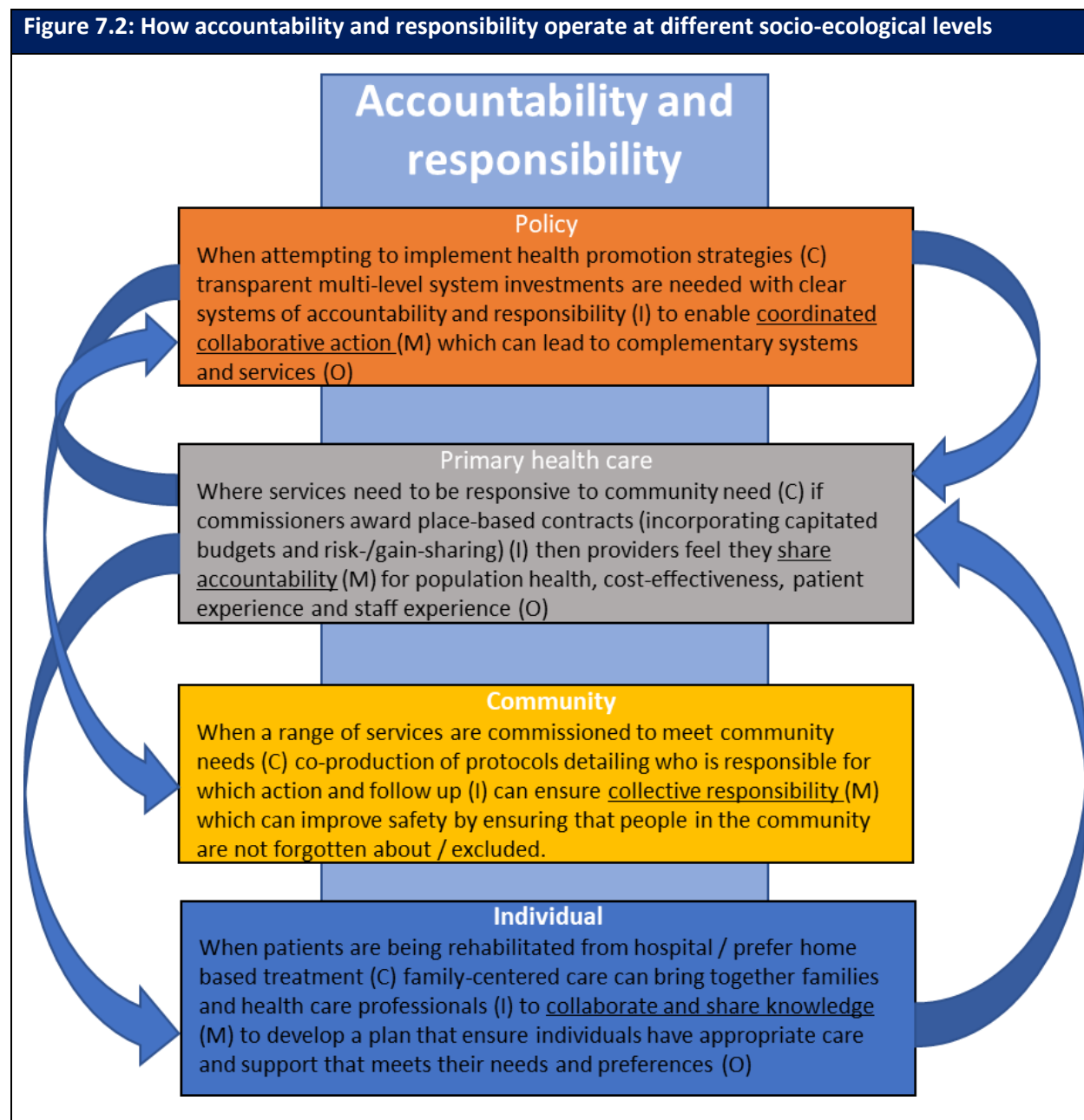
7.2.2 Accountability and Responsibility

Accountability and responsibility refer to responsibility for the provision of health care on multiple levels, with the flexibility for people and organisations to take responsibility for services and actions on a local level, but with shared accountability and oversight across levels.²²⁶ This may be particularly relevant when considering the introduction of large-scale health reform across a whole system.

In relation to the findings of the scoping review, accountability and responsibility may be particularly important for interventions that involve screening and the delivery of services at different levels and in

different locations, such as rehabilitation planning and care from hospital to home care⁷⁵ to ensure that there is coordinated support and training. This draws on the theory of family-centered care, where members of the medical team and the family can share decision making and planning to provide appropriate care for the individual patient.²²⁷

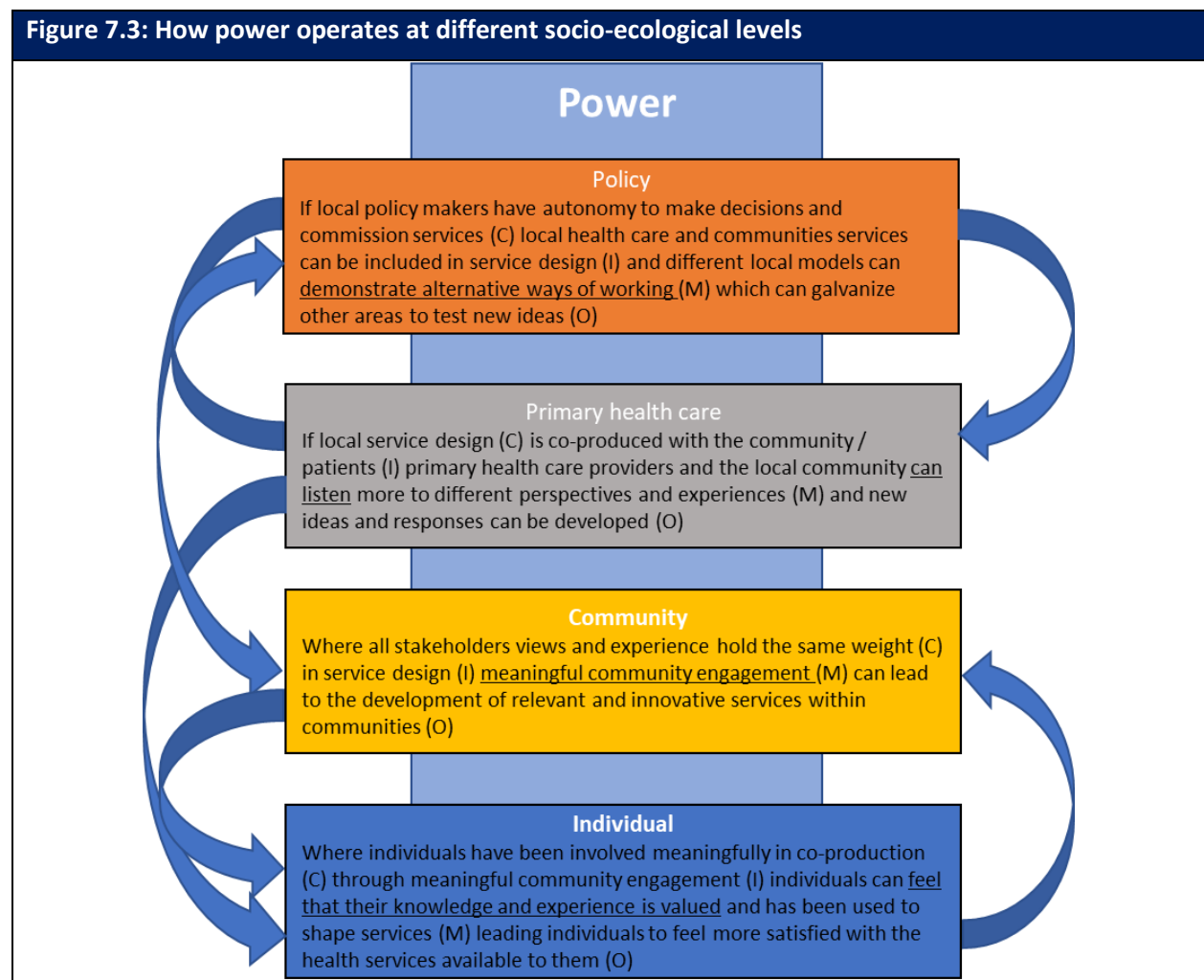
To achieve the outcome of individuals being able to access care that is appropriate for their specific needs, accountability and responsibility other levels of the system is needed (Figure 7.2). It is important that there are clear roles and responsibilities to encourage the diffusion of responsibility and encourage 'buy in' of stakeholders, but with oversight to avoid dilution of accountability.



7.2.3 Power

The mechanism of power in this context refers to where decision making power lies, and who is enabled to make decisions around commissioning and designing services.²²⁸ For meaningful community engagement, it needs to be possible for power to be equally distributed between partners on different levels of the socio-ecological framework. This includes the ability for people on all levels to challenge and have an impact on decisions that are made, rather than the application of a power 'hierarchy'.

Many of the interventions identified in the scoping review rely on the adaption of existing frameworks and models to fit the current pandemic; an example is provided by Benaque et al. 2020.⁸⁸ Co-production and design has been shown to be an effective way of adapting services to meet the needs of specific populations and contexts as highlighted in an by Wherton et al.²²⁹ about the adaption of telehealth services to meet the needs of people with assisted living needs. For coproduction to work effectively, partnerships across all levels needs to enable power sharing and input into decision-making.

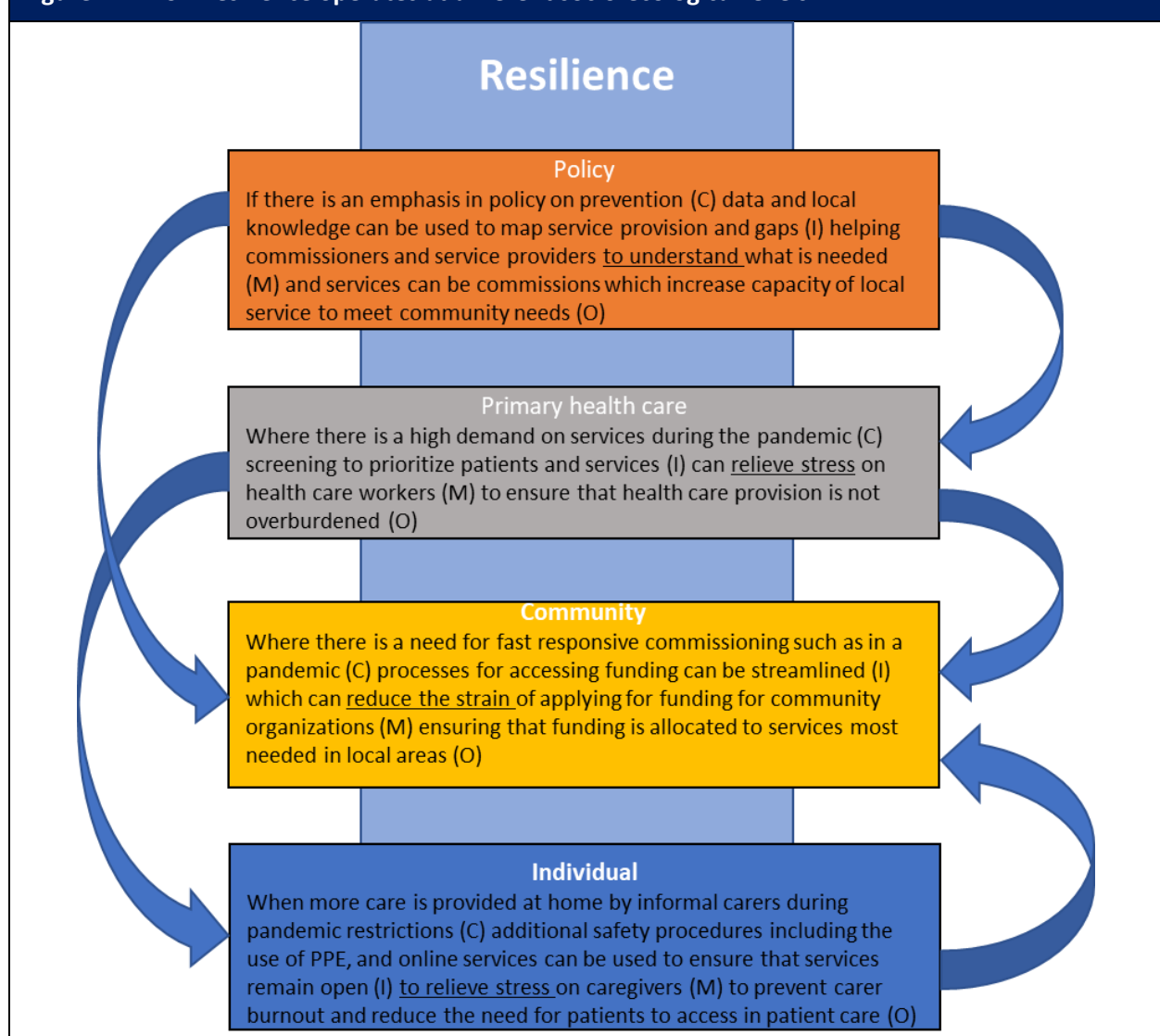


7.2.4 Resilience

In relation to health care systems, resilience refers to their ability to respond to demand, including from external shocks such as the COVID-19 pandemic.²³⁰ This can also include the ability to quickly identify stress points, and responsiveness to relieve tension in areas to prevent Where health promotion is concerned, resilience is necessary across all socio-ecological domains, particularly as stress on the system can transfer to different areas. For example, more care may be carried out in the home by informal carers rather than in care homes or in-patient services, while community services that support carers may close due to lockdown restrictions.

The scoping review highlighted some specific resilience building programmes for individuals, particularly those screened and identified as potentially being vulnerable to loneliness.¹³⁷ In addition, telehealth services provided to individuals when in-person services cannot operate may help to provide social support to isolated individuals,⁹⁷ and potentially help those with substance use issues to limit intake.¹⁰⁴

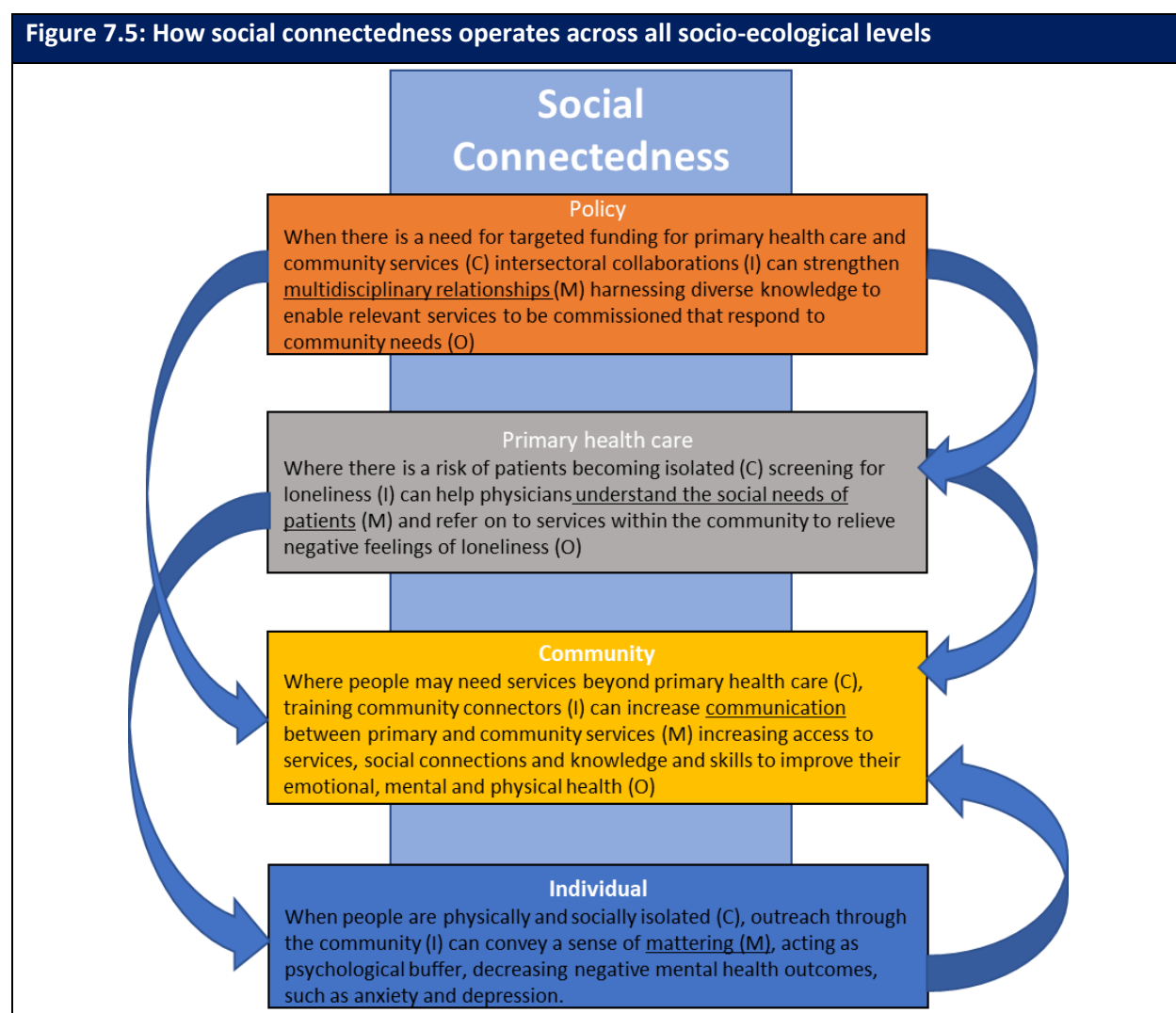
Figure 7.4: How resilience operates at different socio-ecological levels



7.2.5 Social Connectedness

Social connectedness refers to the links and networks between people across the whole socio-ecological system. Perceived social connectedness may be important to the health and well-being of older adults²³¹ allowing them to feel socially engaged in society. This may be enabled through individuals and communities taking part in co-production activities (see Figure 7.3) and could also increase community and individual resilience (see Figure 7.4).

One of the main interventions identified in the scoping review which emphasised social connectedness is social prescribing. Social prescribing is a way of linking patients in primary care with sources of support within the community to help improve their health and wellbeing.²³² Social prescribing relies on connections between primary health care and the community to connect individuals with holistic services that can support and promote physical and mental health.²³³ The availability of these services rely on responsive funding from a policy level. To understand which services are needed within communities, collaborative partnerships between policy makers, primary health care, community service providers and activists are needed.



8. Summary and Conclusions

8.1 Overview of Scoping Review Results

This integrated scoping and rapid realist review was undertaken to help identify interventions that could help reduce mental health and substance use responses among those with pre-existing health conditions that present risk for contracting COVID-19 infection and heightened challenges in recovery from the illness. The physical health conditions examined included obesity, diabetes, cancer, cardiovascular disease, respiratory disease, autoimmune conditions (e.g., rheumatoid arthritis, systemic lupus erythematosus), inflammatory bowel disorders, kidney disease, liver disease, hepatitis, HIV or AIDS, and neurocognitive conditions (e.g., dementia, Parkinsons disease, epilepsy). We also examined the literature regarding functional limitations and frailty. Among this population group, we also aimed to identify what interventions may help among diverse subpopulations that may have heightened vulnerability to mental health and substance-use related risk. To capture comprehensive data, we examined the English and Chinese language literature.

There are multiple intersecting individual, community, and broader societal factors that can contribute to mental health and well-being among those who have a chronic physical health condition that places them at risk of severe COVID-19 infection. Shared etiological components that include biological (e.g., genetic markers), psychological (e.g., perceptions of having one's chronic health condition), and behavioural (e.g., diet, activity, substance use) factors combined with health determinants such as education, income, housing, and employment contribute to both physical and mental health and are, in most cases, modifiable targets to help mitigate risk of mental health and substance use responses.

Given that mental health and well-being results from the interplay of various biological, social, psychological, and environmental factors, efforts in which to mitigate risk of developing poor mental health or substance use as well as improve existing mental health-related symptoms must be multi-faceted. Much of the extracted literature detailed interventions that were promising such as developing contingency plans for service delivery, mental health screening, online delivery of care, and social prescribing. Mental health screening tools may need to be adapted for use in different populations, including those with different health conditions. Efforts towards establishing more integrated and collaborative care models with stepped care approaches as well as fostering competency across practitioners to deliver trauma-informed care may help to direct future health services that are more responsive in times of public health crisis.

There are various approaches that could help to expand capacity of services, particularly those aimed at mental health which are highly vulnerable during medical pandemics. Alternative care models such as the delivery of grouped medical visits in online environments may expand capacity for health services delivery. In addition, flexible services such as home visits and extended hours may help to better address the mental health needs of different populations. Within the care delivery context, it is also well recognized that the health care plans be a product of individual and family centred care as well as shared decision-making. To a lesser extent self-care and lifestyle interventions were discussed as potential adjuncts to care that could help to foster mental health. Augmenting formal health care delivery with peer support and psychological first aid-oriented approaches offered by non-professionals may also help to foster social connectedness and resilience. Furthermore, gatekeeper training where key people such as first responders or human resource managers develop skills to identify individuals

experiencing mental health issues, such as suicide ideation may help to identify those in need of specialized mental health care.

Perhaps one of the most focused upon solutions to address mental health needs during the COVID-19 pandemic has been the use of various digital applications. Exemplars included videoconferencing, text messaging, smartphone-based applications, telehealth, health education delivered in online platforms, mobile apps as an adjunct to telehealth to monitor symptoms related to trauma, insomnia and cognition, and use of social media platforms by para-professionals, peer helpers, and health-related organizations. More recently, digital reality applications such as virtual reality are being tried to help foster more of a sense of psychological presence and improve mental health.

Although the scoping review identified many responses that may be implemented to help mitigate mental health and substance use responses among those with physical health conditions that present risk of severe COVID-19 infection, several limitations must be noted. First, the intervention discussed were for the most part not embedded in an evidence base that was specific to COVID-19 but rather were for the most part identified potential best practices. Second, there was an apparent lack of interventions that may be recommended for diverse populations, such as immigrants, refugees, , older adults, ethnocultural and racialized communities, First Nations, Inuit and Métis, 2SLGBTQ+ groups, individuals with disabilities, and those who are homeless and underhoused. Third, the focus of this work was on examining specific comorbidities. As could be seen in some of the extracted literature as well as the broader investigations about comorbidities, that multi-morbidities were prevalent. This points to a need for future work to consider the complexities of multiple disease states, many of which may place heightened risk for infection, and if there are differing intervention needs in these contexts. Finally, the emphasis of the literature was about reactions or responses that were undertaken during the COVID-19 pandemic to address mental health and substance use responses. Proactive measures for future consideration include aiming at population level approaches that foster mental health promotion. Policy targets such as the social determinants of health (i.e., education, employment, income), health literacy, social supports, resilience, and reducing health and social disparities would shift the current health system towards better responsiveness to the needs of diverse populations in public health crisis contexts.

8.2 Overview of Realist Approach to the Extracted Literature

To help identify ways in which diverse resources interventions are taken up key stakeholders and how they may lead to different outcomes, a realist approach was applied to examine in more depth some of the proposed interventions outlined in the scoping review. As a guide, a socio-ecological mental health promotion framework constructed by the project team was applied to help determine what appeared to be key mechanisms that link micro, meso, and macro-levels of the socio-ecology of mental health promotion. This enabled for us to focus on the underlying foundations of effective implementation of interventions that may meet the needs of diverse populations, and that are built upon the multi-level societal resources and institutional capacities for mental health flourishing identified in the framework. In the specific context of the COVID-19 pandemic, the team identified five mechanisms that were necessary for the operation of many of the interventions highlighted in the scoping review (Table 8.1).

Table 8.1: Mechanisms underlying operations of interventions to mitigate mental health and substance response responses		
Mechanism	Description	Examples of Interventions From The Scoping Review
<i>Trust and feedback</i>	Refers to the establishment and maintenance of relationships between people and organizations that are open, honest, and consider historical factors. Individuals at all levels of the socio-ecological system feel enabled to offer ideas, information, and feedback that can indicate what is needed, and if it is working, to allow the establishment of flexible and responsive services that can meet the needs of people with complex needs.	Specialized care and active monitoring for vulnerable individuals utilizing pre-existing caring relationships for patients may be exemplars of mechanisms where trust and feedback may be fostered.
<i>Accountability and responsibility</i>	Refers to the responsibility for the provision of health care on multiple levels, with the flexibility for people and organizations to take responsibility for services and actions on a local level, but with shared accountability and oversight across levels.	Interventions that involve screening and the delivery of services at different levels and in different locations, such as rehabilitation planning and care from hospital to home care to ensure coordinated support and training
<i>Power</i>	Refers to where decision making power lies, and who is enabled to make decisions around commissioning and designing services. For meaningful community engagement power should be equally distributed between partners on different levels of the socio-ecological framework. This includes the ability for people on all levels to challenge and have an impact on decisions that are made.	Co-production and design of interventions such as the adaption of telehealth services to meet the needs of people with assisted living needs
<i>Resilience</i>	Refers to the ability to respond to demand, including from external shocks such as the COVID-19 pandemic. This can include the ability to quickly identify stress points, and responsiveness to relieve tension in areas to prevent.	Resilience building programs for individuals, particularly those screened and identified as potentially being vulnerable to loneliness, poor mental health, or substance use
<i>Social connectedness</i>	Refers to the links and networks between people across the whole socio-ecological system. One of the main interventions identified in the scoping review which emphasized social connectedness is social prescribing.	Social prescribing that can link patients in primary care with sources of support within the community to help improve their health and wellbeing

Appendix A: English Literature Data Extraction Tables (n=65)

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
Systematic Review, Meta-Analysis and Literature Reviews				
1. Ceravolo MG et al. "Systematic rapid" living" review on rehabilitation needs due to COVID-19: update to March 31st 2020. European journal of physical and rehabilitation medicine (2020). Italy	Frail or frailty / Depression	Aim: Provide rehabilitation community with updates on the latest scientific literature and rehabilitation needs due to COVID-19. Findings: Rehabilitation interventions are described (e.g. music therapy, group rehabilitation), acute care, inpatient, and home interventions. It is recommended: 1) Early rehabilitation should be granted to inpatients with COVID-19; 2) people with restricted mobility due to quarantine or lockdown should receive exercise programs to reduce the risk of frailty, sarcopenia, cognitive decline, and depression; 3) tele-rehabilitation may represent the first option for people at home.	Systematic review	Review based on 9 articles of varying methods
2. Ahmed H et al. Long-term clinical outcomes in survivors of severe acute respiratory syndrome and Middle East respiratory syndrome coronavirus outbreaks after hospitalisation or ICU admission: a systematic review and meta-analysis. Journal of Rehabilitation Medicine. 2020 May 25;52(5). United Kingdom	Respiratory, other/ Post-traumatic stress disorders, Depression	Aim: Determine long-term clinical outcomes in survivors of SARS and MERS coronavirus infections after hospitalization. Findings: Prevalence for PTSD (38.8%), depression (33.2%), and anxiety (30.04%) indicated. Mean scores of the Short Form 36 health survey showed substantially lower values in CoV patients when compared to healthy patients and those with chronic diseases. Acute multidisciplinary rehabilitation during hospital stay, post-acute rehabilitation in step-down rehabilitation or respiratory units and long- term rehabilitation interventions are recommended to optimize physical, psychological and functional recovery in these individuals.	Systematic review and meta-analysis	Studies of modest sample sizes; heterogeneity noted

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
3. Rogers JP et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. The Lancet Psychiatry. 2020 May 18. United Kingdom, Italy	Dementia, other/ Anxiety, depression, PTSD, substance use, psychotic disorder	Aim: Assess psychiatric/ neuropsychiatric presentations of SARS, MERS, and COVID-19. Finding: 65 studies and 7 preprints met inclusion criteria; 3559 cases of corona virus included. Studies were from China, Hong Kong, South Korea, Canada, Saudi Arabia, France, Japan, Singapore, the UK, and the USA. Post-illness point prevalence of PTSD was 32.2% (95% CI 23.7–42.0; 121 of 402 cases from four studies), depression was 14.9% (12.1–18.2; 77 of 517 cases from five studies), and anxiety disorders was 14.8% (11.1–19.4; 42 of 284 cases from three studies).	Systematic review and meta-analysis	Publication bias suggested by authors
RCTs				
4. Wei N et al. Efficacy of internet-based integrated intervention on depression and anxiety symptoms in patients with COVID-19. Journal of Zhejiang University. Science. B. 2020 May 1:1. China	HIV, CVD, hypertension, liver disease, gastric ulcers/ Anxiety, depression	Aim: Screened COVID-19 patients for depression and anxiety after providing an online-based intervention. Also examined if coexisting conditions had an effect on increasing prevalence of psychological distress (GAD-7). Findings: 34.6% of the 26 patients had underlying diseases: four (15.4%) had hypertension, two (7.7%) had liver disease and one (3.8%) each had gastric ulcer, coronary heart disease and AIDS.	RCT	Small sample; potential bias related to unblinding; short follow-up
Case-Control/Retrospective Studies/Mixed Methods/Cross-Sectional				
5. Shalash A et al. Mental health, physical activity and quality of life in Parkinson's disease during COVID-19 pandemic. Movement Disorders. 2020 May 19. Egypt	Parkinson's Disease (PD)/ Anxiety	Aim: Investigate the impact of COVID-19 pandemic on mental health, physical activities and quality of life (QoL) of patients with PD (n=38) and age/sex matched controls (n=20). Assessed using Depression, Anxiety, and Stress Scale–21 (DASS-21), Beck Depression Inventory, the short form of the international physical activity questionnaire (IPAQ)5 and the PD questionnaire (PDQ39). Findings: Most reported a negative impact on their mental health, physical activity, and health care and an interest in virtual visits. DASS - total, depression, and anxiety were correlated with pre - lockdown motor severity. DASS depression	Cross-sectional/ comparisons	Modest sample; tend to be higher educated

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		was positively correlated with pre - lockdown; Beck Depression Inventory (BDI) and negatively with cognition. Total IPAQ scores were negatively correlated with total DASS ($r_s = -0.354$, $P = 0.029$), DASS depression ($r_s = -0.441$, $P = 0.006$), pre - lockdown motor severity–on, and BDI, but positively correlated with education and cognition. Total PDQ39 scores were significantly correlated with total and subscores of DASS, pre - lockdown motor severity, BDI, and worry about unavailability of medication ($r_s = 0.347$, $P = 0.035$). Compared with controls, patients showed significantly worse stress, depression, anxiety, total DASS, moderate physical activity, walking, total IPAQ, total and most of the PDQ39 dimensions PD patients showed a significant decline in physical activity compared with pre - lockdown ($P = 0.002$).		
6. Guo Q et al., Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study. Brain, Behavior, and Immunity, Volume 88, August 2020, 17-27. https://doi.org/10.1016/j.bbi.2020.05.038 China	Peripheral inflammation/ Depression, anxiety, PTS symptoms	Aim: Investigate the mental status of patients (n=103) with COVID-19 and age, education, gender, and place of residence matched controls (n=103); peripheral inflammatory markers also assessed. Excluded were those with lymphatic disorders or malignant hematologic diseases. Qualitative data were collected among five patients with COVID-19. Findings: Depression and anxiety symptoms were more common among COVID-19 patients than in normal controls. Those with COVID-19 had higher depression ($P < 0.001$), anxiety ($P < 0.001$), and post-traumatic stress symptoms ($P < 0.001$). Gender effect was observed in the score of “Perceived Helplessness”, subscale of PSS-10, among female patients was higher ($Z = 2.56$, $P = 0.010$). C-reactive protein (CRP) correlated positively with the PHQ-9 total score ($R = 0.37$, $P = 0.003$) of those with depression. Change of CRP level from baseline inversely correlated with the PHQ-9 total score ($R = -0.31$, $P = 0.002$). Qualitative analysis revealed reports of negative feelings, including fear, guilt, and	Mixed-methods approach – survey and interview of subsample	Modest sample; authors indicate may not represent those with less severe COVID-19 symptoms; not all confounders ruled out; social desirability bias

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		helplessness with stigma and uncertainty of viral disease progression as main concerns expressed by COVID-19 patients.		
7. Vanni G et al. Breast cancer and COVID-19: The effect of fear on patients' decision-making process. In Vivo. 2020 Jun 1;34(3 suppl):1651-9. Italy	Cancer, breast (BC)/ Anxiety	Aim: Assess the effect of BC patients' anxiety caused by the fear of COVID-19 on their decision- making process regarding treatment. Finding: Eighty-two patients with a suspected breast lesion (SBL) were divided into two groups: PRE- and POST-COVID-19-SBL. Seventy-eight breast cancer (BC) patients were divided into PRE- and POST-COVID-19-BC. Significant difference was found in the procedure refusal (PR) rate between the PRE- and POST-COVID-19 periods ($p=0.0065$), 9.30% vs 35.90%. Surgical refusal (SR) distribution demonstrated significant difference between PRE-COVID-19-BC and POST-COVID-19-BC groups ($p=0.0208$). POST-COVID group: 7 patients specified COVID-19 in the written refusal.	Retrospective descriptive	Potential confounders / limited sample/ potential selection bias/ short period of analysis (~2 months)
8. Slaunwhite AK et al. Overdose and risk factors for coronavirus disease 2019. Drug and alcohol dependence. 2020 Jul 1;212:108047. Canada	Respiratory, COPD/ Substance use disorders	Aim: Quantify the prevalence of risk factors associated with mortality due to COVID-19 for persons who have non-fatal overdose between 2015-17 compared with those who do not have such an overdose. Findings: Previous non-fatal overdose increased the odds of having the comorbid conditions investigated: chronic respiratory disease (OR 2.01, 95% CI 1.92-2.11, $p<0.001$) diabetes (OR 1.24, 95% CI 1.16-1.32), coronary artery disease (OR 2.08, 95% CI 1.92-2.27, $p<0.001$), and Elixhauser Comorbidity Index > 2 (OR 18.05, 95% CI 17.19-18.96, $p<0.001$). There was no significant difference in the prevalence of hypertension among those who overdosed and those who didn't.	Retrospective analysis of administrative data	Likely under-reporting of overdose due to mis-classification bias

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
9. Lara B et al. Neuropsychiatric symptoms and quality of life in Spanish patients with Alzheimer's disease during the COVID-19 lockdown [published ahead of print, 2020 May 25]. Eur J Neurol. 2020;10.1111/ene.14339. Spain	Alzheimer's Dementia, Mild Cognitive Impairment/ Anxiety, neuropsychiatric symptoms	Aim: Analyse Alzheimer's (AD) and Mild Cognitive Impairment (MCI) patients' neuropsychiatric symptoms and quality of life due to the impact of the pandemic lockdown. The sample size was 20 AD patients and caregivers and 20 MCI patients and caregivers. Findings: Reported worsening of neuropsychiatric symptoms in patients with AD and MCI during 5 weeks of lockdown, with agitation, apathy and aberrant motor activity being the most affected symptoms. Most frequently affected neuropsychiatric symptoms were apathy [4.15 (3.78) vs. 5.75 (4.02); p=0.002] and anxiety [3.95 (3.73) vs. 5.30 (4.01); p=0.006] in patients with MCI, and apathy [2.35 (2.70) vs. 3.75 (3.78); p=0.036], agitation [0.45 (1.14) vs. 1.50 (2.66); p=0.029] and aberrant motor behaviour [1.25 (2.86) vs. 2.00 (2.93); P = 0.044] in those with AD.	Cross-sectional	Potential recall bias; modest sample
10. Pulvirenti F et al. Health-Related-Quality of Life in Common Variable Immunodeficiency Italian patients switched to remote assistance during the COVID-19 pandemic. The Journal of Allergy and Clinical Immunology: In Practice. 2020 Apr 9. Italy	Respiratory, other/Anxiety	Aim: Health-related quality-of-life assessments help to identify major issues and patients at risk of anxiety/depression in the coronavirus disease 2019 pandemic. Finding: The quality of life was surveyed in 158 patients with PADs by the Common Variable Immune Deficiency Quality of Life questionnaire, a disease-specific tool. The coronavirus disease 2019 epidemic impacted HRQOL and the risk of anxiety/depression of patients with PADs. The remote assistance program was a useful possibility to limit personal contacts without influencing the HRQOL.	Cross-sectional	Modest sample; respondents may have been those most impacted

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
<p>11. Naser MA. (2020). One Aspect of Coronavirus disease (COVID-19) Outbreak in Iran: High Anxiety among MS Patients. Multiple sclerosis and related disorders, 41, 102138. https://doi.org/10.1016/j.msard.2020.102138 Iran</p>	<p>Multiple Sclerosis/ Anxiety</p>	<p>Aim: Measure anxiety levels amongst MS patients during the COVID-19 pandemic. Findings: The mean level of anxiety (Becker Anxiety Inventory Questionnaire) amongst participants was 25.72±6.53, which is within the range of moderate to severe.</p>	<p>Cross sectional</p>	<p>Anxiety levels pre COVID-19 not measured, limited sample, no control</p>
<p>12. Gómez-Salgado J et al. Related Health Factors of Psychological Distress During the COVID-19 Pandemic in Spain. International Journal of Environmental Research and Public Health. 2020 Jan;17(11):3947. Spain</p>	<p>Respiratory, other/Anxiety</p>	<p>Aim: Analyse psychological distress in Spain during the COVID-19 pandemic, identify role of socioeconomic factors, physical symptoms, and other variables. Hypothesized that COVID-19 does not generate psychological distress in the population. A final sample of 4180 people over the age of 18 analyzed. Findings: Physical health conditions reported included high blood pressure (29.0%), chronic respiratory disease (25.3%), diabetes (8.3%), immunosuppression disease or situation (7.0%), metabolic syndrome (5.9%), chronic cardiovascular disease (5.0%), and active cancer (2.6%). 72.0% of participants had some form of psychological distress (GHQ-12 score >8). Distressed individuals were more often female (79.6% female vs 20.4% male, p<0.001) and significantly younger (mean age 39.03 vs 43.43, p<0.001) than non-distressed individuals. There was greater distress in those working outside the home (48.5% vs 18.8% working at home and 32.7% not working, p<0.001) and those not living with children <16 years old (50.3% vs 49.7%, p=0.007). Those who presented symptoms of COVID-19 had significantly higher psychological distress for all physical symptoms assessed (p<0.001 in all cases). This study describes risk factors for psychological distress during the COVID-19</p>	<p>Cross-sectional</p>	<p>Limited generalizability; non-probability sampling</p>

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		pandemic using a cross-sectional design based on a representative sample of the Spanish population. Future health policy measures should be taken to direct resources to those in groups identified as high-risk of psychological distress		
13. Ozamiz-Etxebarria N et al. Stress, anxiety, and depression levels in the initial stage of the COVID-19 outbreak in a population sample in the northern Spain. Cadernos de Saúde Pública. 2020 Apr 30;36:e00054020. Spain	Chronic disease/ Anxiety, depression	Aim: Assess stress, anxiety, and depression with the arrival of the virus and the levels of symptoms according to age, comorbidity, and confinement in a population in northern Spain. Questionnaires were sent to a total of approximately 2,400 individuals, of whom 1,003 replied (recruited March 11-15, 2020, from the three provinces of the Basque Autonomous Community. Findings: Severe and extremely severe levels of stress, anxiety, and depression in the sample in the Basque Autonomous Community in Spain (at initial phase of outbreak) were lower than in the study in China; The Basque (Spain) sample showed higher mean levels of symptoms (stress, anxiety, and depression) after March 14, when the population began to feel the effects of the stay-at-home order; Individuals reporting chronic diseases had higher mean levels of stress, anxiety, and depression compared to participants not reporting such diseases; Unexpectedly, there were higher mean levels of stress, anxiety, and depression in the 18-25-year age bracket, followed by the 26-60-year bracket.	Cross-sectional exploratory-descriptive study	Non-response bias; limited generalizability; unable to report between group statistical significance
14. Sidor A, Rzymiski P. Dietary Choices and Habits during COVID-19 Lockdown: Experience from Poland. Nutrients. 2020 Jun;12(6):1657. Poland	Obesity/ Substance Use, stress	Aim: Assess whether nutritional and consumer habits have been affected during the nationwide COVID-19-related quarantine in Poland. Sample were 1097 Polish people age ≥ 18 years old, and female or male gender. Individuals working on a regular basis during the lockdown were excluded. Findings: 43.5% of surveyed individuals reported eating more during quarantine, and 51.8% admitted to snacking between meals more frequently. Increased food consumption and snacking was more prevalent in individuals with higher BMI; demonstrates that quarantine may pose a significant dietary risk, particularly for overweight and	Cross-sectional online survey	Modest sample; non-response bias; underrepresentation of men noted

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		obese individuals. Eating breakfast every day was more often seen in individuals with higher education (72.3%) than with vocational (66.7%), secondary (58.9%), and primary (42.9%) education level.		
15. Sanchez TH et al. Characterizing the Impact of COVID-19 on men who have sex with men across the United States in April, 2020. AIDS and Behavior. 2020 Apr 29:1-9. USA	HIV/Anxiety, substance use	Aim: Assess the COVID-19 related impacts on the sexual health of men who have sex with men (MSM). Findings: Sample consisted of 1052 US men who have sex with men (MSM) When asked about compliance with local COVID-19 measures, 20.1% reported 100% adherence, 71.4% reported greater than 50% but less than 100% adherence, and 8.5% reported less than 50% adherence to the measures (n = 190 did not answer); Majority of participants had decreased quality of life, increased anxiety (73.4%), and decreased connection to friends due to COVID-19; Large proportions of participants had also experienced problems with basic resource needs (e.g., difficulty buying food, paying rent) - more likely in younger participants; 19.1% of participants reported losing their job due to COVID-19; increased use of recreational drugs and increased alcohol consumption; Many participants reported problems accessing HIV or STI testing and STI treatment due to COVID-19 or the plans to manage it (more prevalent in younger participants); 97.9% of participants were willing to collect specimens at home for mailed-in SARS-CoV-2 COVID-19 testing for diagnostic purposes.	Cross-sectional online survey	Social desirability noted by authors; no comparison group
16. Umucu, E., Lee, B. (2020). Examining the impact of COVID-19 on stress and coping strategies in individuals with disabilities and chronic conditions. Rehabilitation Psychology, 65(3), 193–198.	Comorbidities, Multi-morbidities/ Depression, Anxiety, Stress	Aim: Describe the perceived stress levels and coping mechanism related to COVID-19 in individuals with chronic conditions or disabilities. Finding: Participants reported moderate levels of stress, anxiety, and depression. The most common coping strategies among the participants were acceptance and self-distraction. Perceived stress was positively correlated with the coping strategies of self-distraction, substance abuse, venting, and behavioural disengagement. The coping strategies positively associated with well being were emotional support, humour, and	Cross-sectional online survey	Convenience sample; Primarily White, educated, English-speaking.

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
https://doi.org/10.1037/rep0000328 USA		religion. In a global pandemic situation, individuals with chronic health conditions and disabilities are disproportionately affected. Understanding this impact can lead to the development of improved care and support for these individuals		Some sub-scales of Brief-COPE have low reliability; no stratification by condition
17. Germani A et al. Emerging Adults and COVID-19: The Role of Individualism-Collectivism on Perceived Risks and Psychological Maladjustment. International Journal of Environmental Research and Public Health. 2020 Jan;17(10):3497. Italy	History of chronic physical diseases/ Anxiety, stress, history of psychological disorders	Aim: Evaluate a) emerging adults' perceived knowledge and worries about COVID-19; b) emotional and behavioral difficulties, state anxiety, and stress during lockdown; c) association between (a) and (b); d) relationships between cultural orientations at the individual level and the aforementioned aspects; e) role of cultural dimensions on psychological maladjustment. Finding: 1101 participants. Reported high mean scores as to perceived knowledge, worries, and concerns about COVID-19; STAI-Y State Scale shows presence of relevant levels of anxiety related to the specific moment, and PSS total score fall into the range of moderate stress; knowledge, as well as worries and concerns about COVID-19, were significantly and positively related to psychological maladjustment in terms of emotional/behavioral difficulties, state anxiety, and stress; Only horizontal collectivism was significantly and negatively correlated to emotional/behavioral difficulties, state anxiety, and stress.	Cross-sectional online survey;	Non-probability sample; no specific information by health condition

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
18. Wang C et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus (COVID-19) Epidemic among the General Population in China. International Journal of Environmental Research and Public Health. 2020 February 14. China	Self-reported health and history of chronic illness/ Anxiety, depression,	Aim: Survey the general public to better understand their levels of psychological impact, anxiety, depression, and stress during the initial stage of the COVID-19 outbreak. This study included 1210 respondents from 194 cities in China. Findings: Female gender, student status, and specific physical symptoms were associated with a greater psychological impact of the outbreak and higher levels of stress, anxiety, and depression. Poor or very poor self-rated health status was significantly associated with a greater psychological impact of the outbreak (B=0.76, 95% CI 0.02-1.49), and higher DASS stress subscale (B=0.45, 95% CI 0.02-0.88), DASS anxiety subscale (B=0.90, 95% CI 0.22-1.58), and DASS depression subscale (B=0.65, 95% CI 0.10-1.20) scores as compared to those with very good or good self-rated health status. History of chronic illness was significantly associated with higher IES-R, DASS stress subscale, DASS anxiety subscale, and DASS depression subscale scores.	Cross-sectional questionnaire	General discussion about physical health; no specific details by condition; limited general-izability
19. Nachimuthu S et al. Coping with diabetes during the COVID-19 lockdown in India: Results of an online pilot survey. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2020 May 11. India	Diabetes (type 1/2)/ Anxiety, stress	Aim: An online-based pilot survey was conducted to study how people with diabetes were coping with their diabetes during COVID-19 lockdown. Findings: People with diabetes, especially those on multiple OAD and insulin, should monitor their blood sugar levels more often. The sample size was a total of 100 patients participated in the survey. 92% of the participants had Type 2 diabetes and 54% were males. Majority of the participants were from the age group of 65 or more. Most of the participants had diabetes for more than 5 years. 65% of the study participants had a duration of diabetes from 5 to 10 years.	Cross-sectional Survey	Modest sample, convenience sample
20. Salari M et al. Incidence of Anxiety in Parkinson's Disease During the Coronavirus Disease (COVID-19) Pandemic.	Parkinson's disease/ Anxiety	Aim: Provided a survey that evaluated level of anxiety among those affected by Parkinson's Disease (PD). The sample size was 137 PD patients, 95 PD caregivers and 442 control (random population). Findings: Higher rates of anxiety (BAI-II; Persian score) was reported in patients / caregivers surrounding PD. Main concern was surrounding drug availability in lockdown.	Cross-sectional survey	Modest and non-probability sample; multi-morbidities

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
Movement Disorders. 2020 May 12. Iran		Main concern of PD patients / caregivers surrounded drug availability during quarantine. Could look into ways to mitigate this. A high proportion of sample had pre-existing medical conditions (e.g., cardiac disease, obesity, diabetes).		in many respondents
21. Zipprich HM et al. Knowledge, Attitudes, Practices, and Burden During the COVID-19 Pandemic in People with Parkinson's Disease in Germany. Journal of Clinical Medicine. 2020 Jun;9(6):1643. Germany	Parkinson's disease/ Anxiety, stress	Aim: Examine the adherence to preventive measures for COVID-19 in Parkinson's Disease Patients through looking at the Knowledge, Attitudes and Critical Application of the patients towards COVID-19. Authors conducted semi-structured telephone interviews were performed with 99 patients with Parkinson's disease (PD) and 21 controls to explore knowledge, attitudes, practices, and burden in order to elucidate nonadherence to preventive measures. Information from their medical records was extracted including demographics, information about cognitive state (Montreal Cognitive Assessment (MoCa)), depressive mood (Beck's Depression Inventory II (BDI)), motor function (Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale III (MDS-UPDRS III)), presence of non-motor symptoms (Revised Non-motor Symptoms Questionnaire (NMS-Q)) , and adherence to medication (Stendal Adherence with Medication Score; SAMS). Data on these clinical parameters were obtained from two to six months before the interviews were performed. Findings: Majority of patients understood the preventive measures and felt sufficiently informed. Analysis of qualitative answers, however, showed that about 30% of patients had an insufficient level of knowledge, which was not associated with educational level, cognitive disorders, or depression.	Cross-sectional survey	Modest non-probability sample; relied on medical chart data
22. Brown TS et al. The Effect of The COVID-19 Pandemic On Electively Scheduled HIP and KNEE Arthroplasty Patients in	Arthritis, osteoarthritis/ Anxiety	Aim: Identify hip and knee arthroplasty patients in the US (n=360) who had their scheduled procedure postponed/canceled because of the COVID-19 pandemic and assess their pain, anxiety, physical function, and economic ability to undergo a delayed operation once the threat of COVID-19 has subsided.	Cross-sectional survey	Modest sample; reporting bias noted

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
THE United States. The Journal of Arthroplasty. 2020 Apr 22. USA		Findings: Not knowing when the procedure will be rescheduled was the highest source of anxiety; Not knowing when the procedure will be rescheduled caused moderate or severe anxiety in 217 patients (60%); Becoming infected with COVID-19 and spreading infection to others were also high causes for anxiety; AGE: For the younger cohort, the questions about finances and job insecurity caused significantly more anxiety than in the older group; GEOGRAPHY: In the Northeast, patients had significantly higher anxiety around becoming infected with COVID-19; PAIN: Most patients stated that their pain from hip/knee arthritis has increased since surgery cancellation (54%), and 30% stated that they would have proceeded with surgery in spite of the risks posed by COVID-19; Public health: Most patients (85%) agreed with the decision to stop elective procedures in the face of ongoing pandemic.		
23. Rodler S et al. (2020). Telehealth in Uro-oncology Beyond the Pandemic: Toll or Lifesaver? European Urology Focus, 6(5), 1097–1103. https://doi.org/10.1016/j.euf.2020.05.010 Germany	Genitourinary cancers/ Anxiety	Aim: To determine the perspective of oncology patients on the use of telehealth during the pandemic. The sample consisted of 101 Genitourinary cancer patients undergoing treatment at a uro-oncology unit. Findings: For most patients, their anxiety over cancer superseded that of COVID-19. A majority of patients also opposed interruptions to their treatment. The rating for telehealth during the current crisis was high, but the rating for maintaining telehealth beyond the pandemic was low. Most patients rated their susceptibility to COVID-19 as being equal to or lower than that of the general population. The findings from this study could inform the future of telehealth and treatment options for cancer patients.	Cross-sectional survey	Modest sample and non-probability sampling
24. Rozanova et al. (2020). Social Support is Key to Retention in Care during COVID-19 Pandemic among Older People with HIV and	HIV/Substance use disorder	Aim: Examine COVID-19 pandemic impacts older patients with HIV and substance use disorders and their ability to continue HIV and/or addiction treatment. Findings: While older people with HIV and SUD maintained HIV and SUD therapy throughout COVID-19 lockdown, there is anxiety about the availability of	Cross-sectional telephone survey	Modest sample; convenience sample

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
Substance Use Disorders in Ukraine. <i>Substance Use & Misuse</i> , 55(11), 1902–1904. https://doi.org/10.1080/10826084.2020.1791183 Ukraine		treatment services. Providers were concerned about the stability of clinical services. Social support is critical to avoiding treatment interruption for older patients with HIV and SUD. A quarter of the participants reported having fewer than 2 people including healthcare providers who can support them, and 61% of responders had no treatment supporter.		
25. Goodman-Casanova et al. (2020). Telehealth Home Support During COVID-19 Confinement for Community-Dwelling Older Adults With Mild Cognitive Impairment or Mild Dementia: Survey Study. <i>Journal of medical Internet research</i> , 22(5), e19434. https://doi.org/10.2196/19434 Spain	Dementia, Alzheimer's /Anxiety, Stress	Aim: Study the impact of confinement on the health and well-being of older adults with mild cognitive impairment/dementia living in community dwellings, while also providing television-based health and social support. A telephone based survey was administered to 93 participants (intervention and control) who had already been enrolled in the TV-AssistDem clinical trial from March 25- April 6, 2020. Findings: TV-AssistDem (TeleVision-based ASSistive Integrated Service to supportT European adults living with mild DEMentia or mild cognitive impairment) trial. The mental health and well-being (bored, sad, worried, afraid, anxious) and sleep quality of the majority of the participants was optimal during the COVID-19 lockdown and no differences were noted between the intervention and control. Those living alone experienced greater negative psychological effects and sleeping problems. TV sets were the preferred technological device to obtain COVID-19 information, and those with the TV-AssistDem trial demonstrated greater potential for cognitive stimulation. This study provides insight on the development of interventions that can be used to provide support to older adults during the COVID-19 pandemic.	Cross-sectional telephone survey	Mental health measure self-report of non-validated measures
26. Wałędziak M et al. Bariatric Surgery during COVID-19 Pandemic from Patients' Point of View—The Results of a National Survey.	Obesity, diabetes (type 2)/ Anxiety	Aim: Investigate the impact of the COVID-19 pandemic on bariatric care from the patients' point of view. The sample consisted of 800 bariatric patients who completed the online survey were included in the study (no mention of any exclusions). Findings: .64% of respondents had contact with	National survey (cross-sectional)	Modest sample; recall and social desirability

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
Journal of Clinical Medicine. 2020 Jun;9(6):1697. Poland		patients with confirmed COVID-19 or were staying in quarantine; 21.9% of patients were treated in bariatric centres that currently manage COVID-19 patients; The majority (74.53%) of patients felt more anxiety/fear about their health in regard to the present epidemiologic state; In 172 cases (69.36%), the date of bariatric surgery was postponed due to the COVID-19 pandemic; Regardless of the risk of becoming infected with COVID-19, 42.69% of patients would like to have a visit in a bariatric clinic. Many patients believed that bariatric procedures should be resumed when COVID-19 cases start to decrease, WHO declares the end of the pandemic, all COVID-19 patients are discharged, or a vaccine is introduced; The majority of responders were aware of the fact that obesity was an important risk factor that could impair the course of COVID-19 disease.		bias noted by authors
27. Hao X et al. Severe psychological distress among patients with epilepsy during the COVID-19 outbreak in southwest China. Epilepsia. 2020 Apr 30. China	Epilepsy/ Anxiety	Aim: Aims to compare the severity of psychological distress among epileptic patients in China (n=252) and controls (n=252). Findings: Diagnosis of drug-resistant epilepsy and amount of time spent daily on media coverage of COVID-19 were associated with increased prevalence of severe psychological distress. Overall, there was a significantly greater level of psychological distress (Kessler Psychological Distress Scale – 6 item) in inpatients than controls during COVID-19	Web-based, self-report survey. Cross-sectional	Consecutive sample / clinical population
28. Meng, H., et al. (2020). Analyze the psychological impact of COVID-19 among the elderly population in China and make corresponding suggestions. Psychiatry research, 289, 112983. Advance online publication.	Reference to “debilitated physical quality” and chronic medical history /Anxiety, Depression	Aim: Survey older adults about psychological status during the period of “COVID-19. Findings: The questionnaire included questions about demographics, chronic medical history, previous mental illness, whether there are confirmed Coronavirus cases around them, whether to receive trainings on pandemic related knowledge, PHQ-9 Questionnaire, and GAD-7 Questionnaire. GAD-7 and PHQ-9. Findings: A total of 1556 of which 954 were female and most (n=70) were from 60 to 64 years, 37.1% experienced depression and anxiety. There were gender	Cross-sectional survey	Non-probability sample; self-report measures of physical and mental health

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
https://doi.org/10.1016/j.psychres.2020.112983 China		differences in emotional response, with women experiencing more anxiety and depression than men. No significant differences in mental health by age. Based on the results, psychological intervention strategies for were suggested that included: 1) Concentrate psychological attention on female seniors, low educated seniors, divorced and widowed seniors, and those who are living alone, having sleep problems and mental health issues; 2) improve systems for psychological counseling and psychological crisis intervention for the seniors, and psychological health education in the media; 3) where emotional response is serious, call a psychological hotline, online consultation, or visit a professional institution.		
Consensus Statements				
29. Barker-Davies RM et al. The Stanford Hall consensus statement for post-COVID-19 rehabilitation. British Journal of Sports Medicine. 2020 May 31. United Kingdom	Respiratory, bronchitis (primary), CVD / Anxiety, Depression	Aim: Provide an overarching series of recommendations by assimilating the current evidence base for, and likely requirements of, rehabilitation after COVID-19. The intended patient target is an active population, including military personnel and athletes with the desire to optimise recovery and human performance in occupational settings. Findings: A series of clinical guidelines for rehabilitation are provided for various systems including MSK, cardiac, pulmonary. The study also describes several pulmonary, cardiac, and psychological rehabilitation programs. PR programmes can be delivered within a hospital setting, outpatient, home-based or even remotely supervised, with the majority in the UK outpatient based. If cardiac pathology is present, specific cardiac rehabilitation programmes should be provided tailored to the individual based on their cardiac complications, impairments and rehabilitation needs assessment.	Consensus/ clinical recommend-dations	AGREE II Recall bias; generalizabil-ity

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
30. Algarin, A. B. et al. (2020). Symptoms, Stress, and HIV-Related Care Among Older People Living with HIV During the COVID-19 Pandemic, Miami, Florida. AIDS and Behavior. doi:10.1007/s10461-020-02869-3 USA	HIV/ Stress	Aim: Determine the impact of COVID-19 on the patient care and mental health of people living with HIV (PWLH). Findings: Stress levels in PWLH were impacted due to COVID-19, and that weekly phone calls can allow patients to stay connected while also offering them the opportunity to receive any necessary assistance. New guidelines should be developed for the care of persons with HIV regarding telehealth methods, mental health assessments, and patient education. The areas suggested in this study could be targeted for future PWLH patient guidelines, care, and education.	Consensus/ clinical recommendations	5/24 lost to follow up, and 3 other enrolled participants were not reached during the first call, small sample
General Reviews/Commentaries, Case Studies, and Opinion Pieces				
31. S. Cuschieri. Grech S. COVID-19 and diabetes: The why, the what and the how, Journal of Diabetes and Its Complications, https://doi.org/10.1016/j.jdiacomp.2020.107637 China	Type 2 Diabetes (primary), obesity/ Psychological Stress, Anxiety and Depression	Aim: The aim was to summarize information and resources available on diabetes and COVID-19 and special measures that individuals with diabetes need to follow. Findings: COVID-19 may enhance complications in individuals with diabetes through an imbalance in angiotensin-converting enzyme 2 (ACE2) activation pathways leading to an inflammatory response. These individuals may be prone to worsened COVID-19 complications- general preventive measures, remaining hydrated, monitoring blood glucose regularly and monitoring ketone bodies in urine if on insulin is essential. All this while concurrently maintaining physical activity and a healthy diet. The study suggests preventative measures and recommendation for people with diabetes during the COVID-19 pandemic.	Literature review	Lack of clinical trials and other systematic reviews in search
32. Brown, E. et al. (2020). Anticipating and Mitigating the Impact of the COVID-19 Pandemic on Alzheimer's Disease and Related Dementias. The American Journal of Geriatric Psychiatry, 28(7), 712-721.	Dementia, Alzheimer's, co- and multi-morbidities/ Anxiety, depression	Aim: Highlight mitigation strategies for patients with Alzheimer's Disease and related dementias (ADRD) in relation to the COVID-19 pandemic. Findings: ADRD patients are at a higher risk due to their age and comorbidities. Additionally, COVID-19 has impacted the ability of patients to receive care and treatment. Isolation inhibits patients from reaching out to their social support network, thereby increasing fear and anxiety amongst them. Incorporating alternative social/physical activities within	Review	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
doi:10.1016/j.jagp.2020.04.010 Canada		homes, using technology to stay connected and receive certain healthcare services, making contingency plans. The proposed recommendations could be incorporated into future policies in order to mitigate the impact of COVID-19 on ADRD patients.		
33. Rogers BG et al. Adapting Substance Use Treatment for HIV Affected Communities During COVID-19: Comparisons Between a Sexually Transmitted Infections (STI) Clinic and a Local Community Based Organization. AIDS and Behavior. 2020 May 27:1. USA	HIV/Substance use	Aim: Describe changes in response to COVID-19 made to a substance use treatment program people at risk or living with HIV, primarily for men who have sex with men who use stimulants and/or opioids. Findings: Most psychotherapy services were transitioned to electronic means following APA guidelines. Telemedicine: Clinical psychologists were trained in telemedicine, remote therapy guidelines were developed, and appropriately secure software was procured. This transition decreased access to care to those who did not have electronic means - none of the clients previously treated at the community-based site (rather than the STI site) continued to receive treatment. While in person psychotherapy ceased, the community-based site continued to offer basic needs and harm reduction supplies. Less formal support ("peer-recovery") was administered through Facebook, text, or in person as it is not subject to the same strict privacy regulations as telemedicine.	Case example of a health program	--
34. Pope JE. What does the COVID-19 pandemic mean for rheumatology patients?. Current Treatment Options in Rheumatology. 2020 Apr 30:1. Canada	Arthritis, rheumatoid/ Anxiety	Aim: Discuss how the COVID-19 pandemic affects people with autoimmune rheumatic disease. Findings: Patients with rheumatoid arthritis are not more prone to develop significant health complications during COVID-19 infection. Shortages of Hydroxychloroquine may cause anxiety for individuals suffering from with rheumatic diseases. Medications for treating rheumatoid arthritis should be carefully distributed. A lack of regulation can lead to negative repercussions for individuals suffering from the disease	Narrative review	--
35. Chevance A et al. Ensuring mental health care during the SARS-CoV-2 epidemic in	CVD, other, obesity, diabetes	Aim: To show that the major difficulties in coordinating and managing this crisis highlight the absolute necessity of a common voice for French psychiatry with the health authorities.	Narrative review	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
France: a narrative review. L'encephale. 2020 Apr 22. France	/ Schizophrenia spectrum, depression	Findings: Identified four types of major vulnerabilities among patients with mental disorders during this pandemic: (1) medical comorbidities that are more frequently found among patients with mental disorders (cardiovascular and pulmonary pathologies, diabetes, obesity, etc.) which are risk factors for severe COVID-19 infection; (2) age (the elderly form the population most vulnerable to the coronavirus); (3) cognitive and behavioural disorders, which can hamper compliance with confinement and hygiene measures and finally and (4) psychosocial vulnerability as a result of stigmatization and/or socioeconomic difficulties. Furthermore, the mental health healthcare system is more vulnerable than other healthcare systems		
36. Lois O. Condie (2020) Neurotropic mechanisms in COVID-19 and their potential influence on neuropsychological outcomes in children, Child Neuropsychology, 26:5, 577-596, DOI: 10.1080/09297049.2020.1763938 United States	Cognitive impairment/ Anxiety, depression	Aim: To provide recommendations for some initial updates in neuropsychology practice during the COVID-19 pandemic in children. Findings: There are COVID-19 implications for neuropsychological functioning that include changes in cognitive, motor, and language abilities, executive functioning impact, medical coping difficulties, psychosocial impact, and independent functioning impact.	Narrative review	--
37. Mehra A, et al. A crisis for elderly with mental disorders: Relapse of symptoms due to heightened anxiety due to COVID-19. Asian Journal of Psychiatry. 2020 Jun;51:102114.	CVD, hypertension, Diabetes mellitus/ Depression (primary), anxiety	Aim: To raise awareness about mental health issues in the elderly population during the COVID-19 pandemic. Two case examples (one male/one female) were presented of individuals admitted to hospital with relapse of depressive disorder. Findings: COVID-19 can lead to heightened levels of anxiety in elderly patients. It is important to provide elderly patients with therapies to help them deal with mental health issues during the pandemic. The interventions included psychotherapy,	Case studies (2 cases presented)	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
India		escitalopram, clonazepam, and olanzapine. The authors highlighted that part of prevention of mental health issues in the context of the pandemic that fears about the elderly be minimized. An example included avoiding words on social media like “#BoomerRemover”. Both cases were preoccupied with thoughts of being vulnerable to get the infections and dying to the COVID-19. The report recommends a shift in media practices to decrease anxiety levels in patients		
38. Armbruster M et al. Addressing Health Inequities Exacerbated by COVID-19 Among Youth With HIV: Expanding Our Toolkit. Journal of Adolescent Health. 2020 Jun 8. United States	HIV/ Anxiety, Bipolar, Schizophrenia, ADHD, Autism, Intellectual delay, substance use	Aim: Chronicle the structural and logistic approaches that a team undertook to proactively address the social determinants of health that will be negatively impacted by the COVID-19 pandemic, while supporting youth with HIV (YHIV) to maintain medication adherence and viral suppression. Findings: We anticipated that during and after the pandemic, these challenges would increase their risk of COVID-19 exposure and negatively impact treatment engagement, medication adherence, and viral suppression, resulting in disease progression and increased HIV transmission. A toolkit was developed with various actions and resources to address the health needs of youth with HIV and COVID-19. This program could have wider policy implications if implemented on a larger scale.	Case study of a health program	--
39. Marsden J et al. Mitigating and learning from the impact of COVID-19 infection on addictive disorders. Addiction. 2020 Apr 6. United Kingdom	Cardiovascular diseases/ Substance use (opioid overdose)	Aim: To summarize threats of the COVID-19 pandemic to people with addictive disorders and suggest methods of addressing those issues. Findings: Opioids: Social distancing measures will likely reduce the ability of people with opioid use disorder to access healthcare. The UK encouraged healthcare providers to give 14-day supply of opioid use disorder medications for self-administration rather than supervised consumption at a safe injection site, which may increase fatal opioid related overdoses. Stimulants: Stimulant use increases risk of cardiovascular disease, a major risk factor for COVID-19 mortality. The effects of	Editorial	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		all these substances will likely most affect those living in poverty and with additional mental health disorders.		
40. Khalatbari-Soltani et al. Importance of collecting data on socioeconomic determinants from the early stage of the COVID-19 outbreak onwards . J Epidemiol Community Health Epub ahead of print: doi: 10.1136/ jech-2020-214297 Australia	Authors identify physical health conditions that increase risk/ Anxiety	Aim: Identify how socioeconomic position and other social factors relate to the epidemiology of COVID-19. Findings: Socioeconomic positions such as low income, labour-based occupations and lower educational levels are likely to be determinants of COVID-19 infection, severity and mortality. The authors highlighted barriers and issues among ethnic groups, by sex/gender, and geographical contexts. The authors highlight that socio-economic variables should be considered as clinical factors. It suggests that pandemic recommendations and guidelines. provided by international and national agencies need to recognise the collective contribution of the social determinants of health and their intersectionality to pandemic risk mitigation.	Review	--
41. Bikson M, et al. Guidelines for TMS/tES clinical services and research through the COVID-19 pandemic. Brain Stimulation. 2020 May 12. USA	Depression (primary), anxiety/ stroke	Aim: To facilitate the re-establishment of access to non-invasive brain stimulation (NIBS) clinical services and research operations during the current COVID-19 pandemic and possible future outbreaks, we develop and discuss a framework for balancing the importance of NIBS operations with safety considerations, while addressing the needs of all stakeholders. We focus on Transcranial Magnetic Stimulation (TMS) and low intensity transcranial Electrical Stimulation (tES) - including transcranial Direct Current Stimulation (tDCS) and transcranial Alternating Current Stimulation (tACS). Findings: There is an evident need to maintain NIBS operations through the pandemics and addressing effects of COVID-19 on brain and mind. A model based on three phases (early COVID-19 impact, current practices, and future preparation) with an 11-step checklist (spanning removing or streamlining in-person protocols, incorporating telemedicine, and addressing COVID-19-associated adverse events) is proposed. Recommendations on implementing social distancing	Expert consensus paper based on survey to institutions applying NIBS	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		and sterilization of NIBS related equipment, specific considerations of COVID-19 positive populations including mental health comorbidities. We discuss COVID-19 considerations specifically for stroke, addiction, and pediatrics.		
42. Dell NA et al. Service Needs of Older Adults with Serious Mental Illness. Journal of Gerontological Social Work. 2020 May 14:1-3. USA	Schizophrenia spectrum, Bipolar and related disorders, Major depressive disorder, trauma exposure/PTSD	Aim: To inform social workers of psychosocial needs of older adults with serious mental illnesses during the COVID-19 pandemic as well as interventions to meet these needs. Findings: Addresses some interventions that may reduce the impact of social circumstances on the mental and physical health of older adults, although this was a separate study from the existing literature.	Letter to editor with reference to interventions	--
43. Lima NN et al. People experiencing homelessness: Their potential exposure to COVID-19. Psychiatry Research. 2020 Apr 11:112945. Brazil	Makes reference to physical and mental health conditions in general	Aim: Discuss the vulnerability of homeless individuals with respect to insufficient housing quality and the associated impacts on mental health, COVID-19 transmission, and chronic health conditions. Authors indicated their methods as "The studies were identified using large-sized newspapers with international circulation." Findings: The authors note from their review the risks among homeless populations (e.g., lower life expectancy, increased likelihood of addiction, underlying health conditions, lack of reliable and affordable health care. Suggestions are made to address the needs of this population by providing reasonable access to health services and COVID-19 testing.	Letter to editor based on review of newspaper articles	Physical health conditions not specified, lack of high-quality systematic reviews and RCTs cited.
45. Padala SP et al. Facetime to reduce behavioral problems in a nursing home resident with Alzheimer's dementia during COVID-19. Psychiatry Research. 2020 Apr 23. United States	Dementia, Alzheimer's/ Anxiety	Aim: To highlight that interaction with family members using FaceTime improves behavioral problems in patients with Alzheimer's dementia during COVID. The letter addresses that such applications need to be studied both for clinical and research care to be prepared for future pandemics. Findings: The patient was reported to communicate well as he could "lip read" during the video session. The daughter reported that her father enjoyed the sessions and seemed to be less anxious and agitated by the end of the video calls. Staff reported that after a series of such video calls, the patient was pacing less and had an	Case study	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		improved appetite. The daughter reported that FaceTime had provided a sense of connectedness and had a positive impact on his symptoms.		
46. Gregucci F et al. Cancer patients in COVID-19 era: swimming against the tide. Radiotherapy and Oncology. 2020 Aug 1;149:109-10. Italy	Cancer, other Anxiety	Aim: Discuss experiences of working with individuals with cancer and psychosocial considerations. Findings: The authors discuss aspects of care such the “touch” (mandatory for positioning patients) could be experienced as a danger or a consolation for the cancer patient. Most of their patients, during RT, reported feeling of protection by the physician, the radiotherapist, the nurse who wears gloves and masks: “someone takes care of me concretely”. Other patients report fear of being touched, while being carefully positioned on the treatment table. The services described how they decorated the radiotherapy room with Italian landscape to reduce anxiety. Discussed how “the psychological approach for cancer patients is mandatory to prevent the fear of infection from causing death by taking the patients away from their life-saving treatments.”	Case example of a radiotherapy service	--
47. Helmich RC et al. The impact of the COVID-19 pandemic on Parkinson’s disease: hidden sorrows and emerging opportunities. Journal of Parkinson's disease. 2020;10(2):351. USA	Parkinson’s disease/ Anxiety	Aim: Review of the effects of COVID-19 on individuals with PD. Findings: Suggests various ways to reduce stress/ examining the determinants of these stress factors (e.g treatment availability, outlets for stress). The authors indicate that self-management strategies that reduce stress (e.g., mindfulness), increase coping (e.g., cognitive behavioral therapy) or increase physical exercise (e.g., home-based training programs, alone or in groups) may be helpful.	Commentary	N/A
48. Sockalingam S et al. The Impact of Coronavirus Disease 2019 on Bariatric Surgery: Redefining Psychosocial Care. Obesity. 2020 Jun;28(6):1010-2. Canada	Obesity/ Eating disorders, binge eating disorder, depression	Aim: Discuss challenges with physical distancing and self-isolation and reassess current psychosocial models to reimagine new models integrating virtual mental health tools/supports for bariatric patients. Findings: Approximately 70% of bariatric surgery candidates have a lifetime history of psychiatric illness, which could be exacerbated by COVID-19 pandemic–related stress. Data from SARS suggest that past psychiatric illness is a	Perspective paper	N/A

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		risk factor for developing active psychiatric illness after the pandemic. Extrapolating from these findings, bariatric patients may be at risk for mental health decompensation, which could impact obesity treatment adherence and long-term patient outcomes. Suggestions for interventions included remotely delivered CBT by telephone or videoconferencing for those with binge eating, emotional eating, depression, and anxiety, patient safety protocols (e.g., remote management of suicidal ideation), virtual care tools, such as app-based tools, and obesity-specific support for social support. The authors identified that although synchronous (e.g., “Zoom groups”) and asynchronous bariatric surgery-specific groups (e.g., Facebook) may be options, issues of privacy and credibility of the information shared should be considered. Mobile and online technologies (e-health) have the reported efficacy for psychological symptoms and eating psychopathology.		
49. Minihan E et al. COVID-19, Mental Health and Psychological First Aid. Irish Journal of Psychological Medicine. 2020 May 14:1-2. Ireland	Respiratory, asthma, COPD, hypertension, CVD/ Depression, anxiety, anxiety disorders, substance use	Aim: This article provides an overview of factors elicited in response to COVID-19 and their impact on immunity, physical health, mental health and wellbeing Findings: Explores “Psychological First Aid” as a useful technique to help people in this time of crisis. Highlights risk factors for stress and impacts on mental and physical health.	Review	--
50. Yan F et al. The role of head and neck cancer advocacy organizations during the COVID-19 pandemic. Head & Neck. 2020;1–7. https://doi.org/10.1002/head.26287 United States	Cancer, other (head and neck)/ Anxiety, psychosis/psychotic disorder	Aim: To outline some of the issues faced by patients with Head and Neck cancer during the current crisis and provide examples of programs being developed by advocacy groups to address them. Findings: Discusses advocacy support by professional organizations and HNC advocacy groups and how they responded promptly to concerns of patients by publishing numerous web-based articles, webinars, and podcasts to accurately inform patients of the impact of COVID-19. The groups have also provide online supports and financial assistance	Review	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		eg., gas cards, collaborations with industry to provide waivers for drug costs, COVID-19-related webinars to help navigate HNC patients through these financially difficult times, assisting low-income HNC patients with the costs of nutritional supplements, medical supplies not covered by insurance, copays, transportation, lodging, and dental care. CancerCare, a general oncology advocacy group, help with offsetting costs of general household expenses, transportation, childcare, and medication.		
51. Benaque et al, Research Center and Memory Clinic, Fundació ACE (2020). Dementia Care in Times of COVID-19: Experience at Fundació ACE in Barcelona, Spain. Journal of Alzheimer's disease : JAD, 76(1), 33–40. https://doi.org/10.3233/JAD-200547 Spain	Dementia, Alzheimer's	Aim: To share information on the adaptation of the model of Dementia care in response to the COVID-19 pandemic. Findings: The transition from in-person to telemedicine can be successfully executed through the commitment to a holistic model, a committed team of professionals, and designing a detailed contingency plan. Other changes include offering increased consultations without an appointment, offering scheduled visits to families, using videoconferencing, and shifting continuous education sessions to online platforms. The model implemented by Fundació ACE could be adopted by other facilities to assist with planning during the COVID-19 pandemic.	Case example of non-profit organization providing care to persons with cognitive disorders and their families	--
52. Fortuna LR et al.. Inequity and the disproportionate impact of COVID-19 on communities of color in the United States: The need for a trauma-informed social justice response. Psychol Trauma. 2020;12(5):443-445. doi:10.1037/tra0000889 USA	Refer to poor physical health / Post-traumatic stress disorders, general stress	Aim: To provide insight into the public health impacts of COVID-19 on communities of colour. Findings: Guidelines try to address challenges faced by racialized communities dealing with COVID-19 to prevent mental health problems for youth of colour. Highlighted the need for community and cross-sector collaborations and movement away from practices and regulations that silo clinical and social services, emphasizing respectful, thoughtful, and consistent leadership to empower community stakeholders to address their specific communities' needs; and building capacity around community-academic telehealth partnerships.	Commentary	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
53. Anderson M et al. Developing a sustainable exit strategy for COVID-19: health, economic and public policy implications. Journal of the Royal Society of Medicine. 2020 May;113(5):176-8. United Kingdom	Some chronic physical health examples highlighted eg. Coronary occlusion / Depression (primary), anxiety	Aim: To explain the economic perspective and public policy perspective for exit strategies for COVID-19. Findings: From an economic perspective, there will be a need to ensure a rapid but sustainable recovery. The International Monetary Fund estimates a 6.1% decline in gross domestic product in advanced economies in 2020,11 although other analyses suggest the decline could be greater. Estimates from Germany suggest that a one-month lockdown would cost between 4.3% and 7.5% of gross domestic product (E150–260 billion). From a public policy perspective, there are several challenges to navigate. First, countries are using technologies in novel ways to ease social distancing measures that may impinge upon civil liberties. For example, China is using an app to monitor people’s movement, classifying them according to their health status and travel history.	Commentary	--
54. Ajilore, O., Thames, A.D., The Fire This Time: The Stress of Racism, Inflammation and COVID-19, Behavior, and Immunity (2020), doi: https://doi.org/10.1016/j.bi.2020.06.003 USA	Co-/Multi-morbidities, CVD, lung cancer, type 2 diabetes, hypertension, asthma/ Depression (primary), anxiety, Psychosis/Psychotic disorder	Aim: To determine the impact of racial stress on African Americans on inflammatory conditions during the COVID-19 pandemic. Findings: Systemic racial discrimination among this population has negative effects on their biological function. First, altered immune function and metabolic changes secondary to stress can contribute to medical comorbidities such as type 2 diabetes, hypertension and asthma, all of which increase COVID-19 risk. Hence, discrimination experiences may also explain why African Americans are at a disproportionately higher risk for poor medical (e.g., cardiovascular disease, metabolic, hypertension) and psychiatric outcomes (e.g., depression, anxiety).	Commentary	Generalizability

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
55. Mediouni, M., et al. (2020). COVID-19: How the quarantine could lead to the depreobesity. Obesity Medicine, 19, 100255. doi: 10.1016/j.obmed.2020.100255 USA	Obesity / Depression	Aim: This paper looks at how the frustration and lifestyle associated with quarantine could lead to 'depreobesity'. Findings: Psychologists should play a role in helping individuals deal with stress/depression during quarantine. Policy makers should begin preparing for the upcoming epidemic of 'depreobesity'. This paper helps highlight potential increases in rates of depression and obesity, which could help policy makers prepare for the period after COVID-19.	Commentary	--
56. Shiao, S et al. (2020). The Burden of COVID-19 in People Living with HIV: A Syndemic Perspective. AIDS and Behavior. doi:10.1007/s10461-020-02871-9 USA	HIV/Psychosocial concerns	Aim: To address the burdens faced by PLWH during the COVID-19 pandemic using a syndemic framework, and consequently inform the development of health programming services. Findings: The challenges faced by PLWH must be conceptualized using a syndemic framework in order to effectively account for the psychosocial burdens faced by patients.	"Notes from the Field" commentary	--
57. Tsamakis K et al. COVID-19 related stress exacerbates common physical and mental pathologies and affects treatment (Review). Experimental and Therapeutic Medicine. doi:10.3892/etm.2020.8671 Greece	CVD, myocardial infarction /Anxiety	Aim: To discuss the impact of COVID-19 related stress in Cardiology, Paediatrics, Oncology, Dermatology, Neurology, and Mental Health. Findings: Maintaining effective communication within the healthcare setting, remaining alert, and introducing novel ways of clinical interactions can help combat the effects of COVID-19 related stress.	Review	--
58. Mills JP et al. COVID-19 in older adults: clinical, psychosocial, and public health considerations. JCI insight. 2020 May 21;5(10). USA	Diabetes (type 2)/ Anxiety, Stress, psychosocial affects of isolation	Aim: Discuss the clinical, psychosocial and public health considerations of COVID-19 in the aged population, specifically those with medical comorbidities. Findings: The article presents the clinical and psychosocial considerations. In particular, innovative models such as using nursing facilities for short-stay rehabilitation, long-term acute care hospitals for patients requiring long-term ventilation, house calls, and hospital-at-	Viewpoint	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		home programs to allow seniors to “age-in-place,” have moved health care out of the hospital walls, and helped older adults recover from acute illness and maintain their functional independence.		
59. Nguyen NP et al. Older cancer patients during the COVID-19 epidemic: Practice proposal of the international geriatric radiotherapy group. Cancers. 2020 May;12(5):1287. USA, France, Switzerland, Spain, Italy, Romania, United Kingdom, Canada, Malaysia, Portugal	Cancer/ Anxiety, Depression	Aim: Highlight the special considerations required to prevent infection of older cancer patients and to provide them with adequate social support during their cancer treatment in the time of the pandemic. Findings: Recommendations made: staff education for clinicians (e.g., pathogen infectivity, how to avoid infection when working with patients); a need for personalized care for patients (based on physical performance and SES); scheduling patients with consideration of their transportation availability to minimize interactions; a frailty assessment for older adult cancer patients who require radiotherapy and subsequent hypofractionation when appropriate to reduce total treatment time; social services such as patient navigators should be provided to ensure adequate medical supply, food, and daily transportation to cancer centers, telemedicine for follow-up as well as for those with depression (can be exacerbated during quarantine) and those infected with COVID-19.	Expert Review	N/A
60. Porcelli P. Fear, anxiety, and health-related consequences after the COVID-19 epidemic. Clinical Neuropsychiatry: Journal of Treatment Evaluation. 2020;17(2):103-11. Italy	Co- and multi-morbidities: CVD, obesity, hypertension, diabetes, stroke, cancer, asthma, COPD, osteoarthritis/ Anxiety, substance use disorder	Aim: Discuss fear (in light of the COVID-19 pandemic) and its possible forthcoming consequences on health. Findings: Hopelessness, helplessness, and loneliness could maybe become the ‘normal’ distressing and negative feeling experience of both caregivers and patients - as a result of a lack of interpersonal warmth now apparent in healthcare settings due to COVID-19; Loneliness and experiences of social isolation may have a detrimental effect also at the epigenetic level by shortening the telomere length and thus enhancing biological aging; Psychological distress may have dramatic consequences also on lethal effects and mortality; One of the most important underlying mechanisms connecting stress and health negative	Perspective article	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		effects is the strict connection between psychological factors and the immune system.		
61. Mattioli AV, et al. COVID-19 pandemic: the effects of quarantine on cardiovascular risk. European Journal of Clinical Nutrition. 2020 May 5:1-4. Italy	CVD / Anxiety	Aim: Discuss the impact of quarantine on cardiovascular risk. Findings: Reduced access to food, ability to exercise and engage socially may impact the nutritional and physical activity habits of quarantined persons, resulting in lifestyle changes that are linked with increased cardiovascular disease and obesity. The essay proposed the following interactions: diet: decreased access to fresh foods and limited ability to purchase food may result in poor nutritional habits (i.e. increased reliance on processed, limited consumption of fresh fruits and vegetables) and poor eating behaviours caused by anxiety related to the pandemic (i.e. stress-eating).	Perspective	--
62. Razai MS et al. Mitigating the psychological effects of social isolation during the COVID-19 pandemic. BMJ. 2020 May 21;369. United Kingdom	COPD / Anxiety	Aim: Social prescribing can improve the social and psychological wellbeing of patients by drawing from community resources such as the arts (for example, singing in a virtual choir, dancing, or online drawing classes). It can be delivered by trained non-clinical staff in primary care. Findings: Social prescribing can improve the social and psychological wellbeing of patients by drawing from community resources such as the arts (for example, singing in a virtual choir, dancing, or online drawing classes). It can be delivered by trained non-clinical staff in primary care	Practice pointer	--
63. Balachandar V, et al. Follow-up studies in COVID-19 recovered patients-is it mandatory?. Science of The Total Environment. 2020 Apr 27:139021. India	CVD, myocardial infarction, Respiratory, Parkinson's disease, COPD, acute kidney injury/ Depression, Anxiety	Aim: To review and understand the possible outcomes of COVID-19 recovered patients and determine if they have any other detrimental illnesses (i.e., various multi-organ damages). Findings: Brain: site of symptoms is the olfactory bulb, leading to smell dysfunction, Eye: SARS-CoV-2 may enter through the tears and transmit to other organs, Lung: damages the walls and lining cells, causing inflammation, Heart: inflammation can lead to myocardial infarction, GI system: early GI symptoms and possible liver damage, Renal: multi-organ damage, Mental health aspect:	Review	--

Citation and Country	Physical / Mental Health	Study Aim /Question/Finding/Intervention	Study Design	Quality
		psychological symptoms such as depression and anxiety may result in addition to these PH conditions after infection Rapid follow-up should be offered to COVID-19 recovered patients, including nucleic acid tests; family members should be trained in empathy skills; the community/society should be educated not to stigmatize recovered patients		
64. Da BL et al. COVID-19 hangover: a rising tide of alcohol use disorder and alcohol-associated liver disease. Hepatology. 2020 May 5. USA	Co- and multimorbidities, Metabolic syndrome, chronic kidney disease, obesity, alcoholic hepatitis/ Substance use disorder	Aim: This paper examines the vulnerability of patients with Alcohol Use Disorder (AUD) and Alcohol-associated Liver Disease as they have a depressed immune system. Not only are they at risk for COVID-19 but it can further damage the liver as well as social isolation can lead to increased drinking. Findings: Suggests the use of telehealth for alcohol counseling and addiction treatment. Integration of AUD/ALD clinics post-COVID-19. Suggests the use of telehealth for addiction medicine as well as improving addiction medicine measures post COVID-19.	Commentary	--
65. Khan S et al. Impact of coronavirus outbreak on psychological health. Journal of Global Health. 2020 Jun;10(1). China	Cardiovascular/ Anxiety, depression, PTSD, panic attacks, sleep disturbances	Aim: This review assesses the various effects of COVID-19 on psychological health and suggests interventions that may prove to be helpful. Findings: There are numerous interventions suggested by the paper. These include psychological counseling based therapies (tele-medicine, counseling sessions, cognitive behaviour therapy) and pharmacological treatments.	Commentary	--

Appendix B: Chinese Literature Data Extraction Tables (n=19)

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
1. 张苍,吴金萍,李洁娜,郭晓迪,刘书红,曾咏梅等. "新型冠状病毒肺炎流行期间糖尿病病人心理状况分析", Chinese General Practice Nursing, vol. 18, no. 8, Mar. 2020, pp. 965-968., doi: 10.12104/j.issn.1674-4748.2020.08.065.	T2D/ Anxiety, depression	Aim: Investigate the status of mental health of diabetic people during this pandemic. Findings: Approximately 51% of COVID-19 patients have pre-existing chronic conditions and diabetes comprised of 20% of those cases. This indicates that diabetic patients are high risk groups of COVID-19. Living area, whether or not they are diagnosed COVID-19 cases around the participants, whether or not the participants have sufficient face masks and diabetic medication, whether or not the participants have an understanding about the status of the pandemic, whether or not they are worried about the pandemic, following medical advices will impact the level of depression (P<0.05). Being worried about the pandemic and follow medical advices will impact the level of anxiety. Living area/place and whether or not there is diagnosed case of COVID-19 will impact the level of depression of diabetic patients (P<0.05)	Quantitative Non-Randomized	100%
2. 张金龙,孙蓉,杨娟等. "新型冠状病毒肺炎疫情期间老年患者的焦虑抑郁状态及其影响因素", Chinese Journal of Multiple Organ Diseases in the Elderly, vol. 19, no. 4, 28 Apr. 2020, pp. 246-250, doi: 10.11915/j.issn.1671-5403.2020.04.057.	Comorbidities, Multi-morbidities/ anxiety	Aim: Understand factors of depression and anxiety of elders who were in quarantine and to suggest intervention for depression and anxiety. Findings: 86 senior patients have an overall average anxiety rating of 31. 25 ~ 82. 21 (54. 88±11. 84). 85 cases of some level of anxiety (98.84%), out of which there are 20 mild anxiety patients (23. 53%), 12 severe anxiety (14. 12%) and 53 moderate anxiety patients (62. 35%). 86 senior patients have an overall depression rating of 26. 25 ~ 86. 42(52. 20±13. 36). 68 cases of some of level of depression (79.07%), 18 causes of no depression (20.93%). Of the depressed patients, 44 cases (64.71%) were mildly depressed, 18 cases (26.47%) were moderately depressed, and 6 cases (8.82%) were severely depressed.	Quantitative Non-Randomized	100%
3. 操静,温敏,石义容,伍友春,何清等. "新型冠状病毒肺炎患者焦虑抑郁及影响因素调查", 护理学杂志, vol. 35, no. 9, May 2020, pp. 15-17, doi: 10.3870/j.issn.1001-4152.2020.09.015.	Comorbidities, Multi-morbidities/ anxiety, depression	Aim: Understand COVID-19 patients' psychological status and the contributing factors. Findings: Of 148 COVID-19 patients recruited, 78.38% and 50% have no anxiety and depression, respectively. 20.27% and 1.35% have mild and moderate anxiety, respectively. 31.08%, 17.57%, and 1.35% have mild, moderate, and severe depression, respectively.	Quantitative Non-Randomized	100%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
4. 赵苗苗, 彭德艳, 刘琼, 欧阳玉燕等. "新型冠状病毒肺炎疫情防控期间血液肿瘤患者心理状况调查及影响因素分析", 中西医结合护理(中英文), vol. 6, no. 3, pp. 38-41, doi: 10.11997/nitcwm.202003008.	Cancer / anxiety	Aim: Understand psychological status of cancer patients during the pandemic and to analyze the contributing factors. Findings: 70% of participants have anxiety and 63.33% of participants have depression. Factors impacting anxiety are gender, marital status, hospitalized or not, whether they clearly know preventive measures. Factors impacting depression are gender, age, household income, hospitalized or not (P<0.05)	Quantitative Non-Randomized	100%
5. 陈雪红, 陈春雨, 陈晓霞, 林秀云, 赖淑芬, 许丽云. "新冠肺炎疫情期间肿瘤患者心理困扰及其影响因素", 中国健康心理学杂志, 2020 [pre-print]. Accessed: https://kns.cnki.net/kcms/detail/11.5257.R.20200720.1025.002.html	Cancer/ anxiety	Aim: Investigate the status of psychological distress and its influencing factors in tumor patients during the pandemic of COVID-19. Findings: The study was conducted based on 189 tumor patients from 5 tertiary hospitals in Guangdong province. 50.79% of tumour patients exhibit psychological distress. The more impact that COVID-19 has on surgery and treatment, the higher the distress level. 22.8% patient could not see a doctor as per usual frequency	Quantitative Non-Randomized	100%
6. 徐海燕, 杨科, 杨广建, 杨路, 米玉玲, 崔晓红, 杨敏, 王丹, 王燕. "优化解决肺癌患者在新型冠状病毒肺炎疫情期间诊疗问题及心理问题的探索", Chin J Lung Cancer, 2020, 23(4):247-254. DOI:10.3779/j.issn.1009-3419.2020.101.18	Lung cancer/ anxiety	Aim: Investigate medical needs of lung cancer patients and their mental health status during the epidemic periods, so as to provide rational recommendations for subsequent diagnosis and treatment. Findings: Out of 368 questionnaires collected, most patients with lung cancer have confidence defeating COVID-19, however, 40-75% struggle with nervousness, anxiety, sleep disorders, anger and sadness. 80% are satisfied with 1-2 online consultation(s).	Quantitative Non-Randomized	80%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
7. 周丽香, 唐芸娜, 冯娟, 叶学云, 王燕婷. "新型冠状病毒肺炎疫情期间消化内镜病人诊疗焦虑状况调查分析", 全科护理 18(11): 1349-1351, 2020. DOI: 10.12104/j.issn.1674-4748.2020.11.019	Digestive endoscopy patients/ Anxiety	Aim: To analyze the digestive endoscopy patients' anxiety level and treatment options during the pandemic. Findings: Educational level has an affect on S-AI results ($P<0.05$). S-AI and T-AI results rises when patients knows someone who has been diagnosed with COVID-19. 76.27% willingly pushed back the date of their endoscopy check-up. 80.50% are worried about the delayed check-up's effect on their digestive disorders. Family accompany decreased anxiety levels.	Quantitative Non-Randomized	80%
8. 韩紫慧, 陈兴军, 张亮, 钱蒙蒙 "浅谈新型冠状病毒肺炎 (COVID-19) 患者的心理干预" 醫學食療與健康 2020 年 3 月 第 6 期	Respiratory/ Anxiety	Aim: Analyze the mental health condition of COVID-19 patients and to provide intervention guidelines. Findings: SAS scores decreased after mental health interventions. On the second day of admission, the Self-Rating Anxiety Scale (SAS) was assessed: 10 cases (13.88%) - below cut-off (<50 points), 33 cases (45.83%) - mild anxiety (50-59 points), 20 cases (27.77%) - moderate anxiety (60-69 points), and 9 cases (12.50%) - severe anxiety (≥ 70 points). On the fifth day of admission, the SAS scale was re-assessed after the symptomatic psychological intervention was introduced. Among them, 30 cases (41.66%) - below cut-off (<50 points), 25 cases (34.72%) - mild anxiety (50-59 points), 13 cases (18.05%) - moderate anxiety (60-69 points), and 4 cases (5.55%) severe anxiety (≥ 70 points).	Quantitative Non-Randomized	100%
9. 黄斌英, 张婷婷, 邹国娟, 李焱, 吴丽萍, 黄莹. "新型冠状病毒肺炎疫情下老年人的心理 状态调查和防控分析", 全科护理, 2020, 18(8):935-937. DOI: 10.12104/j.issn.1674-4748.2020.08.061	Comorbid chronic disease, old age, frail or frailty/anxiety	Aim: Investigate the mental health (anxiety) of seniors during the pandemic, provide interventions and suggest next steps in improving their mental protection. Findings: 70% of participants have anxiety and 63.33% of participants have depression. Factors impacting anxiety are gender, marital status, hospitalized or not, whether they clearly know preventive measures. Factors impacting depression are gender, age, household income, hospitalized or not ($P<0.05$)	Quantitative Non-Randomized	100%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
10. 穆婵娟. "中老年普通居民新型冠状病毒肺炎的认知程度及心理状况调查", Chinese General Practice Nursing, vol. 18, no. 8, Mar. 2020, pp. 952-955, doi: 10.12104/j.issn.1674-4748.2020.08.066.	Comorbidities, Multi-morbidities/ anxiety, depression	Aim: Investigate community dwelling middle and older adults' knowledge related to COVID-19, awareness of COVID-19, and psychological status. Findings: Phone interview of 217 elders. The results have shown that 23 people have depression or anxiety with 11 people only have anxiety, 6 people only have depression and 6 people have both depression and anxiety. Age and the presence of comorbidities/multi-morbidities are factors associated with anxiety. The presence of comorbidities/multi-morbidities is the factor associated with depression.	Quantitative Non-Randomized	100%
11. 王梦雨, 刘小蕾, 郭虹, 范宏振, 姜荣环, 谭淑平等. "新型冠状病毒肺炎疫情下中老年人的心理健康状况", Chin J Mult Organ Dis Elderly, vol. 19, no. 4, 28 Apr. 2020, pp. 241-245, doi: 10.11915/j.issn.1671-5403.2020.04.056.	Old age/ anxiety, depression	Aim: Investigate the psychological status of middle and older adults during the pandemic. Findings: 8.5% have moderate to severe depression and 10.7% have moderate to severe anxiety. 50.7%, 30.8%, 11.7%, and 6.8% have no, mild, moderate, and severe depression, respectively. 63.1%, 26.2%, 7.9%, 2.8% have no, mild, moderate, and severe anxiety, respectively.	Quantitative Non-Randomized	80%
12. 吴荔荔, 尚志蕾, 张帆, 孙露娜, 刘伟志 "2 例确诊和 6 例疑似新型冠状病毒肺炎患者创伤后应激症状调查" 第二军医大学学报 2020 年 2 月第 41 卷第 2 期 Acad J Sec Mil Med Univ, 2020, 41(2): 186-190 DOI:10.16781/j.0258-879x.2020.02.0186	Respiratory, other/ Post-traumatic stress disorder	Aim: Explore the psychological status and interventions in confirmed and suspected COVID-19 patients. Findings: The data of 2 confirmed cases and 6 suspected cases of COVID-19 were collected through online survey. Demographic data of the patients were collected by self-designed self-assessment general situation questionnaire. Post-traumatic stress symptoms were assessed by post-traumatic stress disorder checklist for DSM-5 (PCL-5). The screening result of post-traumatic stress symptom was positive in one confirmed case and one suspected case. Invasive symptoms presented in 5 cases.	Quantitative Non-Randomized	60%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
13. 张玉萍, 罗稀, 张健, 等. 新型冠状病毒肺炎疫期肿瘤患者的心理应激及防护对策" 肿瘤预防与治疗, 2020, 33(2) :106 - 110. Zhang YP, Luo X, Zhang J, et al. Psychological stress and protective strategies in cancer patients during the outbreak of Corona Virus Disease2019[J]. J Cancer Control Treat, 2020, 33(2):106-110.	Cancer/ anxiety, depression	Aim: Lay a foundation for strengthening crisis management and improving strategies on intervention and management in psychological stress of cancer patients during the outbreak of the epidemic: Professional intervention: [1] Cognitive behavioural therapy (CBT); [2] mindfulness-based stress reduction (MBSR); [3] Narrative therapy 7-step prevention method: Self regulation includes accepting own's emotions, building trust with health care professionals, regular daily routine, connect with friends and family, entertainment and physical activity, preparing for a good night's sleep, contacting doctors if symptoms worsen	Qualitative	60%
14. 周金, 鄢建军, 童辉等. "新型冠状病毒肺炎疫情期间血液透析患者心理健康管理与实践", Nursing of Integrated Traditional Chinese and Western Medicine, vol. 6, no. 3, pp. 139-141, doi: 10.11997/nitcwm.202003061.	Kidney disease/ mental health	Aim: Summarize mental health problems faced by dialysis patients and the principle of "five in one" as psychological intervention. Findings: To ensure there is no interruption on dialysis and that the patients' psychological status is in good state, the department has established the principle, "five in one". The principle consists of educating patients about COVID-19, sending messages of mental health to patients, providing psychological support by family and friends, providing mental health services.	Qualitative	20%
15. 张苍, 吴金萍, 李洁娜, 郭晓迪, 刘书红, 曾咏梅等. "新型冠状病毒肺炎流行期间糖尿病病人心理状况分析", Chinese General Practice Nursing, vol. 18, no. 8, Mar. 2020, pp. 965-968., doi: 10.12104/j.issn.1674-4748.2020.08.065.	Diabetes/ anxiety, depression	Aim: Investigate the status of mental health of diabetic people during this pandemic. Findings: Accurate information about COVID-19, especially information about the prevention of COVID-19 targeting diabetic patients, should be provided to diabetic patients in a timely manner to reduce uncertainties. Online portal should be provided to diabetic patients as an avenue for mental health counseling.	Quantitative Non-Randomized	80%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
16. 李沁原, 李媛媛, 田小银, 张光莉, 杨巧, 刘玉琳, 罗征秀. "新型冠状病毒肺炎对儿童哮喘控制水平及影响因素分析", 现代医药卫生, 2020. 36(17): 2682-2688. DOI: 10.3936/j.issn.1009-5519.2020.17.008	PH: asthma MH: depression	Aim: Understand the influence and risk factors of COVID-19 on childhood asthma controls in Chongqing area to provide reference for the childhood asthma management during pandemic period. Findings: Parents' depressive thoughts are the main reason for the child asthmatic' negative feelings, depression and increase in asthma severity. Hence, parents should be the main target of psychological therapy during COVID pandemic.	Quantitative Non-Randomized	100%
17. 王琳, 黄瑞英, 陈佳丽, 陈伟菊. "新型冠状病毒肺炎疫情期间老年居家护理实践的探讨", 济南大学学报(自然科学与医学版), 2020.41(2):123-128.DOI:10.11778/j.jdx.2020.02.005	PH: old-age, frail MH: anxiety	Aim: Explore the effect of home care in the elderly under the epidemic situation of COVID-19. Findings: Care procedure: [1] Before at-home care: call to evaluate the patient family's contact history with COVID-19; [2] Teach the patient and family members to properly seal masks while maintaining 1~1.5 metres of safe distance; [3] Provide COVID-19 related training to nurses who specialize in home care; [4] Afterwards, evaluate the ability of family members to care for the elderly patient; [5] Educate and provide training on caring for the elderly patient during the pandemic	Quantitative Randomized	60%
18. 袁锦辉和李清松. "新型冠状病毒感染肺炎疫情下肿瘤放疗患者治疗流程及医患防护措施", Modern Oncology 2020;28(8):1407-1409., doi: 10.3969/j.issn.1672-4992.2020.08.041.	PH: tumour MH: anxiety, depression	Aim: Provide advices regarding strategies to ensure tumor patient's safety during their medical treatment. Findings: The hospital provided an online portal for patients and healthcare workers to ask and answer questions regarding mental health counselling, COVID-19 prevention and new information about the state of COVID-19. This will reduce fearfulness and increase optimistic toward medical treatment and daily life.	Qualitative	80%

Citation	Physical / Mental health	Study Aim / Question/Finding/Intervention	Study Design	Study quality % (yes/5)
19. 陈琼, 余维巍, 王丽静, et al. 老年人新型冠状病毒肺炎防治要点(试行). 中华老年医学杂志. 2020;39(2):113-118. doi:10.3760/cma.j.issn.0254-9026.2020.02.001	PH: old age MH: anxiety and depression	Aim: Draft key points for the prevention and treatment of the Novel Coronavirus Pneumonia in the elderly, aiming to provide help with the prevention and treatment of NCP and the reduction of harm to the elderly population. Findings: As an individual ages, the baseline levels of pro-inflammatory cytokines in the tissues and circulation of the elderly increase with age, especially interleukin (IL)-1 β , IL-6 and tumor necrosis factor- α (TNF- α), which is a phenomenon is called "Inflammatory aging". while performing clinical classifications, physicians must consider the functional status of other body systems, because elderly patients with lung disease may be more likely to induce failure of other systems.	Qualitative	60%

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