



Exploring the effects of contact with nature during Covid 19 lockdown and its impact on individuals' psychological wellbeing: A scoping review

S Letsie

 [rcid.org/0009-0002-6150-001X](https://orcid.org/0009-0002-6150-001X)



Mini-dissertation accepted in partial fulfilment of the requirements for the degree Master of Arts Counselling Psychology at the North-West University

Supervisor: Prof J Potgieter

Graduation: May 2026

Acknowledgements

I want to extend my appreciation to my support system during this phase of my life. The saying, "It takes a village to raise a child," resonates deeply with my experience.

I want to express my gratitude to God for granting me the strength to navigate through this chapter in my life. Drawing inspiration from Philippians 1:6, "being confident of this, that he who began a good work in you will carry it on to completion until the day of Christ Jesus".

I would like to express profound gratitude to my caring parents, Leshoboro and Matseliso Letsie, for their unwavering support and significant contributions to my well-being and success. Your prayers have been a source of my strength.

I wish to extend my acknowledgment and gratitude to Prof Johan Potgieter, my supervisor, for his wisdom and supportive demeanour that guided me through the entire research process.

I express my sincere appreciation to North-West University for providing financial assistance and fulfilling one of my dreams of becoming a psychologist. Thank you for your support.

Lastly, I extend my heartfelt appreciation to my friends for their valuable support.

Table of Contents

Acknowledgements.....	2
List of Figures and Tables.....	5
Abstract.....	6
Preface	8
Declaration by Researcher	9
Permission Letter from Study Leader	10
List of Abbreviations	11
Chapter 1: Literature Overview	12
1.1. Introduction	12
1.2. Literature Review.....	12
1.2.1. <i>Mental Health and Well-being</i>	12
1.2.2 <i>Nature and its Association with Psychological Well-being</i>	13
1.2.3. <i>The Impact of the COVID-19 Pandemic</i>	16
1.2.4. <i>COVID-19 Lockdown and Individuals' Engagement with Nature</i>	18
1.3. Problem Statement.....	19
1.4. Review Questions.....	20
1.5. Contribution of the Study	20
1.6. Summary	21
References	22
Chapter 2: Manuscript for Examination.....	30
Abstract.....	31
2.1. Introduction	32
2.2. Aim of Research Study	34
2.3. Methods of Investigation.....	35
2.4. Data Analysis.....	39
2.5. Results.....	40
2.5.1. <i>Increased Nature Exposure during COVID-19 Lockdown</i>	41
2.5.2. <i>Decreased Nature Exposure during COVID-19 Lockdown</i>	43
2.5.3. <i>Improved Well-being associated with Increased Nature Exposure</i>	44
2.5.4. <i>Lower Well-being associated with Decreased Nature Exposure</i>	45
2.6. Discussion.....	46
2.7. Conclusion.....	51
References	53

Chapter 3: Critical Reflection	61
3.1. Introduction	61
3.2. Summary of the study	61
3.3. Limitations.....	62
3.4. Recommendations	63
3.5. Conclusion.....	65
3.6. Personal reflection	65
References	67
Appendix A: Data Extraction Table	68
Appendix B: Health Research Ethics Committee	95
Appendix C: Optentia Research Committee	97
Appendix D: Language Editing	99
Appendix E: Journal Guidelines for Authors	100

List of Figures and Tables

Figure 1: *PRISMA Flow Diagram for the Scoping Review Process*..... 38

Table 1: *Research Questions, along with Themes and Sub-themes*.....41

Abstract

Background: Prior to COVID-19 it has been reported that exposure to nature facilitates stress recovery by restoring emotional and cognitive resources, building resilience, and enhancing overall well-being. Additionally, frequent contact with nature has been linked to higher life satisfaction, improved psychological and emotional health. These findings proved to be accurate even during events such as the pandemic showcasing nature's restorative impact.

Aim: The aim of this study was to acquire a comprehensive understanding, informed by scientific literature, of changes in individuals' contact with nature during the COVID-19 lockdown and the potential impact of these changes on individuals' psychological well-being.

Methods: The study utilised a scoping review methodology with purposive sampling to select relevant studies. The researcher adhered to the Arksey and O'Malley's (2005) framework for review studies, which ensured that all relevant articles and data were reviewed, allowing for a comprehensive understanding of the topic. Data was collected from eight research articles that met the inclusion and exclusion criteria, and thematic content analysis was conducted using Braun and Clarke's (2006) six-step model for qualitative data analysis.

Findings: The study identified four key themes: (1) increased nature exposure during COVID-19 lockdown, (2) decreased nature exposure during COVID-19 lockdown, (3) improved well-being associated with increased nature exposure, and (4) lower well-being associated with decreased nature exposure. In combination, these results highlighted the importance of having access to quality greenspaces by showing a connection between nature exposure and improved well-being during COVID lockdown.

Conclusion: This review's findings are significant for the general population, as it provided insight on individuals' relation with nature during events like the COVID pandemic, and the impact this had on individuals' well-being. It also provided interesting insights into the potential role that urban planners

and policymakers could play in the development and implementation of greening policies, and the design of urban spaces that would facilitate the continued and optimal use of nature and its effects on well-being during such events.

Keywords: COVID-19, Lockdown, Nature, Well-being

Preface

This mini-dissertation obtained scientific approval from Optentia Research Committee (see Appendix C) and ethical approval was granted by the North-West University, Health Research Ethics Committee (see Appendix B). Additionally, guidelines stipulated by the North-West University *Manual for Master's and Doctoral Studies* were followed in compiling the mini-dissertation. The study adhered to the American Psychological Association (APA) 7th edition including reference lists that abide to its guidelines. As presented in the table of contents, the mini-dissertation pages are consecutively numbered for examination purposes from the title page to appendixes.

The mini dissertation consists of three chapters written in an article format. Chapter one offers the reader insight into the foundational aspects of the mini dissertation. Chapter two adheres to the intended journal (i.e. *Ecopsychology*) publication guidelines. Lastly, chapter three provides a critical reflection of the review study including the reviewer's personal reflection of the research process. The mini dissertation has been language edited by Monica Botha (see Appendix D) and submitted to Turn-It-In.

Declaration by Researcher

I, Senate Letsie (47607564), hereby declare that this review study titled “Exploring the effects of contact with nature during Covid 19 lockdown and its impact on individuals’ psychological wellbeing: A scoping review”, is my own work and has never been submitted to any other university. This mini-dissertation is submitted for examination purposes and serves as partial fulfilment of the requirement for the degree *Master of Health Sciences in Counselling Psychology* at North-West University in Potchefstroom. I have obtained permission from all relevant parties to conduct this research study, and also declare that all the sources used have been acknowledged by means of referencing.

Signed: July 2025

S. Letsie

Senate Letsie

Permission Letter from Study Leader

I, the undersigned, who acts as the study leader of this study and co-author of the journal article, hereby declare that this mini-dissertation was completed by Senate Letsie and is her work. I hereby grant permission for Senate Letsie to submit the mini-dissertation for examination purposes and in partial fulfilment of the requirements for the degree Master of Health Sciences in Counselling Psychology at the North-West University, Potchefstroom.



Prof Johan Potgieter

23/06/2025

Date

List of Abbreviations

ART	Attention Restoration Theory
MHC-SF	Mental Health Continuum – Short Form
NWU	North-West University
SRT	Stress Reduction Theory
WHO	World Health Organization

Chapter 1: Literature Overview

1.1. Introduction

The objective of this chapter is to offer the reader insight into the foundational aspects of this minor dissertation. The study aimed to conduct a scoping review to summarise existing scientific literature on nature exposure during the COVID-19 lockdown and examine its impact on individuals' psychological well-being.

1.2. Literature Review

The following section provides a brief overview of literature regarding exposure to nature and its connection with mental health and well-being. An overview is also provided of the advent of the COVID-19 pandemic, and especially the associated lockdown period, and how this might have impacted on the health and well-being of individuals.

1.2.1. Mental Health and Well-being

The World Health Organization (WHO) describes mental health as "*a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community.*" (WHO, 2022, para.1). The American Psychological Association (2018) define mental health as "*a state of mind characterized by emotional well-being, good behavioural adjustment, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relationships and cope with the ordinary demands and stresses of life*". In combination, these definitions suggest that mental health represents a state of well-being and optimal functioning in various domains of life. According to Corey Keyes' (2002) Mental Health Continuum (MHC) theory, mental health is a broad concept which is applicable to everyone (Ticzon & Montaña, 2023). This theory suggests that mental health and mental illness exist on opposite ends of a wellness spectrum, and that individuals may find themselves moving to different ends on the continuum based on their changing circumstances (Vinko et al., 2022). This theory therefore allows for the evaluation

of mental health across a spectrum ranging from languishing, which is described as a lack of positive mental health and characterised by feelings of emptiness, detachment, and disconnection, to flourishing, which represents a state of positive mental health, characterised by emotions of joy, satisfaction, and effective functioning (Westerhof & Keyes, 2010).

Mental health is therefore a complex concept, which encompasses more than just the absence of mental disorders, but also the presence of various facets of well-being (Keyes, 2002). According to the WHO, well-being is an optimal state of health characterised by an individual's realisation of their maximum potential physically, psychologically, socially, spiritually, and economically (Kamitsis & Francis, 2013). Having been researched since the early 1970s, well-being has become associated with concepts such as happiness, self-acceptance, a purpose-driven life, and life satisfaction (Carruthers & Hood, 2004).

In their description of the multifaceted nature of well-being, Russell et al. (2013) identified ten human needs contributing to individual well-being, including physical health, mental health, spirituality, certainty, sense of control and security, learning or capability, inspiration, sense of place, identity, autonomy, connectedness, belonging, and subjective well-being. Another study by Pritchard et al. (2020) reported the significance of vitality for psychological wellness and optimal functioning, emphasising its connection to physical and mental energy.

Interestingly, spending time outdoors, especially in natural settings, has been linked to a number of these facets, such as increased physical and mental energy (Bratman et al., 2012; Pritchard et al., 2020). This highlights the importance of nature exposure for our continued psychological well-being.

1.2.2 Nature and its Association with Psychological Well-being

The significance of humans' connection to nature can be traced back to ancient times when our ancestors depended on their relationship with nature to find food, water, and shelter (Capaldi et

al., 2015). According to the Biophilia Hypothesis (Kellert & Wilson, 1995), this intimate relationship has contributed over millennia to human genes being programmed through evolution to respond positively to other forms of life, and to seek connection with nature for the purpose of survival. Beyond its contribution to survival, the notion that connecting with or being exposed to nature enhances individuals' well-being has been documented by traditional Chinese healers as early as 1950 and has since received prominent support in Western literature (Capaldi et al., 2015).

The numerous benefits of nature exposure have been thoroughly documented by researchers from various fields, including psychology, environmental education, and medicine (Garza-Terán et al., 2022). Within the field of psychology, and the context of human psychological functioning, Kamitsis and Francis (2013) describe nature and natural environments as moderators that cause a decrease in negative moods and distress. Research has also consistently demonstrated a positive association between nature exposure and improved coping abilities (Jiang et al., 2014).

In recent times, the link between human well-being and interactions with nature has received increasing attention and recognition (Ausseil et al., 2022; Rantala & Puhakka, 2020). Research suggests that spending significant time in natural settings can enhance well-being, and particularly one's perceived psychological well-being (Rantala & Puhakka, 2020) which, according to these authors, involve both *feeling good* and *functioning well* as core components.

According to Jiang et al. (2014), scientists have identified a link between exposure to nature and improved coping abilities for dealing with life's challenges. Exposure to green spaces is linked to reduced stress levels while exposure to nature has been found to promote feelings of tranquillity, serenity, and relaxation, whilst reducing physiological stress indicators (Franco et al., 2017). Beyond these immediate benefits, frequent nature exposure has been associated with a range of positive outcomes, including life satisfaction, stress resilience, and enhanced psychological and emotional well-being (Mintz et al., 2021; Phillips et al., 2023). Moreover, residing near natural areas has been linked to lower psychological distress and higher life satisfaction (Capaldi et al., 2015; Kamitsis &

Francis, 2013). Collectively, these findings highlight the positive impact that spending time in nature has on overall well-being.

Several theories, including the Attention Restoration Theory (ART) by Kaplan (1995) and the Stress Reduction Theory (SRT) by Ulrich (1991), have been developed to explain the psychological benefits associated with exposure and contact with natural environments. Kaplan's ART suggests that natural settings play a role in alleviating mental fatigue and restoring concentration, and that being in natural environments helps to restore people's ability to concentrate and reduce mental exhaustion (Ohly et al., 2016). This theory hypothesizes that exposure to natural environments can enhance cognitive performance by restoring limited cognitive resources and directed attention (Stevenson et al., 2018).

Ulrich's SRT is regarded as a prominent theory in psychology for explaining the relationship between environmental exposure and mental stress (Luo & Jiang, 2022). This theory suggests that exposure to nature and natural environments facilitates stress recovery (Reese et al., 2021). According to Ulrich et al. (1991) and Bratman et al. (2012), SRT provides a critical framework for understanding how contact with nature contributes to stress reduction. The theory proposes that exposure to artificial environments tends to induce mental stress, whereas exposure to natural settings helps to reduce it (Luo & Jiang, 2022; Ulrich et al., 1991).

In support of both these theories, researchers like Luo and Jiang (2022) and Ulrich et al. (1991) suggest that environments with water and vegetation were vital for the survival of early humans, which explains why ancient people became skilled at identifying and using natural resources such as plants, animals, and food that were critical for their survival. This is put forward as one probable reason why natural environments also seem to help even modern humans reduce physiological stress (Luo & Jiang, 2022). Supporting this notion, Jiang et al. (2014) observed that higher levels of vegetation in urban areas are associated with stress reduction.

Both the ART and SRT therefore help to explain the growing body of knowledge confirming that fresh air, sunlight, and green nature are essential to healthy living, and can even contribute to the healing of patients in hospitals (Marcus, 2007). Krasilnikova et al. (2021) suggest that nature exposure remains a valuable therapeutic element in medical practice. Green prescriptions, which involve interaction with nature in the comfort of the patient's own space, or structured green care services such as horticultural therapy, have therefore become customary practice (Bragg & Leck, 2017).

It is important to note that the health benefits mentioned above are not limited to exposure to pristine natural environments. A number of studies have found that even engaging with gardens, whether through viewing them, participating in gardening, or involving oneself in therapeutic activities, is linked to better well-being, enhanced physical activity, and decreased social isolation (Howarth et al., 2020). It is now accepted that many forms of nature exposure play an essential role in healing and well-being, and that time spent interacting with nature has a positive impact on individuals' long-term mental and physical health (White et al., 2019). Coventry et al. (2021) report that, as a consequence, significant resources have been allocated to nature-based social prescribing in countries like the United Kingdom, to promote the use and accessibility of green spaces, particularly for communities whose mental health was severely impacted by COVID-19.

1.2.3. The Impact of the COVID-19 Pandemic

COVID-19 was first reported in Wuhan, Hubei Province, China in December 2019 by the WHO and from there spread all over the world (Kumar et al., 2021). In response to the pandemic, countries worldwide implemented strict lockdown measures to curb the spread of the virus, significantly changing the general public's freedom of movement (Soga et al., 2021).

Due to the severity of symptoms and the rapid spread of the virus, the COVID-19 pandemic led many governments to enforce movement restrictions, often referred to as "lockdown", while individuals were encouraged to isolate themselves from others (Dubey et al., 2020; Mækelæ et al.,

2020). The term "lockdown" has become widely used globally and refers to compulsory measures implemented to mitigate the spread of COVID-19 within communities (Joffe, 2021; Mboera et al., 2020; Rahaman et al., 2020). According to Mboera et al. (2020, pp. 308-309), "lockdown entails three key measures: geographical containment, home confinement, and the closure of social, educational, and economic activities, including the prohibition of mass gatherings". The primary objective of lockdown measures was to restrict individuals from moving between different locations and involved establishing data tracking systems to monitor people's movements within specified areas (Joffe, 2021; Nyarko et al., 2020).

Common lockdown restrictions included limitations on local and international travel, social distancing, enforcement of curfews, and a shift from traditional face-to-face school and work attendance to online sessions (Hwang et al., 2020; Lee, Mkandawire et al., 2022; Lopez et al., 2021). The implementation of lockdown measures varied between countries, with national and local authorities adopting different approaches, leading to diverse outcomes (Ren, 2020).

In spite of these attempts made by governments internationally to 'flatten the curve' of infections, the COVID-19 pandemic caused a severe epidemiological and psychological crisis, leading to widespread health concerns, including fever, cough, shortness of breath, and potential cardiovascular damage. By the end of 2023, the WHO reported over 6.9 million deaths linked to the SARS-CoV-2 virus. In addition to this tremendous impact on the global population's physical health, individuals' general well-being was significantly impacted due to the virus's more sinister consequences.

The profound impact that the COVID-19 pandemic had on individuals' well-being has since received research attention (Shi et al., 2020). Whilst the direct effects of exposure to the virus have been well documented, evidence of its indirect effects on individuals' well-being is only now emerging. It has become clear that, in addition to the tragic losses of life, the pandemic also caused a significant mental health crisis (Lopez et al., 2021). The emergence of terms like Post-Pandemic Stress Disorder

(PPSD), which refers to the emotional and psychological response of living through the mental impact of COVID-19 (Cleary, 2020; Laskawiec et al., 2022), affirms the significance of mental challenges experienced by many individuals since the pandemic.

Research by Mintz et al. (2021) and Soga et al. (2021) confirms that there has been a global increase in the prevalence of symptoms of anxiety, depression, and other psychological illnesses, stemming from the fears and uncertainties associated with COVID-19. Additional evidence is emerging that a significant portion of COVID-19's impact on individuals' mental health globally can be attributed to lockdown measures (Jenkins et al., 2021). Mintz et al. (2021) observed that the isolation and confinement caused by lockdown restrictions was believed to have contributed to the impairment of psychological well-being, and the occurrence of a wide range of lasting psychological problems. Moreover, Srivastava et al. (2022) reported widespread anxiety among individuals globally due to the COVID-19 pandemic. Lockdown restrictions were found to have exacerbated the stress experienced universally, regardless of individuals' socio-economic status, race, age, or gender (Bhattacharjee & Ghosh, 2022).

1.2.4. COVID-19 Lockdown and Individuals' Engagement with Nature

One of the outcomes of lockdown, as demonstrated by Dzhambov et al. (2021), was the limitation on people's access to natural environments. Certain lockdown restrictions, while effective in reducing the number of infections, had a profound effect on key aspects of well-being, including a sense of place, connectedness, control, and security (Mintz et al. 2021). This, according to Mækelæ et al. (2020), offers one possible explanation for the significant impact of the COVID-19 pandemic on individuals' well-being. The COVID-19 pandemic and subsequent lockdown restrictions significantly limited individuals' access to and frequency of contact with natural environments like botanical gardens and national parks (Ciottia et al., 2020; Jenkins et al., 2021; Mintz et al., 2021). The significant association between nature exposure and well-being, as described earlier, might partly explain how some of the physical and mental health challenges were exacerbated by the pandemic. Mintz et al.

(2021) observed that individuals who had greater exposure to nature during lockdown reported higher levels of psychological and emotional well-being. These findings are supported by Ugolini et al. (2020), who highlighted reduced opportunities for outdoor activities and immersion in natural environments as key factors. Similarly, Lee, Mkandawire et al. (2022) reported that limited access to nature during lockdown increased stress levels, indicating the critical role of nature in mitigating psychological distress.

In contrast to the above, a number of studies (Lee, Cheng et al., 2022; Mintz et al., 2021; Soga et al., 2021) suggest that some individuals increased their engagement with nature during the pandemic. Despite these differences, there is consensus that lockdown restrictions led to significant changes in the visitation and utilisation of green spaces globally (Lee, Cheng et al., 2022), leading to profound effects on both humans and nature (Soga et al., 2021). These abrupt changes have prompted scholars to investigate and analyse the impact of green spaces on health, social dynamics, and broader societal systems (Capaldi et al., 2015; Kamitsis & Francis, 2013).

Given the well-established association between nature and individual well-being, there is interest in exploring the overall impact that the COVID-19 pandemic and the associated lockdown had on individuals' access to and interaction with nature, and how this influenced their well-being. The proposed study therefore aimed to acquire a comprehensive understanding, informed by scientific literature, of changes in individuals' contact with nature during the COVID-19 lockdown and the potential impact of these changes on individuals' psychological well-being.

1.3. Problem Statement

Research suggests that people's inclination to spend time in natural environments is an effective means of maintaining well-being, particularly when dealing with negative physical and psychological health impacts associated with stressful life events (Berdejo-Espinola et al., 2021). COVID-19 represented one such stressful event that affected many people worldwide. Despite the

recognised significance of outdoor activities for stress relief, socialisation and reconnection, lockdown regulations often hindered people from accessing public recreational areas and green spaces (Phillips et al., 2023).

It is important to understand how such alterations in people's exposure to nature during the lockdown period impacted their psychological well-being. Several studies that focused on the indirect effects of COVID-19 yielded contradicting results, hindering the formation of a clear understanding and detailed conclusions regarding the pandemic's impact on individuals' exposure to nature, and its effects on their well-being. This study, therefore, aimed at conducting a scoping review to summarise existing scientific literature on nature exposure during the COVID-19 lockdown and examined its impact on individuals' psychological well-being.

1.4. Review Questions

The current study attempted to answer two questions: 1. "What is known about changes in contact with nature during COVID-19 lockdown?" 2. "What impact did these changes have on individuals' psychological well-being?"

1.5. Contribution of the Study

Although the psychological and health benefits of contact with nature have been established, contradicting results have emerged regarding changes in individuals' exposure to and contact with nature during the COVID-19 pandemic due to lockdown measures, and how this might have impacted the psychological well-being of individuals. A review of current literature would contribute to our understanding of the role that nature, as a mediating factor, could play as a health-promoting resource during such events. This information might be beneficial to the general population, as well as future researchers and mental health practitioners with an interest in the field. Understanding and summarising the impact that the COVID-19 lockdown had on individuals' ability to access natural spaces, and the associated effect this might have on their well-being, could not only empower and

equip the general population and mental health practitioners with knowledge when dealing with probable future crises, but could potentially also influence broader healthcare principles and policies should similar situations occur in the future.

1.6. Summary

This chapter provided information regarding the review study that follows, investigating the impact of the COVID-19 lockdown on individuals' contact with nature and subsequent psychological well-being. The chapter aimed to establish a theoretical foundation for understanding the relation between exposure to nature and psychological well-being. Theories such as the SRT, ART, and the MHC theory, were put forward to explain the widely observed psychological benefits of interacting with nature. The following chapter presents the findings of the review that emerged since the outbreak of the COVID-19 pandemic and may offer insight into the role that nature contact and exposure plays during stressful events.

References

- American Psychological Association (2018). APA Dictionary of Psychology. [Dictionary]
<https://dictionary.apa.org/mental-health>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 19-32. ISSN 1364-5579.
<https://doi.org/10.1080/1364557032000119616>
- Ausseil, A. G. E., Greenhalgh, S., Booth, P., Lavorel, S., & Collins, A. (2022). A novel approach to identify and prioritize the connections between nature and people's well-being in New Zealand. *Frontiers in Environmental Science*, 10, 782229. <https://doi.org/10.3389/fenvs.2022.782229>
- Berdejo-Espinola, V., Suárez-Castro, A. F., Amano, T., Fielding, K. S., Oh, R. R. Y., & Fuller, R. A. (2021). Urban green space use during a time of stress: A case study during the COVID-19 pandemic in Brisbane, Australia. *People and Nature*, 3(3), 597-609. <https://doi.org/10.1002/pan3.10218>
- Bhattacharjee, A., & Ghosh, T. (2022). COVID-19 pandemic and stress: coping with the new normal. *Journal of Prevention and Health Promotion*, 3(1), 30-52.
<https://doi.org/10.1177/26320770211050058>
- Bragg, R., & Leck, C. (2017). Good practice in social prescribing for mental health: The role of nature-based interventions. *Natural England Commissioned Reports*, 228.
- Bratman, G. N., Hamilton, J. P., & Daily, G. C. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, 1249(1), 118-136. <https://doi.org/10.1111/j.1749-6632.2011.06400.x>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Capaldi, C. A., Passmore, H. A., Nisbet, E. K., Zelenski, J. M., & Dopko, R. L. (2015). Flourishing in nature: A review of the benefits of connecting with nature and its application as a wellbeing intervention. *International Journal of Wellbeing*, 5(4). <https://doi.org/10.5502/ijw.v5i4.449>

- Carruthers, C., & Hood, C. D. (2004). The power of the positive: Leisure and well-being. *Therapeutic Recreation Journal*, 38(2), 225-245. https://www.bctra.org/wp-content/uploads/tr_journals/1003-3932-1-PB.pdf
- Ciottia, M., Ciccozzib, M., Terrinonic, A., Jiangd, W., Wangd, C., & Bernardinic, S. (2020). The COVID-19 Pandemic. *Critical Reviews In Clinical Laboratory Sciences*, 57(6), 365–388. <https://doi.org/10.1080/10408363.2020.1783198>
- Cleary, K. (2020, May 4). *COVID-19: The pandemic's impact on mental health*. Spotlight. <https://www.spotlightnsp.co.za/2020/05/04/covid-19-the-pandemics-impact-on-mental-health/>
- Coventry, P. A., Brown, J. E., Pervin, J., Brabyn, S., Pateman, R., Breedvelt, J., Gilbody, S., Stancliffe, R., McEachan, R., & White, P. L. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM-population Health*, 16, 100934. <https://doi.org/10.1016/j.ssmph.2021.100934>
- Dubey, S., Biswas, P., Ghosh, R., Chatterjee, S., Dubey, M. J., Chatterjee, S., Lahiri, D., & Lavie, C. J. (2020). Psychosocial impact of COVID-19. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(5), 779-788. <https://doi.org/10.1016/j.dsx.2020.05.035>
- Dzhambov, A. M., Lercher, P., Browning, M. H., Stoyanov, D., Petrova, N., Novakov, S., & Dimitrova, D. (2021). Does greenery experienced indoors and outdoors provide an escape and support mental health during the COVID-19 quarantine? *Environmental Research*, 196, 110420. <https://doi.org/10.1016/j.envres.2020.110420>
- Franco, L. S., Shanahan, D. F., & Fuller, R. A. (2017). A review of the benefits of nature experiences: More than meets the eye. *International Journal of Environmental Research and Public Health*, 14(8), 864. <https://doi.org/10.3390/ijerph14080864>
- Garza-Terán, G., Tapia-Fonllem, C., Fraijo-Sing, B., Borbón-Mendívil, D., & Poggio, L. (2022). Impact of contact with nature on the wellbeing and nature connectedness indicators after a desertic

- outdoor experience on Isla del Tiburon. *Frontiers in Psychology*, 13, 864836.
<https://doi.org/10.3389/fpsyg.2022.864836>
- Howarth, M., Brett, A., Hardman, M., & Maden, M. (2020). What is the evidence for the impact of gardens and gardening on health and well-being: a scoping review and evidence-based logic model to guide healthcare strategy decision making on the use of gardening approaches as a social prescription. *BMJ Open*, 10(7), e036923. <http://dx.doi.org/10.1136/bmjopen-2020-036923>
- Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. *International Psychogeriatrics*, 32(10), 1217-1220.
<https://doi.org/10.1017/S1041610220000988>
- Jenkins, M., Houge Mackenzie, S., Hodge, K., Hargreaves, E. A., Calverley, J. R., & Lee, C. (2021). Physical activity and psychological well-being during the COVID-19 lockdown: relationships with motivational quality and nature contexts. *Frontiers in Sports and Active Living*, 3, 637576.
<https://doi.org/10.3389/fspor.2021.637576>
- Jiang, B., Chang, C. Y., & Sullivan, W. C. (2014). A dose of nature: Tree cover, stress reduction, and gender differences. *Landscape and Urban Planning*, 132, 26-36.
<https://doi.org/10.1016/j.landurbplan.2014.08.005>
- Joffe, A. R. (2021). COVID-19: rethinking the lockdown groupthink. *Frontiers in Public Health*, 9, 625778. <https://doi.org/10.3389/fpubh.2021.625778>
- Kamitsis, I., & Francis, A. J. (2013). Spirituality mediates the relationship between engagement with nature and psychological wellbeing. *Journal of Environmental Psychology*, 36, 136-143.
<https://doi.org/10.1016/j.jenvp.2013.07.013>
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15, 169–82. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2)
- Kellert, S. R., & Wilson, E. O. (1995). *The biophilia hypothesis*. Island Press.

- Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 207-222. <https://doi.org/10.2307/3090197>
- Krasilnikova, E. E., Zhuravleva, I. V., & Zaika, I. A. (2021). Creating healing and therapeutic landscapes: Design experience. *RUDN Journal of Agronomy and Animal Industries*, 16(3), 238-254. <https://doi.org/10.22363/2312-797X-2021-16-3-238-254>
- Kumar, A., Singh, R., Kaur, J., Pandey, S., Sharma, V., Thakur, L., Sati, S., Mani, S., Asthana, S., Sharma, T. K., Chaudhuri, S., Bhattacharyya, S., & Kumar, N. (2021). Wuhan to world: the COVID-19 pandemic. *Frontiers in Cellular and Infection Microbiology*, 11, 596201. <https://doi.org/10.3389/fcimb.2021.596201>
- Laskawiec, D., Grajek, M., Szlacheta, P., & Korzonek-Szlacheta, I. (2022, May). Post-pandemic stress disorder as an effect of the epidemiological situation related to the COVID-19 pandemic. *Healthcare*, 10(6), 975. <https://doi.org/10.3390/healthcare10060975>
- Lee, J. H., Mkandawire, M., Niyigena, P., Xotyeni, A., Itamba, E., & Siame, S. (2022). Impact of COVID-19 lock-downs on nature connection in Southern and Eastern Africa. *Land*, 11(6), 872. <https://doi.org/10.3390/land11060872>
- Lee, J.-h., Cheng, M., Syamsi, M. N., Lee, K. H., Aung, T. R., & Burns, R. C. (2022). Accelerating the nature deficit or enhancing the nature-based human health during the pandemic era: An international study in Cambodia, Indonesia, Japan, South Korea, and Myanmar, following the start of the COVID-19 pandemic. *Forests*. <https://doi.org/10.3390/f13010057>
- Lopez, B., Kennedy, C., Field, C., & McPhearson, T. (2021). Who benefits from urban green spaces during times of crisis? Perception and use of urban green spaces in New York City during the COVID-19 pandemic. *Urban Forestry & Urban Greening*, 65, 127354. <https://doi.org/10.1016/j.ufug.2021.127354>
- Luo, L., & Jiang, B. (2022). From oppressiveness to stress: A development of Stress Reduction Theory in the context of contemporary high-density city. *Journal of Environmental Psychology*, 84, 101883. <https://doi.org/10.1016/j.jenvp.2022.101883>

- Mækelæ M. J., Reggev, N., Dutra, N., Tamayo, R. M., Silva-Sobrinho, R. A., Klevjer, K., & Pfuhl, G. (2020). Perceived efficacy of COVID-19 restrictions, reactions, and their impact on mental health during the early phase of the outbreak in six countries. *Royal Society Open Science*, 7(8), 200644. <https://doi.org/10.1098/rsos.200644>
- Marcus, C. C. (2007). Healing Gardens in Hospitals. *Interdisciplinary Design and Research e-Journal*. <https://www.researchgate.net/publication/237446315>
- Mboera, L. E., Akipede, G. O., Banerjee, A., Cuevas, L. E., Czipionka, T., Khan, M., Kock, R., McCoy, D., Mbanga, B. T., Misinzo, G., Shayo, E., Sheel, M., Sindato, C., & Urassa, M. (2020). Mitigating lockdown challenges in response to COVID-19 in Sub-Saharan Africa. *International Journal of Infectious Diseases*, 96, 308-310. <https://doi.org/10.1016/j.ijid.2020.05.018>
- Mintz, K. K., Ayalon, O., Nathan, O., & Eshet, T. (2021). See or be? Contact with nature and well-being during COVID-19 lockdown. *Journal of Environmental Psychology*, 78, 101714. <https://doi.org/10.1016/j.jenvp.2021.101714>
- Nyarko, R. O., Boateng, E., Kahwa, I., Boateng, P. O., Asare, B., Asum, C., Ampong, G. A., & Nayembil, D. A. (2020). The impact on public health and economy using lockdown as a tool against COVID-19 pandemic in Africa: a perspective. *Journal of Epidemiology and Public Health Reviews*, 5(3). <http://doi.org/10.16966/2471-8211.188>
- Ohly, H., White, M. P., Wheeler, B. W., Bethel, A., Ukoumunne, O. C., Nikolaou, V., & Garside, R. (2016). Attention Restoration Theory: A systematic review of the attention restoration potential of exposure to natural environments. *Journal of Toxicology and Environmental Health, Part B*, 19(7), 305-343. <https://doi.org/10.1080/10937404.2016.1196155>
- Phillips, T. B., Wells, N. M., Brown, A. H., Tralins, J. R., & Bonter, D. N. (2023). Nature and well-being: The association of nature engagement and well-being during the SARS-CoV-2 pandemic. *People and Nature*, 5(2), 607-620. <https://doi.org/10.1002/pan3.10433>

- Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The relationship between nature connectedness and eudaimonic well-being: A meta-analysis. *Journal of Happiness Studies*, 21, 1145-1167. <https://doi.org/10.1007/s10902-019-00118-6>
- Rahaman, M. A., Islam, M. S., Khan, A. A., Sarker, B., & Mumtaz, A. (2020). Understanding "Quarantine," "Social Distancing," and "Lockdown" during "COVID-19" Pandemic in Response to Global Health: A Conceptual Review. *Open Journal of Social Sciences*. <https://doi.org/www.scirp.org/journal/jss>
- Rantala, O., & Puhakka, R. (2020). Engaging with nature: Nature affords well-being for families and young people in Finland. *Children's Geographies*, 18(4), 490-503. <https://doi.org/10.1080/14733285.2019.1685076>
- Reese, G., Kohler, E., & Menzel, C. (2021). Restore or get restored: The effect of control on stress reduction and restoration in virtual nature settings. *Sustainability*, 13(4), 1995. <https://doi.org/10.3390/su13041995>
- Ren, X. (2020). Pandemic and lockdown: a territorial approach to COVID-19 in China, Italy, and the United States. *Eurasian Geography and Economics*, 61(4-5), 423-434. <https://doi.org/10.1080/15387216.2020.1762103>
- Russell, R., Guerry, A. D., Balvanera, P., Gould, R. K., Basurto, X., Chan, K. M., Klain, S., Levine, J., & Tam, J. (2013). Humans and nature: how knowing and experiencing nature affect well-being. *Annual Review of Environment and Resources*, 38, 473-502. <https://doi.org/10.1146/annurev-environ-012312-110838>
- Shi, L., Lu, Z. A., Que, J. Y., Huang, X. L., Liu, L., Ran, M. S., Gong, Y., Yuan, K., Sun, W., Sun, Y., Shi, J., Bao, Y., & Lu, L. (2020). Prevalence of and risk factors associated with mental health symptoms among the general population in China during the coronavirus disease 2019 pandemic. *JAMA Network Open*, 3(7), e2014053-e2014053. <https://doi.org/10.1001/jamanetworkopen.2020.14053>

- Soga, M., Evans, J. M., Cox, T. C. D., & Gaston, J. K. (2021). Impacts of the COVID-19 pandemic on human–nature interactions: Pathways, evidence, and implications. *People and Nature*, 3(3), 518-527. <https://doi.org/10.1002/pan3.10201>
- Srivastava, R., Gupta, S., & Sanjeev, M. A. (2022). Comprehending and measuring pandemic induced stress among professionals due to lockdown and work from home. *Journal of Public Affairs*, 22, e2791. <https://doi.org/10.1002/pa.2791>
- Stevenson, M. P., Schilhab, T., & Bentsen, P. (2018). Attention Restoration Theory II: A systematic review to clarify attention processes affected by exposure to natural environments. *Journal of Toxicology and Environmental Health, Part B*, 21(4), 227-268. <https://doi.org/10.1080/10937404.2018.1505571>
- Ticzon, J. N. R., & Montaña, M. P. T. (2023). Mental health continuum as a moderator to the impact of COVID-19 pandemic and psychological distress. *European Journal of Science, Innovation and Technology*, 3(1), 159-171.
- Ugolini, F., Massetti, L., Calaza-Martínez, P., Cariñanos, P., Dobbs, C., Ostoić, S. K., Marin, A. M., David Pearlmutter, D., Saaroni, H., Šaulienė, I., Simoneti, M., Andrej Verlič, A., Vuletić, D., & Sanesi, G. (2020). Effects of the COVID-19 pandemic on the use and perceptions of urban green space: An international exploratory study. *Urban Forestry & Urban Greening*, 56, 126888. <https://doi.org/10.1016/j.ufug.2020.126888>
- Ulrich, R. S. (2023). Stress reduction theory. D. Marchand, E. Pol, & K. Weiss (eds.), *100 Key Concepts in environmental psychology* (pp.143-146). Routledge.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11(3), 201-230. [https://doi.org/10.1016/S0272-4944\(05\)80184-7](https://doi.org/10.1016/S0272-4944(05)80184-7)
- Vinko, M., Mikolič, P., Roškar, S., & Jeriček Klanšček, H. (2022). Positive mental health in Slovenia before and during the COVID-19 pandemic. *Frontiers in Public Health*, 10, 963545. <https://doi.org/10.3389/fpubh.2022.963545>

- Westerhof, G. J., & Keyes, C. L. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development*, 17, 110-119. <https://doi.org/10.1007/s10804-009-9082-y>
- White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M.H & Flemming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, 9(1), 7730. <https://doi.org/10.1038/s41598-019-440973>
- World Health Organization (2022, June 17). Mental Health. Fact sheet. <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>.

Chapter 2: Article

This chapter will be submitted for publication in the *Ecopsychology* journal. The article adheres to the guidelines stipulated by the journal (see Appendix E).

Manuscript for Examination

Exploring the effects of contact with nature during Covid 19 lockdown and its impact on individuals' psychological wellbeing: A scoping review

Senate Letsie, Johan C. Potgieter

School of Psychosocial Health, North-West University (Potchefstroom Campus), South Africa

Corresponding author: Prof Johan C. Potgieter

Department of Psychology

School of Psychosocial Health

North-West University, Potchefstroom Campus, South Africa

Private Bag X6001, Potchefstroom 2520

Email: johan.potgieter@nwu.ac.za

Abstract

Exposure to nature facilitates stress recovery by restoring emotional and cognitive resources, building resilience, and enhancing overall well-being. Additionally, frequent contact with nature has been linked to higher life satisfaction, and improved psychological and emotional health. The aim of this study was to acquire a comprehensive understanding, informed by scientific literature, of changes in individuals' contact with nature during the COVID-19 lockdown and the potential impact of these changes on individuals' psychological well-being. The study utilised a scoping review methodology, with purposive sampling, to select relevant studies. The researcher adhered to Arksey and O'Malley's (2005) framework for review studies, which ensured that all relevant articles and data were reviewed, allowing for a comprehensive understanding of the topic. Data was collected from eight research articles that met the inclusion and exclusion criteria, and thematic content analysis was conducted using Braun and Clarke's (2006) six-step model for qualitative data analysis. The study identified four key themes: (1) increased nature exposure during COVID-19 lockdown, (2) decreased nature exposure during COVID-19 lockdown, (3) improved well-being associated with increased nature exposure, and (4) lower well-being associated with decreased nature exposure. These findings are significant for the general population and healthcare practitioners as they provide insight into individuals' relation with nature. In addition, urban planners, and policymakers should note results indicating the importance of the development and implementation of greening policies and designing urban spaces that could effectively support individuals' well-being during such crises.

Keywords: COVID-19, Lockdown, Nature, Well-being

2.1. Introduction

The significance of humans' connection to nature can be traced back to ancient times when our ancestors depended on nature to find food, water, and shelter (Capaldi et al., 2015). Beyond its contribution to survival, the notion that connecting with or being exposed to nature enhances well-being has been documented by traditional Chinese healers as early as 1950 and has since received prominent support in Western literature (Capaldi et al., 2015; Pritchard et al., 2020). According to the Biophilia Hypothesis formulated by Kellert and Wilson (1995), human genes have been programmed through evolution to respond positively to other forms of life and to seek connection with nature for the purpose of survival.

Since the emergence of the hypothesis that humans have an innate connection with nature, extensive research across various fields, including psychology, environmental education, and medicine, has documented the benefits of contact with natural environments (Garza-Terán et al., 2022). Historically, as early as the 17th and 18th centuries, fresh air, sunlight, and green surroundings were recognised as essential components in patient recovery (Marcus, 2007). This early understanding has since evolved into a growing body of evidence demonstrating the profound impact of nature on physical and mental well-being.

Recent studies highlight that exposure to nature facilitates recovery from stress by restoring emotional and cognitive resources depleted through daily activities (Hartig et al., 2021). Additionally, exposure to nature supports human adaptation to surroundings, fostering resilience and enhancing overall well-being. Frequent interaction with nature has been associated with increased life satisfaction, improved psychological and emotional health, and greater resistance to stress (Barragan-Jason et al., 2023; Mintz et al., 2021; Phillips et al., 2023; Siah et al., 2023). Research further suggests that nature serves as a psychological buffer, mitigating the effects of distress and negative life events (Kamitsis & Francis, 2013).

Beyond emotional well-being, access to nature has been linked to enhanced attentional functioning, reduced psychological distress, and improved mood regulation. Individuals who live in areas with nearby green spaces report lower stress levels and greater life satisfaction (Capaldi et al., 2015; Kamitsis & Francis, 2013). Furthermore, Bressane et al. (2024) and Gong et al. (2024) concluded that both the quality and availability of green spaces are fundamental to supporting human health, emphasising the need for continued integration of natural environments into urban planning and public health strategies. Similarly, Rantala and Puhakka (2020) found that time spent in natural environments positively influences mood, self-esteem, and emotional stability, while Yao et al. (2021) reported that maintaining or increasing engagement with natural spaces such as visiting parks or viewing nature from home correlates with reduced psychological distress and somatic symptoms. Together, these studies highlight the critical role of nature in promoting individuals' psychological well-being.

The onset of the COVID-19 pandemic in early 2020 contributed to abrupt and significant changes in people's daily lives as governments enforced isolation and physical distancing measures to contain the virus's spread. The pandemic also disrupted people's ability to connect with and utilise natural spaces, due to the global lockdown restrictions and associated limitations (Soga et al., 2021). On a practical level, lockdown restrictions meant that most people spent most of their time alone at home (Pouso et al., 2021), as restrictions on movement and access to public spaces, such as parks, nature reserves, and hiking trails limited individuals' opportunities for direct contact with nature.

While the measures implemented to flatten the curve saved lives, Pouso et al. (2021) and Soga et al. (2021) highlight that these measures also had significant long-term effects on mental health globally, leading to increased rates of anxiety, depression, and other psychological challenges (Mintz et al., 2021; Soga et al., 2021). The isolation, confinement, and restrictions on movement exacerbated stress and contributed to lasting psychological issues, affecting people across diverse socio-economic backgrounds, ages, and demographics (Bhattacharjee & Ghosh, 2022; Jenkins et al., 2021; Srivastava

et al., 2022). Inadvertently, the restrictions imposed during the COVID-19 pandemic may have adversely affected mental and physical well-being, as access to green spaces, which is known to alleviate stress and enhance mood, was significantly limited (Buheji et al., 2020; Maury-Mora et al., 2022). This aligns with Lopez et al. (2021), who found that continued exposure to nature played a crucial role in helping individuals to cope during the COVID-19 crisis, highlighting the significant health benefits of connecting with natural environments.

Several studies have highlighted how participants' interactions with nature during COVID-19 was influenced by each country's unique restrictions and limitations. During the pandemic, individuals found creative ways to maintain nature contact, for instance Buheji et al. (2020) emphasised the importance of psychological and stress-reduction strategies, such as using social media to sustain a sense of connection with nature despite lockdown restrictions. In Madrid, Maury-Mora et al. (2022) further detailed that individuals adapted to the pandemic limitations by engaging in activities such as indoor plant care, virtual nature experiences, national park tours, and local outdoor activities, including walking, running, gardening, and wildlife observation.

In summary, spending time in natural environments offers numerous health benefits. Berdejo-Espinola et al. (2021) opine that nature's restorative effects become valuable in coping with the negative health impacts of stressful life events. This insight reinforces the importance of nature exposure, not only for overall health, but also as a key factor in mitigating elevated stress and anxiety, particularly during challenging times such as the COVID-19 lockdown period.

2.2. Aim of Research Study

The aim of the review study was to acquire a comprehensive understanding, informed by scientific literature, of changes in individuals' contact with nature during the COVID-19 lockdown and the potential impact of these changes on individuals' psychological well-being.

2.3. Methods of Investigation

A scoping review was selected as the most appropriate approach to address the aim of this study. Scoping reviews are particularly useful in new and emerging areas of research (Peters et al., 2020). According to Arksey and O'Malley (2005), scoping reviews are designed for collecting, summarising, and presenting available research evidence, and allow for a comprehensive assessment and understanding of existing knowledge, helping to identify key concepts, gaps, and trends in the field.

Arksey and O'Malley's (2005) framework was used for this review due to its systematic approach to mapping the breadth of literature in emerging fields. COVID-19 and its impact on the health and well-being of individuals emerged over the past four years and individuals had to adapt to a sudden change in their lives. Since the onset of the pandemic, several studies have emerged on the indirect impact that the pandemic has had on individuals' well-being, particularly through changes in nature contact and exposure during lockdown. This review included studies utilising quantitative, qualitative, and mixed-methods research approaches in order to provide a thorough understanding of the changes in individuals' contact with nature during the COVID-19 lockdown and to assess the potential impact of these changes on psychological well-being. The chosen framework provides an ideal structure for synthesizing diverse studies, as it allows for the inclusion of both qualitative and quantitative research, ensuring a comprehensive understanding of the topic while addressing the inconsistencies and gaps in existing findings. Arksey and O'Malley's (2005) framework involved the following stages:

Step 1-Identifying the research question: In this case, the review questions were 1."What is known about changes in contact with nature during COVID-19 lockdown?" and 2. "What impact did these changes have on individuals' psychological well-being?"

Step 2-Recognising possible studies: To ensure a comprehensive search, and prevent any omissions of potentially valuable source documents, the literature search was conducted using the North-West University Library databases. The preliminary search was conducted using the following keywords as Boolean operators: COVID-19 or Corona virus or Lockdown or Lockdown restrictions or COVID-19 lockdown or COVID-19 pandemic or Coronavirus pandemic or Quarantine, and Nature or Natural environments or Green spaces or Wilderness areas and Well-being or Psychological well-being. Boolean operators such as AND, and OR were used to refine the search criteria and enhance the relevance of the search results by broadening the search scope. Relevant results were retrieved from the following databases: Springer Nature Journals, CINAHL with Full Text, Health Source: APA PsycArticles, GreenFILE, ScienceDirect, SPORTDiscus with Full Text, SocINDEX with Full Text, Directory of Open Access Journals, Business Source Complete, Emerald Insight, and APA PsycInfo.

Step 3-Selecting relevant studies: Only studies conducted between 2020 and 2024, written in English, and containing relevant search terms in their titles and abstracts were included in the review. Setting the range to focus on articles published in 2020-2024 ensured that relevant studies conducted during and post COVID-19 and its associated lockdown restrictions were included. The selected time frame ensured the inclusion of all possible publications since the beginning of the pandemic.

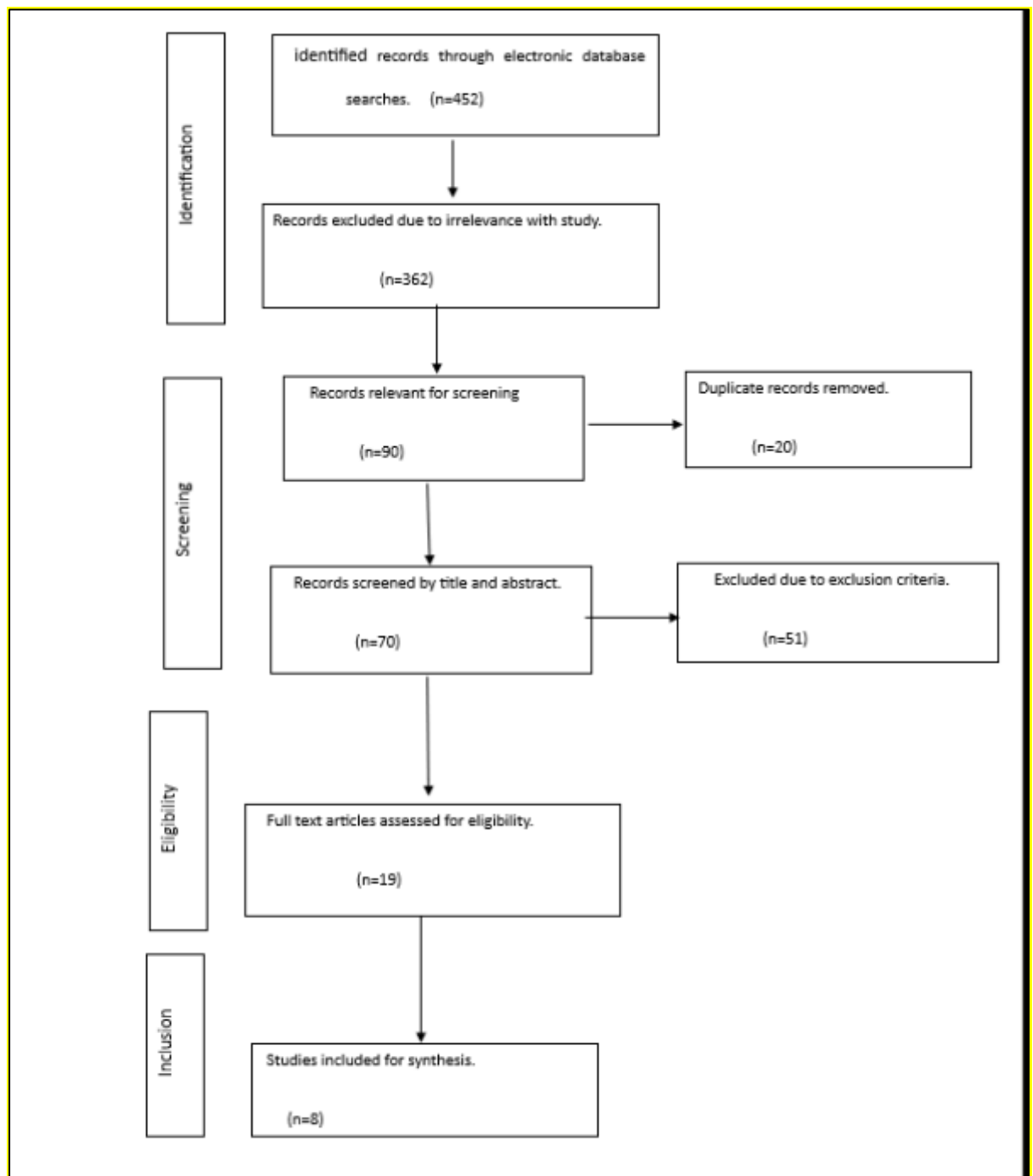
Articles were included in the review if they met ethical standards and adhered to rigorous scientific standards, ensuring their relevance and credibility. Only studies that indicated ethics approval and confirmed that participants provided informed consent were included. The selection and screening process involved reviewing the titles and abstracts of articles to determine their relevance for inclusion in the study. Wallwork and Southern (2020) reported that research titles and abstracts identify key concepts that are sufficient to aid readers in understanding the significance of the study.

The screening process involved a systematic approach to identifying and selecting relevant studies. Initially, 452 records were identified through electronic database searches. After an initial review, 362 records were excluded due to irrelevance to the study, leaving 90 records for further

assessment. These 90 records were then thoroughly analysed, with 20 duplicates removed. The remaining 70 records were carefully examined in detail, with the full text of each article reviewed against predefined inclusion and exclusion criteria. These criteria included relevance to the research focus, appropriateness of study design, methodological rigour, data reliability, and overall study quality. As a result, 51 articles were excluded, as they did not meet the criteria for inclusion in the study. Subsequently, 19 full-text articles were evaluated for eligibility based on the study design, and methodological quality and its adherence to ethical considerations. After this detailed evaluation, eight studies were selected for analysis, while 12 studies were eliminated due to factors such as insufficient data, or methodological flaws. Figure 1 illustrates the PRISMA Flow Diagram for the scoping review process.

Figure 1:

PRISMA Flow Diagram for the Scoping Review Process



Step 4-Charting the data: Relevant information to the research questions was extracted from the selected source documents. The extraction process involved capturing details such as authors' information, study aim, study design, data collection method, population, location, findings,

discussions, and conclusions. A summary of the data extraction table is provided in the supplementary material (Appendix A).

Step 5-Collating, summarising, and reporting the results: To answer the research questions, data was categorised and summarised using thematic analysis by following the steps proposed by Creswell (2014), as well as Clarke and Braun (2017), as clearly outlined under the data analysis section below. The use of these steps contributed to the clarity and structure with which the research results were reported.

2.4. Data Analysis

Thematic content analysis was used to analyse the qualitative data. Clarke and Braun (2017) define thematic analysis as a method for identifying, analysing, and interpreting patterns of meaning within qualitative data. The process involved six steps as recommended by Braun and Clarke (2006):

1. Familiarisation with the data: The process entailed reading and becoming familiar with the full-text articles and relevant sections of the included studies. After identifying and retrieving relevant studies, they were thoroughly read to familiarise the reviewer with the content and data.

2. Generating initial codes: In this phase the reviewer generated and produced initial codes from the data. Articles were read multiple times. During the second and third readings, the reviewer highlighted similar points across the articles and created codes to categorise the information.

3. Searching for themes: This refers to sorting the different codes from step 2 into potential themes. The reviewer used tables to allocate similar concepts and information into the same columns. All similar codes were placed in one column, with other codes placed in separate columns.

4. Reviewing themes: This step involved reviewing and refining themes to identify the main themes or patterns. The themes identified in step 3 were reviewed and adjusted as needed. Information was reviewed multiple times to ensure that it was correctly placed in the appropriate

columns and that similar patterns were clearly identified. Themes that did not address the research question were removed.

5. Defining and naming themes: This refers to summarising and describing the main themes or patterns that emerge from the data. The themes identified and classified in step 4 were named based on the patterns that emerged from the articles. The reviewer used synonyms and phrases to summarise each theme, ensuring clarity and providing the reader with a clear understanding of the theme's content.

6. Producing the report: In this last step the reviewer drafted a report on the findings. Results were written up in accordance with the themes and supported by literature.

It is important to emphasise that the identification and categorisation of themes followed an inductive approach, which was not guided by any pre-existing theory. Instead, the themes and patterns emerged directly from the data itself.

2.5. Results

This scoping review focussed on eight research articles that addressed the research questions and objectives of the study as stated previously. These studies utilised diverse methodologies, most of which followed a quantitative approach, and included longitudinal (Stock et al., 2022), exploratory (Khalilnezhad et al., 2021; Marques et al., 2022; Van Eeden et al., 2023), cross-sectional (Ribeiro et al., 2021), quasi experimental (Tomasso et al., 2021) and mixed methods (Labib et al., 2022; Lusseau & Baillie, 2023) designs. Geographically, the studies encompassed various regions including Europe, Oceania, North America, as well as the Middle East and Asia. Within these broad geographical regions, participants were from areas characterised by varying levels of development and socio-economic status. Most of the studies involved individuals 18 years and older, with a predominant representation of women (Marques et al., 2022; Ribeiro et al., 2021; Stock et al., 2022; Tomasso et al., 2021).

From the analysis of these studies, several themes and sub-themes emerged in relation to the research questions, as illustrated in Table 1 below.

Table 1:

Research Questions along with Themes and Sub-themes

Research question	Theme	Sub-theme
Research question 1: What is known about changes in contact with nature during COVID-19 lockdown?	1.1 Increased nature exposure during COVID-19 lockdown	1.1.1 Access to private green space
		1.1.2 Access to public green space
		1.1.3 Social media
	1.2 Decreased nature exposure during COVID-19 lockdown	1.2.1 Fears of falling ill 1.2.2 Socio-economic status
Research question 2: What impact did these changes have on individuals' psychological well-being?	2.1 Improved well-being associated with increased nature exposure	2.1.1 Facilitation of positive aspects of well-being
		2.1.2 Reduction of negative aspects of well-being
	2.2 Lower well-being associated with decreased nature exposure	2.2.1 Mental health declines
		2.2.2 The role of personal motivational factors and pre-COVID-19 lifestyle

2.5.1. Increased Nature Exposure during COVID-19 Lockdown

In relation to the first research question, the first theme revealed that lockdown led to an increase in time spent in nature. During lockdown restrictions some individuals took advantage of the regulations and spent time in available green spaces. Interestingly, several studies included in this review revealed that overall nature exposure increased during lockdown, in spite of the associated restrictions imposed on individuals' freedom of movement. A number of sub-themes emerged, illustrating the different ways in which people connected with nature during lockdown.

The first way in which individuals were able to increase their nature exposure was through having ***access to private green spaces***. The study by Marques et al. (2023) reported that participants from New Zealand had varying levels of access to private outdoor spaces during the COVID-19 lockdown, with 20.5% reporting access to private gardens, 15.5% to patios, and 11.3% to private land.

This is in line with what Ribeiro et al. (2021) found in a study conducted in Spain, where 94.0% of participants had access to indoor plants, 92.6% to balcony plants, 95.4% to home or courtyard gardens, 90.9% to private community green spaces, and 80.0% to natural views of nature from home which they reported utilising during the COVID-19 lockdown. Labib et al. (2022) concur that private green space usage witnessed significant changes during lockdown, with participants reporting increased green views through windows, as well as increased gardening activity when staying at home. In a study conducted in Iran, participants reported that these private green spaces became safe havens where they engaged in nature-centred activities such as relaxation, nature observation, and spending time outdoors (Khalilnezhad et al., 2021).

The second way in which individuals increased their nature exposure was through having **access to public green spaces**. Research by Lusseau and Baillie (2023) found that during the COVID-19 lockdown, public parks, gardens, and forests in Berlin and Paris were frequently utilised, with the number of visits to woodland areas also increasing (Marques et al., 2023). Likewise, in Australia, urban parks and waterways were frequently visited (Van Eeden et al., 2023) and was second only to the use of private green spaces like gardens. This clearly applied in contexts where lockdown restrictions permitted individuals access to these spaces. For instance, in Victoria, Australia, movement was restricted to a 5 km radius from one's home and most people adjusted their green space access to these specific restrictions (Lusseau & Baillie, 2023; Van Eeden et al., 2023), frequenting publicly available green areas in their local area.

Lastly, individuals increased their nature exposure through **social media connection**. Tomasso et al. (2021) found that the transition to virtual work and reduced activities during lockdown enabled some individuals to have more contact with nature, even when direct access to preferred outdoor environments was restricted. Preference for nature-related content increased on social media, as illustrated by a study analysing social media data, and specifically individuals' Twitter activity during lockdown (Lusseau & Baillie, 2023). This research study found that users frequently shared their

experiences of enjoying spending time in parks and searched for open green spaces in cities such as Paris, Berlin, and London.

2.5.2. Decreased Nature Exposure during COVID-19 Lockdown

In contrast to the above, the reviewed articles showed that lockdown resulted in reduced time spent in public outdoor nature for a number of individuals. This decline in the visitation of public green spaces during the pandemic (Khalilnezhad et al., 2021) was linked to two key sub-themes.

The first sub-theme related to a decreased amount of time spent in nature during lockdown involved individuals' **fears of falling ill**. According to Marques et al. (2022), participants' behaviours changed during lockdown, with several individuals reporting that they deliberately reduced their connection with outdoor nature due to fears of contracting COVID-19, which outweighed for them the importance of being outdoors. In a study conducted in Iran (Khalilnezhad et al., 2021), frequent use of public green spaces before the pandemic was reported by 96% of respondents. However, during lockdown, there was a significant decline in visitation, with findings indicating that 42% of respondents refrained from visiting public green spaces, while 40% reduced their visits to once a month. The reduction of public green space usage was also observed by Ribeiro et al. (2021) in Spain, with reports indicating that the proportion of people who visited such places daily went from 20.8% before lockdown to 9.0% during lockdown. These findings suggest that, in addition to government restrictions, a large part of the declines reported in nature visits was due to individuals' fears of contracting the virus (Khalilnezhad et al., 2021).

Another factor that contributed to individuals' decreased nature exposure during the COVID-19 lockdown was their **socio-economic status**. In most studies there was a clear distinction between affluent and deprived neighbourhoods' access to green spaces. Studies showed that the use of green spaces during the period of lockdown declined in deprived neighbourhoods due to less greenery being available in these areas (Khalilnezhad et al, 2021; Lusseau & Baillie, 2023).

The decrease in nature exposure associated with lower socio-economic status was not only linked to the relative absence of neighbourhood greenery, but also to financial difficulties. According to Labib et al. (2022) and Van Eeden et al. (2023), people who experienced financial difficulties spent less time in natural environments. Lusseau and Baillie (2023) found that district forested parks were visited by people from deprived neighbourhoods, but that travelling outside of their local areas to reach these parks had financial implications for those who could least afford it.

Based on the results section above, it seems that nature exposure during COVID-19 showed both increases and decreases, depending on several characteristics of individuals and their environments. The impact that these changes had on individuals' well-being was explored through research question 2. Several prominent themes and sub-themes emerged, as shown in Table 1.

2.5.3. Improved Well-being associated with Increased Nature Exposure

Regarding the second research question, literature highlights that increased nature exposure during the COVID-19 lockdown resulted in improved well-being for most participants. These increases in nature exposure resulted in various well-being benefits represented by the following sub-themes:

Firstly, increased nature exposure led to the ***facilitation of positive aspects of well-being***. During lockdown, certain individuals experienced well-being benefits that served to maintain their connection to nature. This was confirmed by 95% of Marques et al.'s (2022) participants who reported that having access to nature during lockdown facilitated their coping ability and positively contributed to their mood during this particularly challenging time. Labib et al. (2022) concur that nature exposure during lockdown had protective effects in helping participants to cope with mental and physical health conditions associated with the pandemic. Several of the reviewed studies stated that increased nature exposure enhanced positive feelings such as happiness, pleasure, life satisfaction and physical energy (Khalilnezhad et al., 2021; Labib et al., 2022; Stock et al., 2022).

The second sub-theme was that nature exposure during lockdown facilitated a ***reduction of negative aspects of well-being***. In most countries the uncertainties brought along by the pandemic, and especially restrictions and drastic changes associated with the lockdown period, were experienced as overwhelming by participants. Studies show that individuals utilised green spaces to buffer these stressors and protect their mental health. Findings from the Ribeiro et al. (2021) study reported that in Portugal and Spain, maintaining or increasing exposure to nature was associated with improved mental health, as well as reduced stress levels and fewer individuals experiencing psychological distress. Similarly, a number of participants from other studies shared that spending time in nature during lockdown helped to alleviate depressive symptoms, tension, somatization and anxiety, highlighting nature's role in reducing psychological distress (Khalilnezhad et al., 2021; Labib et al., 2022; Ribeiro et al., 2021; Stock et al., 2022; Tomasso et al., 2021).

2.5.4. Lower Well-being associated with Decreased Nature Exposure

The last theme related to the second research question revealed that lockdown resulted in lower well-being associated with decreased nature exposure. As a result of decreased nature exposure during the COVID-19 lockdown, several participants from the studies included reported a decrease in their well-being, which was associated with two sub-themes.

The decreases in nature exposure led to ***mental health declines*** during the pandemic. It has been reported that while lockdown restrictions aided in containing the spread of COVID-19, they have also been linked with deteriorating mental health and well-being, particularly among individuals with restricted access to natural environments, leading to symptoms such as post-traumatic stress, confusion, anger, and anxiety (Ribeiro et al., 2021). Marques et al. (2022) shared that during the pandemic, 57% of the participants with no views of nature from their households reported experiencing negative emotions ranging from feeling bad, sad, scared and fearful and that the majority felt that having access to blue spaces, forests and mountains would help elevate their mood (Marques et al., 2022). Mental health declines were mostly reported in deprived neighbourhoods, which are

categorised as areas with limited access to good quality green spaces, lower walkability, and limited surrounding agricultural land (Stock et al., 2020; Tomasso et al., 2021; Van Eeden et al., 2023). Deprived neighbourhoods were also associated with increases in negative feelings such as anxiety, fear, and tension (Khalilnezhad et al., 2021).

Lastly, it emerged that the degree to which individuals' well-being was influenced by nature exposure during the COVID-19 lockdown was strongly influenced by their *pre-COVID lifestyle*. According to Van Eeden et al. (2023), participants' pre-COVID feelings of being connected with nature, including both cognitive and emotional aspects, influenced their inclination to seek out nature experiences during the pandemic. A study by Tomasso et al. (2021) proposed that pre-COVID-19 routine behaviours related to nature-seeking may have influenced the extent of which participants sought nature during lockdown, which often resulted in alleviating feelings of nature deprivation and supported well-being. Based on the literature reviewed studies, the detrimental effect that decreased nature exposure had on individuals' well-being seems to have been influenced by participants' pre-COVID 19 routines and habits.

In combination, these results confirm the role of nature in promoting well-being and suggest that access to natural environments may be important in protecting individuals from additional harm during crises such as the recent COVID-19 pandemic. Additionally, the results highlight the adverse effects that restrictions placed on individuals' access to nature could impose on the health burden of communities during already stressful situations. These results are discussed in more detail in the following section.

2.6. Discussion

The aim of the study was to acquire a comprehensive understanding, informed by scientific literature, of (i) changes in individuals' contact with nature during the COVID-19 lockdown, and (ii) the potential impact of these changes on individuals' psychological well-being. Broadly speaking, the

themes that emerged from this review study show that the COVID-19 lockdown resulted in both increased nature exposure (which was associated with improved individual well-being), and decreased nature exposure (which was associated with reduced well-being).

When taking a closer look at the themes related to the first research question, the results showed that participants' access to and utilisation of nature differed, depending on the respective lockdown restrictions that were enforced in their countries. This aligns with the statement by Garrido-Cumbrera et al. (2021) that COVID-19 significantly altered people's daily routines, with some increasing their access to nature, while others experienced a reduction in it. In the initial phase of COVID-19, most countries implemented lockdown measures to control the spread of the virus, which included closure of educational institutions, travel limitations, and the suspension of most leisure activities (Hwang et al., 2020; Mboera et al., 2020). Interestingly, this reduction in activities during lockdown provided some individuals with an increased amount of free time.

The reported increase in nature exposure during COVID-19 suggests that people gravitate towards nature naturally when given an opportunity, especially during challenging circumstances. The first theme, which alludes to an increased nature exposure during COVID-19, highlighted various ways and means for connecting individuals with nature and natural environments, even during periods when direct contact with nature was not readily available.

In response to limitations in accessing their preferred outdoor natural environments, results show that individuals increasingly turned to alternative forms of engagement with nature, such as private green spaces and virtual interactions through social media platforms. The most frequently utilised of these was private green spaces, which emphasises the importance of households having home gardens when access to public green spaces is limited. The review's findings showed that the increased use of private greenery, such as gardens and courtyards during lockdown, contributed positively to individuals' mental, physical, social and psychological well-being.

These results seem to confirm pre-COVID literature highlighting the positive impact of private green spaces on health, which has led to increased implementation of nature-based therapeutic practices such as horticulture, forest therapy and healing gardens for treatment purposes (Bonham-Corcoran et al., 2022; Stigsdotter et al., 2010). Green spaces such as gardens have been found to enhance individuals' quality of life, well-being, sense of community, and cognitive functions, and have also been associated with reducing stress, depression, fatigue and anxiety symptoms (Soga et al., 2017; Van den Berg et al., 2010; Wilson & Christensen, 2011). Based on these positive impacts, the integration of private green space should be a strong recommendation during urban planning and the conceptualization of public health strategies to improve the well-being of individuals during such events. Furthermore, it seems important that policymakers and clinicians invest in nature-based therapy programmes, making optimal use of private green space such as gardens for treatment purposes to help improve public health.

In relation to the increased use of social media platforms to access 'nature', it has been established that nature is part of the top 10 most used hashtags since 2010 and that the pandemic accelerated the trend (Smith, 2025). This could be explained at least in part by findings that even engaging with nature virtually is associated with positive feelings and improved well-being (Xu et al., 2021). According to Büscher (2016), social media could be a powerful tool to enhance individuals' interest and participation in nature conservation. The increased use of social media platforms like Facebook and Twitter by participants to access green space, albeit virtually, suggests that nature's benefits are limitless and extend beyond direct physical contact, emphasising the importance of implementing various ways of engaging with nature.

In spite of the above-mentioned increases in nature exposure, a number of studies reported a significant decline in nature exposure during the COVID-19 lockdown. Firstly, it emerged that individuals' self-imposed restrictions, stemming from personal fears of contracting the virus, contributed to the reported decrease. This showcases the importance and need for psychoeducation

in teaching individuals about the health and well-being benefits of being in nature, which could counterbalance fears for the possibility of falling ill. The primary reason for the decline in nature exposure was, however, the restrictions placed on individuals who previously engaged with nature through visits to public green spaces such as botanical gardens, national parks, and educational environments. It is interesting to note that these restrictions in access to public green spaces were particularly relevant among individuals from lower socio-economic backgrounds.

This seems to align with Stock et al. (2022), who found the amount of time individuals spend in nature to be directly related to their level of satisfaction with the “walkability and greenspace” of their neighbourhood, which showed a direct association with socio-economic status. These results highlight the role of socio-economic conditions in enabling or limiting access to nature. Our review study reiterated the influence of socio-economic status on individuals' access to nature, especially during the COVID-19 lockdown. Participants with higher socio-economic status benefited more from the availability of private green spaces, which facilitated continued exposure to nature during lockdown. In addition to this, those living in less affluent areas were often associated with limited availability of public green spaces. The availability of green space, both private and public, therefore emerged as an important mechanism through which socio-economic statuses could influence individuals' quality of life during pandemic situations. Although this is not a new finding (APA, 2010), the complex relationship between individuals' quality of life and socio-economic status (Nutakor et al., 2023) seemed to be even more pronounced during COVID-19, emphasising the health issues associated with inequality. This presents an important area for future research aimed at developing strategies, such as increased availability of private and public green space, to address and reduce these inequities for the sake of vulnerable communities.

Collectively, findings from the first research question underscore the importance of designing both homes and communities with good quality access to natural environments due to its importance as a potential health resource (Bragg et al., 2015). Individuals residing in low socio-economic areas

would benefit especially from concerted efforts to increase the availability of green space, both private and public, during these types of pandemic crises. On a practical level, municipalities could focus on establishing additional public green spaces to promote social inclusion and increased nature connectedness. Notably, the use of social media platforms also emerged as a potentially valuable resource during periods of restricted access to nature, as they would enable individuals to engage with nature virtually while providing a safe space for social interaction and community engagement (Flynn et al., 2022).

In relation to the second research question, this scoping review revealed that individuals' well-being improved with increased nature exposure during the COVID-19 lockdown. These findings are supported by well-established findings that contact with nature is associated with a number of positive outcomes, including improved mental, physical, psychological and emotional well-being (Barragan-Jason et al., 2023; Bratman et al., 2012; Cox et al., 2017; Phillips et al., 2023; Pritchard et al., 2020; Sandifer et al., 2015; Siah et al., 2023 ; White, 2019). This aligns well with the inclusive definition of health proposed by the WHO (1948), stating that health is not just the absence of illness, but a complete state of physical, mental, and social well-being.

In addition to facilitating positive health and well-being outcomes, increased nature exposure also reduced the occurrence of negative health outcomes. This confirms findings by Stock et al. (2022, pp. 4-5), stating that "an increase in the number of days spent outside was associated with decreases in depressive and anxiety symptoms and an increase in life satisfaction". By implication, exposure to nature may aid in reducing pressure on public health systems, which were overwhelmed globally during COVID-19. Reports by Lee et al. (2022) confirm that natural environments supported individuals in restoring both psychological and physical health during the pandemic, which contributed to a reduction in the overutilisation of healthcare systems.

As a final point, it is also worth noting that individuals' pre-COVID-19 lifestyles habits influenced some participants' choices regarding their connection to, and inclination toward seeking

out nature during the COVID-19 lockdown. This points toward the potential significance of helping individuals to develop healthy lifestyle habits, characterized by a positive relationship with nature as a resource for well-being. Developing such habits could help individuals to cope better with future crises, such as pandemics, and could pre-emptively lessen the pressure on healthcare systems during such trying times. In addition to assisting community members and municipalities with the establishment of more private and public green spaces, the implementation of programmes that promote and enhance people's connectedness to nature, and educate them in terms of the related health benefits, could significantly enhance the utilisation of this important resource. According to Rippe (2018), such lifestyle habits influence both short and long-term health and quality of life, emphasising the importance of educating the public about the benefits of utilising natural surroundings. Adopting to, and practising these healthy lifestyle habits, would ensure that nature exposure becomes a consistent practice rather than a quick fix during times of crisis. In summary, it is recommended that policies should be developed to enhance access to green spaces, and the promotion of indoor and private nature exposure should be encouraged through community programmes and infrastructure support.

2.7. Conclusion

This scoping review analysed and summarised existing literature on contact with nature during the COVID-19 lockdown and its impact on individuals' well-being. The objectives of the study were accomplished successfully in relation to what is known about changes in contact with nature during the COVID-19 lockdown and the impact that these changes had on individuals' psychological well-being.

The results revealed a correlation between increased nature exposure and improved well-being during the pandemic. The findings highlighted various ways in which individuals enhanced their well-being, including accessing nature through both public and private green spaces. When traditional

access to nature was restricted, social media platforms served as alternative means for maintaining a connection with nature which could continue to be adopted in future should such conditions reoccur.

Secondly, the review found that confinements imposed by COVID-19 and changes in daily routines led to reduced nature contact for some individuals. The results showed that decreased nature exposure contributed to participants' lowered well-being. One of the key contributing factors to these findings was the role of socio-economic status. Specifically, participants from low socio-economic statuses appeared to have been more heavily impacted due to limited access to quality green spaces and related mental health declines, indicating the importance of improving access to good quality green spaces within low income communities in particular, whether physically or virtually.

The study recognises that lockdown had a negative impact on individuals' well-being, affecting them physically, psychologically, and emotionally. The reviewed literature demonstrated that, during the pandemic, contact with nature played a crucial role in mitigating some of the adverse effects of stress and isolation, thereby supporting overall mental health and well-being. Having said this, it is crucial to recognise that the pandemic brought about various challenges aside from reduced nature exposure that should be considered, rather than solely attributing everything to contact with nature or the lack thereof. Although the increased use of green space is not suggested as a fix-all, this scoping review did highlight its importance, and the potential benefit of implementing programmes aimed at educating individuals about nature exposure to support their health and well-being.

Lastly, it is important to note a significant limitation of this study, in that it drew information from studies predominantly focused on international contexts, resulting in a noticeable gap in research from African settings. Although the findings can be interpreted to apply across various contexts, the lack of African representation emerged as a significant factor, which can be addressed by future researchers. The following chapter provides a more in-depth exploration of this, and additional limitations, and provides recommendations for future research.

References

- American Psychological Association, (2010). Fact Sheet: Age and Socioeconomic Status 2025. APA.
<https://www.apa.org/pi/ses/resources/publications/age>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 19-32. ISSN 1364-5579.
<https://doi.org/10.1080/1364557032000119616>
- Barragan-Jason, G., Loreau, M., de Mazancourt, C., Singer, M. C., & Parmesan, C. (2023). Psychological and physical connections with nature improve both human well-being and nature conservation: A systematic review of meta-analyses. *Biological Conservation*, 277, 109842.
<https://doi.org/10.1016/j.biocon.2022.109842>
- Berdejo-Espinola, V., Suárez-Castro, A. F., Amano, T., Fielding, K. S., Oh, R. R. Y., & Fuller, R. A. (2021). Urban green space use during a time of stress: A case study during the COVID-19 pandemic in Brisbane, Australia. *People and Nature*, 3(3), 597-609. <https://doi.org/10.1002/pan3.10218>
- Bhattacharjee, A., & Ghosh, T. (2022). COVID-19 pandemic and stress: coping with the new normal. *Journal of Prevention and Health Promotion*, 3(1), 30-52.
<https://doi.org/10.1177/26320770211050058>
- Bonham-Corcoran, M., Armstrong, A., O'Briain, A., Cassidy, A., & Turner, N. (2022). The benefits of nature-based therapy for the individual and the environment: an integrative review. *Irish Journal of Occupational Therapy*, 50(1), 16-27. <https://doi.org/10.1108/IJOT-06-2021-0015>
- Bragg, R., Wood, C., Barton, J., & Pretty, J. (2015). Wellbeing benefits from natural environments rich in wildlife. *Wellbeing Benefits from Natural Environments rich in Wildlife: A Literature Review for The Wildlife Trusts*, 1-39.
- Bratman, G. N., Hamilton, J. P., & Daily, G. C. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, 1249(1), 118-136. <https://doi.org/10.1111/j.1749-6632.2011.06400.x>

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bressane, A., da Cunha Pinto, J. P., Goulart, A. P. G., & de Castro Medeiros, L. C. (2024). Which dimensions of nature contact in Urban Green Spaces most significantly contribute to mental wellbeing? A multidimensional analysis in Brazilian metropolitan cities. *Health & Place*, 89, 103335. <https://doi.org/10.1016/j.healthplace.2024.103335>
- Buheji, M., Jahrami, H., & Dhahi, A. (2020). Minimising stress exposure during pandemics similar to COVID-19. *International Journal of Psychology and Behavioral Sciences*, 10(1), 9-16. <https://www.researchgate.net/publication/340600756>
- Büscher, B. (2016). Nature 2.0: Exploring and theorizing the links between new media and nature conservation. *New Media & Society*, 18(5), 726-743. <https://doi.org/10.1177/1461444814545>
- Capaldi, C. A., Passmore, H. A., Nisbet, E. K., Zelenski, J. M., & Dopko, R. L. (2015). Flourishing in nature: A review of the benefits of connecting with nature and its application as a wellbeing intervention. *International Journal of Wellbeing*, 5(4). <https://doi.org/10.5502/ijw.v5i4.449>
- Clarke, V., & Braun, V. (2016). Thematic analysis. *The Journal of Positive Psychology*, 12(3), 297–298. <https://doi.org/10.1080/17439760.2016.1262613>
- Cox, D. T., Shanahan, D. F., Hudson, H. L., Fuller, R. A., Anderson, K., Hancock, S., & Gaston, K. J. (2017). Doses of nearby nature simultaneously associated with multiple health benefits. *International Journal of Environmental Research and Public Health*, 14(2), 172. <https://doi.org/10.3390/ijerph14020172>
- Creswell, J. W. (2014). *Qualitative inquiry and research design; choosing among five approaches*. Sage.
- Flynn, M. A., Veilleux, E., & Stana, A. (2022). A post from the woods: Social media, well-being and our connection to the natural world. *Computers in Human Behavior Reports*, 5, 100171. <https://doi.org/10.1016/j.chbr.2022.100171>
- Garrido-Cumbrera, M., Foley, R., Braçe, O., Correa-Fernández, J., López-Lara, E., Guzman, V., Marín, A. G. & Hewlett, D. (2021). Perceptions of change in the natural environment produced by the

- first wave of the COVID-19 pandemic across three European countries. Results from the Green COVID study. *Urban Forestry & Urban Greening*, 64, 127260.
<https://doi.org/10.1016/j.ufug.2021.127260>
- Garza-Terán, G., Tapia-Fonllem, C., Fraijo-Sing, B., Borbón-Mendívil, D., & Poggio, L. (2022). Impact of contact with nature on the wellbeing and nature connectedness indicators after a desertic outdoor experience on Isla del Tiburon. *Frontiers in Psychology*, 13, 864836.
<https://doi.org/10.3389/fpsyg.2022.864836>
- Gong, K., Wang, C., & Yin, J. (2024). Effects of the natural environment on the subjective and psychological well-being of older people in the community in China. *Buildings*, 14(9), 2854.
<https://doi.org/10.3390/buildings14092854>
- Hartig, T. (2021). Restoration in Nature: Beyond the Conventional Narrative. In: Schutte, A. R., Torquati, J. C., & Stevens, J. R. (eds.), *Nature and Psychology. Nebraska Symposium on Motivation* (Vol 67). Springer. https://doi.org/10.1007/978-3-030-69020-5_5
- Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. *International Psychogeriatrics*, 32(10), 1217-1220.
<https://doi.org/10.1017/S1041610220000988>
- Jenkins, M., Houge Mackenzie, S., Hodge, K., Hargreaves, E. A., Calverley, J. R., & Lee, C. (2021). Physical activity and psychological well-being during the COVID-19 lockdown: relationships with motivational quality and nature contexts. *Frontiers in Sports and Active Living*, 3, 637576.
<https://doi.org/10.3389/fspor.2021.637576>
- Kamitsis, I., & Francis, A. J. (2013). Spirituality mediates the relationship between engagement with nature and psychological wellbeing. *Journal of Environmental Psychology*, 36, 136-143.
<https://doi.org/10.1016/j.jenvp.2013.07.013>
- Kellert, S. R., & Wilson, E. O. (1995). *The biophilia hypothesis*. Island Press.

- Khalilnezhad, M. R., Ugolini, F., & Massetti, L. (2021). Attitudes and behaviors toward the use of public and private green space during the COVID-19 pandemic in Iran. *Land*, 10(10), 1085. <https://doi.org/10.3390/land10101085>
- Labib, S. M., Browning, M. H., Rigolon, A., Helbich, M., & James, P. (2022). Nature's contributions in coping with a pandemic in the 21st century: A narrative review of evidence during COVID-19. *Science of The Total Environment*, 833, 155095. <http://dx.doi.org/10.1016/j.scitotenv.2022.155095>
- Lee, J. H., Mkandawire, M., Niyigena, P., Xotyeni, A., Itamba, E., & Siame, S. (2022). Impact of COVID-19 lock-downs on nature connection in southern and eastern Africa. *Land*, 11(6), 872. <https://doi.org/10.3390/land11060872>
- Lopez, B., Kennedy, C., Field, C., & McPhearson, T. (2021). Who benefits from urban green spaces during times of crisis? Perception and use of urban green spaces in New York City during the COVID-19 pandemic. *Urban Forestry & Urban Greening*, 65, 127354. <https://doi.org/10.1016/j.ufug.2021.127354>
- Lusseau, D., & Baillie, R. (2023). Disparities in greenspace access during COVID-19 mobility restrictions. *Environmental Research*, 225, 115551. <https://doi.org/10.1016/j.envres.2023.115551>
- Marcus, C. C. (2007). Healing gardens in hospitals. *Interdisciplinary Design and Research e-Journal* <https://www.researchgate.net/publication/237446315>
- Marques, B., McIntosh, J., Muthuveerappan, C., & Herman, K. (2022). The importance of outdoor spaces during the COVID-19 lockdown in Aotearoa—New Zealand. *Sustainability*, 14(12), 7308. <https://doi.org/10.3390/su14127308>
- Maury-Mora, M., Gómez-Villarino, M. T., & Varela-Martínez, C. (2022). Urban green spaces and stress during COVID-19 lockdown: A case study for the city of Madrid. *Urban Forestry & Urban Greening*, 69, 127492. <https://doi.org/10.1016/j.ufug.2022.127492>
- Mboera, L. E., Akipepe, G. O., Banerjee, A., Cuevas, L. E., Czipionka, T., Khan, M., Kock, R., McCoy, D., Mbanga, B. T., Misinzo, G., Shayo, E., Sheel, M., Sindato, C., & Urassa, M. (2020). Mitigating

- lockdown challenges in response to COVID-19 in Sub-Saharan Africa. *International Journal of Infectious Diseases*, 96, 308-310. <https://doi.org/10.1016/j.ijid.2020.05.018>
- Mintz, K. K., Ayalon, O., Nathan, O., & Eshet, T. (2021). See or be? Contact with nature and well-being during COVID-19 lockdown. *Journal of Environmental Psychology*, 78, 101714. <https://doi.org/10.1016/j.jenvp.2021.101714>
- Nutakor, J. A., Zhou, L., Larnyo, E., Addai-Danso, S., & Tripura, D. (2023). Socioeconomic Status and Quality of Life: An Assessment of the Mediating Effect of Social Capital. *Healthcare*, 11(5), 749. <https://doi.org/10.3390/healthcare11050749>
- Peters, M. D., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Implementation*, 19(1), 3-10. <https://doi.org/10.11124/JBIES-20-00167>
- Phillips, B. T., Wells, M. N., Brown, H. A., Tralins, R. J., & Bonter, N. D. (2023). Nature and well-being: The association of nature engagement and well-being during the SARS-CoV-2 pandemic. *People and Nature*. <http://doi.org/10.1002/pan3.10433>
- Pouso, S., Borja, A., Fleming, L. E., Gomez-Baggethun, E., White, M. P., & Uyarra, M. C. (2020). Contact with blue-green spaces during the COVID-19 pandemic lockdown beneficial for mental health. *The Science of the Total Environment*, 756, 143984. <https://doi.org/10.1016/j.scitotenv.2020.143984>
- Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The relationship between nature connectedness and eudaimonic well-being: A meta-analysis. *Journal of Happiness Studies*, 21, 1145-1167. <https://doi.org/10.1007/s10902-019-00118-6>
- Rantala, O., & Puhakka, R. (2020). Engaging with nature: Nature affords well-being for families and young people in Finland. *Children's Geographies*, 18(4), 490-503. <https://doi.org/10.1080/14733285.2019.1685076>
- Ribeiro, A. I., Triguero-Mas, M., Santos, C. J., Gómez-Nieto, A., Cole, H., Anguelovski, I., Filipa Martins Silva, F. M., & Baró, F. (2021). Exposure to nature and mental health outcomes during COVID-

- 19 lockdown. A comparison between Portugal and Spain. *Environment International*, 154, 106664. <https://doi.org/10.1016/j.envint.2021.106664>
- Rippe, J. M. (2018). Lifestyle medicine: the health promoting power of daily habits and practices. *American Journal of Lifestyle Medicine*, 12(6), 499-512. <https://doi.org/10.1177/1559827618785554>
- Sandifer, P. A., Sutton-Grier, A. E., & Ward, B. P. (2015). Exploring connections among nature, biodiversity, ecosystem services, and human health and well-being: Opportunities to enhance health and biodiversity conservation. *Ecosystem Services*, 12, 1-15. <https://doi.org/10.1016/j.ecoser.2014.12.007>
- Siah, C. J. R., Goh, Y. S., Lee, J., Poon, S. N., Ow Yong, J. Q. Y., & Tam, W. S. W. (2023). The effects of forest bathing on psychological well-being: A systematic review and meta-analysis. *International Journal of Mental Health Nursing*, 32(4), 1038-1054.
- Smith, S. P. (2025). # Nature is trending: Social media, viral landscapes, and digital environmental activism in Oman. *International Journal of Cultural Studies*, 28(2), 442-461. <https://doi.org/10.1177/13678779241268090>
- Soga, M., Evans, M. J., Cox, D. T. C., & Gaston, K. J. (2021). Impacts of the covid-19 pandemic on human–nature interactions: pathways, evidence and implications. *People and Nature*, 3(3), 518-527. <https://doi.org/10.1002/pan3.10201>
- Soga, M., Gaston, K. J., & Yamaura, Y. (2017). Gardening is beneficial for health: A meta-analysis. *Preventive Medicine Reports*, 5, 92-99. <https://doi.org/10.1016/j.pmedr.2016.11.007>
- Srivastava, R., Gupta, S., & Sanjeev, M. A. (2022). Comprehending and measuring pandemic induced stress among professionals due to lockdown and work from home. *Journal of Public Affairs*, 22, e2791. <https://doi.org/10.1002/pa.2791>
- Stigsdotter, U.K., Palsdottir, A.M., Burls, A., Chermaz, A., Ferrini, F., & Grahn, P. (2010). Nature-Based Therapeutic Interventions In *Forests, trees and human health* (pp. 309-342). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-90-481-9806-1_11

- Stock, S., Bu, F., Fancourt, D., & Mak, H. W. (2022). Longitudinal associations between going outdoors and mental health and wellbeing during a COVID-19 lockdown in the UK. *Scientific Reports*, 12(1), 10580. <https://doi.org/10.1038/s41598-022-15004-0>
- Tomasso, L. P., Yin, J., Cedeño Laurent, J. G., Chen, J. T., Catalano, P. J., & Spengler, J. D. (2021). The Relationship between Nature Deprivation and Individual Wellbeing across Urban Gradients under COVID-19. *International Journal of Environmental Research and Public Health*, 18(4), 1511. <https://doi.org/10.3390/ijerph18041511>
- Van den Berg, A. E., Van Winsum-Westra, M., De Vries, S., & Van Dillen, S. M. (2010). Allotment gardening and health: a comparative survey among allotment gardeners and their neighbors without an allotment. *Environmental Health*, 9, 1-12. <http://www.ehjournal.net/content/9/1/74>
- Van Eeden, L. M., Francis, L., Squires, Z. E., Hames, F., Bekessy, S. A., Smith, L., & Hatty, M. (2023). Demographic and spatial variables associated with spending time in nature during COVID-19 lockdowns. *Urban Forestry & Urban Greening*, 82, 127895. <https://doi.org/10.1016/j.ufug.2023.127895>
- Wallwork, A., & Southern, A. (2020). Chapter 1 Research Papers: Titles and Abstracts. In: *100 Tips to Avoid Mistakes in Academic Writing and Presenting. English for Academic Research*. Springer. https://doi.org/10.1007/978-3-030-44214-9_1
- White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M.H & Flemming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, 9(1), 7730. <https://doi.org/10.1038/s41598-019-440973>
- Wilson, J. F., & Christensen, K. M. (2011). The relationship between gardening and depression among individuals with disabilities. *Journal of Therapeutic Horticulture*, 21(2), 28-41. <https://www.jstor.org/stable/24865203>

World Health Organization (WHO). (1948). *Summary reports on proceedings minutes and final acts of the international health conference held in New York from 19 June to 22 July 1946*. WHO, 35.

<https://apps.who.int/iris/handle/10665/85573>

Xu, S., Murrell, G., Golding, S. E., Brockett, B. F., Gatersleben, B., Scarles, C., White E. V., Willis, C., & Wyles, K. J. (2021). #Springwatch #WildMorningswithChris: engaging with nature via social media and wellbeing during the COVID-19 lockdown. *Frontiers in Psychology*, 12, 701769.

<https://doi.org/10.3389/fpsyg.2021.701769>

Yao, W., Zhang, X., & Gong, Q. (2021). The effect of exposure to the natural environment on stress reduction: A meta-analysis. *Urban Forestry & Urban Greening*, 57, 126932.

<https://doi.org/10.1016/j.ufug.2020.126932>

Chapter 3: Critical Reflection

3.1. Introduction

The objective of this chapter is to provide a critical reflection of the review study by summarising the findings, identifying limitations, providing recommendations, and insights to guide future research and practice. Additionally, it includes the reviewer's personal reflection on the research process. Critically reflecting on the review helps to ensure that the findings are not only scientifically robust, but also meaningful for practical application and future research.

3.2. Summary of the study

The study aimed to examine changes in individuals' contact with nature during the COVID-19 lockdown, and the potential impact of these changes on psychological well-being. The research questions guiding this scoping review were: (i) What is known about changes in contact with nature during COVID-19 lockdown? and (ii) What impact did these changes have on individuals' psychological well-being?

To ensure a comprehensive search, and prevent any omissions of potentially valuable source documents, the researcher utilised the North-West University library database as it offered access to multiple search engines. The preliminary search was conducted in the following databases: Springer Nature Journals, CINAHL with Full Text, Health Source: APA PsycArticles, GreenFILE, ScienceDirect, SPORTDiscus with Full Text, SocINDEX with Full Text, Directory of Open Access Journals, Business Source Complete, Emerald Insight, and APA PsycInfo, which helped to enhance objectivity. The researcher followed a systematic approach, aligned with widely accepted search strategies, utilising keyword searches including but not limited to COVID-19, Coronavirus, Lockdown, Lockdown Restrictions, Nature, Natural Environments, Well-being or Psychological well-being.

During the research process, the researcher adhered to Arksey and O'Malley's (2005) framework for review studies, which consists of six stages (i.e. Stage 1: Specify the research question,

Stage 2: Identify relevant literature, Stage 3: Study selection, Stage 4: Extract, map, and chart the data, Stage 5: Summarize, synthesize, and report the results, and Stage 6: Integrate expert consultation). The framework ensured that all relevant articles and data were carefully chosen, and thoroughly reviewed, allowing for a comprehensive understanding of the topic. The initial 452 articles extracted were reduced to eight articles included in the review through the implementation of inclusion and exclusion criteria.

This scoping review employed Braun and Clarke's (2006) six step model to guide the analysis of qualitative data. More specifically, thematic content analysis, which has been reported to produce insightful and trustworthy findings (Nowell et al., 2017), was used to analyse, identify and categorise text into frequently recurring themes. The analysis identified four themes, namely: (1) increased nature exposure during COVID-19 lockdown, (2) decreased nature exposure during COVID-19 lockdown, (3) improved well-being associated with increased nature exposure, and (4) lower well-being associated with decreased nature exposure. Overall, the themes indicated nature's role as a health-promoting resource during crises such as COVID-19 and its impact on well-being.

3.3. Limitations

As mentioned previously, the review's limitations include an overrepresentation of international studies. The predominant inclusion of studies from so-called WEIRD (i.e. western, educated, industrialized, rich, and democratic) countries could represent a form of sampling bias that could limit the applicability of the study's findings within the African context. However, although the selected articles focused mainly on international studies, these were inclusive of varying levels of development and socio-economic status. In addition to this, the overrepresentation of mostly educated individuals with access to online questionnaires and internet connections could potentially be a fair representation of the current new age social media culture, which has been reported as becoming part of individuals' meaningful daily routines (Valkenburg, 2022). Furthermore, in relation to the use of convenience sampling, the articles included had to be drawn from publications that

emerged during the pandemic in order to capture participants' authentic experiences during lockdown restrictions, thereby limiting the potential number of source documents.

Another limitation of this study stems from the use of Braun and Clarke's (2006) six steps model for thematic content analysis. The model used to analyse the data relied on the researcher's interpretation when identifying and categorising themes, which may have led to the introduction of subjectivity. The process of assigning meanings to data often depends on the researcher's perspective, which can vary between individuals. However, with this review, the categorisation of the themes was overseen by the primary and secondary reviewer to minimize the potential effect of such subjectivity.

Lastly, only articles published in English were included. This language restriction may have excluded potentially high-quality studies, leading to a lack of representation of diverse cultures and communities and introducing a potential cultural bias. The research also included a narrative review study, which focused on nature's role in coping with the pandemic. While this could be considered a limitation since both studies focused on participants' engagement with nature during the pandemic, the overlap was addressed by distinguishing the scope of each study. This scoping review had a broader focus beyond nature contact which included the impact that changes in nature contact had on individuals' psychological well-being.

3.4. Recommendations

The findings derived from the research indicated that there was both heightened and reduced exposure to nature during the COVID-19 lockdown, along with increased and lowered well-being as a result. The following practical recommendations are proposed:

Firstly, it is recommended that policies including, but not limited to the management of health facilities, should be developed to enhance access to green spaces during stressful periods such as the COVID-19 lockdown, as these spaces both prevent the occurrence of mental health problems and improve and accelerate the recovery process. These policy measures should guide the creation of

urban planning strategies aimed at ensuring the equitable distribution of public green spaces, particularly in areas characterised as low socio-economic status. This recommendation is based on findings that highlighted significant inequalities between affluent and deprived areas in terms of nature exposure and its impact on well-being.

It is also recommended that activities promoting private and public nature exposure be encouraged through educational and community programmes, including, but not limited to infrastructure support. These educational programmes could potentially include gardening workshops, seed distribution, and providing resources to help individuals create balconies or indoor gardens. Additionally, infrastructure support can be achieved by encouraging developers to incorporate green features such as rooftop gardens and courtyard spaces into urban housing developments.

Finally, it is also recommended that governments, and specifically health and agriculture departments, should implement campaigns that would educate the general population about the benefits of nature and its impact on well-being. To sustain nature's benefits for future success, it is everyone's responsibility to maintain and enhance the quality of their green spaces. However, there seems to be a gap regarding the understanding and appreciation of the benefits of nature amongst certain populations, which highlights the inequities mentioned in the previous chapter.

Some of the gaps identified earlier regarding the study's design and the use of qualitative methods of data relating to changes in contact with nature during the COVID-19 lockdown and their impact on individuals' psychological well-being, leave a gap in quantifiable knowledge. Such knowledge is crucial for understanding the measurable relationships between nature exposure and mental and psychological well-being. To address this, future research studies should aim to explore the long-term effects of nature deprivation or increased exposure on individuals' mental health and psychological well-being. This includes examining whether the benefits or adverse impacts persist after lockdown and how they influence coping mechanisms during future crises. There is a noticeable

absence of such research within the African context. Future research should focus on the African continent to capture the context information that authentically applies to it.

3.5. Conclusion

Understanding the changes in nature contact during the COVID-19 lockdown and its impact on individuals' psychological well-being is important because it helps to identify strategies to improve mental health during crises, informs public health policies, and highlights the role of nature in enhancing well-being and resilience. This study revealed that while some individuals were restricted from accessing nature during the COVID-19 lockdown, particularly in less affluent urban areas, others were able to maintain their contact with nature. Factors contributing to this included the use of technology, as well as residing in affluent suburbs with access to parks, private green spaces, and gardens. The findings also provided evidence of the potential harm caused by a lack of access to nature, which contributed to increased stress and negatively affected individuals' mood and well-being.

The findings that some individuals experienced decreased time in contact with nature during COVID-19 while others-maintained access through private gardens, highlight the importance of equitable nature access for mental well-being. These outcomes could inspire further research into developing interventions that bridge these differences, such as promoting the creation of accessible green spaces in deprived areas or expanding virtual nature experiences. Moreover, this study paves the way for investigating long-term psychological benefits of contact and exposure to both physical and digital nature, which could inform policies and practices designed to improve public health and well-being, especially in times of future crises.

3.6. Personal reflection

“Trust the process” is a phrase that was ingrained throughout this research journey. I found out about review studies in 2023. This new discovery required me to familiarise myself with such

studies, which led to the decision to conduct a scoping review. After finalising my research topic, I decided on conducting a scoping review because such reviews have been described as useful in new areas of research, and appropriate for assessing and understanding knowledge in emerging fields (Peters et al., 2020). COVID-19 and its impact on the health and well-being of individuals emerged over the past four years. Personally, I was negatively affected by the pandemic - I tested positive and lost some relationships. These personal experiences impacted my research experience positively, transforming it from an academic task into a meaningful opportunity for reflection. It allowed me to explore and offer insights on how to better cope with stress and crises, while also highlighting the importance of raising awareness and promoting education on nature's restorative benefits.

The past academics years have provided me with an opportunity to trust the process and grow as an individual. I am grateful for the knowledge and experiences gained during this period. While I have always been aware of the benefits of nature, my involvement in this research has emphasised its critical role in promoting well-being. It is no longer about merely spending time outdoors, but encompasses understanding of what the environment offers and how one can contribute to sustaining natural spaces. There is a lot that can be implemented in local communities, especially in South African, as previously recommended. My interests of caring for nature, which in turn nurtures us, has evolved based on the findings of this study, and I have actively been sharing this knowledge with others.

References

- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 19-32. ISSN 1364-5579. <https://doi.org/10.1080/1364557032000119616>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847. <https://doi.org/10.1177/1609406917733>
- Peters, M. D., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBIM Evidence Implementation*, 19(1), 3-10. <https://doi.org/10.11124/JBIES-20-00167>
- Valkenburg, P. M. (2022). Social media use and well-being: What we know and what we need to know. *Current Opinion in Psychology*, 45, 101294. <https://doi.org/10.1016/j.copsyc.2021.12.006>

Appendix A: Data Extraction Table

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
Stock, S., Bu, F., Fancourt, D., & Mak, H. W. (2022). Longitudinal associations between going outdoors and mental health and wellbeing during a COVID-19 lockdown in the UK.	To explore the longitudinal associations between going outdoors and people's mental health and wellbeing during the first national lockdown (March–May 2020).	Quantitative Longitudinal study	Observations – Involving online weekly and then monthly (24th August 2020 onwards) data collection from participants for the duration of the COVID-19 pandemic. The study used survey data from the COVID-19 Social Study.	Over 70,000 Adults (aged 18 +) in the UK during the COVID-19 pandemic. Participants who completed the study during the first UK national lockdown between 23 March and 11 May 2020 (N = 65,727) were included. Participants who had at least two survey responses during the observational period (N = 48,091) were included. Analytical sample size of 155,366 observations from 35,301 participants. This means that each	United Kingdom	The number of days spent outside was associated with a decreased number of depressive symptoms. Increases in days spent outside were associated with increased levels of life satisfaction. Findings showed a positive association between going outdoors and improved mental health and wellbeing during the first COVID-19 lockdown in the UK.	Increases in days spent outside were associated with increased levels of life satisfaction was associated with decreases in depressive and anxiety symptoms and an increase in life satisfaction. If people felt satisfied with the “walkability” of their neighbourhood , their time spent outdoors was associated more strongly with lower anxiety and depression. If they felt satisfied with the local green space and parks , their time spent outdoors was associated more strongly with lower depression. Further, if they lived with other people, their time

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
				participant contributed multiple data points over time. On average, each participant provided 4.4 observations, with the number of observations per person ranging from 2 to 8.			spent outdoors was more strongly associated with lower anxiety and greater life satisfaction. Whilst our findings suggest improvements in mental health and wellbeing with an increase in going outdoors, our moderation analyses show that such relationships may differ depending on certain household and neighbourhood factors. For instance, we found that the associations between the number of days spent outside, and reduced anxiety symptoms and improved life satisfaction were more prominent for people living with others than those living alone.

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							it has been shown that greater satisfaction with neighbourhood green space or walkability is associated with increased walking behaviour and better physical and mental health. It has been shown that greater satisfaction with neighbourhood green space or walkability is associated with increased walking behaviour and better physical and mental health. Our analysis revealed an association between an increased number of days outside and improved mental health and wellbeing during the first COVID-19 national lockdown in the UK. This study provides evidence for the

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							importance of encouraging people to leave their homes even for limited exercise during lockdowns. Highlighted the value of investing in high quality neighbourhood environments as a public health measure in town planning. Supports the implementation of broader nature-based social prescribing schemes beyond the pandemic to support mental wellbeing through connecting people to nature-based activities.
Lusseau, D., & Baillie, R. (2023). Disparities in greenspace access during COVID-19 mobility restrictions.	To longitudinally relate change in human density in urban greenspace to inferred motivation to use these spaces and realised experiences with	Mixed method	Integrate data from Facebook, Twitter, and Google Search	Facebook users using Oxford COVID-19 Government Response Tracker We searched archived tweets geo-located in the three cities using	Berlin, Paris, and London	We first found that greenspace rich tiles, associated with the main parks and gardens in the cities, were similarly used more during the first lockdown.	People sought greenspace, searched online for access, and commented positively on its use, particularly after lockdowns. In London, only affluent neighbourhoods saw

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
	the overall view to determine whether these experiences are equitably realised in neighbourhood of varying deprivation levels			the academic track of the Twitter API for tweets mentioning Parks in the three relevant languages.		The pattern of lockdown waves differed between the cities. In London, the preference for greenspace in affluent areas observed in the first lockdown waned in subsequent waves while the preference observed in deprived areas in Berlin increased, particularly in weekends. We found that forests were used significantly more than usual by people originating from deprived areas (Fig. S9), particularly over weekends. People predominantly searched to find out whether parks were open. People talked more about enjoying time in parks on Twitter during the lockdowns in all three cities.	an increase in use with greenspace, while it decreased in deprived neighbourhoods. The difference between neighbourhoods decreased during the weekend, yet overall affluent areas retained, at all times, a greenspace advantage. Greenspace access can decrease stress in deprived areas. People sought greenspace more than usual during the pandemic. People adapted their greenspace experience to mobility restrictions and generally sought urban greenspace more at a time of wellbeing deterioration, The study findings showed that greenspace design must strive to increase affordance in deprived

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						Tweets about parks during lockdowns received on average significantly more likes in all three cities. People sought greenspace more than usual during the pandemic. People actively searched for nearby parks and greenspaces during COVID-19 mobility restrictions, particularly when they were permitted to visit them. Online discussions about greenspaces were more positive, especially at the start of the pandemic. Access to and use of urban greenspaces were influenced by neighbourhoods' deprivation levels. In London and Paris, affluent areas had greater greenspace advantages, while in	areas and greenspace access. Greenspace design must strive to increase affordance in deprived areas and greenspace access increasing equitability in greenspace access, to ensure that people with deprivation-related constraints can still receive greenspace exposure.

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						Berlin, greenspaces in more deprived neighbourhoods were used more frequently.	
Marques, B., McIntosh, J., Muthuveerappan, C., & Herman, K. (2022). The importance of outdoor spaces during the COVID-19 lockdown in Aotearoa—New Zealand.	To explore the different typologies of outdoor spaces accessed during COVID-19 lockdown, examine the associated physical activities, and investigate how these spaces and activities influence emotional responses and help individuals cope with confinement. It aims to better understand spatial elements and characteristics of outdoor spaces that are essential to people, in unusual	Quantitative Exploratory Research Design	Online survey questionnaire	New Zealand general public Collected data (N = 275) Excluded (N = 63) Final sample = 212 responses Most of the participants were female (76.6%). Participants were mostly adults in the age range of 18–25 years old	New Zealand general public	The respondents reported more negative emotions ranging from feeling ‘bad’ (23.5%), feeling ‘sad’ (13.9%), to feeling ‘fearful’ (11.05%). When asked what type of outdoor spaces were physically accessible during the lockdown, 20.5% mentioned private gardens, 15.5% said a private patio or deck, and 11.3% mentioned private land area connection. A total of 15.9% of the respondents had access to a public park, while 10.8% had nearby forest or woodland access. Participants (95%) reported that having	This research supports other findings regarding the connection with nature and its importance to physical, social, and emotional wellbeing. Open spaces provided residents with places of refuge and safe outdoor activities that permitted users to maintain their health and wellbeing. Participant behaviours changed during the lockdown, with some having less connection with the outdoors, but others taking advantage of the opportunity for increased outdoor activity. many were afraid of going outside because of the

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
	circumstances where access is restricted					access to these spaces helped them cope with the lockdown and positively contributed to their mood. The study found that the value of the outdoor environment was more about the opportunity to be outdoors, rather than the specific characteristics of the environment itself. Participant behaviours changed during the lockdown, with some individuals experiencing less connection with the outdoors, while others took advantage of the opportunity for increased outdoor activity.	possibility of infection. In many ways, the fear of contracting COVID-19 outweighed the importance of being outdoors, despite the fact that outdoor environments are less contagious than those inside. The personal confinement imposed by the response to COVID-19 caused a profound change to people's habits and routines around the world, emphasising the importance of green areas and outdoor spaces and drawing to our attention their inadequacy for physical exercise, their limitations for mental relief, and their limited numbers. As people feared for their health, they avoided others, limited outdoor

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							activities, and reduced physical exercise. Everyone found confinement stressful, with some variation in intensity and duration, but not to the effect of influencing the environmental qualities appreciated. Parks, community gardens, and other natural areas are essential to urban dwellers' mental, physical, and social wellbeing, especially if directives to physically distance from one another become long-standing or recurrent. The findings show the importance of outdoor environments in supporting health and wellbeing through active engagement with private and public recreational and natural environments to benefit from the

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							therapeutic effects of nature.
Khalilnezhad, M. R., Ugolini, F., & Massetti, L. (2021) Attitudes and Behaviors toward the Use of Public and Private Green Space during the COVID-19 Pandemic in Iran	To explore the behavioural change in the use and the motivation to visit a green space (public or private) during the pandemic as compared to the pre-pandemic period, the effect of green spaces (private and public) on users' feelings, the relations between the extent to which the access to green spaces was missed, and characteristics of respondents and the place they live. The study aimed at exploring the following aspects concerning visitors of public and	Quantitative Exploratory study design	Online Survey Questionnaire using Google Modules online platform.	Inhabitants of Birjand, Iran. General population without any specific characteristics N = 401 N = 7 not considered for the analysis The survey collected 394 valid responses, mostly represented by women.	Birjand, Iran	During the pandemic, the visitation of green spaces in general was much reduced, especially regarding the public green spaces public green spaces are frequently visited by the respondents, although the accessibility of nearby public green spaces (distance set at 300 m) is limited to only one third of all respondents. Being in a green space (Table 2) resulted in an enhancement of positive feelings, such as happiness and pleasure. Majority of respondents indicated that green spaces contribute to reducing a series of negative feelings such as anxiety and tension	Public green spaces are frequently visited by the respondents, although the accessibility of nearby public green spaces (distance set at 300 m) is limited to only one third of all respondents. Also, approximately half of the respondents did not have any private green space available nearby their residence, especially those living in a condominium, and a few did not have any public green space in the surroundings. The study showed how the visitation of green spaces in Birjand was in general much reduced during the pandemic, especially in public green spaces.

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
	private green spaces in the town of Birjand: (i) the behavioural changes in the use and in the motivation to visit a green space during the pandemic, as compared to the pre-pandemic period. (ii) the feelings (positive/negative) perceived in a green space. (iii) the extent to which access to a public green space during the pandemic was missed by users; and (iv) the perception of meaningful ecosystem services and benefits connected to green spaces.					and sadness and depression. Private green spaces contributed more to the reduction of anxiety and fear than the public green spaces. The positive feelings (i.e., happy, pleased) were correlated to the higher price of urban lands ($p < 0.05$) but also to the lower amount of greenery per capita (higher classes), while negative feelings such as anxiety, fear and hanger were more typical of males and greater in less preferred neighborhoods for residency, and tension, hanger and sadness (depression, feeling blue) were greater in neighborhoods with	Private green spaces in the form of yards or gardens constitute a crucial alternative to the lack of public green spaces. The study has demonstrated the great visitation of private green spaces with respect to public ones during the pandemic (66% vs. 18% of respondents, respectively visited at least several times a month), most likely influenced by their proximity. Public green spaces were visited for walking even by those people with a private green space, while the private ones became places to enjoy nature-centered activities such as relaxation, observing nature and staying outdoors, which were probably

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						higher greenery per capita. Results highlighted that the majority of respondents missed going to a green space very much. The extent to which a green area was missed depended on the usual frequency of visitation before the pandemic, the gender (with women more influenced) and the distance of public green space visited before the pandemic, as if missing a green area was likely related to the actual scarce presence of favourite green spaces nearby.	elicited by the situation. In addition, there was an increase of people passing through a green space to reach a destination, which supports the importance of green corridors made of tree-lined streets and gardens in the urban fabric, not only for the variety of services, such as shade, climate mitigation but also for psychological benefits and wellbeing The results suggest that being in a green space (either public or private) enhances positive feelings such as happiness and pleasure (on average by 65.5% and 61% respondents, respectively declared that they felt happier and more pleased), and also physical

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							energy, although to a lesser extent. Green spaces in general were effective in the reduction of all negative feelings, and the private ones were more effective in the reduction of anxiety and fear. However, in general, lesser preferred neighborhoods and greater greenery per capita were found to be related to greater anxiety, likely linked to the pandemic. Under circumstances of lockdown, with no access to public spaces, the importance of private spaces can indeed buffer individuals from depressive and anxiety-related symptoms. While private gardens can compensate for a lack of access to public

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							green spaces, both the public and private green spaces are the essential health resources in times of crisis Less preferred areas for residency seemed to be more related to negative feelings such as anxiety and nervousness but also tension and fear. However, the presence of greenery in the neighborhood was found to be related to some negative feelings such as anxiety and nervousness if related to public green spaces. The study has demonstrated how important are green spaces in a time of limitation of movement due to restrictions against the spread of the pandemic, as they

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							enhance positive feelings and reduce anxiety and stress, and allow different types of activities, especially linked to social aspects.
Labib, S. M., Browning, M. H., Rigolon, A., Helbich, M., & James, P. (2022) Nature's contributions in coping with a pandemic in the 21st century: A narrative review of evidence during COVID-19.	To synthesize the evidence about nature's contributions to health and wellbeing during the first two years of the COVID-19 pandemic.	Mixed methods	Studies with varying methodological and theoretical conceptualizations	1430 articles from 3 databases (Web of Science:1223; Scopus: 978; PubMed: 418).	North America, Europe, and East Asia	Nature exposure and mental health associations included evidence that linked nature exposure to reduced depression. Nature contact in terms of increased duration and frequency of outdoor nature visits was associated with increased emotional and mental wellbeing. Multiple studies identified that gardening during the lockdown was directly associated with lower psychopathological distress and indirectly associated through lowering COVID-19 related distress.	Some exposure types witnessed greater changes than others, such as reporting of increased green view through windows; additionally, gardening increased when staying at home. However, the frequency of visiting outdoor natural spaces had mixed changes depending on lockdown severity, sociocultural contexts, and personal motivation factors. These associations were generally in the positive direction, indicating that increased nature exposure during

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						In addition to actual nature exposure, virtual nature (e.g., digital videos, multisensory nature exposure, virtual reality) showed that watching videos of forested areas for 5 min for five days lowered perceived anxiety levels during lockdown compared to watching videos of urban environments. increased nature exposure was associated with greater happiness, higher subjective wellbeing, and life satisfaction. Survey data from a nationally representative sample of Australians in October 2020 indicated that people who reported more difficult financial situations spent less	COVID-19 generally improved health and wellbeing and that nature exposure showed protective effects in coping with mental and physical health conditions. The changes in nature exposure during the pandemic were associated with several health-related outcomes. These associations were generally in the positive direction, indicating that increased nature exposure during COVID-19 generally improved health and wellbeing and that nature exposure showed protective effects in coping with mental and physical health conditions. As presented in Fig. 2, for mental health, studies showed

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						time in natural environments and felt less that these spaces helped them socially connect more than people with better financial situations.	consistent positive associations between all types of nature exposures and lower depression, anxiety, stress as well as improved wellbeing (e.g., happiness, life satisfaction). Studies also indicated evidence in favour of the positive influence of gardening and garden ownership on improved mental health. In pre-COVID studies, gardening and garden ownership were reported to improve mental health conditions. Based on the available evidence, we argue that nature played a vital role in lowering mental health burden during COVID-19 pandemic. During COVID-19, many people

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							increased their contact with nature. Spending time in private green spaces such as gardens considerably increased, along with increased visits to select outdoor natural areas. duration and frequency of visits to public natural areas were influence by the severity of lockdowns, COVID-19 mortality rates, and sociocultural factors. Nature exposure during the COVID-19 pandemic was consistently associated with improved mental health and wellbeing (strong evidence). Increased nature exposure was related to less depression, stress, loneliness, and anxiety. Particularly, different forms of nature

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							exposures such as indoor plants, virtual and simulated nature, window view greenness etc positively influenced mental health.
Ribeiro, A. I., Triguero-Mas, M., Santos, C. J., Gómez-Nieto, A., Cole, H., Anguelovski, I., ... & Baró, F. (2021) Exposure to nature and mental health outcomes during COVID-19 lockdown. A comparison between Portugal and Spain.	To determine which sociodemographic, housing and lockdown-related characteristics were associated with changes in exposure to nature during the COVID-19 lockdown in Portugal and Spain. Secondly to estimate the associations of these changes with mental health.	Cross-sectional quantitative study	Online Questionnaires	Participants had to be 18 years old or older and reside in Portugal or Spain during the lockdown. This study included 3157 participants (1638 from Portugal, 1519 from Spain). The majority of the participants in both countries were women	Spain and Portugal	In both countries, as expected, there was a significant reduction in the use of public natural spaces. For instance, in Spain, the proportion of people that visited this type of spaces everyday went from 20.8% (before the lockdown) to 9.0% (during the lockdown). The frequency of exposure to private green space and greenery increased in both countries. The overall frequency of the remaining forms of nature exposure (views from home and community private green spaces) was not	We found that exposure to nature brought mental health benefit during the lockdown period. We also found a significant reduction in the utilization of public natural spaces in both Portugal and Spain (despite access was only explicitly forbidden in Spain) and a slight increase in contact with private green space and greenery (indoor plants, home/courtyard gardens, etc.). In Portugal, maintaining or increasing the routine of visiting public

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						significantly altered, as there were equivalent proportions of people that increased and reduced their utilization. The frequency of exposure to private green space and greenery increased during the lockdown. In Portugal, individuals aged 40–64 years were more likely than other age groups to maintain/increase views of nature (OR 2.26; 95%CI 1.50, 3.41), while those living in households with more cohabitants were less likely to do so. We observed that, in Portugal, maintaining/increasing exposures to public natural spaces (via visits) and views of nature from home were associated with	natural spaces and contemplating those spaces from home was associated with lower levels of stress, somatization and psychological distress, while in in Spain, exposure to private green space and greenery, namely indoor plants and community private green spaces, were found to be associated with lower levels of stress and less somatization of symptoms. In Portugal, maintaining or increasing the frequency of visiting public natural spaces (e.g. public parks, street greenery, woodlands, water bodies etc.) was associated with better mental health outcomes, more

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						lower levels of psychological distress. In both countries, crude models showed that maintaining/increasing exposure to public natural spaces and views of nature were associated with lower levels of somatization. In Spain, adjusted models revealed that maintaining/increasing the exposure to community private green spaces (adjusted beta = 0.82; 95%CI = 1.61, = 0.03) and other spaces (adjusted beta = 1.06; 95%CI = 1.79, = 0.32) was significantly and negatively associated with somatization. In Spain, we found that individuals who maintained//increased exposure to indoor plants presented	precisely, with lower levels of stress. Maintaining or increasing exposure to private green space and greenery, to public natural spaces and views of nature was associated with improved mental health outcomes during the COVID-19 pandemic and subsequent general lockdowns, both in Portugal and Spain. Maintaining or increasing exposure to private green space and greenery, to public natural spaces and views of nature was associated with improved mental health outcomes during the COVID-19 pandemic and subsequent general lockdowns. These associations varied between

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						significantly lower levels of stress.	countries possibly reflecting the different mobility restrictions and epidemiological situation experienced by the two nations
Tomasso, L. P., Yin, J., Cedeño Laurent, J. G., Chen, J. T., Catalano, P. J., & Spengler, J. D. (2021) The relationship between nature deprivation and individual wellbeing across urban gradients under COVID-19.	To assess how retracted nature contact and perceived nature deprivation during the COVID-19 pandemic influence physical and emotional well-being, specifically examining their impact on self-assessed nature exposure, perceived nature deprivation, and subsequent flourishing as measured by the Harvard Flourishing Index.	Quasi-experimental quantitative research design	Online survey methods	N = 529 Age 18 years and above majority female	Boston, Atlanta, San Francisco, and Phoenix	Greater time spent in nature under COVID-19 restrictions vis-à-vis pre-pandemic had the most pronounced effect on reducing feelings of deprivation. Results demonstrate the potential of local nature contact to support individual wellbeing in a background context of emotional distress and social isolation, important in guiding public health policies beyond pandemics. Other exposure variables significantly associated with lower perceived nature deprivation were	individuals who felt nature deprived under shelter-in place experienced reduced flourishing. Declines in flourishing corresponded monotonically to individual feelings of nature deprivation since shelter-in-place began. It is possible that transition to virtual or reduced work and shuttered alternate activities enabled some individuals to experience greater nature contact, though others were unable to access desired nature venues for context-

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						public nature parks and reserves remaining fully open under the pandemic as compared to restricted entry policies, attenuated COVID-19 sheltering policies, pet ownership, older age, and Western U.S residence.	specific outdoor activities. Individuals who reported feeling nature-deprived or strongly nature deprived since sheltering began experienced a statistically significant drop in flourishing of 4.6% and 6.8%, respectively. COVID-19 shelter-at-home policies restricting personal mobility, destination availability, and openness of public spaces preclude or constrict choice of nature contact for many people, leaving incidental contact with indoor and neighborhood nature the de facto exposure. individuals who went outside but found their preferred nature inaccessible felt sixty

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							percent more deprived of nature (0.36, 95% CI: (0.80, 0.07), $p = 0.10$) than those unaffected by lockdown Our results show that higher frequency of outdoor nature-seeking established prior to COVID-19 may have contributed to flourishing once pandemic restrictions were introduced. Higher levels of cumulative nature exposure demonstrated lower nature deprivation scores as well as the reverse effect, that withdrawal of nature exposure and opportunities to pursue activity in nature compromise individual emotional health and wellbeing. Lower nature deprivation was

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							associated with higher flourishing.
Van Eeden, L. M., Francis, L., Squires, Z. E., Hames, F., Bekessy, S. A., Smith, L., & Hatty, M. (2023). Demographic and spatial variables associated with spending time in nature during COVID-19 lockdowns.	To explore how the Victorian public was accessing and engaging with nature during the COVID pandemic	Quantitative Exploratory study design	Survey questionnaires administered on 1024 Australians from Victoria	Victorian public with respect to age (adults 18 years and over) N = 1024 993 had sufficient and correct information. 48.6% women and 51.16% men.	Victoria, Australia	Higher connection with nature was associated with being female, older, and speaking a language other than English. Most respondents reported a change in the amount of time that they spent in nature because of COVID lockdowns: 29.90% of people reporting a little or a lot more time in nature and 39.58% of people reporting a little or a lot less time in nature (Fig. 2). The remaining 30.51% (n = 303) reported no change in time spent in nature. People commonly reported to have spent a little or a lot more time were their own gardens (48.94%)	The restrictions on movement affected people differently in how they spent time in nature, with an almost even split of people spending more, less, or having no change in how much time they spent in nature. Women were more likely to report spending more time in nature. Similarly, Higher connection with nature was associated with spending more time in nature (Table 1). One's own garden was the place that people most reported spending time and more time since the beginning of the pandemic (Fig. 2). The second-most reported place where people spent time

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
						and urban parks (25.48%). Spending more time in nature was positively associated with being female, having a higher connection with nature, living in an area that has higher socio-economic advantage, having a higher area of native vegetation within 1 km of one's home, and being closer to a park and coast or waterway.	(and an increase in time during the pandemic, Fig. 2) was urban parks, and proximity to a park, or a waterway were all associated with increased time spent in nature. Having access to nature places is important for spending time in nature. Specifically, having nearby parks, coasts, or other waterways as well as a higher area of native vegetation within 1 km of one's home were important predictors of spending more time in nature. Living in an area with a higher socio-economic status was also an important predictor of whether one spent more time in nature or not, and indeed, higher local socio-economic status

Authors and Title	Aim	Study Design	Data Collection Method	Population	Location	Findings	Discussion and Conclusions
							was associated with variables representing access to nature, specifically proximity to a park and higher area of surrounding agricultural land (Table 1). lower socio-economic status areas have been associated with more COVID-19 cases, which has been partly attributed to higher numbers of “blue collar” workers who have not been able to work from home. This reinforces that accessible nature in cities is important not only for social resilience during a pandemic, but potentially for future crises such as those caused by a changing climate.

Appendix B: Health Research Ethics Committee



Private Bag X1260, Potchefstroom
South Africa 2520
Tel: 086 016 9698
Web: <http://www.nwu.ac.za/>

North-West University Health Research Ethics
Committee (NWU-HREC)

Tel: 016 296-1208
Email: Ethics-HREC@nwu.ac.za (for human
studies)

19 September 2024

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the North-West University Health Research Ethics Committee (NWU-HREC) on 19/09/2024, the NWU-HREC hereby approves your study as indicated below. This implies that the NWU-HREC grants its permission that, provided the general conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Exploring the effects of restricted contact with nature during Covid 19 lockdown and its impact on individuals' psychological wellbeing: A scoping review
Principal Investigator/Study Supervisor/Researcher: Prof JC Potgieter
Student: S Letale - 47607564

Ethics number:

N	W	U	-	0	0	1	6	2	-	2	4	-	A	1
Institution			Study Number			Year			Status					

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation;
A = Authorisation

Application Type: Systematic review
Commencement date: 19/09/2024
Expiry date: 30/09/2025

Risk:

Minimal

Approval of the study is provided for a year, after which continuation of the study is dependent on receipt and review of an annual monitoring report and the concomitant issuing of a letter of continuation. A monitoring report is due at the end of September annually until completion of the study.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- The principal investigator/study supervisor/researcher must report in the prescribed format to the NWU-HREC:
 - Annually on the monitoring of the study, whereby a letter of continuation will be provided annually, and upon completion of the study; and
 - without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.
- The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the principal investigator/study supervisor/researcher must apply for approval of these amendments at the NWU-HREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.
- Annually a number of studies may be randomly selected for active monitoring.
- The date of approval indicates the first date that the study may be started.
- In the interest of ethical responsibility, the NWU-HREC reserves the right to:

9.1.5.4.2 Ethics Approval Letter of Study 1

- request access to any information or data at any time during the course or after completion of the study;
- to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;
- withdraw or postpone approval if:
 - any unethical principles or practices of the study are revealed or suspected;
 - it becomes apparent that any relevant information was withheld from the NWU-HREC or that information has been false or misrepresented;
 - submission of the annual monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and/or
 - new institutional rules, national legislation or international conventions deem it necessary.
- NWU-HREC can be contacted for further information via Ethics-HRECApply@nwu.ac.za or 018 299 1206

The NWU-HREC would like to remain at your service and wishes you well with your study. Please do not hesitate to contact the NWU-HREC for any further enquiries or requests for assistance.

Yours sincerely,



Chairperson NWU-HREC

Current details: (2323652) Grifly Drive: Research and Postgraduate Education/1.5.4 Template/1.5.4.2_NWU-HREC_EAL.docx
20 August 2019
File Reference: 1.5.4.2

Appendix C: Optentia Research Committee



PO Box 1174, Vanderbijlpark
South Africa 1900
Tel: 016 910-3410

www.optentia.co.za

Student Name: Senate Letsie
Student number
47607564

16 July 2024

"Exploring the effects of restricted contact with nature during Covid 19 lockdown and its impact on individuals' psychological wellbeing: A scoping review"

Dear Senate,

This letter serves to confirm that your research proposal has been accepted and approved by the Optentia Research Committee.

Optentia Research Committee	
Prof S Rothmann (chair)	Prof M Heyns
Prof J Hoffman	Mrs E Bothma
Dr T Jefferis	Prof B Ngwenya
Prof M Stander	Prof N Duncan
Dr N Bernard	Prof W Nell
Prof V Roos	Dr Evan den Berg
Dr J Bosman	Prof E Oosthuysen
Prof E Deacon	Dr T Chascha
Dr L Coxen	Prof J Potgieter (observer)
Prof F Cilliers	

The ethics application is referred to the North-West University Health Research Ethics Committee (HREC).

Best wishes for your study!

Best Regards,

Prof. S. (Ian) Rothmann

Director: Optentis Research Unit

Appendix D: Language Editing



Monica Botha
T/a I'Avenir Consulting
Postnet Suite 043
Private Bag X9
QUEENSWOOD
0121

Cellular: 083 269 0757
E-mail: monicabo@iantic.net

TO WHOM IT MAY CONCERN

This serves to confirm that I have edited and proofread the mini-dissertation entitled

**Exploring the effects of contact with nature during Covid 19 lockdown and its
impact on individuals' psychological wellbeing: A scoping review**

prepared by Ms S Letsie, submitted in partial fulfilment of the requirements of the degree Master of Arts in Counselling Psychology at the North-West University, according to the specifications of the University, where available, and the latest standards for language editing and technical (computer-based) layout.

Editing was restricted to language usage and spelling, consistency, formatting and the style of referencing. No structural writing of any content was undertaken.

As an editor I am not responsible for detecting any content that may constitute plagiarism.

To the best of my knowledge, all references have been provided in the prescribed format.

I am not accountable for any changes made to this dissertation by the author or any other party after the date of my edit.

Electronically signed (actual signature withheld for security reasons)

MONICA BOTHA

28 May 2025

Sole Proprietor: Monica Botha

*Business Planning Corporate Systems Engineering Corporate Document Standards
Business and Academic Document Technical and Language Editing*

Appendix E: Journal Guidelines for Authors

Manuscript Types and Guidelines

Original Articles	• 5,000-word limit • Unstructured abstract of no more than 250 words • Maximum total of six (6) figures and/or tables
Review Articles	• 5,000-word limit • Unstructured abstract of no more than 250 words • Maximum total of six (6) figures and/or tables • No limit on references

Letters to the Editor	• 500-word limit • No abstract • May include one figure OR table • Reference citations are identical in style to those of full original articles, but should not exceed five (5).
-----------------------	---

Word limits do NOT pertain to the abstract, disclosure statements, author contribution statements, funding information, acknowledgments, tables, figure legends, or references.

Please follow the general style guidelines of the [American Psychological Association](#).

References

References must be prepared following the [citation style of the American Psychological Association](#).

References must be prepared in Word, double-spaced, and listed in alphabetical order. Include the reference section as part of the main text file, not as a separate file. Each listed reference should be cited in the text, and each text citation should be listed in the References section. References should be cited in the text using the last name of the author(s) followed by the year of publication in parentheses, e.g., Vogt (2011) or (Vogt, 2011); Greer & Vin-Raviv (2019) or (Greer & Vin-Raviv, 2019). If there are three or more authors, the first citation should read (Long, Lake, Lynn, & Viles, 2018), and the second citation, (Long et al., 2018). If there is more than one work by an author (or authors) in a given year, they should be labeled alphabetically within each year, e.g., (Yerbury & Boyd, 2018a,b).

In the reference list, the first three authors should be listed followed by et al. (not italicized). Use journal abbreviations as provided by PubMed/Medline. An Endnote template can be found [here](#).

If references to personal communications or unpublished data are used, they are not to be in the list of references. They should be referred to in the text in parentheses: (AB Jones, personal communication, month and year). Written permission must be obtained from the author of any unpublished material cited from other laboratories and should accompany the manuscript. Include among the references any articles that have been accepted but have not yet published; identify the name of publication and add "In Press." If the reference has been published online, provide the DOI number in place of the page range.

PaperPal Preflight

The Paperpal Preflight service is available for this journal. PaperPal Preflight allows authors to check their **Original Research** manuscripts for common errors prior to submitting a manuscript for consideration. Please note that this does not guarantee that your paper will pass all submission or other checks, nor that it will be considered for review.

The checks are configured for Original Research manuscripts only and may not be applicable to other manuscript types. There may be additional requirements for submission. Please review the full instructions for authors for guidelines.

The basic service is free. PaperPal preflight offers an *optional* fee-based service that will provide a report showing tracked changes and potential modifications. Please note that if this service is used, a clean copy of the manuscript must be uploaded to the submission system.

There is no obligation to use either the free or paid service. No editorial, review, nor any other decisions will be dependent on its use.

All manuscripts must be submitted through the journal's ScholarOne Manuscripts site.

Manuscript Structure

Specific journal requirements will vary, however the general order of elements in each manuscript should be

- Title page* with full manuscript title, all contributing authors' names and affiliations, a short running title, a denotation of the corresponding author, and a list of 4-6 keywords/search terms,
- Abstract,
- Main text without embedded figures or tables and with appropriate section headings, if applicable. Most research papers should be organized as follows: Introduction, Materials and Methods, Results, Discussion, and Conclusions.
- Acknowledgments,
- Authorship confirmation/contribution statement (CRediT format is preferred)
- Author(s) disclosure (Conflict of Interest) statement(s), even when not applicable,
- Funding statement, even when not applicable,
- References,
- Tables included in the text or as a separate document,
- Figure legends at the end of the main text or in a separate Word file,
- Figures uploaded as individual high-resolution files,
- Supplemental files uploaded as individual files.