THE EFFECTS OF AN ONLINE BRIEF MINDFULNESS ACTIVITIES TRAINING ON THE PSYCHOLOGICAL FUNCTIONING OF MEDICAL OFFICERS: A PILOT STUDY

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DECLARATION

I hereby declare that the work in this thesis is my own work, except for quotations and summaries which have been duly acknowledged. And to the best of my knowledge, it does not contain any materials previously published or written by another person except where sources are properly acknowledged in the text; and that it has not been submitted in part or in whole to fulfil the requirements of any other subject or course or for a degree or diploma or certificate in any university. In making this declaration, I hereby understand and acknowledge any breaches of the declaration constitute an academic misconduct which may lead to my exclusion and/or expulsion from the programme and/or Master's degree.

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ABSTRACT

Empirical evidence suggested that psychological interventions can be successfully delivered online. Medical officers are under high levels of stress as the main frontliners managing the COVID-19 pandemic alongside their day-to-day roles, family obligations, and research work. This study aimed to examine whether a brief mindfulness activities training for medical officers improve outcomes for depression, anxiety, stress and mindfulness. A randomized, controlled trial (RCT) was conducted at Hospital *Universiti Sains Malaysia* where participants were randomly assigned to one of four groups of (1) low frequency intervention group (daily session over a week), (2) medium frequency intervention group (daily session over two weeks), (3) high frequency intervention group (daily session over three weeks) or (4) the control group. Outcome measures included the Depression, Anxiety, and Stress Scale (DASS-21) and the Mindful Attention Awareness Scale (MAAS). Of the 22 participants, an increase in mindfulness, as measured by the MAAS, was found in the intervention group (p = 0.002). There was also a reduction in depression levels (p = 0.01) as measured by the DASS-21. The increase in mindfulness was observed in the low frequency and high frequency group, while the reduction of depression levels could not be observed between frequency groups. Participants self-reported increased relaxation and stress reduction. This study provides insights into the feasibility and acceptability of an online, brief mindfulness activities training for medical officers. Findings will inform the future design and implementation of larger studies.

Keywords: online mindfulness interventions, medical officers, frequency, mindfulness, psychological wellbeing

ABSTRAK

Bukti empirikal menunjukkan bahawa intervensi psikologi dapat berjaya dihantar dalam talian. Pegawai perubatan berada di bawah tahap tekanan yang tinggi sebagai barisan hadapan utama yang menangani pandemi COVID-19 di samping peranan mereka sehari-hari, tanggungjawab keluarga, dan kerja penyelidikan. Kajian ini bertujuan untuk mengkaji kesan daripada latihan aktiviti kesedaran singkat untuk pegawai perubatan atas kemurungan, kegelisahan, tekanan dan kesedaran. Percubaan terkawal secara rawak (*Randomized controlled trial*) dilakukan di Hospital Universiti Sains Malaysia di mana para peserta ditugaskan secara rawak kepada salah satu daripada empat kumpulan (1) kumpulan intervensi frekuensi rendah (sesi harian selama seminggu), (2) kumpulan intervensi frekuensi sederhana (setiap hari sesi selama dua minggu), (3) kumpulan intervensi frekuensi tinggi (sesi harian selama tiga minggu) atau (4) kumpulan kawalan. Ukuran hasil termasuk Skala Depresi, Kecemasan, dan Tekanan (DASS-21) dan Skala Kesedaran Perhatian Mindful (MAAS). Daripada 22 peserta, perbezaan yang signifikan didapati antara kumpulan intervensi dan kumpulan kawalan atas tahap kesedaran ($p = 0.002$), dan tahap kemurungan secara keseluruhan ($p = 0.01$). Peningkatan tahap kesedaran didapati di dalam kumpulan interventsi frekuensi rendah dan frekuensi tinggi, tetapi penurunan tahap kemurungan tidak didapati di antara kumpulan-kumpulan intervensi. Peserta melaporkan peningkatan dalam daya untuk relaks dan penurunan tekanan diri. Kajian ini memberi gambaran mengenai kemungkinan dan penerimaan latihan aktiviti dalam talian yang ringkas untuk pegawai perubatan. Penemuan akan memberitahu rancangan masa depan untuk pelaksanaan kajian yang lebih besar.

Kata kunci: Intervensi kesedaran minda atas talian, pegawai perubatan, frekuensi, kesedaran minda, kesihatan minda

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LISTS OF ABBREVIATIONS

APA	American Psychological Association
CBT	Cognitive-behavioral therapy
CFI	Comparative fit index
COVID-19	Coronavirus disease 2019
DASS-21	21-item Depression, Anxiety, and Stress Scale
FDI	Future Disposition Inventory
FFMQ	Five-Facets Mindfulness Questionnaire
GFI	Goodness-of-fit index
GHQ	General Health Questionnaires
KIMS	Kentucky Inventory of Mindfulness Skills
MAAS	Mindful Attention Awareness Scale
MANOVA	Multivariate analysis of variance
MAT	Monitor and Acceptance Theory
MBCT	Mindfulness-Based Cognitive Therapy
MBIs	Mindfulness-based Interventions
MBSR	Mindfulness-Based Stress Reduction
MCO	Movement Control Order
MMT	Mindfulness-to-Meaning Theory
PANAS	Positive Affect Negative Affects Scale
PHQ-9	Patient Health Questionnaire-9
PTSD	Post-Traumatic Stress Disorder
RMSEA	Root mean square error of approximation
SAEI	Suicide Anger Expression Inventory
SCMS	Self Control and Self-Management Scale

SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Residual
UPM	*Universiti Putra Malaysia*
USM	*Universiti Sains Malaysia*
WHO	World Health Organization

LIST OF SYMBOLS

-	minus
=	equal
<	less than
>	more than
*	asterisks; indicates statistical significance
%	percentage
df	degree of freedom
M	mean
SD	standard deviation
SE	standard error
N	total number of cases
α	alpha
d	cohen's d; indicates effect size
F	F-distribution test statistic
P	probability value
r	estimate of pearson product-moment correlation coefficient
T	t-test statistic
χ^2	chi-square
z	z-statistic; standard score

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The coronavirus disease 2019 (COVID-19) remains to show no signs of stopping, and as of 6th March 2021, registered more than 110 million cases with the death toll exceeding 2 million (World Health Organization, 2021). In Malaysia alone, more than 310 thousand cases have been confirmed from the latest wave since October 2020 (World Health Organization, 2021). Preliminary literature depicts a worrying trend of increased workload, physical exhaustion, isolation, stigmatization, trauma, and a high risk of stress or burnout amongst medical officers (Buselli et al., 2021). The paper alluded that the situation was contributed by a lack of information available about the virus, high transmission rates, fears of exposing family members to the virus, and emotional strain from conveying to surviving family members the death of COVID-19 cases. As such, the prevalence for common mental health disorders such

as depression, anxiety, and post-traumatic stress disorder (PTSD) were three to five times higher in medical officers compared to those who are unaffected by the pandemic (Cénat et al., 2021). Precautionary measures taken to manage the pandemic has deemed that psychological interventions or support for this population had to be conducted without physical contact, were flexible in nature, and brief to accommodate medical officers' other commitments. Studies show promise for mindfulness interventions for clinical and non-clinical populations for psychological improvements and wellbeing (Linardon, 2019), particularly in areas of depression and anxiety (Goldberg, et al., 2018; Goyal, et al., 2014; Khoury, et al., 2013). This paper presents the implementation of a brief mindfulness activities training delivered via an online platform to improve the wellbeing of medical officers in the midst of the COVID-19 pandemic.

1.2 BACKGROUND

Medical officers belong to a vulnerable group with a higher risk of mental health disorders due to multiple stressors. In a systematic review and meta-analysis by Frajerman, Morvan, Krebs, Gorwood, and Chaumette (2019) the prevalence of burnout in the population was found to be 44.2% regardless of gender, with academic stress and working conditions contributing to the phenomena. Similarly, medical officers in the midst of postgraduate studies were noted to be at risk for burnout, anxiety, and depression across countries of France, India, and Malaysia (Fond, et al., 2019; Shete & Garkal, 2015; Yusoff & Rahim, 2010). In Yusoff and Rahim's study (2010) they were described to have a prevalence of distress at 36.36% directly attributed to stressors from academics, work performance, and poor relationships (with family members and work supervisors). This is a concern as the numbers are higher than the reported prevalence

of mental health problems among adults (29.2%) from the general Malaysian population (Malaysian Healthcare Performance Unit, 2017). Taken together, these alarming signs indicate that medical officers are faced with a tremendous and increasing amount of stress that represents a need for the development of an intervention to implement appropriate coping skills.

As of March 2021, the coronavirus disease 2019 pandemic known as COVID-19 has breached all six continents in the world with diagnosed cases and deaths resulting in climbing mortality rates (World Health Organization, 2020). At the time of writing, the COVID-19 originating from Wuhan, China has been effectively curbed while the highest number of cases is recorded in the United States of America (World Health Organization, 2020). In Malaysia, a lockdown in the form of a Movement Control Order (MCO) was ordered on 16th March and extended three times up until May 2020. A second and third wave of the pandemic resulted in various controlled movement impositions that are currently maintained as precautionary measures. The challenges faced by healthcare workers that include medical officers include a high risk of exposure to the virus, adaptation to new hospital statements and guidelines, grey areas in decision making, and ethical dilemmas in the form of limited ventilations and its use on identified patients (Abdullah, et al., 2020). In China, 53.8% of national survey respondents admitted to moderate or severe psychological impact from the outbreak (Wang, et al., 2020), while in Malaysia an upsurge in mental health disorders is expected (Shanmugam, Juhari, Nair, Ken, & Guan, 2020). The uncertainties of day-to-day witnessing of the COVID-19 pandemic casualties on top of academic and work stressors are likely to lead to a psychological impact for medical officers as frontliners.

A plethora of studies have found the efficacy in utilizing mindfulness interventions to improve psychological wellbeing (Linardon, 2019). Goldberg et al. (2018) found results that

suggested the efficacy of mindfulness-based therapies to be equivalent to firstline psychological interventions and other evidence-based therapies such as cognitive-behavioral therapy (CBT) and antidepressant medications. The development of mindfulness skills result in enhanced awareness, insight, and acceptance of experiences that contribute towards positive outcomes and enhance measures of resilience (Gu , Strauss, Bond, & Cavanagh, 2015; Joyce, et al., 2018).

In light of the efficacy of mindfulness interventions, a number of studies have attempted to implement the delivery of such skills via online interventions. Similar impact was observed onto psychological outcomes such as depression, anxiety, mindfulness, wellbeing, and stress (Spijkerman, Pots, & Bohlmeijer, 2016). An online intervention would also be appropriate as the population remains vigilant in precautionary measures during the COVID-19 pandemic. In conjunction with studies observing benefits from brief mindfulness interventions (Howarth, Smith, Perkins-Porras, & Ussher, 2019), a local study further supported the use of interventions with medical students for a duration up to four weeks with significant larger effects (Yusoff, 2014). To further advance the finesse of mindfulness interventions, studies have urged for research on the specific dosage of mindfulness interventions (Howarth, Smith, Perkins-Porras, & Ussher, 2019; Linardon, 2019).

Taking these accounts into consideration, an online brief mindfulness intervention package that can benefit medical officers by improving their resilience and psychological wellbeing in the face of multiple diversities is suggested. It will allow medical officers to apply mindfulness skills in the midst of the COVID-19 pandemic as frontliners in an already stressful workplace environment, and help them to be aware of their emotional states to apply mindfulness activities when needed. The identification of appropriate intervention dosage will

act as a safeguard against exhaustion or burnout from an extensive and long intervention for medical officers. Additionally, the intervention package can also be utilized with limited costs and manpower required with no mandatory geographic location.

The proposed study aims to deliver an online, brief mindfulness training on medical officers to determine its effect on psychological functioning. Positive findings could contribute to a standardized online mindfulness training activity suitable for the medical officers among the Malaysian population. Additionally, the study aims to address the gap in literature identified by Howarth et al. (2019) and Linardon et al. (2019) in determining the appropriate dosage of interventions to achieve its maximum potential through a longitudinal study design.

1.3 RATIONALE AND PROBLEM STATEMENT

There is a plethora of research evidencing enhanced mindfulness and improved psychological outcomes from brief mindfulness interventions or training. The research literature in the subsequent chapter will highlight the positive effect sizes recorded and discuss its implications. However, there are several literature gaps that remains to be addressed.

Firstly, there is a lack of studies investigating the effects of mindfulness interventions or training delivered via an online platform in Malaysia. Online access to psychological training presents multiple benefits in relation to convenience and wider engagement with potential audiences (Jayawardene, Lohrmann, Erbe, & Torabi, 2017). A local adaptation to mindfulness interventions known as "Mindful-Gym" has only been limited to medical students in *Universiti Putra Malaysia* (UPM) (Keng, Phang, & Oei, 2015), and has yet to be delivered

online. To date, only one study observed the effects of an online mindfulness intervention delivered to medical students in Australian rural areas. Moore, et al. (2020) suggested that the intervention was feasible with positive and ongoing changes observed from brief weekly mindfulness practices. Meanwhile in Malaysia, only one study observed the effects of an online, "ultra-brief" single-session mindfulness intervention onto the general public with results suggestive of feasible application to improve mental health (K. S. Pheh et al., 2020). In other words, the findings were yet to be generalized and applied to healthcare workers, nor the medical officers assumed in this study during the COVID-19 pandemic.

The second problem statement can be deduced from the lack of research on appropriate intervention dosage or length for mindfulness interventions. Stand-alone measures of mindfulness interventions such as mindful breathing was observed to be beneficial for measures of anxiety and depression (Blanck et al., 2018; Shuai et al., 2020), but no conclusion was made regarding the recommended length or dosage of such interventions. Klingbeil et al. (2017) observed that intervention dosage was not meaningfully associated with effects of mindfulness interventions, but the sample mentioned was a group of adolescents. Similarly, some studies recommended for further exploration of the an appropriate intervention dosage for better study outcomes (Barrett & Stewart, 2021; Howarth et al., 2019; Linardon & Fuller-Tyszkiewicz, 2020; Lindsay & Creswell, 2019). Therefore, this study attempts to further investigate and explore the research gap.

The COVID-19 pandemic has led to real and challenging mental crisis for the Malaysia population on top of physical, economic, and social challenges. The MCO is a necessary precaution against greater spread of the virus. However, this places a greater risk to mental health exists from erroneous thinking, disrupted daily functioning, and restricted movement in

the midst of unlimited access to online updates with unverifiable sources. Potential disastrous consequences include emotional disturbances, lowered physical immunity, poor social relationships and overall functioning. Mindfulness interventions recognize the need for people to take a pause mentally in this critical period by simple steps of noticing and being present in any daily actions. Based on research, a brief mindfulness training for Malaysian healthcare workers, especially medical officers would be helpful in psychological outcomes that would improve other domains especially psychological wellbeing. There is no research available to understand the precedence of this unique period in all of human history, and therefore the feasibility or effect of such an exercise conducted via the online platform is unknown. Additionally, limited findings are available on the association between therapeutic dose and study effects. Recommendations called for small doses of mindfulness interventions applied gradually increasing over time to explore this research gap (Howarth, Smith, Perkins-Porras, & Ussher, 2019). Mental health and psychosocial support that can be incorporated using online platform for example among this vulnerable group of frontliners is urgently needed. Designing an intervention program that is feasible, convenient, acceptable, and efficient can provide a strong impact that translates into better management of the international pandemic crisis.

1.4 RESEARCH QUESTIONS

This study aims to investigate the effect of mindfulness activities training conducted via online platform on psychological functioning of medical officers.

Specifically, research questions are:

(i) Is it feasible to deliver a mindfulness activities training on an online platform?

(ii) What are the differences in the effects of mindfulness activities training on the participants' level of depression, anxiety, stress, and mindfulness before and after the training?

(iii) What are the differences in the effects of the mindfulness activities training when they are performed at different frequencies and length of period?

1.5 OBJECTIVES OF THE STUDY

General Objectives

1. To establish a brief mindfulness activities training administered via an online platform.
2. To examine the effects of mindfulness activities training administered on participants' levels of depression, anxiety, and stress before and after training.
3. To investigate the differences in the effects of mindfulness activities training administered via an online platform conducted at different frequencies and length of period.

1.6 SIGNIFICANCE OF STUDY

Extensive research has been applied to studies on mindfulness and its applications for relaxation, mood regulation, and cognitive improvement. However, few studies have applied such interventions onto the Malaysian population. Additionally, there is a dearth of information on online mindfulness studies in Malaysia. This research will present a new and innovative way of delivering a mindfulness activities training with minimal guidance. For instance, respondents can learn the application of mindfulness activities integrated with daily life instead

of relying on face-to-face psychological interventions that may not be available in times of need, such as during the COVID-19 pandemic. Through an online platform, respondents can learn such skills as if they are attending a private session with a trained professional. Trained participants may also use the online platform to refresh their mindfulness skills.

Additionally, this study provides a further understanding of the effects of differences in frequency and length of mindfulness interventions. Mindfulness trainers and participants may apply a suitable frequency and length of mindfulness activities to be applied to maximize the efficiency of the training program. On the other hand, this study will also provide information on combining several mindfulness training activities on psychological functioning.

This research is further expected to contribute to the research available on online intervention studies in the hopes that it may be considered a suitable approach for other populations that may not have access to full psychological services during emergencies or a pandemic. Particularly, how psychological functioning in aspects of depression, anxiety, and stress may be better managed during trying times.

1.7 VARIABLE DEFINITIONS

The independent variables of this study are: (i) Time (2 levels: pre- and posttest); (ii) group (2 levels: intervention and control); and (iii) frequency (3 levels: low, medium, and high). The dependent variables (DV) of this study are: (i) mindfulness; (ii) depression, anxiety, and stress.

Mindfulness. Mindfulness is defined as a state of awareness through the intentional attention on the present moment, in a non-judgmental and acceptive manner (J Kabat-Zinn, 1994). It is scored through the 15-item self-reported scale of Mindful Attention Awareness Scale (MAAS). Higher MAAS scores indicate higher mindfulness levels. In the present study, the main interest is to observe differences in levels of mindfulness through the MAAS scores in the pre- and post-measurements, where improvement is indicated by a significant increase in MAAS scores.

Depression. Depression is defined principally by a loss of self-esteem and motivation, with resulting low probabilities of achieving life goals that are significant to the individual . It is scored through the 7-items on the depression scale of 21-item Depression, Anxiety, and Stress Scale (DASS-21). Psychological functioning in the depression scale will be monitored via DASS-21 scores in the pre- and post-measurements. A reduction in the level of depression will be perceived through a significant decrease in the depression scale of DASS-21.

Anxiety. Anxiety is defined as the enduring state of anxiety as observed by situational anxiety, accompanied by an acute sense of fear. It is scored through the 7-items on the anxiety scale of DASS-21. Psychological functioning in the anxiety scale will be monitored via DASS-21 scores in the pre- and post-measurements. Similarly, a reduction in the level of anxiety will be perceived through a significant decrease in the anxiety scale of DASS-21.

Stress. Stress is measured by a persistent state of arousal and tension with low tolerance of becoming upset or frustrated, such as nervous tension and nervous energy. It is scored through the 7-items on the stress scale of DASS-21. Psychological functioning in the stress scale will be monitored via DASS-21 scores in the pre- and post-measurements. Similarly, a

reduction in the level of stress will be perceived through a significant decrease in the stress scale of DASS-21.

1.8 THEORETICAL APPROACH

Mindfulness has been conceptualized in numerous ways since its first mention in the late 19th century through early translations of Buddhist texts (Gethin, 2011) and subsequently to an exponential rise in interest of its applications in the 1990s. The term originated from the Pali language word *sati* that was literally "to remember", but thought to expand to include "to consistently remember", and "being-aware-of" (Brown et al., 2007). Most definitions to date emphasize on the attention and awareness component of mindfulness. In the Buddhist paradigm, it was believed that monitoring (*vipaśyanā*) was the key to increased lucid insight (*prajñā*). Further along the process, acceptance would then result in a betterment of suffering (*duhkha*) through the relief from cravings (*rāga*) and aversions (*dvesha*) (Young, 2016).

In the context of western clinical psychotherapy in the 1980s and 1990s, mindfulness is mainly associated with Jon Kabat-Zinn through his work in the Stress Reduction Clinic and Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts. The influences of Buddhist texts and beliefs upon his work can be observed through his definition of mindfulness as a state of awareness arising through attending to present-moment experience in a non-judgmental and acceptive manner (J Kabat-Zinn, 1994). This has led to the development of the Mindfulness-Based Stress Reduction (MBSR) by Kabat-Zinn and Mindfulness-Based Cognitive Therapy, or MBCT (Segal et al., 2002). In fact, a

number of clinical approaches such as the person-centered therapy (Rogers, 1961) and Gestalt therapy (Perls & Perls, 1973) emphasize the importance of the present-oriented consciousness to enjoy fullness in life.

The two main arguments regarding definitions of mindfulness have been about its unidimensionality or two-dimensional constructs. Researchers advocating a one-dimensional construct of mindfulness describes its core feature as the present-centered awareness and attention (Brown & Ryan, 2003), with awareness viewed as a subjective experience of perceiving internal and external events happening in the reality at any given moment and attention viewed as a redirecting of focus towards awareness to accept specific aspects of the reality (Brown et al., 2007). This resulted in the development on the Mindful Attention Awareness Scale (MAAS), a unidimensional scale that measures the attentional awareness component of mindfulness.

On the other hand, advocators of a two-dimensional construct of mindfulness opined that it has two distinct features of mindful attention and compassion or acceptance (Bishop et al., 2004; Lindsay & Creswell, 2017). Mindful attention referred to the ability to purposefully orient one's attention towards here-and-now experiences, whereas compassion or acceptance pertains to the ability to cultivate an attitude of receptivity and openness towards present-moment experiences. Inevitably other researchers arrived at the conclusion that mindfulness had more than two dimensions (Baer et al., 2004, 2006), which culminated in the development of self-report measures such as the Kentucky Inventory of Mindfulness Skills or KIMS (Baer et al., 2004), and the Five-Facets Mindfulness Questionnaire or FFMQ (Baer et al., 2006). Nonetheless, this paper observes the two-dimensional constructs of mindfulness by exploring two definitive theoretical models.

Mindfulness-to-Meaning Theory (MMT). Garland and colleagues' MMT model was developed in 2015 to provide a comprehensive theory connecting mindfulness and psychological wellbeing through mindful emotional regulation strategies. They proposed that mindfulness generates meaning (eudaimonic meaning) through two key pathways—reappraisal and savoring. This hypothesis was culminated through the integration of three separate models of mindfulness; the mindful coping model (Garland et al., 2009) with the upward spiral model of flourishing (Garland et al., 2017), the transaction model (Folkman & Lazarus, 1984) and the systems theory and cybernetics (Umpleby & Dent, 1999). Its core tenets include: (i) employing attentional control in the event of stress, (ii) decentering from appraisals in the midst of stress, (iii) broadening awareness to include internal and external sensory information, (iv) culminating new adaptive appraisals, and lastly (v) utilizing emotional regulation for life satisfaction (Garland et al., 2015a). The attentional control is a component shared by most researchers on mindfulness, with interventions wielding its usage through focused attention and open monitoring that results in decentering from appraisals (Garland et al., 2017). Decentering is a process of disengagement from internal experiences to reduce attention on emotionally arousing situations that results in stress, and instead focus on other sensory information (Garland et al., 2015a). This is similar to the process of "defusion" under the Acceptance and Commitment Therapy (Hayes et al., 2009). New, alternative appraisals are then introduced when one is able to view the situation in an acceptive stance through the previously stated processes. This results in a positive emotional regulation strategy that improves overall life satisfaction (Garland et al., 2015b).

Monitor and Acceptance Theory (MAT). The MAT was developed by Lindsay and Creswell (2017) in order to satisfy the theoretical gap between mindfulness mechanisms and

mindfulness-related outcomes. The basic mechanisms underlying the theory was postulated to be (i) attention monitoring, the training of sustained attention on internal and external sensations and (ii) acceptance, the key to emotional regulation through an umbrella term of "acceptance" that includes nonreactivity, equanimity, nonjudgment, openness, non-evaluative, and non-elaborative (Lindsay & Creswell, 2017). The acceptance component builds upon the MMT model by rejecting the idea of reappraisals lauded by the advocating researchers. The MAT posits that mindfulness is a nonelaborative awareness while reappraisals are of an elaborative process (Lindsay & Creswell, 2015). As such, the core tenets include (i) utilizing attention monitoring to trigger increased awareness of present-moment experiences which could enhance affects (whether positive, negative, or neutral), (ii) inducing acceptance through the regulation of one's reactivity to the experience, and (iii) uniting both components to regulate emotions. Attention monitoring was the pre-requisite for fostering acceptance while acceptance functions as the key component in mindfulness training for emotional regulation (Lindsay et al., 2018). The conceptual framework of the original MAT model is illustrated in **Figure 1.1**.

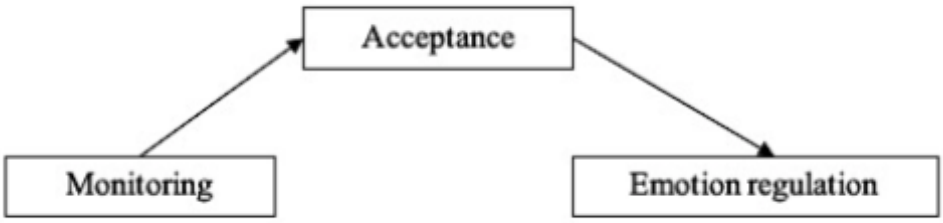

Figure 1.1 Path model illustrating the mechanism of mindfulness in emotional regulation, according to the MAT.

1.8.1 Relevance to the present study

The present study aims to develop and pilot an online mindfulness activities training program to measure the effects of this intervention on the levels of mindfulness, depression, anxiety, and stress among medical officers during the COVID-19 pandemic. It also intends to identify the appropriate intervention period to induce effects among the sample through varying interventions ranging from one-week to three-weeks. The intervention activities were adopted based on the definition of mindfulness by Kabat-Zinn (1994) and Bishop et al. (2004), which identifies a two-dimensional framework of mindfulness. Specifically, mindfulness activities were identified based on the present-moment awareness and acceptance components. The outcome of the pilot study will be measured using the MAAS as one of the most commonly used self-report measurement of mindfulness in Malaysia (Brown & Ryan, 2003). Additionally, the MAT (Lindsay & Creswell, 2017) that supports a bi-component construct of mindfulness will be utilized in understanding the process of mindfulness in its intervention and outcomes. Despite the relatively new introduction of the model and it is yet to be applied extensively through multiple research studies, the underlying theoretical ground was embedded based on models developed in the early stages of conceptualizing mindfulness.

1.9 CONCEPTUAL FRAMEWORK

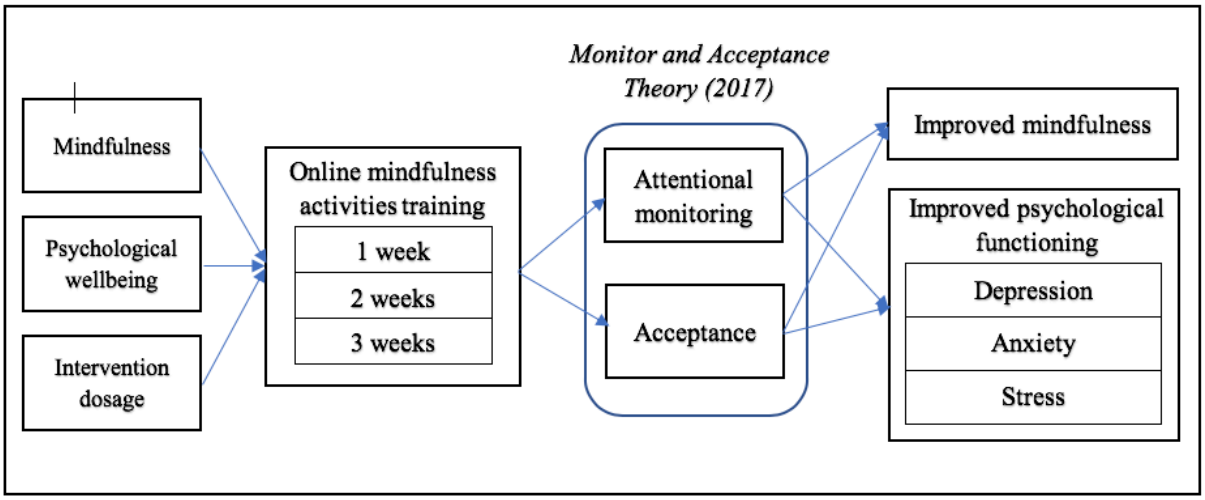

Figure 1.2 Conceptual framework of the present study.

The conceptual framework of the present study is illustrated in **Figure 1.2**. From the literature in previous sections, the mental health of frontliners such as medical officers are in a precarious state and is further reviewed in the latter sections of this paper. The global concern is regarding the unstable containment of the COVID-19 pandemic added onto a highly demanding profession required to handle stressors from career, family, and health at the same time (Abdulah & Musa, 2020; Arafa et al., 2021; Elbay et al., 2020; Hafiz et al., 2018; Norful et al., 2021; Tengilimoğlu et al., 2021; Wong, 2008). Considering the time-constraints for medical officers who are juggling multiple responsibilities, an online platform will be utilized to deliver the intervention. Literature has indicated that mindfulness training through an online platform will lead to increased levels of mindfulness from baseline to post-intervention (Farris et al., 2021; Kemper & Yun, 2015; Krusche et al., 2013; Mayor-Silva et al., 2021; Morledge et al., 2013; Santesteban-Echarri et al., 2018; Spijkerman et al., 2016). Hence, the online

mindfulness activities training is aimed to be administered for the improvement of psychological wellbeing among medical officers during the pandemic.

Brief mindfulness training aims to cultivate both components of the MAT (Lindsay & Creswell, 2017)—attentional monitoring and acceptance. Since mindfulness improves attentional monitoring and leads to acceptance in a nonjudgemental and nonavoidant manner, improved psychological and mental health outcomes are anticipated. Regular practice of mindfulness would increase both components of the MAT. There is a plethora of literature highlighting the efficacy of mindfulness interventions in its effective regulation of negative affects and health-inducing benefits for psychological wellbeing (Blanck et al., 2018; Creswell et al., 2019; Goldberg et al., 2018; Goyal et al., 2014; Gu et al., 2015; Stefan & David, 2020). As mindfulness interventions tends to be correlated with lower levels of depression, anxiety, and stress, we aimed to utilize a mindfulness activities training based on MAT for medical officers in Malaysia to improve psychological wellbeing.

The literature review further observed that brief interventions as little as one session and up to eight weeks observed significant, positive psychological outcomes (Howarth et al., 2019; Kemper, 2017; Lindsay, Young, et al., 2018; Romcevich et al., 2018; Schumer et al., 2018; Hui Zhang et al., 2021). Intervention dosage and length not exceeding eight weeks observe the highest effect sizes, while recommendations for increasing, small dosages of mindfulness intervention will improve positive intervention outcomes (Howarth et al., 2019). Since medical officers would likely benefit better from interventions that are convenient and accessible, different dosages of online mindfulness training are postulated to lead to different levels of increased mindfulness and psychological functioning. As such, it is hypothesized that

the varying intervention lengths of the mindfulness activities training would indicate accurate dosages of mindfulness intervention for positive psychological outcomes.

1.10 HYPOTHESES

1. There will be significant changes in the scores of mindfulness (as measured by MAAS) from pre- to post-intervention for participants in the intervention group, and not the control group.
2. There will be a decrease in the scores of depression (as measured by DASS-21) from pre- to post-intervention for participants in the intervention group, and not the control group.
3. There will be a decrease in the scores of anxiety (as measured by DASS-21) from pre- to post-intervention for participants in the intervention group, and not the control group.
4. There will be a decrease in the scores of stress (as measured by DASS-21) from pre- to post-intervention for participants in the intervention group, and not the control group.
5. There will be significant changes in the scores of mindfulness, depression, anxiety and stress from pre- to post-intervention for participants in the low frequency intervention group, and not the control group.
6. There will be significant changes in the scores of mindfulness, depression, anxiety and stress from pre- to post-intervention for participants in the medium frequency intervention group, and not the control group.
7. There will be significant changes in the scores of mindfulness, depression, anxiety and stress from pre- to post-intervention for participants in the high frequency intervention group, and not the control group.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will present a review of literature on mindfulness and mindfulness-based interventions, conduct of online mindfulness interventions, its impact on psychological functioning (depression, anxiety and stress), and intervention dosage. Issues related to online mindfulness interventions and recommendations from previous studies will also be discussed extensively.

2.2 MINDFULNESS INTERVENTIONS

2.2.1 Conceptualization of mindfulness

Mindfulness has been defined in numerous ways; first and foremost, through translations from Buddhist texts in the late 19th century (Gethin, 2011). Mindfulness was one of the Buddhist practices adopted by Westerners who traveled to Southeast Asia and taught to their fellow countrymen using the doctrinal framework of Buddhism (Young, 2016). The term was translated from the Pali word *sati* as "to remember" and illustrated to include "recollection (*anussati*), recall (*paissati*), remembrance (*saraatā*), keeping in mind (*dhāraatā*), absence of floating (*apilāpanatā*), and absence of forgetfulness (*asammussanatā*)" (Gethin, 2011). Taking together, it was considered to be in alignment with the modern understanding of mindfulness that included conscious and sustained attention in the present moment. The Buddhist paradigm believed that monitoring (*vipaśyanā*) was the key to increased lucid insight (*prajñā*). Further along the process, acceptance would then result in a betterment of suffering (*duhkha*) through the relief from cravings (*rāga*) and aversions (*dvesha*) (Young, 2016).

In psychological literature following the development of mindfulness in therapy, it was defined by aspects that it was thought to include. One of the most widely known definition was by Jon Kabat-Zinn (1994), whereby mindfulness refers to purposeful awareness and attention on present experiences, observing them in a nonjudgmental and acceptive stance. He postulated that it nurtures greater awareness of presence that embraces opportunities for growth and transformation. Another operative definition proposed was a "nonelaborative, nonjudgmental, present-centered awareness" of internal sensations in the environment that is viewed in an acceptive manner (Bishop et al., 2004). Bishop et al.'s (2004) definition is emphasized due to

the highlight of two separate components, (i) the mindful attention and (ii) the acceptance-based component. The attentional component involves self-regulation of attention through the purposely orientation to current thoughts, feelings, bodily sensations in the here-and-now. On the other hand, the acceptance-based component involves the adoption of an attitude of curiosity, openness, and receptivity towards positive, negative, or neutral experiences without the intention to avoid, judge, or suppress them.

Other definitions put forward by researchers included additional aspects to mindfulness with variance in descriptions as to theoretical or operational levels such as a self-regulatory ability (Brown & Ryan, 2003), an acceptance skill (Lindsay & Creswell, 2017; Linehan, 1994), and a meta-cognitive skill (Bishop et al., 2004). Baer and colleagues (2006) considered mindfulness to be multi-faceted with five significantly correlating factors—observing, describing, acting with awareness, nonreactivity and nonjudging. This model produced evidence that all factors (excluding "observing") were significantly and negatively associated with psychological distress, whereas "observing" was positively associated with psychological distress. The ability to maintain purposeful awareness to experiences were not sufficient to improve psychological wellbeing, unless other factors such as the description of experiences in a non-reactive and non-judgmental manner and acting in awareness to the reality to lead to overall improved mental health.

As a result of the varying definitions and descriptions, the development of exact measurements for mindfulness ranged in complexity based on the proposed number of constructs involved. Researchers proposing a one-dimensional construct considered mindfulness to be entirely composed of present-centered awareness and attention (Brown & Ryan, 2003), with the highlight on awareness as a subjective experience of perceiving internal

and external events at a particular moment, while attention was the redirecting of focus towards awareness in order to accept specific aspects of reality (Brown et al., 2007). Advocators of a two-dimensional construct of mindfulness opined that the two distinct features of mindful attention and acceptance had to be measured for a full understanding of the term (Bishop et al., 2004; Lindsay & Creswell, 2017). The MAAS (Brown & Ryan, 2003) was developed as a unidimensional scale measuring attentional awareness, while the KIMS (Baer et al., 2004) and FFMQ (Baer et al., 2006) measured up to five constructs of mindfulness. Subsequent literature has called for a need to align with one understanding of the constructs of mindfulness for a stable platform to further the research on mindfulness (Brown et al., 2007).

The importance of understanding the mechanisms of action of psychological interventions is highly necessary in order to optimize therapeutic effects, enhance active components of the interventions, match therapies across conditions and individuals, and to contribute to theory development through analyses of results (Kazdin, 2007). Despite multiple manners of conceptualizing the concept of mindfulness, it remains unclear as to how components under the construct function in boosting psychological health and reduce psychological distress. To facilitate the understanding of mindfulness for effective intervention execution, the subsequent section reviews two recent theories attempting to fulfil the research gap identified; namely the Mindfulness-to-Meaning Theory (Garland et al., 2015a) and the Monitoring and Acceptance Theory (Lindsay & Creswell, 2017).

2.2.2 Mechanisms underlying mindfulness

Mindfulness-to-Meaning Theory (MMT). The MMT (Garland et al., 2015a) was developed to provide a comprehensive theory that bridged the concept of mindfulness that

results in psychological wellbeing observed through a sense of meaning in life, by relying on emotional regulation strategies. The authors posited that mindfulness could lead to eudaimonic meaning by utilizing a mechanism of positive appraisal—selectively choosing to view stressful events as neutral, positive, or growth-promoting (Folkman & Lazarus, 1984). The theory proposes that mindfulness practices leads to a metacognitive, flexible state of awareness that trancends routine appraisals by emphasizing on decentering, broadening attention, and enveloping or expanding information from the environment of which alternative reappraisals can be generated (Garland et al., 2017).

Eudaimonic meaning was described as a sense of wellbeing from higher-order cognitive constructs such as self-actualization and autonomy, distinct from hedonic wellbeing that was occupied with basic emotional states (Garland et al., 2017). On the other hand, positive reappraisal was termed as a process that broadens the scope of appraisal through the understanding that even negative experiences had opportunities for growth. As such, meaning is derived from stressful environments while maladaptive cognitive habits ceased (Garland et al., 2015b). The theory was culminated through the integration of three separate models of mindfulness; the mindful coping model (Garland et al., 2009) with the upward spiral model of flourishing (Garland et al., 2017) the transaction model (Folkman & Lazarus, 1984) and the systems theory and cybernetics (Umpleby & Dent, 1999).

A number of studies have supported the association between mindfulness and reappraisals, although limited information was provided as to how these two components were developed concurrently. For example, participation in mindfulness interventions evidenced increased positive reappraisal, while studies observing their interrelationships noted that this reappraisal mediates levels of stress by increasing dispositional mindfulness (Garland et al.,

2011; Gu et al., 2015; Hanley & Garland, 2014; Teasdale et al., 1995). As such, studies that pursued the effects between mindfulness interventions and positive appraisals suggested the presence of a fundamental relation that supported the theory (Garland et al., 2017a, 2017b) that could also be applied to chronic pain and addictions (Garland, 2019). A meta-analysis exploring the relationships between mindfulness and meaning in life found a moderate effect size that was mediated by decentering, self-awareness, and focusing on positive experiences (Chu & Mak, 2020). On the other hand, the component of positive reappraisal may be viewed as an active process of modifying thoughts through cognitive change, which was perceived by other researchers to be antithetical to the nature of mindfulness (Garland et al., 2015a, Lindsay & Creswell, 2017). This suggests that the MMT mechanism may be insufficient to fulfill the conceptualization of mindfulness as a state that is acceptive and nonreactive.

Monitor and Acceptance Theory (MAT). The Monitor and Acceptance Theory was proposed by Lindsay and Creswell (2017) to explore the psychological mechanisms of mindfulness driving cognitive, affective, stress, and health outcomes through a parsimonious and testable framework. Firstly, the authors narrowed the definition of mindfulness to contain both the component of (1) attention to monitor one's experiences, and (2) a momentary attitude of acceptance towards said experience. Secondly, both components were identified in prominent mindfulness training programs such as the MBSR or MBCT. The authors postulated that learning skills in attention or awareness were effective in cognitive improvement and bearing both positive and negative affective information, while training in acceptance is necessary for improved affective, stress, and physical health outcomes. However, the authors emphasized that mindfulness training programs do not teach solely on acceptance, but encourage its development through an acceptive perception of day-to-day experiences (Lindsay & Creswell, 2017). Details of the framework are in **Table 2.1**.