



Mindfulness practice during COVID-19 crisis: Implications for confinement, physical inactivity, and sedentarism

Dev Roychowdhury^{§,*}

Health Research Hub, DR ACADEMY, Melbourne, Australia

ARTICLE INFO

Keywords:

Mindfulness
Mindful breathing
Mantram chanting
Crisis
Health
Well-being

ABSTRACT

COVID-19 pandemic has radically impacted and altered the lives of billions of people around the world. Due to strict government policies, most individuals now find themselves confined at home with limited movement permissible. Although these measures are enforced to help abate the rate of infection, such restrictions have huge implications for the psychophysiological health, lifestyle, and overall well-being of individuals. The COVID-19 confined circumstances, coupled with the gradually declining levels of physical activity and rising levels of sedentarism that is prevalent in the modern society, can have deleterious effect on the psychological, physical, and social health of individuals. This paper argues for essential alternative measures to be introduced that would not only assuage the detrimental effects of COVID-19 confinement, physical inactivity, and sedentarism in the short-term, but also promote psychophysiological health and well-being in the long-term. In particular, this paper recommends the practice of mindfulness as a viable option under the current circumstances. This paper further outlines the health benefits of mindfulness practice and illustrates two effective and efficient practices — mindful breathing and mantram chanting — that could be suitably utilized under the current altered and confined COVID-19 arrangement by individuals across the life span. Potential benefits, recommendations, and risks have also been addressed.

Mindfulness Practice during COVID-19 Crisis: Implications for Confinement, Physical Inactivity, and Sedentarism

COVID-19 pandemic has emerged as a major epidemiological, economic, and global health crisis (Roychowdhury, 2020a). So far, the pandemic has infected 232,075,351 individuals and claimed the lives of 4,752,988 people (World Health Organization, 2020a). The economic burden of this pandemic has been estimated to cost between \$5.8 and \$8.8 trillion (Dennis, 2020), which is expected to plunge most countries into recession (World Bank, 2020). The pandemic has already immobilized critical mental health services in 93% of countries worldwide (World Health Organization, 2020b). Although the full impact of COVID-19 on health is yet to be determined, research has already reported on the significant mental and neurological complications it causes, such as delirium, anxiety, depression, agitation, insomnia, hypogeusia, anosmia, and stroke, among others (e.g., Ellul et al., 2020; Liang et al., 2020; Pfefferbaum & North, 2020; World Health Organization, 2020c). Furthermore, COVID-19 pandemic is also likely to exacerbate stressors for people who are vulnerable, disadvantaged,

and/or have pre-existing health conditions (Roychowdhury, 2020a). The current paper offers the case for mindfulness practice as a possible strategy to alleviate the stress experienced during this pandemic.

Considering the rapid transmissibility of COVID-19 virus and the slow roll-out of effective, affordable, and viable vaccines around the world, major governments and health agencies decreed sweeping measures to curtail and effectively manage the spread of the virus (Roychowdhury, 2020a, 2021a). One such non-pharmaceutical prevention and containment measure that has been legally enforced by major governments, not only for individuals who have contracted the virus or have been in contact with a confirmed case, but also for members of the general public who have been advised to stay indoors, is confinement (Roychowdhury, 2020a). However, the literature on confinement indicates that it has a profoundly detrimental effect on the psychological and physical health of individuals. Confinement and isolation have been consistently linked with a range of risk factors for poor health, undesirable health outcomes, increased morbidity, and early mortality (see Roychowdhury, 2020a).

* Corresponding author.

E-mail address: info@drdevroy.com

[§] Author Note: Dr Dev Roychowdhury is a researcher, scholar, and consultant in mindfulness, mental health, and sport, exercise, and performance psychology, with extensive lecturing, research, and industry experience. He is the Research Director and Chief Consultant at DR ACADEMY and Executive Member of Managing Council of Asian South-Pacific Association of Sport Psychology. For more information, please visit: <https://www.drdevroy.com>

COVID-19 confinement has significantly altered the lives of billions of people around the world — individuals are advised to stay indoors and be physically distanced; schools, universities, workplaces, and gyms have been closed; travel bans have been imposed; and cultural, social, and sporting events have been cancelled. With such restrictions in place, COVID-19 confinement has fundamentally changed human movement (i.e., little or no walking, commuting, jogging, running, or participation in social, recreational, or organized leisure or sport), thereby increasing susceptibility to physical inactivity and sedentarism. It would, therefore, be reasonable to state that most people would find meeting previous physical activity recommendations (e.g., [World Health Organization, 2020d](#)) arduous. This has huge implications for people's mental and physical health and well-being. Involvement in regular physical activity has consistently been linked to positive psychophysiological markers of health across the life span (see [Roychowdhury, 2020b](#)). Therefore, limited or restricted physical activity during COVID-19 confinement is expected to further impede people's ability to invest in their physical health and fitness, which has been positively associated with improved immunological regulation and function, increased anti-inflammatory influence, delayed onset of age-related dysfunction, and improved cardiovascular health (e.g., [Bloch et al., 2020](#); [Nieman & Wentz, 2019](#)) — factors that are especially pertinent for individuals in confined circumstances.

Conversely, physical inactivity and sedentarism have been associated with major causes of morbidity and mortality ([World Health Organization, 2020d](#)). Global estimates from WHO (2020d) indicate that 28% of adults and 81% of adolescents (aged 11–17 years) are insufficiently active and that the levels of physical activity involvement have not improved since 2001. This is particularly critical for the current confined circumstances as physical inactivity and sedentarism have already been declared as global crises (e.g., [Kohl et al., 2012](#); [Ozemek et al., 2019](#); [Pratt et al., 2019](#)). Considering the current confinement and isolation measures and evidence from extant literature, [Roychowdhury \(2020a\)](#) has urged that the emerging global psychological distress and isolation due to COVID-19 pandemic should also be treated as a crisis and that appropriate precautionary and mitigatory measures need to be developed to assist members of general public who find themselves isolated for an indefinite and uncertain period of time and unable to engage in regular forms of physical activity. Thus, increasing levels of physical inactivity and sedentary behaviours are also likely to exacerbate stressors during COVID-19 confinement. In other words, COVID-19 confinement, coupled with the deleterious effects of physical inactivity and sedentarism, can concoct a dangerous recipe for a range of adverse psychophysiological health issues for individuals.

Additionally, studies involving physically active populations have also reported profoundly adverse psychophysiological effects of COVID-19 pandemic. For instance, research within the sport and exercise contexts has identified several detrimental effects of COVID-19 pandemic on athletes' training and well-being. COVID-19 confinement and lockdown measures meant that a number of international sporting events were either cancelled or postponed ([BBC Sport, 2020](#); [Samuel et al., 2020](#)). As a result, athletes have been found to experience a wide range of sentiments and eventualities, including need for quick adjustment; loss of routine/training and opportunity; risk of over-training due to limited opportunities to train and increased likelihood of injuries; limited interactions with teammates, coaches, and others; increased concerns for doping; retirement; uncertainty; financial concerns; and existential crisis, among others ([Taku & Arai, 2020](#); [Schinke et al., 2020](#)). Other sport professionals, such as coaches and referees, were also found to experience significant career, fiscal, and social concerns ([Pillay et al., 2020](#); [Samuel et al., 2020](#); [Taku & Arai, 2020](#); [Webb, 2020](#)). Overall, it would be reasonable to state that COVID-19 confinement has significantly affected the mental, physical, social, and financial health of athletes and other sport professionals. This is also exacerbated by the fact that athletes are known to experience additional mental health risks and challenges compared to non-athletic groups ([Schinke et al., 2018](#)). This

further suggests that individuals (including active and inactive populations) are at a higher risk of developing adverse psychophysiological health issues, due to the current confined conditions.

Given COVID-19 confinement, limited freedom and space for movement (and training), and severe punitive actions for breaching lockdown measures, along with globally declining levels of physical activity and increasing amounts of sedentary behaviours, there is an insistent need to develop novel and innovative approaches that can simultaneously foster a sense of positive health and well-being and alleviate adverse health effects caused by confinement, physical inactivity, and sedentarism, under the current circumstances. This would be especially pertinent for individuals who are mentally and/or physically challenged, remotely located, socially isolated, and/or belong to vulnerable or disadvantaged groups. These may include children, young or elderly adults, individuals with psychological or physical disability or injury, survivors of domestic violence or suicide, and refugees or homeless people. These approaches, therefore, need to be free or low-cost, easily comprehensible and accessible, and readily deployable.

One such approach that has a proven track record of providing psychophysiological benefits is mindfulness (e.g., [An et al., 2019](#); [Goldberg et al., 2021](#); [Khoury et al., 2013](#); [Pascoe et al., 2021](#)). Mindfulness has proven to be efficacious not only in times of crisis, but also in alleviating a range of mental and physical ailments in a variety of other contexts. In the following sections, I present mindfulness as a viable option that individuals could utilize during COVID-19 confinement and in the absence of regular avenues to engage in moderate physical activity behaviours to mitigate risk of psychological distress. Furthermore, I illustrate two key examples of mindfulness practice that individuals could utilize during the confinement period.

Mindfulness

Interest in mindfulness and mindfulness-based practices has skyrocketed in the past two decades. The origins of the modern mindfulness movement, pioneered by Jon Kabat-Zinn, is often misattributed to Buddhism. It is now understood that Prince Siddhartha, influenced by Vedic teachings at the time, which had been passed on from one generation to the next in an unbroken line of transmission over thousands of years, incorporated elements of mindful meditative practices into his Noble Truths (see [Andersen & Waterson, 2017](#); [Radhakrishnan & Moore, 1957](#); [Roychowdhury et al., 2021](#); [Wilson, 2014](#)). It has been argued that western scholars, in the early 16th century, willfully lumped Vedic and Buddhist texts as “Oriental Philosophy” to then extol their practices as scientific, rational, and naturalistic, and adapt them to their Western contexts (see [Lopez, 2008, 2012](#); [Roychowdhury et al., 2021](#); [Wilson, 2014](#)). Furthermore, several contemporary scholars have also critiqued the cultural adaptation of mindfulness into Western secular societies for neoliberal and capitalistic motives (e.g., [Hyland, 2017](#); [Purser, 2019](#); [Roychowdhury, 2021b, 2021c](#); [Roychowdhury et al., 2021](#); [Van Dam et al., 2017](#); [Wilson, 2014](#)). Nevertheless, it should be noted that the custom of being still and attentive has been a common practice adopted by people across different indigenous cultures and religions. For instance, First Nations Australians have long practiced *Dadirri* or “inner, deep listening and quiet, still awareness” (see [Lavrencic et al., 2021](#); [Ungunmerr, 2017](#)), which is akin to the elements of mindfulness practice.

Mindfulness may be simply referred to as the capacity of being aware of what is unfolding within and around with the intention of understanding the true nature of being/existence, consciousness, and reality. According to [Roychowdhury \(2021c\)](#), mindfulness, as enshrined in Vedic contemplative philosophy, forms an essential component of one's meditative journey towards the path of enlightenment and liberation and is cultivated through rigorous practice. Mindfulness, in the context of modern society, has been characterized as the ability to pay purposeful attention in the present moment without any judgement. The three core concepts that lie at the heart of contemporary mindfulness include:

(a) *present moment awareness*: the ability to center attention to the here and now, (b) *equanimity*: the ability to maintain a sense of internal balance between positive and negative states, and accept what is, and (c) *non-doing*: the ability to embrace spontaneity and stillness without expediency (Roychowdhury 2021d).

There has been an explosion of research investigating and detailing the benefits of mindfulness practice on the psychological, physical, and social health of individuals. More specifically, mindfulness has been found to increase cognitive performance and flexibility (e.g., Chiesa et al., 2011; Moore & Malinowski, 2009; Siegel, 2007); develop effective emotional regulation (e.g., Chambers et al., 2008; Corcoran et al., 2010; Jha et al., 2010); enhance working memory capacity (e.g., Chambers et al., 2008; Jha et al., 2010); enrich self-insight, morality, and intuition (e.g., Siegel, 2007, 2009); promote spiritual well-being (e.g., Roychowdhury, 2019); reduce negative self-beliefs (e.g., Goldin & Gross, 2010) and ruminations (e.g., Chambers et al., 2008; Corcoran et al., 2010; Ramel et al., 2004); lower stress (e.g., Coffey & Hartman, 2008; McKim, 2008); alleviate anxiety (e.g., McKim, 2008) and depression (e.g., Chambers et al., 2008; McKim, 2008); decrease reactivity (e.g., Goldin & Gross, 2010); and enhance overall well-being (e.g., Carmody & Baer, 2008). Mindfulness has also been found to improve many aspects of physical health resulting in reduced physical pain and decreased muscle tension (e.g., Creswell et al., 2019; McKim, 2008; Wippert & Wiebking, 2018); better sleep quality (e.g., Howell et al., 2008); lowered cardiovascular disease risk (e.g., Nardi et al., 2020); and improved immune function (e.g., Grossman et al., 2004). Moreover, mindfulness has also been linked to improved relationship satisfaction and lowered relationship stress, conflict, and negativity (e.g., Barnes et al., 2007; Wachs & Cordova, 2007). Given the current COVID-19 circumstances, mindfulness has been found to be an extremely important factor in predicting resilience, satisfaction, and meaning in life, and lowering sense of fear and hopelessness (e.g., Saricali et al., 2020).

These salutary effects of mindfulness are profoundly significant for individuals who are experiencing COVID-19 confinement and unable to participate in usual and regular forms of physical activity. In the following sections, I outline two key mindfulness practices that individuals could suitably utilize under the current COVID-19 confinement circumstances.

Mindful breathing practice

Mindful breathing practice involves using one's breath as an anchor to cultivate attentive awareness. This practice involves a sense of self-monitoring where an individual fully engages in the present moment by noticing the continuous stream of their *breath exchange* (inhalation and exhalation). Numerous studies on mindful breathing have consistently linked it to enhanced attentional control and self-regulation and a sense of positive and relaxed inner mental state (e.g., Cooper et al., 2003; Larson et al., 2013), even when involved with demanding cognitive tasks (e.g., Bing-Canar et al., 2016).

Studies in crisis settings (e.g., palliative care) have consistently reported that a five-minute mindful breathing practice results in rapid improvement in perceived distress and physiological responses (e.g., Lei Chui et al., 2021; Ng et al., 2016). Mindful breathing practice is understood to enhance interoceptive awareness (Fox & Cahn, 2018), increase vagal tone and reduce sympathetic nervous system activity (Schmalzl et al., 2015), activate the parasympathetic nervous system (Brown & Gerbarg, 2005), lower amygdala reactivity (Kral et al., 2018), and facilitate stress regulation (Sharma, 2013). The ability to redirect attention to mindful breathing can not only improve focus, regulate stress, and facilitate deeper insights into emotional-motivational state (Bornemann et al., 2015; Fissler et al., 2016), it can also help anchor the mind in the present moment and away from rumination (Farb et al., 2015).

Cho and colleagues (2016) examined the efficacy of daily mindfulness breathing practices on test anxiety for highly anxious individuals

and found that mindful breathing practices not only yielded large effect sizes in reducing anxiety, but also showed increased positive automatic thoughts over time, when compared to other techniques. Similarly, in a recent study, Feruglio and colleagues (2020) found that participants who exclusively practiced mindful breathing showed reduced tendency to brooding and increased positive vision of the future. This capacity to cultivate emotional and cognitive flexibility whilst maintaining resilience in the present moment and dispositional optimism for the future, especially in times of crisis, has huge implications for individuals who are currently in COVID-19 confinement and want to allay the adverse psychophysiological effects that confinement, physical inactivity, and sedentarism may cause. Table 1 presents an illustration of mindful breathing practice that individuals may utilize under the current COVID-19 confined circumstances.

Mindful mantram chanting practice

Mantram (Sanskrit: मन्त्र) is considered to be a "powerful spiritual formula, which, when repeated silently in the mind, has the capacity to transform consciousness....It is a short, powerful spiritual formula for the highest power that we can conceive of....[for] calling up what is best and deepest in ourselves" (Easwaran 2008, p. 12). Mindful mantram chanting refers to the conscious utterance of mantram, which may be a numinous sound, word, or phrase, that may carry spiritual, sacred, or transcendental significance and meaning. This practice of chanting involves repeating or iterative speaking of the sound(s), word(s), or phrases in the form of recitations. Easwaran (2008, 2013) highlights the importance of choosing a mantram and outlines several pertinent steps for initiating into one. The mantram is thought to be effective when chosen from one of the established spiritual traditions and practiced silently with as much concentration as possible. Some of the famous examples of mantram include *OM* ("ॐ" or "AUM", considered to be the sound

of the Universe; see Sivaraman, 1989); *Tat Tvam Asi* (तत् त्वम् असि or "That Thou Art") from *Chandogya Upanishad* in *Sam Veda* in Hinduism (see Gupta, 1962); and *Om mani padme hum* (ॐ मणिपद्मे हूँ or "Jewel in

the lotus of the heart") in Buddhism (see Studholme, 2002). It should be noted that it is not uncommon for individuals, in certain spiritual and religious affiliations, to vocalize mantram chanting in groups and aloud. However, under the current COVID-19 confinement and especially when individuals find themselves co-habiting with other people in proximity, it may be practical, convenient, and respectful to practice mantram chanting silently.

Research investigating mantram chanting has found that long-term practice or constant repetition of mantram leads to better stress management for cancer patients, military veterans with trauma experiences, and people living with HIV and other chronic diseases (e.g., Bormann et al., 2006, 2008, 2013, 2014; Buttner et al., 2016; Yong et al., 2018); reduced insomnia (e.g., Barger et al., 2015; Beck et al., 2017); and enhanced emotional, psychosocial, and spiritual well-being (e.g., Bormann et al., 2006, 2017; Yong et al., 2011). Additionally, meditative chanting practices have been found to help individuals reduce distress and prevent emotional reactivity when confronted with negative stimuli (Gao et al., 2017; Kiken & Shook, 2012). A recent study utilizing multi-modal electrophysiological and neuroimaging methods corroborated that meditative chanting practices may be more effective in alleviating specific neuropsychiatric symptoms, increasing the stability of cardiac function, and inducing distinctive psychotherapeutic effects, which exert positive stress-reducing sentiments and play a vital role in promoting spiritual bliss and emotional tranquility (Gao et al., 2019). Considering these myriad benefits, mindful mantram chanting practice may provide another suitable alternative for individuals who are currently in confinement. Table 2 presents an illustration of mindful mantram chanting

Table 1
Illustration of Mindful Breathing Practice.

Steps	Description
Step 1	Find a comfortable position. You could be seated on a chair or on a cushion on the floor. Maintain a straight back and posture, but not too tight. You may choose to keep your eyes open or closed.
Step 2	Notice and relax your body. Notice how your posture feels. See if you have any tension in your body and relax.
Step 3	Tune into your breathing as you breathe in and then out. Notice how the breath naturally flows. You do not need to rush it. Just <i>be</i> . Notice how you feel when you breathe. See if you can notice the sensation of your breath on your chest, stomach, head, and nostrils. See if you can fully attend to your breathing, one breath at a time.
Step 4	As you continue to do this, you may notice that your mind starts to wander off. You may notice positive or negative thoughts enter your awareness. Perhaps, you can hear noises around you or feel the gentle breeze of the wind. This is normal. See if you can acknowledge their presence and just <i>be</i> in what is. See if you can observe the reality of things without wanting to rush, change, or judge them or yourself in the process.
Step 5	Gently bring your attention back to your breathing. See if you can tune into your breathing again. As one breath starts and then gradually ends, the next begins. See if you can maintain this for a few minutes. When you complete your mindful breathing practice, offer yourself the appreciation, encouragement, and gratitude for immersing in this practice. As you conclude your conscious breathing practice, notice if your presence feels centered and still. Stay in that calmness for a few moments.

Table 2
Illustration of Mindful Mantram Chanting Practice.

Steps	Description
Step 1	You may begin your mantram chanting journey by choosing a quiet place within your abode. However, you do not need to set dedicated times to repeat the mantram. You may repeat the mantram whenever you get a chance or wish to. You could chant the mantram (silently) when you wake up, make your morning tea, get ready for school or work, wait in a queue at the supermarket, walk in the local park, or before you go to bed. The idea is to make the mantram part of your daily routine. The more you practice, the better it is for you.
Step 2	As you begin chanting, be mindful that you are doing so silently and with as much concentration as possible. When you chant, notice how the sensations vibrate within you as you enunciate each syllable of the chant. You may choose to focus on the words, sound of the words, movement of your lips, or your breath.
Step 3	As you continue to do this, you may notice that your mind starts to wander off. Sometimes you may observe that the process of chanting has become somewhat mechanistic as you find yourself engrossed in other tasks. This is normal. See if you can simply notice that you became distracted without any judgments.
Step 4	Gently bring your attention back to the mantram chanting. See if you can tune into the rhythm of mantram chanting again. Maintain this rhythm and chanting for a few minutes. As you conclude your conscious mantram chanting practice, notice if your presence feels centered and still. Stay in that calmness for a few moments.

practice that individuals may utilize under the current COVID-19 confined circumstances.

Based on the tenets of Vedic teachings, both mindful breathing and mantram chanting practices facilitate the development of two crucial mental processes: Śamatha (Sanskrit: शमथ), which refers to the development of concentration/contemplation (i.e., Dhyāna or Sanskrit: ध्यान) in meditation to calm the mind, and Vipāśyanā (Sanskrit: विपश्यना), which refers to the development of insight into the true nature of reality and being. Experienced practitioners who combine both śamatha and vipāśyanā in their meditative practices are expected to develop wisdom (Prajña or Sanskrit: प्रज्ञा) over time and reach Samādhi (Sanskrit: समाधी), which refers to a state characterized by equanimity and total understanding of the ultimate consciousness. The capacity to invest in meditative practices that helps calm the mind whilst simultaneously protecting against negative stimuli and stressors has huge implications for individuals who are currently experiencing COVID-19 confinement and unable to reap the health benefits that physical activity and movement provide.

Discussion and recommendations

COVID-19 pandemic has radically altered human behaviours and movement. A majority of the global population now finds itself in confined and isolated situation, which is likely to cause significant psychological distress (Roychowdhury, 2020a). COVID-19 confinement, severe punitive actions for breaching lockdown measures, and limited avenues

for individuals to engage in regular forms of physical activity is likely to cause people to settle for sedentary activities and lifestyle. The profoundly detrimental effects of COVID-19 pandemic (e.g., Ellul et al., 2020; Liang et al., 2020; Pfefferbaum & North, 2020) and confinement (e.g., Roychowdhury, 2020a) coupled with the globally declining levels of physical activity and increasing amounts of sedentary behaviours (World Health Organization, 2020d) are likely to exacerbate undesirable health outcomes, morbidity, and mortality (Roychowdhury, 2020a).

Considering the pandemic has already immobilized critical mental health services in 93% of countries worldwide (World Health Organization, 2020b), the uncertainty that surrounds COVID-19 confinement and lockdowns, and the detrimental health effects that prolonged physical inactivity and sedentarism cause, it is vital that any approach that is introduced to counteract their adverse effects be swift, easy to utilize, and without any concomitant harmful consequences. Mindfulness presents as the optimum antidote under these circumstances, as it has been consistently linked with numerous psychological (e.g., Carmody & Baer, 2008; Chiesa et al., 2011; Corcoran et al., 2010; Goldin & Gross, 2010; Jha et al., 2010; McKim, 2008; Siegel, 2009), physical (e.g., Creswell et al., 2019; Grossman et al., 2004; Howell et al., 2008; Nardi et al., 2020), and interpersonal (e.g., Barnes et al., 2007; Wachs & Cordova, 2007) benefits. The salubrious effects of mindfulness indicate that it could provide substantial benefit to individuals who find themselves in COVID-19 confinement and unable to participate in regular forms of physical activity but intend to engage in some form of practice to maintain optimal immune defense, assuage the detrimental effects of physical inactivity and sedentarism, and enhance positive effects on overall health and well-being.

The two mindfulness practices illustrated in this paper provide three overarching functions that may be especially pertinent under current COVID-19 circumstances: (a) managing immediate distress, (b) building long-term resilience and well-being, and (c) catalyzing agency for transformational change. First, these mindfulness practices allow individuals to manage their immediate distress by focusing, re-centering, and calming their minds (e.g., Cooper et al., 2003; Farb et al., 2015; Larson et al., 2013). This allows them to distance themselves from the stress and chaos that surrounds them and regain a sense of serenity. Second, when practiced consistently over time, these mindfulness exercises build long-term psychological health and well-being (e.g., Carmody & Baer, 2008; Saricali et al., 2020). It allows individuals to foster a sense of present moment awareness, equanimity, and non-doing, that not only strengthens their resilience in the short-term, but also provides them the capacity to quickly recover from and adapt in future adversities and crises. Further, regular practice of mindfulness also helps allay physical ailments and promote immunological defense, among other benefits (e.g., Creswell et al., 2019; Goldin & Gross, 2010; Grossman et al., 2004; Howell et al., 2008; Nardi et al., 2020). And finally, regular mindfulness practice reduces ruminations, stress, and emotional reactivity; improves memory, concentration, and decision-making; and enhances self-insight and morality (e.g., Corcoran et al., 2010; Jha et al., 2010; McKim, 2008; Siegel, 2007, 2009). These attributes cause transformational change in individuals by fostering empathy and compassion, improving relationship with self and others, and enhancing overall quality of life.

These benefits have huge implications for individuals and organizations around the world, especially under the current COVID-19 pandemic context. The contagion of COVID-19 epidemic has forced people to stay confined which when coupled with restricted movement and declining levels of physical activity in the general population can potentially promulgate a range of psychological and physiological complications, which may not only prove dangerous in the interim but also impact the health, well-being, and lifestyle of people for years to come. Therefore, akin to the confinement policies, there is an insistent need to introduce measures that not only have the potential to bring immediate relief in the short-term, but also foster a sense of psychophysiological resilience and well-being in people in the long-term, especially in the absence of alternative and effectual treatment options.

Considering the myriad benefits of mindfulness practice and in the current context of COVID-19 pandemic, health professionals could develop and introduce tailored mindfulness programs and interventions, both at individual and community levels. For instance, government and community engagement programs could be introduced to teach people mindful breathing practices that they may suitably use within the comfort of their homes. Mindfulness programs could be introduced at schools, universities, workplaces, and community centres to encourage children, students, and workers to imbibe mindfulness into their daily lives. Health professionals could recommend mindful mantram chanting practice to their clients and help them understand the benefits it may bring during COVID-19 confinement. In doing so, health professionals themselves should also receive appropriate training in mindfulness and mindfulness-based interventions. Major health organizations, agencies, and universities could develop and distribute mindfulness resources to train their staff, members, and the wider public. Also, these resources could be widely disseminated using popular video-conferencing tools (e.g., Zoom and Skype) and social media platforms (e.g., YouTube, Facebook, Twitter, LinkedIn, and Instagram) to reach as many individuals and groups as possible. Public service announcements could be made by governments and major media channels to ensure that people are routinely encouraged and reminded to practice mindfulness. Moreover, future ethnographic, phenomenological, longitudinal, and cross-cultural research ought to be conducted to ascertain how mindfulness may assist individuals who are confined (and/or in any form of crisis) and unable to exercise physical movement. Also, specific preventative measures and resources (e.g., utilising practices such as mindfulness) that can help promote biopsychosocial resilience in individuals need to be designed

to help them cope in future crisis scenarios. Additionally, although the present paper focused on mindfulness practices that individuals can suitably utilize within the comfort of their homes, there are a number of other mind-body practices (such as Yoga and Tai Chi) that also have a demonstrated track record of providing psychophysiological benefits. Engaging in these practices would be especially pertinent to assuage the detrimental effects of physical inactivity and sedentarism caused by confinement. Future research should, therefore, focus on examining and comparing the benefits that these practices may bring, especially for individuals who are in confinement and/or experiencing crisis. Furthermore, investing in mindfulness practice to reap associated psychophysiological benefits would not only be pertinent for people who are currently in confinement and want to remain physically active, but also for those individuals who need to be physically active and fit for vocational reasons. This includes professional athletes and staff; military and para-military personnel; space travellers; fire-fighters, paramedics, and lifeguards; construction, labour, and other remote workers; and dance performers and physical trainers, to name a few. Engaging in regular mindfulness practice may assist individuals in this cohort to exercise better self-control, emotional regulation, and health management, and hence remain job-ready. Therefore, sporting bodies, military forces, emergency services, and other agencies will greatly benefit by introducing regular mindfulness programs and interventions in their workplaces and encouraging their workers and members to imbue routine mindfulness practices in their daily lives.

Despite the explosion of research reporting on the benefits of mindfulness practices, several scholars have urged to exercise caution when *prescribing* mindfulness to individuals. For instance, Farias and Wikholm (2018) have argued that although some people may benefit from mindfulness practice, others may suffer moderate to serious adverse effects. In a study involving twenty-seven long-term meditators, it was found that seventeen subjects reported at least one adverse effect and two other subjects suffered profound adverse effects (Shapiro, 1992). Similarly, Lomas et al. (2014) reported that although meditation practice was portrayed to be an overall rewarding activity, all participants found some aspects of it challenging. Most of the participants in this study also maintained that although they found meditating challenging, they also viewed "these experiences as being ultimately valuable for wellbeing and psychological development" (Lomas et al., 2014). As such, it appears that different individuals would respond differently to mindfulness practice, which can either be attributed to the individuals or to elements of the mindfulness practice being performed (Roychowdhury, 2021e). It is likely that some people either may not respond or react adversely to mindfulness practices. A possible explanation is that engaging in mindfulness practices may exacerbate pre-existing vulnerabilities for some individuals. For instance, when an individual experiencing some form of crisis is asked to 'be aware of' or 'open up to' their state, it may amplify their inner frailties and weaknesses, thereby intensifying psychological distress. This would be especially true if the individual lacked a strong sense of being and/or did not have adequate coping resources. Nevertheless, it is evident that mindfulness practices, despite their salutary effects, may bring with them unintended consequences. Considering the surprisingly under-researched area of 'dark side of meditation', future research should explore individual differences in and examine the adverse effects of mindfulness practices (Roychowdhury, 2021e). Furthermore, it is also recommended that individuals who are either unaware of or unsure about how mindfulness practice may benefit them should seek assistance, guidance, and training from professionals who have knowledge of and expertise in both traditional and contemporary mindfulness research and practice (Roychowdhury et al., 2021).

Considering the current chaos caused by COVID-19 crisis that has affected the lives of billions of people globally, it is necessary that strict containment measures are observed to curtail the spread of the virus. And so, individuals are advised to continue to stay confined and practice recommended hygiene and protection measures. The mindfulness

practices illustrated in this paper are intended to provide individuals with tools that they could appropriately utilise, under the current circumstances, to allay the detrimental effects of confinement, physical inactivity, and sedentarism. These mindfulness practices are not intended to provide individuals with a false sense of self-enhancement or superiority (e.g., Vonk & Visser, 2021), although this may eventuate for some individuals in certain cases. Individuals are, therefore, reminded that they must remain equipoise and not be entrapped into a false sense of strength which may cause them to engage in risky behaviours. Furthermore, individuals may greatly benefit from using this period of confinement to invest in self-care, prudence, and planning for a post-COVID world. These skills, that are developed under current crisis context, may also instil resilience and equip individuals to deal with crisis scenarios in the future.

The mindfulness practices illustrated in this paper may provide a novel and humble beginning for individuals who find themselves confined and unable to engage in regular forms of physical activity. It is hoped that these practices would help individuals regain a sense of tranquility whilst simultaneously allaying the detrimental effects of COVID-19 confinement, physical inactivity, and sedentarism. In doing so, it should be noted that the two mindfulness practices introduced in this paper are only for illustration purposes and that there are numerous other ways to learn and practice mindfulness in daily life. Considering the current apathy, uncertainty, and hopelessness coupled with a range of psychophysiological constraints that current COVID-19 confinement has caused around the world, the purpose of this paper was to introduce two effective mindfulness practices that individuals can readily adopt and benefit from in their significantly altered COVID-19 confined lives.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- An, Y., Huang, Q., Zhou, Y., Zhou, Y., & Xu, W. (2019). Who can get more benefits? Effects of mindfulness training in long-term and short-term male prisoners. *International Journal of Offender Therapy and Comparative Criminology*, 63(13), 2318–2337. [10.1177/0306624x19846771](https://doi.org/10.1177/0306624x19846771).
- Andersen, M., & Waterson, A. (2017). A brief impressionistic history of paying attention: The roots of mindfulness. In S. Zizzi, & M. Andersen (Eds.), *Being mindful in sport and exercise psychology: Pathways for practitioners and students* (p. 15). Fit Publishing.
- Barger, M., Weinrich, S., Bormann, J., Bouvier, M., & Hardin, S. (2015). Mantram repetition program decreases insomnia among homeless women: A pilot study. *Journal of Psychosocial Nursing and Mental Health Services*, 53(6), 44–49. [10.3928/02793695-20150526-03](https://doi.org/10.3928/02793695-20150526-03).
- Barnes, S., Brown, K., Krusemark, E., Campbell, W., & Rogge, R. (2007). The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy*, 33, 482–500. [10.1111/j.1752-0606.2007.00033.x](https://doi.org/10.1111/j.1752-0606.2007.00033.x).
- BBC Sport (2020). Coronavirus: How the virus has impacted sporting events around the world. <https://www.bbc.com/sport/15605235> [Accessed August 31, 2021].
- Beck, D., Holt, Cosco, Burkard, L., Andrews, J., Liu, T., Heppner, L., & Bormann, J. (2017). Efficacy of the mantram repetition program for insomnia in veterans with posttraumatic stress disorder: a naturalistic study. *Advances in Nursing Science*, 40(2), E1–E12. [10.1097/ans.0000000000000144](https://doi.org/10.1097/ans.0000000000000144).
- Bing-Canar, H., Pizzuto, J., & Compton, R. (2016). Mindfulness-of-breathing exercise modulates EEG alpha activity during cognitive performance. *Psychophysiology*, 53(9), 1366–1376. [10.1111/psyp.12678](https://doi.org/10.1111/psyp.12678).
- Bloch, W., Hall, M., & Steinacker, J. (2020). Sport in times of Corona. *German Journal of Sport Medicine*, 71(4), 83–84. [10.5960/dzsm.2020.432](https://doi.org/10.5960/dzsm.2020.432).
- Bormann, J., Becker, S., Gershwin, M., Kelly, A., Pada, L., Smith, T., & Gifford, A. (2006). Relationship of frequent mantram repetition to emotional and spiritual well-being in healthcare workers. *Journal of Continuing Education in Nursing*, 37(5), 218–224. [10.3928/00220124-20060901-02](https://doi.org/10.3928/00220124-20060901-02).
- Bormann, J., Gifford, A., Shively, M., Smith, T., Redwine, L., Kelly, A., Becker, S., Gershwin, M., Bone, P., & Belding, W. (2006). Effects of spiritual mantram repetition on HIV outcomes: a randomized controlled trial. *Journal of Behavioral Medicine*, 29(4), 359–376. [10.1007/s10865-006-9063-6](https://doi.org/10.1007/s10865-006-9063-6).
- Bormann, J., Thorp, S., Wetherell, J., & Golshan, S. (2008). A spiritually based group intervention for combat veterans with posttraumatic stress disorder. *Journal of Holistic Nursing*, 26(2), 109–116. [10.1177/0898010107311276](https://doi.org/10.1177/0898010107311276).
- Bormann, J., Thorp, S., Wetherell, J., Golshan, S., & Lang, A. (2013). Meditation-based mantram intervention for veterans with posttraumatic stress disorder: A randomized trial. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(3), 259–267. [10.1037/a0027522](https://doi.org/10.1037/a0027522).
- Bormann, J., Walter, K., Leary, S., & Glaser, D. (2017). An internet-delivered mantram repetition program for spiritual well-being and mindfulness for health care workers. *Spirituality in Clinical Practice*, 4(1), 64–73. [10.1037/scp0000118](https://doi.org/10.1037/scp0000118).
- Bormann, J., Weinrich, S., Allard, C., Beck, D., Johnson, B., & Holt, L. (2014). Mantram repetition: An evidence-based complementary practice for military personnel and veterans in the 21st century. *Annual Review of Nursing Research*, 32, 79–108. [10.1891/0739-6686.32.79](https://doi.org/10.1891/0739-6686.32.79).
- Bornemann, B., Herbert, B., Mehling, W., & Singer, T. (2015). Differential changes in self-reported aspects of interoceptive awareness through three months of contemplative training. *Frontiers in Psychology*, 5, 1504. [10.3389/fpsyg.2014.01504](https://doi.org/10.3389/fpsyg.2014.01504).
- Brown, R., & Gerbarg, P. (2005). Sudarshan Kriya yogic breathing in the treatment of stress, anxiety, and depression: Part I—neurophysiologic model. *The Journal of Alternative and Complementary Medicine*, 11(1), 189–201. [10.1089/acm.2005.11.189](https://doi.org/10.1089/acm.2005.11.189).
- Buttner, M., Bormann, J., Weingart, K., Andrews, T., Ferguson, M., & Afari, N. (2016). Multi-site evaluation of a complementary, spiritually-based intervention for veterans: The mantram repetition program. *Complementary Therapies in Clinical Practice*, 22, 74–79. [10.1016/j.ctcp.2015.12.008](https://doi.org/10.1016/j.ctcp.2015.12.008).
- Carmody, J., & Baer, R. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*, 31, 23–33. [10.1007/s10865-007-9130-7](https://doi.org/10.1007/s10865-007-9130-7).
- Chambers, R., Lo, B., & Allen, N. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research*, 32, 303–322. [10.1007/s10608-007-9119-0](https://doi.org/10.1007/s10608-007-9119-0).
- Chiesa, A., Calati, R., & Serretti, A. (2011). Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review*, 31, 449–464. [10.1016/j.cpr.2010.11.003](https://doi.org/10.1016/j.cpr.2010.11.003).
- Cho, H., Ryu, S., Noh, J., & Lee, J. (2016). The effectiveness of daily mindful breathing practices on test anxiety of students. *PLOS ONE*, 11(10), Article e0164822. [10.1371/journal.pone.0164822](https://doi.org/10.1371/journal.pone.0164822).
- Coffey, K., & Hartman, M. (2008). Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complementary Health Practice Review*, 13, 79–91. [10.1177/1533210108316307](https://doi.org/10.1177/1533210108316307).
- Cooper, N., Croft, R., Dominey, S., Burgess, A., & Gruzeliar, J. (2003). Exploring the role of alpha oscillations during externally vs. internally directed attention and the implications for idling and inhibition hypotheses. *International Journal of Psychophysiology*, 47, 65–74. [10.1016/S0167-8760\(02\)00107-1](https://doi.org/10.1016/S0167-8760(02)00107-1).
- Corcoran, K., Farb, N., Anderson, A., & Segal, Z. (2010). Mindfulness and emotion regulation: Outcomes and possible mediating mechanisms. In A. Kring, & D. Sloan (Eds.), *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment* (pp. 339–355). Guilford Press.
- Creswell, J., Lindsay, E., Villalba, D., & Chin, B. (2019). Mindfulness training and physical health. *Psychosomatic Medicine*, 81(3), 224–232. [10.1097/psy.0000000000000675](https://doi.org/10.1097/psy.0000000000000675).
- Dennis, M. (2020). The impact of COVID-19 on the world economy and higher education. *Enrollment Management Report*, 24(9), 3. [10.1002/emt.30720](https://doi.org/10.1002/emt.30720).
- Easwaran, E. (2008). *The Mantram handbook: A practical guide to choosing your Mantram and calming your mind*. Nilgiri Press.
- Easwaran, E. (2013). *Strength in the storm: Transform stress, live in balance and find peace of mind*. Nilgiri Press.
- Ellul, M., Benjamin, L., Singh, B., Lant, S., Michael, B., Easton, A., ... Solomon, T. (2020). Neurological associations of COVID-19. *The Lancet Neurology*, 19(9), 767–783. [10.1016/s1474-4422\(20\)30221-0](https://doi.org/10.1016/s1474-4422(20)30221-0).
- Farb, N., Daubenmier, J., Price, C., Gard, T., Kerr, C., Dunn, B., Klein, A., Paulus, M., & Mehling, W. (2015). Interoception, contemplative practice, and health. *Frontiers in Psychology*, 6, 10.3389/fpsyg.2015.00763.
- Farias, M., & Wikholm, C. (2018). Has the science of mindfulness lost its mind? *BJPsych Bulletin*, 40(6), 329–332. [10.1192/pb.bp.116.053686](https://doi.org/10.1192/pb.bp.116.053686).
- Feruglio, S., Matiz, A., Grecucci, A., Pascut, S., Fabbro, F., & Crescentini, C. (2020). Differential effects of mindfulness meditation conditions on repetitive negative thinking and subjective time perspective: A randomized active-controlled study. *Psychology & Health*, 1–24. [10.1080/08870446.2020.1836178](https://doi.org/10.1080/08870446.2020.1836178).
- Fissler, M., Winnebeck, E., Schroeter, T., Gummersbach, M., Huntenburg, J., Gaertner, M., & Barnhofer, T. (2016). An investigation of the effects of brief mindfulness training on self-reported interoceptive awareness, the ability to decenter, and their role in the reduction of depressive symptoms. *Mindfulness*, 7(5), 1170–1181. [10.1007/s12671-016-0559-z](https://doi.org/10.1007/s12671-016-0559-z).
- Fox, K., & Cahn, B. (2018). *Meditation and the brain in health and disease*. <https://doi.org/10.31231/osf.io/m2sez>.
- Gao, J., Fan, J., Wu, B.-W., Halkias, G., Chau, M., Fung, P., Chang, C., Zhang, Z., Hung, Y.-S., & Sik, H. (2017). Repetitive religious chanting modulates the late-stage brain response to fear- and stress-provoking pictures. *Frontiers in Psychology*, 7, 2055. [10.3389/fpsyg.2016.02055](https://doi.org/10.3389/fpsyg.2016.02055).
- Gao, J., Leung, H., Wu, B.-W., Skouras, S., & Sik, H. (2019). The neurophysiological correlates of religious chanting. *Scientific Reports*, 9(1), 4262. [10.1038/s41598-019-40200-w](https://doi.org/10.1038/s41598-019-40200-w).
- Goldberg, S., Riordan, K., Sun, S., & Davidson, R. (2021). The empirical status of mindfulness-based interventions: A systematic review of 44 meta-analyses of randomized controlled trials. *Perspectives on Psychological Science*, Article 174569162096877. [10.1177/1745691620968771](https://doi.org/10.1177/1745691620968771).
- Goldin, P., & Gross, J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion*, 10, 83–91. [10.1037/a0018441](https://doi.org/10.1037/a0018441).

- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*, 35–43. [10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7).
- Gupta, A. (1962). The Meanings of “That Thou Art. *Philosophy East and West, 12*(2), 125–134. [10.2307/1397392](https://doi.org/10.2307/1397392).
- Howell, A., Digdon, N., Buro, K., & Sheptycki, A. (2008). Relations among mindfulness, well-being, and sleep. *Personality and Individual Differences, 45*(8), 773–777. [10.1016/j.paid.2008.08.005](https://doi.org/10.1016/j.paid.2008.08.005).
- Hyland, T. (2017). McDonaldizing spirituality: Mindfulness, education, and consumerism. *Journal of Transformative Education, 15*(4), 334–356. [10.1177/1541344617696972](https://doi.org/10.1177/1541344617696972).
- Jha, A., Stanley, E., Kiyonaga, A., Wong, L., & Gelfand, L. (2010). Examining the protective effects of mindfulness training on working memory capacity and affective experience. *Emotion, 10*, 54–64. [10.1037/a0018438](https://doi.org/10.1037/a0018438).
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chaplea, M.-A., Paquin, K., & Hofmann, S. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763–771. [10.1016/j.cpr.2013.05.005](https://doi.org/10.1016/j.cpr.2013.05.005).
- Kiken, L., & Shook, N. (2012). Mindfulness and emotional distress: The role of negatively biased cognition. *Personality and Individual Differences, 52*(3), 329–333. [10.1016/j.paid.2011.10.031](https://doi.org/10.1016/j.paid.2011.10.031).
- Kohl, H., Craig, C., Lambert, E., Inoue, S., Alkandari, J., Leetongin, G., & Kahlmeier, S. (2012). The pandemic of physical inactivity: Global action for public health. *The Lancet, 380*(9838), 294–305. [10.1016/S0140-6736\(12\)60898-8](https://doi.org/10.1016/S0140-6736(12)60898-8).
- Kral, T., Schuyler, B., Mumford, J., Rosenkranz, M., Lutz, A., & Davidson, R. (2018). Impact of short- and long-term mindfulness meditation training on amygdala reactivity to emotional stimuli. *NeuroImage, 181*, 301–313. [10.1016/j.neuroimage.2018.07.013](https://doi.org/10.1016/j.neuroimage.2018.07.013).
- Larson, M., Steffen, P., & Primosch, M. (2013). The impact of a brief mindfulness meditation intervention on cognitive control and error-related performance monitoring. *Frontiers in Human Neuroscience, 7*, 1–12. [10.3389/fnhum.2013.00308](https://doi.org/10.3389/fnhum.2013.00308).
- Lavrencic, L., Donovan, T., Moffatt, L., Keiller, T., Allan, W., Delbaere, K., & Radford, K. (2021). Ngarranga Giinganay (“thinking peacefully”): Co-design and pilot study of a culturally-grounded mindfulness-based stress reduction program with older first nations Australians. *Evaluation and Program Planning, 87*, Article 101929. [10.1016/j.evalprogplan.2021.101929](https://doi.org/10.1016/j.evalprogplan.2021.101929).
- Lei Chui, P., Wai, S., Lai, L. L., See, M., & Tan, S. B. (2021). Mindful breathing: Effects of a five-minute practice on perceived stress and mindfulness among patients with cancer. *Clinical Journal of Oncology Nursing, 25*(2), 174–180. [10.1188/21.cjon.174-180](https://doi.org/10.1188/21.cjon.174-180).
- Liang, L., Ren, H., Cao, R., Hu, Y., Qin, Z., Li, C., & Mei, S. (2020). The effect of COVID-19 on youth mental health. *Psychiatric Quarterly, 91*(3), 841–852. [10.1007/s1126-020-09744-3](https://doi.org/10.1007/s1126-020-09744-3).
- Lomas, T., Cartwright, T., Edginton, T., & Ridge, T. (2014). A qualitative analysis of experiential challenges associated with meditation practice. *Mindfulness, 6*, 848–860. [10.1007/s12671-014-0329-8](https://doi.org/10.1007/s12671-014-0329-8).
- Lopez, D. (2008). *Buddhism and science: A guide for the perplexed*. University of Chicago Press.
- Lopez, D. (2012). *The scientific Buddha: His short and happy life*. Yale University Press.
- McKim, R. (2008). Rumination as a mediator of the effects of mindfulness: Mindfulness-based stress reduction (MNSR) with a heterogeneous community sample experiencing anxiety, depression, and/or chronic pain. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 68*(11-B), 7673.
- Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition, 18*, 176–186. [10.1016/j.concog.2008.12.008](https://doi.org/10.1016/j.concog.2008.12.008).
- Nardi, W., Harrison, A., Saadeh, F., Webb, J., Wentz, A., & Loucks, E. (2020). Mindfulness and cardiovascular health: Qualitative findings on mechanisms from the mindfulness-based blood pressure reduction (MB-BP) study. *PLOS ONE, 15*(9), Article e0239533. [10.1371/journal.pone.0239533](https://doi.org/10.1371/journal.pone.0239533).
- Ng, C., Lai, K., Tan, S., Sulaiman, A., & Zainal, N. (2016). The effect of 5 minutes of mindful breathing to the perception of distress and physiological responses in palliative care cancer patients: A randomized controlled study. *Journal of Palliative Medicine, 19*(9), 917–924. [10.1089/jpm.2016.0046](https://doi.org/10.1089/jpm.2016.0046).
- Nieman, D., & Wentz, L. (2019). The compelling link between physical activity and the body's defense system. *Journal of Sport and Health Science, 8*(3), 201–217. [10.1016/j.jshs.2018.09.009](https://doi.org/10.1016/j.jshs.2018.09.009).
- Ozemek, C., Lavie, C., & Rognmo, Ø. (2019). Global physical activity levels - Need for intervention. *Progress in Cardiovascular Diseases, 62*(2), 102–107. [10.1016/j.pcad.2019.02.004](https://doi.org/10.1016/j.pcad.2019.02.004).
- Pascoe, M., de Manincor, M., Tseberja, J., Hallgren, M., Baldwin, P., & Parker, A. (2021). Psychological mechanisms underlying the mood benefits of meditation: A narrative review. *Comprehensive Psychoneuroendocrinology, 6*, Article 100037. [10.1016/j.cpnec.2021.100037](https://doi.org/10.1016/j.cpnec.2021.100037).
- Pillay, L., Janse van Rensburg, D., Jansen van Rensburg, A., Ramagole, D., Holtzhausen, L., Dijkstra, H., & Cronje, T. (2020). Nowhere to hide: The significant impact of coronavirus disease 2019 (COVID-19) measures on elite and semi-elite South African athletes. *Journal of Science and Medicine in Sport, 23*, 670–679. [10.1016/j.jsams.2020.05.016](https://doi.org/10.1016/j.jsams.2020.05.016).
- Pfefferbaum, B., & North, C. (2020). Mental health and the COVID-19 pandemic. *New England Journal of Medicine, 383*(6), 510–512. [10.1056/nejmp2008017](https://doi.org/10.1056/nejmp2008017).
- Pratt, M., Ramirez Varela, A., Salvo, D., Kohl, H., & Ding, D. (2019). Attacking the pandemic of physical inactivity: What is holding us back? *British Journal of Sports Medicine, 54*(13), 760–762. [10.1136/bjsports-2019-101392](https://doi.org/10.1136/bjsports-2019-101392).
- Purser, R. (2019). *McMindfulness: How mindfulness became the new capitalist spirituality*. Repeater Books.
- Radhakrishnan, S., & Moore, C. (1957). *A source book in Indian philosophy*. Princeton University Press.
- Ramel, W., Goldin, P., Carmona, P., & McQuaid, J. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research, 28*, 433–455. [10.1023/B:COTR.0000045557.15923.96](https://doi.org/10.1023/B:COTR.0000045557.15923.96).
- Roychowdhury, D. (2019). Spiritual well-being in sport and exercise psychology. *SAGE Open, 9*(1), 1–6. [10.1177/2158244019837460](https://doi.org/10.1177/2158244019837460).
- Roychowdhury, D. (2020). 2019 novel coronavirus disease, crisis, and isolation. *Frontiers in Psychology, 11*, 1958. [10.3389/fpsyg.2020.01958](https://doi.org/10.3389/fpsyg.2020.01958).
- Roychowdhury, D. (2020). Using physical activity to enhance health outcomes across the life span. *Journal of Functional Morphology and Kinesiology, 5*(1), 1–13. [10.3390/jfmk5010002](https://doi.org/10.3390/jfmk5010002).
- Roychowdhury, D. (2021). *Understanding psychobehavioural responses during crisis: An evolutionary sport, exercise, and health psychology perspective*[manuscript submitted for publication].
- Roychowdhury, D. (2021). *Understanding mindfulness in sport, exercise, and performance psychology*. In J. Shapiro (Ed.), *Routledge encyclopedia of psychology in the real world*. Routledge.
- Roychowdhury, D. (2021). Mindfulness: Spiritual transcendence or neoliberal scam. *Journal of Meditation*. UID: jmdtn/drdevroychowdhury/mindfulness.x2 <https://www.drdevroy.com/mindfulness-x2>. [Accessed August 31, 2021].
- Roychowdhury, D. (2021). Moving mindfully: The role of mindfulness practice in physical activity and health behaviours. *Journal of Functional Morphology and Kinesiology, 6*(1), 19. [10.3390/jfmk6010019](https://doi.org/10.3390/jfmk6010019).
- Roychowdhury, D. (2021). *Considerations in contemporary mindfulness research and practice*. [manuscript submitted for publication].
- Roychowdhury, D., Ronkainen, N., & Guinto, M. (2021). The transnational migration of mindfulness: A call for reflective pause in sport and exercise psychology. *Psychology of Sport and Exercise, 56*, Article 101958. [10.1016/j.psychsport.2021.101958](https://doi.org/10.1016/j.psychsport.2021.101958).
- Samuel, R., Tenenbaum, G., & Galily, Y. (2020). The 2020 coronavirus pandemic as a change-event in sport performers' careers: Conceptual and applied practice considerations. *Frontiers in Psychology, 11*, Article 567966. [10.3389/fpsyg.2020.567966](https://doi.org/10.3389/fpsyg.2020.567966).
- Saricali, M., Satici, S., Satici, B., Gocet-Tekin, E., & Griffiths, M. (2020). Fear of COVID-19, mindfulness, humor, and hopelessness: A multiple mediation analysis. *International Journal of Mental Health and Addiction, 10*. [10.1007/s11469-020-00419-5](https://doi.org/10.1007/s11469-020-00419-5).
- Schinke, R., Papaioannou, A., Henriksen, K., Si, G., Zhang, L., & Haberl, P. (2020). Sport psychology services to high performance athletes during COVID-19. *International Journal of Sport and Exercise Psychology, 18*(3), 269–272. [10.1080/1612197X.2020.1754616](https://doi.org/10.1080/1612197X.2020.1754616).
- Schinke, R., Stambulova, N., Si, G., & Moore, Z. (2018). International Society of Sport Psychology position stand: Athletes' mental health, performance, and development. *International Journal of Sport & Exercise Psychology, 16*(6), 622–639. [10.1080/1612197X.2017.1295557](https://doi.org/10.1080/1612197X.2017.1295557).
- Schmalzl, L., Powers, C., & Henje Blom, E. (2015). Neurophysiological and neurocognitive mechanisms underlying the effects of yoga-based practices: Towards a comprehensive theoretical framework. *Frontiers in Human Neuroscience, 9*, 235. [10.3389/fnhum.2015.00235](https://doi.org/10.3389/fnhum.2015.00235).
- Shapiro, D. (1992). Adverse effects of meditation: A preliminary investigation of long-term meditators. *International Journal of Psychosomatics, 39*, 62–67.
- Sharma, M. (2013). Yoga as an alternative and complementary approach for stress management. *Journal of Evidence-Based Complementary & Alternative Medicine, 19*(1), 59–67. [10.1177/2156587213503344](https://doi.org/10.1177/2156587213503344).
- Sivaraman, K. (1989). *Hindu spirituality: Vedas through Vedanta*. Motilal Banarasisass Publishers.
- Siegel, D. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being*. Norton.
- Siegel, D. (2009). Mindful awareness, mindsight, and neural integration. *The Humanistic Psychologist, 37*, 137–158. [10.1080/08873260902892220](https://doi.org/10.1080/08873260902892220).
- Studholme, A. (2002). *The origins of Om Manipadme Hum: A study of the Karandavyuha Sutra*. State University of New York Press.
- Taku, K., & Arai, H. (2020). Impact of COVID-19 on athletes and coaches, and their values in Japan: Repercussions of postponing the Tokyo 2020 Olympic and Paralympic games. *Journal of Loss and Trauma, 25*, 623–650. [10.1080/15325024.2020.1777762](https://doi.org/10.1080/15325024.2020.1777762).
- Ungunmerr, M. (2017). To be listened to in her teaching: Dadirri: Inner deep listening and quiet still awareness. *EarthSong Journal: Perspectives in Ecology, Spirituality and Education, 3*(4), 14–15. <https://search.informit.org/doi/10.3316/informit.732386012034745>.
- Van Dam, N., van Vugt, M., Vago, D., Schmalzl, L., Saron, C., Olendzki, A., Meissner, T., Lazar, S., Kerr, C., Gorchov, J., Fox, K., Field, B., Britton, W., Brefczynski-Lewis, J., & Meyer, D. (2017). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science, 13*(1), 36–61. [10.1177/1745691617709589](https://doi.org/10.1177/1745691617709589).
- Vonk, R., & Visser, A. (2021). An exploration of spiritual superiority: The paradox of self-enhancement. *European Journal of Social Psychology, 51*(1), 152–165. [10.1002/ejsp.2721](https://doi.org/10.1002/ejsp.2721).
- Wachs, K., & Cordova, J. (2007). Mindful relating: Exploring mindfulness and emotion repertoires in intimate relationships. *Journal of Marital and Family Therapy, 33*, 464–481. [10.1111/j.1752-0606.2007.00032.x](https://doi.org/10.1111/j.1752-0606.2007.00032.x).
- Webb, T. (2020). The future of officiating: Analysing the impact of COVID-19 on referees in world football. *Soccer & Society, 22*(1-2), 12–18. [10.1080/14660970.2020.1768634](https://doi.org/10.1080/14660970.2020.1768634).
- Wilson, J. (2014). *Mindful America: The mutual transformation of Buddhist meditation and American culture*. Oxford University Press.
- Wippert, P., & Wiebking, C. (2018). Stress and alterations in the pain matrix: A biopsychosocial perspective on back pain and its prevention and treatment. *International Journal of Environmental Research and Public Health, 15*(4), 785. [10.3390/ijerph15040785](https://doi.org/10.3390/ijerph15040785).
- World bank (2020). The global economic outlook during the COVID-19 pandemic: A changed world. <https://www.worldbank.org/en/news/feature/2020/06/08/the-global-economic-outlook-during-the-covid-19-pandemic-a-changed-world> [Accessed August 31, 2021].

- World Health Organization (2020). COVID-19 disrupting mental health services in most countries, WHO survey. <https://www.who.int/news/item/05-10-2020-covid-19-disrupting-mental-health-services-in-most-countries-who-survey> [Accessed August 31, 2021].
- World Health Organization (2020). COVID-19 Clinical management: Living guidance. <https://www.who.int/publications/i/item/WHO-2019-nCoV-clinical-2021-1> [Accessed August 31, 2021].
- World Health Organization (2020). Physical activity. <https://www.who.int/news-room/fact-sheets/detail/physical-activity> [Accessed August 31, 2021].
- Yong, J., Kim, J., Park, J., Seo, I., & Swinton, J. (2011). Effects of a spirituality training program on the spiritual and psychosocial well-being of hospital middle manager nurses in Korea. *Journal of Continuing Education in Nursing*, 42(6), 280–288. [10.3928/00220124-20101201-04](https://doi.org/10.3928/00220124-20101201-04).
- Yong, J., Park, J., Kim, J., Kim, P., Seo, I., & Lee, H. (2018). The effects of holy name meditation on spiritual well-being, depression, and anxiety of patients with cancer. *Journal of Hospice & Palliative Nursing*, 20(4), 368–376. [10.1097/njh.0000000000000451](https://doi.org/10.1097/njh.0000000000000451).
- World Health Organization (2020). WHO Coronavirus (COVID-19) Dashboard. <https://covid19.who.int> [Accessed September 29, 2021].