

The Journal of Behavioral Science (TJBS)

Original Article

Mindful Self-Compassion Training Online and Perceived Stress: Exploring Moderation of Awareness and Mediation of Acceptance

Phyu Phyu Zaw¹, Yoshi Takahashi^{2*}, and Khin Sandar Thein³

Author Affiliation

¹ Doctoral candidate, Graduate School for International Development and Cooperation, Hiroshima University, Japan.

² Associate Professor, Graduate School of Humanities and Social Sciences, Hiroshima University, Japan.

³ Doctoral student, Graduate School of Humanities and Social Sciences, Hiroshima University, Japan.

*Corresponding author e-mail: yoshit@hiroshima-u.ac.jp

Article Information

Received: 29.9.21

Revised: 2.11.21

Accepted: 3.11.21

Keywords

mindful self-compassion,
awareness, acceptance,
perceived stress

Abstract

Mindful self-compassion (MSC) training is considered an effective method for reducing stress. This study aims to analyze whether MSC training influences perceived stress and investigates the roles of awareness and acceptance in the relationship between training and perceived stress as a moderator and a mediator, respectively. The research framework is based on the monitoring and acceptance theory and the emotion regulation theory. This study used a randomized controlled trial, where 25 voluntary participants from the alumni of the Ship for South-East Asian Youth Program in Myanmar were randomly assigned to a treatment or a waitlist control group. To examine the relationships, we used t-tests and moderated mediation analyses. The results showed that training had a positive effect on acceptance ($t = -3.32, p = .00$) and a negative effect on perceived stress ($t = 3.57, p = .00$), although it did not affect awareness significantly ($t = .37, p = .77$). It was also found that acceptance has a statistically significant full mediation on the relationship between training and perceived stress, with a negative indirect effect ($a*b = -.26$, Bootstrap $CI_{95} = -.54$ and $-.02$). Notably, awareness did not moderate the relationship between acceptance and perceived stress ($b = -.31, t = -1.91, p > .05$). The findings contribute to the literature from the perspectives of psychology and adult learning as it uses an experimental research design to investigate the underlying mechanism of the effect of MSC online training on perceived stress, critical in influencing a variety of behaviors.

For decades, mindfulness-based interventions (MBIs) have been broadly recognized as the most promising type of cognitive behavioral intervention for enhancing the psychological well-being of individuals in both clinical and non-clinical populations (Davis et al., 2015). Diverse MBIs are used with non-clinical populations, such as mindfulness-based stress reduction (MBSR) and the relatively unexplored mindful self-compassion (MSC).

To articulate the specific qualities of the two MBIs, and to explore the underlying mechanism of MBIs' effectiveness, definitions of mindfulness and its two major components need to be elaborated. Mindfulness can be defined as a way of paying attention to the present-moment experience with a mental stance of receptivity and acceptance (Kabat-Zinn, 1994). The monitoring and acceptance theory (MAT) on mindfulness (Lindsay & Creswell, 2017) proposes two components of mindfulness commonly

described across its definitions and measures: (a) the use of attention to "monitor" one's present-moment experiences and thereby strengthening the "awareness" of these experiences, and (b) a mental attitude of "acceptance" toward moment-to-moment experiences. Based on Rapgay and Bystrisky's (2009) distinction between attention monitoring and awareness, van Dam et al. (2010) claimed that the former is a particular cognitive faculty, and the latter is a directable but broader aspect of consciousness. Awareness refers to the continuous monitoring of experiences with a focus on the current experience rather than a preoccupation with past or future events (Roemer & Orsillo, 2003). We will be using the construct of awareness to operationalize as one component of mindfulness, as it is more proximal to attitudinal and behavioral outcomes. The other component, acceptance, is an orientation of receptivity and noninterference with present-

moment experiences that contrasts with tendencies to suppress, avoid, alter, prolong, or fixate on certain stimuli (Lindsay & Creswell, 2019). Lindsay and Creswell (2017) have argued that acceptance skills are necessary to modify the way an individual relates to present-moment experiences and to regulate reactivity to affective experiences.

Returning to features of MBSR and MSC training, both cover awareness and acceptance to develop positive outcomes, but their relative focuses are contrasting. MBSR training, with more emphasis on awareness, uses mindfulness meditation, mindful movements, and inquiries to train participants to relate differently to stressors and to moment-to-moment experiences in their daily lives. On the other hand, MSC training, while based on and inspired by the MBSR, is a program created to provide participants with tools for coping with difficult emotions that emphasizes self-compassion; acceptance is one of its main components. MSC training encompasses practices for responding to difficult thoughts and emotions with self-kindness, openness, and curiosity. It is a protocol-standardized intervention aimed at increasing mindfulness and compassion to self. Both attitudes promote acceptance of experiences and reduction of suffering associated with experiential avoidance, an antonym of experiential acceptance (Neff & Germer, 2013).

The distinction between the two types of training is important. This is because, in MBI, the two components of mindfulness play different roles in achieving wellbeing outcomes. Lindsay and Creswell (2017) argued that attention monitoring skill predicts cognitive performance in affectively cold contexts whereas an extra acceptance skill is necessary to reduce emotional reactivity in affectively hot contexts. Specifically, acceptance is expected to mediate the relationship between MBIs and wellbeing outcomes such as negative affectivity, stress, and stress-related outcomes, according to the emotion regulation theory (Gross, 1998a) and the experiential learning cycle (Kolb, 1984) developed in the context of adult learning studies. On the other hand, awareness does not mediate such a relationship. Instead, it acts as a moderator between acceptance and outcomes as suggested by the MAT (Lindsay & Creswell, 2017). Stated differently, it is a conditional application of the emotion regulation theory. The MAT, in contrast, interprets the function as an interaction between awareness and acceptance rather than moderation.

MSC training was selected as the MBI for the analysis of the present study, as it emphasizes acceptance over other components of mindfulness or self-compassion. Particularly, MSC training includes the minimum necessary material related to awareness, such as affectionate awareness, only in the second of eight total sessions. In this regard, analyzing MSC training may provide insights beyond the MAT, although the training requires additional time to develop awareness.

Based on the discussion above, the objective of the present study (in line with the MAT and the emotion regulation theory) is to examine how components of mindfulness, that is, awareness and acceptance, play a role in the relationship between MSC training and outcomes. Perceived stress was selected as the outcome variable, as it is a proximal outcome of the emotion regulation process that improves various behavioral outcome variables related to psychological wellbeing. Because of the potential applicability of mindfulness to a person's experiences and the critical role played by stress in influencing a variety of outcomes, we adopted perceived stress rather than specific behaviors as our outcome.

The contributions of the present study are threefold. Firstly, since the underlying mechanism of MBI including MSC are underexplored, this study can contribute to the literature by exploring this mechanism based on awareness, and acceptance according to the MAT, as well as through the perspective of the emotion regulation theory (Graz & Tull, 2010) or modified emotion regulation theory as a whole. Secondly, our focus is not on the general population but on the specific sample, that is, self-critical people, which justifies our selection of MSC as an intervention. Such people are expected to improve their acceptance and in turn reduce their stress. Finally, our experimental research design can be a contribution as well. Many studies have proven that MBIs enhance the psychological wellbeing of diverse individuals (Kotera & van Gordon, 2021; van der Meulen et al., 2021). Most of these studies are correlational, however, more researchers are examining MBIs using randomized controlled trials (RCTs). These studies focus mainly on MBSR training, and less so on MSC training. To date, only three empirical studies have investigated the effect of MSC training using RCTs (Finlay-Jones et al., 2021; Friis et al., 2016; Neff & Germer, 2013), which have found improvements in outcomes. Only the direct effect of MSC and not the underlying

mechanism that involved awareness and acceptance, however, were analyzed.

Literature Review

As mentioned in the introduction, MSC training aims to improve both awareness and acceptance, although its main emphasis is on acceptance, as it is a critical part of self-compassion. In particular, an important part of the MSC training curriculum involves developing the acceptance and willingness to experience fully pleasant or unpleasant psychological events. The training uses different approaches to support the gradual acceptance of emotional discomfort, adjusting to it over five stages: resisting, exploring, tolerating, allowing, and befriending (Germer, 2009). Thus, individuals can change, avoid, or control internal events without expending their attentional resources. Alternatively, they can increase focus on proper decision-making without the interference of emotions and thoughts (Bond & Bunce, 2003).

Empirical studies support this argument. In their pilot study, Neff and Germer (2013) showed that MSC training resulted in a significant increase in the overall level of mindfulness, as measured by the Cognitive Affective Mindfulness Scale (CAMS-R; Feldman et al., 2007) which covered awareness, acceptance, attention, and present focus. As the four-component integrated scale had a Cronbach's α of .89, we may expect that MSC training affects not only acceptance but also awareness. Therefore, the following hypotheses were proposed:

H1: MSC training has a significant positive influence on awareness.

H2: MSC training has a significant positive influence on acceptance.

The influence of MSC on more distal outcomes, including stress, is also expected.

Empirically, the effects of MSC on relevant outcomes have been investigated as a simple direct relationship without explicitly exploring the underlying mechanism. A meta-analysis of 27 RCT trials by Ferrari et al. (2019) provided support for self-compassion-based interventions improving 11 diverse psychological outcomes, including perceived stress in clinical and non-clinical populations. For example, the enhancing self-compassion (ESC) program, an RCT study by Arimitsu (2016), found that seven weekly 1.5-hour sessions each resulted in the significant reduction of

negative thoughts and emotions in the treatment group. Dundas et al. (2017) found that a two-week self-compassion course for university students enhanced their personal growth self-efficacy, and reduced self-judgment, habitual negative self-directed thinking, anxiety, and depression. Two other RCTs also found improvements in outcomes due to the intervention. The first study was by Neff and Germer (2013), who are also the founders of the MSC training. They conducted an RCT for MSC training and concluded that the training is effective in improving individual well-being. The second study by Friis et al. (2016) showed a statistically and clinically significant reduction in depression and diabetes distress in the treatment group after MSC training.

In the present study, perceived stress was selected as the outcome variable. It is an appropriate intermediate outcome variable that leads to various attitudinal and behavioral outcomes related to individual well-being. The relationship between stress and such outcomes has been supported by empirical evidence (Hill et al., 2021; McManus et al., 2004;) and therefore, the following hypothesis was developed:

H3: MSC intervention has a significant negative influence on perceived stress.

Mediation of Acceptance

As mentioned earlier, acceptance is a critical component of MBIs (Block-Lerner et al., 2009). It is considered a dynamic emotion regulation skill and an important mechanism of MBI for improving stress-related health outcomes (Lindsay & Creswell, 2017). The emotion regulation theory (Gross, 1998a) explicates this skill and the first three stages of the emotion regulatory process by Gross (1998b) can be employed to explain this mechanism. Participants of MBIs are encouraged to intentionally incline toward their present-moment experiences without avoidance (at the situation selection stage), to explore the selected present moment nonjudgmentally (in the selection modification stage), and to attend to that experience in an accepting stance (the attentional deployment stage). According to Robins et al. (2004), fully open acceptance is that which is without constriction, distortion, judgment, evaluation, and attempts to retain an experience or get rid of it; therefore, acceptance is experiencing something without the haze of what one wants

and does not want it to be. MBIs that develop experiential acceptance through these stages can lead to a reduction in trainees' stress levels. Along with presenting this argument, Holmes et al. (2006) also suggested that acceptance is the only way to regulate emotions in managing unwanted private events.

The mediating role of emotion regulation has been consistently presented as a central process in mindfulness literature (Hayes & Feldman, 2004; Mandal et al., 2011; Roemer & Orsillo, 2003). In particular, Chambers et al. (2009) mentioned that, in mindful emotion regulation, all the mental events are simply allowed to come and go and need not be acted upon (i.e., acceptance). Further, Iani et al. (2019) considered acceptance as a crucial variable in the mindful emotional regulation process. Hayes et al. (1999) argued that brief acceptance training, which involves an accepting and detached lens, helps individuals regulate emotions. This means that acceptance may mediate the relationship between training and outcomes. Even though there have been many empirical studies on mindfulness and MBIs, little or no experimental work has tested the mediation of acceptance as an emotion regulation mechanism (Lindsay & Creswell, 2019) bridging MBIs, including MSC training and wellbeing outcomes. Hence, the fourth hypothesis is:

H4: Mindful acceptance mediates the relationship between MSC training interventions and perceived stress.

Moderating Effect of Mindful Awareness on the Relationship between Mindful Acceptance and Perceived Stress

In contrast to acceptance, awareness does not have a direct effect on individual outcomes. Awareness enhanced by attention monitoring heightens affective experience and reactivity, exacerbates negative symptoms, enhances positive experiences, and improves cognitive functioning outcomes in affectively neutral contexts; thereby, awareness alone is not sufficient to balance attentional control with emotion regulation and improve outcomes (Lindsay & Creswell, 2017). Although adopting trait mindfulness and not state mindfulness cultivated by MBI, Lindsay and Creswell (2019) found that the interaction between acceptance and awareness had a positive

effect on affective functioning and stress-related health outcomes. In this regard, the role of awareness is secondary, although we cannot ignore its role in developing positive outcomes. From the perspective of the emotion regulation theory, awareness works as a boundary condition that determines the effect of MBIs and MSC training. Therefore, the MAT may be understood as a modified version of the emotion regulation theory.

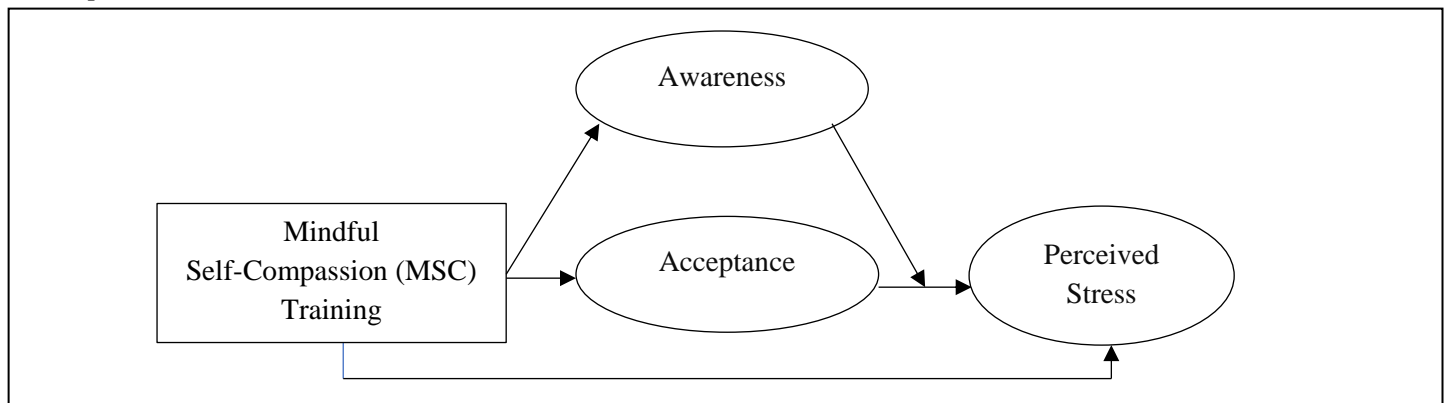
This can be interpreted in the context of adult learning studies, more specifically, the experiential learning cycle of Kolb (1984). The cycle consists of four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. After a concrete experience, reflective observation occurs as a combination of awareness through observation and acceptance during the reflection process. Consequently, the combination generates a "theory" (abstract conceptualization) on how to approach the learner's experience based on appropriately regulated emotion. The theory is applied (active experimentation) to deal with further experiences (leading to the next round of concrete experience).

Thus, the MAT predicts that the combination of awareness and acceptance skills improves affective functioning and stress-related health outcomes (Lindsay & Creswell, 2017). According to Lindsay and Creswell (2019), awareness (while their argument started from its antecedent; attention monitoring) skills are associated with beneficial mental and physical health outcomes only when accompanied by acceptance skills. This is because acceptance skills, along with awareness, modify the way one relates to present-moment experience by regulating reactivity to affective experience (Lindsay & Creswell, 2017). We may interpret their argument based on the negative acceptance-perceived stress relationship, which states that the higher the awareness, the stronger the negative relationship between acceptance and perceived stress. This leads to the fifth hypothesis:

H5: Mindful awareness positively moderates the relationship between mindful acceptance and perceived stress.

A conceptual framework of the study is presented in Figure 1.

Figure 1
Conceptual Framework



Methodology

Participants

The participants were alumni of the Ship for South-East Asian Youth Program (SSEAYP) from Myanmar, a Buddhist dominant country where meditation methods have been commonly utilized. The program has been implemented by member countries of the Association of Southeast Asian Nations and Japan. The aims of the program are to promote friendship and mutual understanding among the youth of Japan and the Southeast Asian countries, to broaden their perspective of the world and to strengthen their spirit of international cooperation and practical skills for international collaboration (Cabinet Office of Japan, n.d.). The participants are selected as the sample because they are above-average and ambitious (and consequently self-critical and stressed) young people for whom the MSC training is highly relevant. The MSC training is intended especially for those people with a self-critical nature, toward promoting increased self-acceptance among them. Therefore, the sample seems to match very well with this type of training program. The SSEAYP's selection process is highly competitive, and the alumni in Myanmar are typically above-average young individuals who are fluent in the English language (with the IELTS band scores ranging from 7 to 8.5), and socially and academically capable. Participants were recruited via a social media platform commonly used by alumni. Program volunteers were randomly assigned to a treatment or a waitlist control group. Altogether, 42 participants initially volunteered to participate in the program. Among them, 40 participants actually answered the online questionnaire at Time 0. They were randomly assigned to two groups – 20 participants in the treatment group and 20 participants in the waitlist control group. After delivering the eighth session, at Time 1, only 13

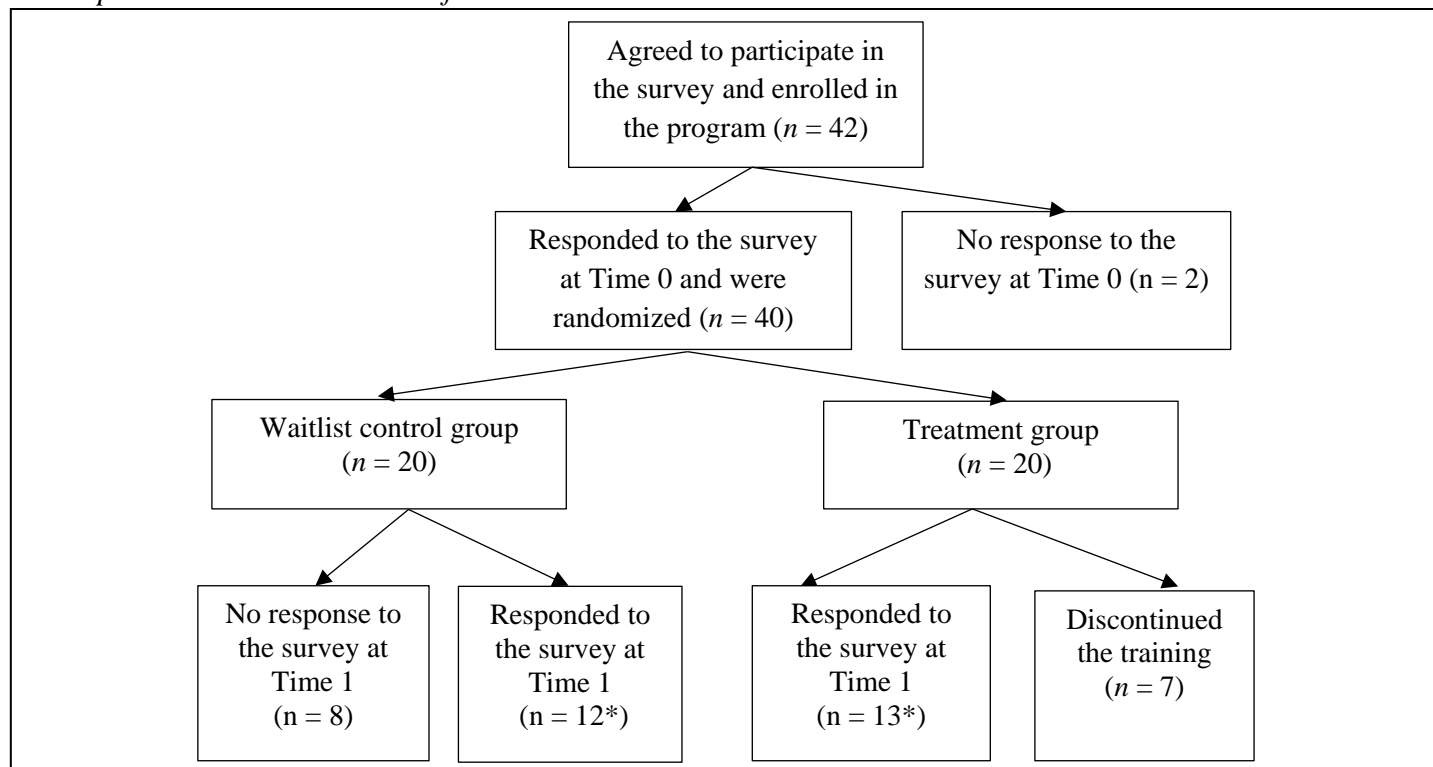
participants in the treatment group and 12 participants in the waitlist control group answered the questionnaire again, and were included in the final analysis. Therefore, for both Time 0 and Time 1, only the responses of those participants were used for the purpose of data analysis. Figure 2 depicts the participant flow chart.

Intervention

The MSC training intervention developed by Neff and Germer (2013) was delivered online by the first author (an authorized MSC trainer), with the third author as a facilitator. The program involved both formal (sitting meditation) and informal (daily activities) mindful self-compassion practices. The training was delivered by the first author who was also an authorized MSC program trainer in the Myanmar language following standard MSC protocol in eight weekly sessions of 2.5 h each, plus a 3-hour silent retreat session. Training contents including mindful self-compassion, mindfulness, how to practice loving kindness, how to discover the participant's own compassionate voice, how to meet difficult emotions, and how to explore challenging relationships etc. were provided didactically and experientially. The training began in December 2020. Due to the COVID-19 pandemic, the training was offered online via Zoom sessions every week (in accordance with the Center for Mindful Self-Compassion (CMSC) Professional Training Committee's guidance about teaching MSC online).

Ethical Consideration

Informed consent was obtained from all participants before the initial survey was conducted. The ethical review board of the Graduate School for International Development and Cooperation, Hiroshima University, reviewed and approved the study protocol (reference no. 6923/Entry 36/2020).

Figure 2*Participant Selection Flow Chart from the Pretreatment to Post-treatment Period*

Note. *Number of respondents considered in the analysis.

Measures

The online questionnaire was offered in English language only as all the participants of the current study are fluent in it. The 20-item philadelphia mindfulness scale (Cardaciotto et al., 2008) was used to measure two components of mindfulness; awareness and acceptance. All items are rated on a 5-point Likert-type scale ranging from never (1) to very often (5). Example items include “I am aware of what thoughts are passing through my mind.” and “I try to distract myself when I feel unpleasant emotions.” The full list of items is provided in the Appendix. Cronbach’s alpha values for awareness and acceptance were .80 and .85, respectively.

The 10-item perceived stress scale by Cohen et al. (1994) was used to assess perceived stress. All items are rated on a 5-point Likert-type scale ranging from never (0) to very often (4). Example items include “How often have you been upset because of something that happened unexpectedly?” and “How often have you been angered because of things that are outside of your control?” The Cronbach’s alpha for perceived stress was .80.

Statistical Analyses

For the statistical analyses, we used the following tests: the treatment and control groups were compared using the t-test and chi-square test, in terms of demographic characteristics and the outcome variables of awareness, acceptance, and perceived stress before MSC training. The direct effect of MSC training on the outcomes were analyzed through a t-test. Moreover, the mediation of acceptance between the training and perceived stress as well as the moderation of awareness on the relationship between acceptance and perceived stress were tested using Hayes’ (2013) conditional PROCESS analysis.

Results

The effect of MSC on perceived stress and the role played by awareness and acceptance in the relation between training and outcome as a moderator and a mediator, was investigated in this study. This section reports the results of the statistical analyses conducted

Table 1 presents a correlational matrix and descriptive statistics of mindfulness, perceived stress, and demographic variables.

Table 1
Descriptive Statistics

	Mean	SD	1	2	3	4	5	6	7
1. Gender	1.72	0.46							
2. Age	1.64	0.57	0.24						
3. Marital status	0.04	0.20	1.27	.13					
4. Education	2.12	0.67	0.25	.67**	-.04				
5. Employment status	4.12	1.36	0.12	.60**	.13	.63**			
6. Awareness	3.57	0.55	-0.12	-.10	-.17	.01	-.13		
7. Acceptance	2.82	0.67	-0.03	.08	.05	-.24	.13	-.00	
8. Perceived stress	1.83	0.48	0.01	-.20	.20	-.04	-.30	-.20	-.67**

Note. $N = 25$; M = mean; SD = standard deviation; Gender (Male = 1, Female = 2); Age (18 to 24 = 1, 25 to 34 = 2, 35 to 44 = 3); Marital status (Single = 0, Married = 1); Education (Undergraduate = 1, Graduate = 2, Master degree = 3, Professional degree = 4, Doctorate = 5); Employment status (Student = 1, Unemployed not looking for a job = 2, Unemployed looking for a job = 3, Employed part time = 4, Employed full time = 5). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2
Mediation of Mindful Acceptance on the Relationship between MSC Training and Perceived Stress

Predictor	B	SE	95% CI		R^2
			LL	UL	
Total effect	-.16**	.17	-.65	.05	.37**
Direct effect	-.30	.13	-.61	-.08	
	Boot IE	Boot SE	95% CI		
			LL	UL	
Indirect effect via mindful acceptance	-.26*	.13	-.54	-.02	.52***

Note. b = Unstandardized Coefficient; SE = Standard Error; Boot SE = Bootstrapped Standard Error; Boot IE = Bootstrapped Indirect Effect; CI = Confidence Interval; LL = Lower Level; UL = Upper Level, * $p < .05$. ** $p < .01$, *** $p < .001$.

The likelihood ratio chi-square test was used for gender ($\chi^2 = .33$, $p = .57$), marital status ($\chi^2 = 1.51$, $p = .22$), and employment status ($\chi^2 = .71$, $p > .05$), and an independent sample t-test was used for age ($t = 1.70$, $p = .10$) and education ($t = .94$, $p = .36$). No significant difference was found between the two groups in terms of demographic data, indicating that our random assignment was successful in this regard.

The independent sample t-test showed no significant difference between treatment and control groups for outcome variables at Time 0 (immediately before the intervention). Hence, there was no significant difference between both groups for awareness ($t = .37$, $p = .72$), acceptance ($t = -.76$, $p = .45$), and perceived stress ($t = 0.26$, $p = .80$) at Time 0, which indicated that the random assignment was

successful. However, a significant difference was found between both groups for acceptance ($t = -3.32$, $p = .00$) and perceived stress ($t(23) = 3.57$, $p = .00$) at Time 1 (immediately after the intervention). Here, the treatment group had a higher level of acceptance and a lower level of perceived stress than the control group. Therefore, Hypotheses 2 and 3 were supported. On the other hand, there was no significant difference between both groups for awareness ($t = .37$, $p = .77$) at Time 1. Hence, Hypothesis 1 was not supported.

To test the mediation and moderation hypotheses, Hayes's (2013) conditional PROCESS analysis was conducted using SPSS 27. The results of the PROCESS analysis are presented in Tables 2 and 3.

Table 3*Conditional Effect of Mindful Awareness on the Relationship between Mindful Acceptance and Perceived Stress*

Predictor	<i>B</i>	<i>SE</i>	95% <i>CI</i>	
			LL	UL
<i>F</i> (20,4) = 8.28***				
Effect on perceived stress				
MSC intervention	-.29	.16	-.62	.04
Mindful acceptance	-.26	.13	-.53	.01
Mindful awareness	-.05	.13	-.33	.23
Mindful acceptance x mindful awareness	-.31	.16	-.66	.03
			95% <i>CI</i>	
Conditional effect of mindful awareness	Boot IE	Boot SE	LL	UL
-1SD (-0.55)	-.09	.18	-.47	.30
Mean (0)	-.26	.13	-.53	.01
+1SD (+0.55)		.13	-.70	-.17

Note. *b* = Unstandardized Coefficient; *SE* = Standard Error; Boot *SE* = Bootstrapped Standard Error; Boot *IE* = Bootstrapped Indirect Effect; *CI* = Confidence Interval; LL = Lower Level; UL = Upper Level; **p* < .05. +1SD = one standard deviation above the mean; -1SD = one standard deviation below the mean.

According to Table 3, the interaction term of awareness and acceptance ($b = -.31$, $p > .05$) on perceived stress was not found to be significant at the 5% level for the current sample. Hence, our hypothesis 5 was not supported, though the moderation was significant at the 10% level. However, the conditional effect of mindful awareness on the relationship between mindful acceptance and perceived stress was found to be significant ($b = -.43$, $p < .05$) when the level of awareness was high (+1SD) and was not significant when the level was mean and low (-1SD). This result may suggest a noteworthy change, which is discussed in detail in the next section.

Even though being beyond the framework of the present study, as the objective of MSC training is to improve self-compassion rather than only its component of acceptance, the additional analysis was made by adopting self-compassion instead of acceptance. The independent sample *t*-test indicates that the level of self-compassion between the treatment and control groups were not significantly different from each other ($t = -1.41$, $p = .17$) at Time 0, whereas that of the treatment groups had higher self-compassion than the control group ($t = -2.50$, $p = .02$) at Time 1. Therefore, it can be concluded that the effect of MSC training on self-compassion was positively significant as same as that on acceptance. However, when checking the mediation of self-compassion scale on the relationship between the training and perceived stress, the indirect effect was found to be insignificant ($a*b = -.16$, Bootstrap $CI_{95} =$

-.34 and .01).

Discussion

Contrasting results were found between the hypotheses, including for awareness and other variables (not including awareness). Specifically, the former (H1, H5) was not supported, while the latter (H2, H3, H4) was supported. Based on this, we argue that the direct application of the emotion regulation theory was supported, but the MAT as a modified version of the emotion regulation theory and the experiential learning cycle framework in the context of adult learning studies were not supported.

In the present study, MSC training did not have a significant positive effect on awareness (H1). This result does not align with the results of Neff and Germer (2013), in which overall mindfulness including awareness was significantly increased after MSC training. Neff and Germer (2013) also found that the effectiveness of training is significantly related to the number of days per week in which participants engaged in formal sitting meditation. In the current study, the trainer strictly followed the MSC agenda of providing in-class didactic and experiential learning for the participants. However, one limitation is that the trainer did not provide participants with guided recordings for home practice, which may lessen the effectiveness of the intervention. Further, participants in the treatment group admitted that they, most of the time, failed to engage in the home practice sitting meditation that enhances mindful awareness between each session. In addition,

participants voluntarily agreed to join the research-oriented type of training free-of-charge. Therefore, their motivation to practice the sitting meditation home practices appears to be lower than those who usually have to join the training program with a fee. Moreover, conducting therapeutic training such as MSC training online may decrease the potency of the program when compared to in-person training. Even though the participants were strictly advised to join the session from a private space, they may have experienced various distractions as they joined the training from home, which could have been prevented during in-person sessions. These may be the reasons for the failure to obtain significant results.

In contrast, the result showed a positive effect of MSC training on acceptance (H2). As mentioned earlier, training depends on both the didactic and experiential learning of participants. In class, didactic and experiential learning topics appear to be potent enough for the participants to cultivate and embrace acceptance. However, in the case of awareness, it is more dose-dependent (altering with the number of days and hours of sitting meditation practices every week).

Moreover, MSC training had a negative effect on perceived stress (H3) while its underlying mechanism was mediated by acceptance (H4), both of which are along with the literature. Although empirical evidence on the mediation have not been available, as mentioned in the literature review section, acceptance is justifiable as a mediator based on emotion regulation theory.

Lastly, awareness did not moderate the relationship between acceptance and perceived stress, although it was significant at the 10% level (H5). However, the different results based on the specific level of awareness is noteworthy. Specifically, it was found that the relationship between acceptance and perceived stress is significant in cases of high awareness (+1SD) and non-significant in the other cases (mean and -1SD). This difference could be interpreted in terms of a non-linear type of moderation in which after reaching a threshold level just above the mean value of awareness level (+0.06SD), moderation would be activated. Training participants with low to middle levels of awareness may face relatively limited experiences necessitating emotion regulation. At the same time, such experiences are manageable by other means without acceptance-based emotion regulation. In this case, seemingly higher ambitions

may work effectively. For example, they may be more likely to change their thoughts about negative experiences by re-framing them as challenge stressors (Cavanaugh et al., 2000), using them as good learning opportunities or expecting more appreciation from others for suppressing negative feelings. Hence, the availability of acceptance does not affect the stress level. However, this cognitive change may not be sufficient for the management of more overwhelming experiences. Such experiences require acceptance-based emotion regulation and tend to be more available when awareness is higher than the threshold. Consequently, acceptance enables participants to reduce their perceived stress. Moreover, the statistically insignificant moderating effect might have derived from the relatively large standard error of each coefficient, potentially due to individual differences and the small sample size.

Implications

As discussed above, the MAT was not applicable because of the specific conditions in our study. However, we should be cautious in criticizing the theory as it can be more applicable if the boundary conditions like personal factors such as neuroticism and conscientiousness (de Vibe et al., 2015,) and tolerance (Xu et al., 2016) were introduced.

Through this study, it might be argued that even though awareness was not given much attention, MSC training can still reduce perceived stress, by the improvement of acceptance. MSC training but also recommend caution for two reasons. First, the survey participants had specific features that may not be found in the general adult population. Second, the role of awareness suggested by the MAT was not significant in the present study, which may imply that training programs with more emphasis on awareness will produce better results in stress reduction.

Limitation and Future Research Directions

The major limitation of this study was that we could not confirm the causal effect of acceptance on perceived stress, as there was no direct acceptance intervention. Due to the small sample size, causal mediation analysis, including sensitivity analysis of the effect of the mediator (Imai et al., 2010) may be too strict to diagnose the mediation. The small sample size might also have caused unexpectedly non-significant results. Generalizing the results is not advised due to the specific characteristics of the

sample. Further research with a larger and more representative sample is necessary to confirm the results of the current study. Finally, the number of days per week and the number of hours per day in which participants engaged in formal and informal practices were not recorded, which may have contributed to the statistically insignificant effect of MSC training on awareness. Future studies could collect data to address these limitations.

Conclusion

This study investigated the influence of online MSC training on voluntary participants (who are SSEAYP alumni) in Myanmar during the COVID-19 period, specifically examining the relationship between online MSC training and perceived stress, and the role played by awareness and acceptance as a moderator and mediator.

To the best of our knowledge, there has been little or no research on the effect of online MSC training to date, and this study may be one of the first to provide empirical data on the effect of MSC training on perceived stress with an experimental research design. Furthermore, this study is the first to empirically identify acceptance as a mediator in the relationship between MSC training and perceived stress by incorporating the role of awareness in the process. The indirect path indicating the influence of the intervention on perceived stress via acceptance was found to be statistically significant, as suggested by the emotion regulation theory. However, awareness was neither improved by the training nor moderated the relationship between acceptance and perceived stress, which was contrary to what was expected from the MAT.

References

- Arimitsu, K. (2016). The effects of a program to enhance self-compassion in Japanese individuals: A randomized controlled pilot study. *The Journal of Positive Psychology*, 11(6), 559–571. <https://doi.org/10.1080/17439760.2016.1152593>
- Block-Lerner, J., Wulfert, E., & Moses, E. (2009). ACT in context: an exploration of experiential acceptance. *Cognitive and Behavioral Practice*, 16(4), 443–456. <https://doi.org/10.1016/j.cbpra.2009.04.005>
- Bond, F. W., & Bunce, D. (2003). The Role of Acceptance and Job Control in Mental Health, Job Satisfaction, and Work Performance. *Journal of Applied Psychology*, 88(6), 1057–1067. <https://doi.org/10.1037/0021-9010.88.6.1057>
- Cabinet Office of Japan. (n.d.). *The Ship for Southeast Asian and Japanese Youth Program (SSEAYP)*. <https://www8.cao.go.jp/youth/kouryu/en/sseayp/sseayp.html>
- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: The Philadelphia Mindfulness Scale. *Assessment*, 15(2), 204–223. <https://doi.org/10.1177%2F1073191107311467>
- Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among US managers. *Journal of Applied Psychology*, 85, 65–74. <https://doi.org/10.1037/0021-9010.85.1.65>
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*, 29(6), 560–572. <https://doi.org/10.1016/j.cpr.2009.06.005>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring Stress: A Guide for Health and Social Scientists*, 10(2), 1–2.
- Davis, M. C., Zautra, A. J., Wolf, L. D., Tennen, H., & Yeung, E. W. (2015). Mindfulness and cognitive-behavioral interventions for chronic pain: Differential effects on daily pain reactivity and stress reactivity. *Journal of Consulting and Clinical Psychology*, 83(1), 24. <https://dx.doi.org/10.1037%2Fa0038200>
- de Vibe, M., Solhaug, I., Tyssen, R., Rosenvinge, J. H., Sørli, T., Halland, E., & Bjørndal, A. (2015). Does personality moderate the effects of mindfulness training for medical and psychology students? *Mindfulness*, 6(2), 281–289. <https://doi.org/10.1007/s12671-013-0258-y>
- Dundas, I., Binder, P. E., Hansen, T. G., & Stige, S. H. (2017). Does a short self-compassion intervention for students increase healthy self-regulation? A randomized control trial. *Scandinavian Journal of Psychology*, 58(5), 443–450. <https://doi.org/10.1111/sjop.12385>
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and

- initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29(3), 177–190. <https://doi.org/10.1007/s10862-006-9035-8>
- Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., & Einstein, D. A. (2019). Self-compassion interventions and psychosocial outcomes: A meta-analysis of RCTs. *Mindfulness*, 10(8), 1455–1473. <https://doi.org/10.1007/s12671-019-01134-6>
- Finlay-Jones, A., Strauss, P., Perry, Y., Waters, Z., Gilbey, D., Windred, M. A., Murdoch, A., Pugh, C., Ohan, J. L., & Lin, A. (2021). Group mindful self-compassion training to improve mental health outcomes for LGBTQIA+ young adults: Rationale and protocol for a randomised controlled trial. *Contemporary Clinical Trials*, 102, 106268. <https://doi.org/10.1016/j.cct.2021.106268>
- Friis, A. M., Johnson, M. H., Cutfield, R. G., & Consedine, N. S. (2016). Kindness matters: A randomized controlled trial of a mindful self-compassion intervention improves depression, distress, and HbA1c among patients with diabetes. *Diabetes Care*, 39(11), 1963–1971. <https://doi.org/10.2337/dc16-0416>
- Germer, C. (2009). *The Mindful Path to Self-Compassion: Freeing Yourself from Destructive Thoughts and Emotions*. Guilford.
- Gratz, K. L., & Tull, M. T. (2010). Emotion regulation as a mechanism of change in acceptance-and mindfulness-based treatments. *Assessing mindfulness and acceptance processes in clients: Illuminating the Theory and Practice of Change*, 2, 107–133.
- Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression and physiology. *Journal of Personality and Social Psychology*, 74, 224–237. <https://doi.org/10.1037/0022-3514.74.1.224>
- Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271–299. <https://doi.org/10.1037/1089-2680.2.3.271>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An Experimental Approach to Behavior Change* (2nd ed.). Guilford.
- Hayes, A. F. (2013). *Mediation, Moderation, and Conditional Process Analysis: Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford.
- Hayes, A. M., & Feldman, G. (2004). Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: Science and Practice*, 11(3), 255. <https://psycnet.apa.org/doi/10.1093/clipsy.bph080>
- Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M., & O'Connor, D. B. (2021). Stress and eating behaviours in healthy adults: A systematic review and meta-analysis. *Health Psychology Review*, <https://doi.org/10.1080/17437199.2021.1923406>
- Holmes, P., Georgescu, S., & Liles, W. (2006). Further delineating the applicability of acceptance and change to private responses: The example of Dialectical Behavior Therapy. *The Behavior Analyst Today*, 7(3), 311–324. <http://dx.doi.org/10.1037/h0100157>
- Iani, L., Lauriola, M., Chiesa, A., & Cafaro, V. (2019). Associations between mindfulness and emotion regulation: The key role of describing and nonreactivity. *Mindfulness*, 10(2), 366–375. <https://doi.org/10.1007/s12671-018-0981-5>
- Imai, K., Keele, L., & Tingley, D. (2010). A General Approach to Causal Mediation Analysis. *American Psychological Association*, 15(4), 309–334. <https://doi.org/10.1037/a0020761>
- Kabat-Zinn, J. (1994). *Wherever You Go, There You Are: Mindfulness Meditation in Everyday Life*. Hyperion.
- Kolb, D. (1984). *Experiential Learning as the Science of Learning and Development*. Prentice Hall.
- Kotera, Y., & van Gordon, W. (2021). Effects of self-compassion training on work-related well-being: A systematic review. *Frontiers in psychology*, 12, 1142. <https://doi.org/10.3389/fpsyg.2021.630798>
- Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: Monitor and Acceptance Theory (MAT). *Clinical Psychology Review*, 51, 48–59. <https://doi.org/10.1016/j.cpr.2016.10.011>
- Lindsay, E. K., & Creswell, J. D. (2019). Mindfulness, acceptance, and emotion regulation: Perspectives from Monitor and Acceptance Theory (MAT). *Current Opinion*

- in *Psychology*, 28, 120-125.
<https://doi.org/10.1016/j.copsyc.2018.12.004>
- McManus, I. C., Keeling, A., & Paice, E. (2004). Stress, burnout and doctors' attitudes to work are determined by personality and learning style: A twelve year longitudinal study of UK medical graduates. *BMC Medicine*, 2, 29.
<http://www.biomedcentral.com/1741-7015/2/29>
- Mandal, S. P., Arya, Y. K., & Pandey, R. (2011). Mindfulness, emotion regulation and subjective wellbeing: An overview of pathways to positive mental health. *Indian Journal of Social Science Research*, 8(1-2), 159–167.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, 69(1), 28–44.
<https://doi.org/10.1002/jclp.21923>
- Rapgay, L., & Bystrisky, A. (2009). Classical mindfulness. *Annals of the New York Academy of Sciences*, 1172(1), 148.
<https://doi.org/10.1111/j.1749-6632.2009.04405.x>
- Robins, C. J., Schmidt, H. III, & Linehan, M. M. (2004). Dialectical Behavior Therapy: Synthesizing Radical Acceptance with Skillful Means. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and Acceptance: Expanding the Cognitive-Behavioral Tradition* (pp. 30–44). Guilford.
- Roemer, L., & Orsillo, S. M. (2003). Mindfulness: A promising intervention strategy in need of further study. *Clinical Psychology: Science and Practice*, 10(2), 172–178.
<https://doi.org/10.1093/clipsy.bpg020>
- van Dam, N. T., Earleywine, M., & Borders, A. (2010). Measuring mindfulness? An item response theory analysis of the Mindful Attention Awareness Scale. *Personality and Individual Differences*, 49(7), 805–810.
<https://doi.org/10.1016/j.paid.2010.07.020>
- van der Meulen, R. T., Valentin, S., Bögels, S. M., & de Bruin, E. I. (2021). Mindfulness and self-compassion as mediators of the Mindful2Work Training on perceived stress and chronic fatigue. *Mindfulness*, 12(4), 936–946. <https://doi.org/10.1007/s12671-020-01557-6>
- Xu, W., Oei, T. P., Liu, X., Wang, X., & Ding, C. (2016). The moderating and mediating roles of self-acceptance and tolerance to others in the relationship between mindfulness and subjective well-being. *Journal of Health Psychology*, 21(7), 1446-1456.
<https://doi.org/10.1177%2F1359105314555170>