

Improving psychological wellbeing outlook with online mindfulness-based stress reduction (MBSR) program during the Covid-19 pandemic: A study of synchronous intervention

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Keywords

mindfulness-based stress reduction, MBSR, online MBSR, psychological well-being, COVID-19 pandemic

Anahtar kelimeler

farkındalık temelli stres azaltma, MBSR, çevrimiçi MBSR, psikolojik iyi oluş, COVID-19 pandemisi

Abstract

This study was designed to explore the effect of an online Mindfulness-Based Stress Reduction (MBSR) program on multidimensional factors of psychological well-being, such as finding meaning in life, cognitive and emotional awareness, self-compassion, gratitude, emotion regulation, self-acceptance, positive relationships, environmental mastery, personal growth, having a purpose in life, and autonomy. The sample consisted of 27 ($Mean_{age} = 31.56, SD = 9.55$) participants. Participants received the online MBSR program for eight weeks, consisting of one session lasting two and a half hours each week and eight progressive sessions in total, with a four-hour silence retreat day between the sixth and seventh sessions, for a total of 24 hours. All participants completed the Gratitude, Self-Compassion, Emotion Regulation Skills, Cognitive and Affective Mindfulness, Meaning in Life, and Multidimensional Psychological Well-Being scales before and after the intervention. The means of the pre-test and post-test results were calculated for each participant, and Pearson correlation was examined for the study variables. Repeated measures ANOVA was conducted to examine the effect of the MBSR program on the pre-test and post-test findings of the participants. The results showed that the levels of participants' psychological well-being increased in the pre- and post-assessments. In addition, the levels of cognitive and affective mindfulness, self-compassion, search for and presence of meaning, emotion regulation skills, and gratitude increased significantly. The findings of this study suggest that online MBSR, like face-to-face MBSR, may have positive effects on participants in terms of psychological well-being.

Öz

COVID-19 pandemisi sırasında çevrimiçi bilinçli farkındalık temelli stres azaltma (MBSR) programı ile psikolojik iyi oluş görünümünün iyileştirilmesi: Senkronize müdahale çalışması
Bu çalışma; çevrimiçi platformda sunulan Mindfulness Temelli Stres Azaltma (MBSR) kursunun; yaşamda anlam bulma, bilişsel ve duygusal farkındalık, öz-şefkat, minnettarlık, duygu düzenleme, kendini kabul, olumlu ilişkiler, çevresel ustalık, kişisel gelişim, hayatta bir amacının olması ve ottonomi gibi psikolojik iyi oluş halinin çok boyutlu faktörlerinin üzerindeki etkisini keşfetmek amacıyla yürütülmüştür. Örneklem, 27 ($Ort.yaş = 31.56, SS = 9.55$) katılımcıdan oluşmaktadır. Katılımcılara sekiz hafta boyunca, her hafta iki buçuk saat süren bir oturum ve toplamda aşamalı olarak ilerleyen sekiz oturumdan ve altıncı ve yedinci oturum arasında dört saat süren sessizlik inzivası gününden oluşan; toplamda 24 saat süren çevrimiçi MBSR programı uygulanmıştır. Tüm katılımcılar bu müdahaleden önce ve sonra Minnettarlık, Öz-Şefkat, Duygu Düzenleme Becerileri, Bilişsel ve Duygusal Farkındalık, Yaşamın Anlamı ve Çok Boyutlu Psikolojik İyi Olma ölçeklerini doldürmüşlerdir. Ön test ve son test sonuçlarının ortalaması her katılımcı için hesaplanmış, çalışma değişkenleri için Pearson korelasyonuna bakılmıştır. MBSR programının katılımcıların ön test ve son test bulguları arasındaki fark-etkisine bakabilmek için Tekrarlanan Ölçümler için ANOVA yapılmıştır. Sonuçlar, katılımcıların öncesi ve sonrası değerlendirmelerde psikolojik iyi oluş düzeyinin arttığını göstermiştir. Ayrıca, bilişsel ve duygusal farkındalık, öz-şefkat, hayatta anlam arayışı ve varlığı, duygu düzenleme becerileri ve minnettarlık düzeyleri anlamlı şekilde artmıştır. Bu çalışmanın bulguları; çevrimiçi sunulan MBSR'nin yüz yüze sunulan MBSR gibi katılımcılar üzerinde psikolojik iyi oluş hali açısından olumlu etkiler gösterebileceğini tartışmaya sunmaktadır.

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“Meditation is the ultimate mobile device, you can use it anywhere, anytime, unobtrusively” said the teacher of Buddhist meditation, Sharon Salzberg (2011). When the COVID-19 pandemic began and many daily routines shifted to remote formats, this metaphor became particularly relevant—not just for defining mindfulness, but also for the tools used to access mindfulness meditations. It’s been almost fifty years that structured, eight-week, and mainly face-to-face and in-person, mindfulness-based interventions (MBIs) have been systematically studied regarding the effects on psychological well-being in both clinical and non-clinical populations, and still, it’s relatively recent, growing, and specific literature (Kabat-Zinn, 1982, 1990, 1994, 2003; Kuyken et al., 2015; Segal et al., 2002, 2013; Tickell et al., 2020). However, COVID-19 led to the rise of online MBIs. Like many other aspects of daily life, Mindfulness-Based Stress Reduction (MBSR)—the foundation of all MBIs—transitioned to an online format during the early months of the pandemic, a period that was naturally challenging and stressful (Bossi et al., 2022; Kang et al., 2021; Nourian et al., 2021). Although it has been almost three years since the beginning of the pandemic, providing MBSRs through online systems has been an active, first-hand tool in daily life since then (Isham et al., 2022; Liu et al., 2020; MacDonald & Neville, 2022; Sanilevici et al., 2021). Even though there is positive evidence that online MBSR is effective for increasing well-being, scientific support for the current findings and further studies are still needed, especially in different contexts by focusing on a variety of factors (Riley et al., 2022; Sanilevici et al., 2021). This study aims to examine the effects of an online MBSR program on various dimensions of well-being in a non-clinical population during the first four months of the COVID-19 pandemic. These dimensions include psychological well-being, meaning in life, mindfulness skills, self-compassion, gratitude, and emotion regulation skills.

Jon Kabat-Zinn (1994, p. 4), founder of the MBSR, defined mindfulness as *“the awareness that arises through paying attention in a particular way, on purpose, in the present moment, and nonjudgmentally”*. After this leading definition, different researchers brought their perspectives on the definitions of mindfulness. These definitions are mainly centered around the concepts of here and now, open awareness, focused attention, sustained attention, nonjudgemental observations, acceptance, self-, emotion- and body regulation, and intentionally directing/shifting the attention by using certain anchors such as breath, body parts, and body sensations (Baer, 2003; Bishop et al., 2004; Brown & Ryan, 2003). To improve the skills in these areas, an individual needs to practice certain structured exercises based on mindfulness meditation. During these meditational practices, individuals are invited to give their attention to both external stimuli (noise, smell, etc.) and internal stimuli (thoughts,

emotions, body sensations, etc.), which both appear and disappear intrapersonal and interpersonal dynamics moment by moment (Kabat-Zinn, 2003; Shapiro et al., 2006). While practicing these exercises regularly, certain attitudes, called mindfulness attitudes, are also targeted to be improved, and all these attitudes are covered by all MBIs. Originally, there are seven attitudes as highlighted by Kabat-Zinn (2013), namely nonjudgemental awareness, patience, beginner’s mind, trust, non-striving, acceptance, and letting go. Since mindfulness-based practices are processed through mainly experience-based acquisition, these attitudes are improved by such guidance for a participant as being aware of the different dimensions of any kind of experience, exploring the experience with openness and curiosity without any judgment, paying kind attention to the experience itself and accepting whatever it is either pleasant or unpleasant (Crane, 2017; Crane et al., 2013; Kabat-Zinn, 2003, 2013). From a much broader perspective including all these definitions and explanations, in addition to the mindfulness attitudes, it might be concluded that within the scope of MBIs, there are four main areas of practice: *mindfulness of the body, mindfulness of feelings, mindfulness of the state of mind, and mindfulness of the processes and the contents of the human mind* (Analayo, 2004; Crane et al., 2017). These areas were developed based on the structure of MBSR, which is referred to as the parent of all MBIs (Crane et al., 2017).

MBSR, which was developed by Kabat-Zinn (1982, 1990, 2003), is an eight-week group intervention that aims to improve the abovementioned mindfulness skills, thus in turn, coping skills with stress and the general line of well-being (Grossman et al., 2010; Kabat-Zinn, 1990, 2003). Within the scope of MBSR, each session is a two-and-a-half-hour length, consists of structured and formal exercises, and progresses gradually. In addition, there are certain practices given as homework between all sessions, and one silence retreat between the sixth and seventh sessions (Kabat-Zinn, 2003, 2013). For the current study, traditional MBSR with all steps and content was applied in online meetings.

The specific definition and conceptualization of psychological well-being have been widely challenging despite the historical deep roots in the literature (Dodge et al., 2012). Still, psychological well-being might be mainly defined as the balanced state of being, including the perception of one’s mental, physical, and environmental health. It includes nonjudgemental awareness and acceptance towards oneself and others, improved autonomy, a state of searching and finding meaning in life, fulfillment, and improved emotion regulation skills (Ryff, 1989; Tang et al., 2019). From a eudemonistic approach, a sense of meaning in life, and feeling compassion and gratitude are important elements of well-being (Greenberg & Arndt, 2012; Kleinman et al., 2013; Ryff, 1995; Ryff & Keyes, 1995). In addition, these elements are not distinct from each

other, yet they have positive associations with not only each other but also emotion regulation skills, coping with stress, and the variety of dimensions in general mental health (Disabato et al., 2017; Hooker et al., 2018). Studies are focusing on the positive influence of certain interventions, including the dimensions of MBIs, on these elements regarding the improvement in well-being (Sakuraya et al., 2020). Several studies have examined the direct influence of various types of MBIs on the elements mentioned above, demonstrating positive outcomes (Baer, 2009; Brown et al., 2007; Garland et al., 2011; Kraemer et al., 2016; Shapiro et al., 2006). However, the COVID-19 pandemic introduced an unprecedented global challenge. This situation raises questions about how these dimensions of well-being are affected during such a crisis, when people are physically and mentally impacted and required to stay at home due to continuous lockdowns, which in turn limit their ability to maintain social connections and support. Additionally, it is worth exploring whether a traditional intervention like MBSR, designed to reduce stress and enhance well-being, remains equally effective when delivered in a non-traditional format, such as online, during the pandemic.

Studies conducted worldwide during the pandemic consistently showed that isolated living conditions led to increased depression, anxiety, and high stress levels (Bäuerle et al., 2020; Lima et al., 2020; Mariani et al., 2020; Wang et al., 2020). Additionally, psychological well-being began to decline after the early stages of the pandemic (Zacher & Rudolph, 2021). On the other hand, research on MBIs, which were necessarily offered online during the pandemic, found that these interventions had a positive impact on well-being. They were associated with reduced distress and anxiety, as well as improvements in mindfulness, emotion regulation skills, and perceived social support (Al-Ozairi et al., 2023; Dai et al., 2022; Sanilevici et al., 2021; Zhang et al., 2021). However, these MBIs were often delivered in brief or adapted formats of MBSR and focused on various psychological well-being outcomes, such as depression, anxiety, insomnia, emotion regulation skills, and resilience (Baumgartner & Schneider, 2021; Bossi et al., 2022; Gonzales-Garcia et al., 2021; Liu et al., 2020; MacDonald & Neville, 2022; Sanilevici et al., 2021). In contrast, the current study aimed to implement the full MBSR protocol.

Given the abovementioned review of the literature, it is important to examine the potential influence of an online version of the eight-week-long MBSR intervention, including the silence retreat, on well-being, which is viewed across a wide range of the spectrum. The current study is one of the first studies that focuses on a broad spectrum of well-being under the implementation of the full content of MBSR delivered through an online system during the COVID-19 pandemic in Türkiye. Accordingly, the current study aims to examine the influence of an online eight-week

MBSR intervention on psychological well-being, meaning in life, mindfulness skills, self-compassion, gratitude, and emotion regulation skills during the COVID-19 pandemic. It is hypothesized that online MBSR intervention would improve psychological well-being, including all dimensions above.

METHODS

Participants

The sample consists of 27 participants ($M_{age} = 31.56$, $SD = 9.55$; 2 male 7.4%), who had been assigned to the MBSR courses and volunteered to participate in this study. Initially, 42 participants completed the pre-tests. However, 15 participants dropped out, leaving a final group of 27 participants. There were no significant differences in gender or education level between those who dropped out and those who completed the study (p 's $> .05$). In the demographic form, participants were asked to rate their prior experience with mindfulness practices on a seven-point Likert scale (1 = no experience at all, 7 = a lot of experience). The mean rating was 2.63 ($SD = 1.28$), indicating that the majority of the sample had minimal experience with mindfulness practices. Lastly, regarding exclusion of the participants, the only exclusion criterion was about psychopathology; participants who had no record of mental illness were included in the study. Those who had a medical record of psychopathology were directed to Mindfulness-Based Cognitive Therapy (MBCT) program, which is an adaptation of MBSR, aiming to develop the skills to recognize these symptoms and build confidence in their ability to respond effectively.

Measures

At the beginning of the study, all participants were given a demographic form including questions about age, gender, and previous meditation and yoga experiences. Table 1 shows the Cronbach's alpha coefficient scores of the measures for the pre-test (Wave 1) and the post-test (Wave 2). Then, all the below-mentioned questionnaires were presented individually.

Multidimensional Psychological Well-being Scale (Ryff & Keyes, 1995) It consists of eighteen items and is used to measure well-being, which is considered a composite concept of *self-acceptance, positive relations, environmental mastery, personal growth, purpose in life, and autonomy*. The scale was adapted to Turkish by Imamoğlu & Karakitapoğlu-Aygün (2004), and Cronbach's alpha coefficient was reported to be .79. In the present study, higher scores indicate higher psychological well-being, including positive

Table 1. Cronbach's Alpha Coefficient Scores of the Measures

	Pretest Cronbach's alpha	Posttest Cronbach's alpha
Psychological well-being	.73	.78
Search for meaning in life	.84	.89
Presence of meaning in life	.73	.75
Mindfulness	.81	.87
Self-compassion	.97	.95
Gratitude	.75	.80
Emotion regulation skills	.95	.96

Note. Measures were used on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*).

self-regard, qualified relations with other people, mastery of the surrounding environment, continued growth and development, and the capacity for self-termination.

Meaning in Life Questionnaire (MLQ; Steger et al., 2006) The MLQ is a 10-item scale, consists of two subscales; i.e., five items assess presence of meaning in life (e.g., "I have a good sense of what makes my life meaningful"), and five items assess search for meaning in life (e.g., "I am always looking to find my life's purpose"), rated on a 7-point Likert type scale (1 = Absolutely untrue, 7 = Absolutely true). For the Turkish adaptation of the scale, internal consistency scores were reported to be .78 and .88, respectively (Yeniçeri, 2013). Higher scores indicate higher levels of presence and search.

Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007) The CAMS-R is a 10-item scale to assess mindful attitudes (i.e., attention, present-focus, awareness, acceptance/non-judgment) towards internal experiences (e.g., "I try to notice my thoughts without judging them") and was reported to have an internal consistency score of .77. The internal consistency scores of the Turkish form were found to be .77 and .73 in two studies involving university students and a community sample (Catak, 2012). In the present study, participants were asked to indicate how true each item was for them on a 7-point Likert-type scale (1 = Strongly disagree, 7 = Strongly agree). Higher scores indicate greater cognitive and affective mindfulness.

Self-Compassion Scale (SCS; Neff, 2003) The SCS is a 26-item measure created to evaluate self-compassion. This concept is described as the ability to be receptive to and affected by one's own suffering, to feel compassion and kindness towards oneself, to maintain a nonjudgmental and understanding attitude toward personal shortcomings, and to recognize that such experiences are part of the shared human condition (Neff, 2003, p. 224). Examples of scale items are, "I am tolerant of my own flaws and inadequacies," and "When something upsets me, I try to keep my emotions in balance". The scale was adapted to Turkish by Kantaş (2013), and the internal consistency score was

reported to be .94. In the present study, participants responded to each item using a 7-point Likert-type scale (1 = Almost never, 7 = Almost always), and higher scores indicated greater self-compassion.

Gratitude Questionnaire (GQ; McCullough et al., 2002) The GQ is a 6-item scale developed by McCullough et al. (2002) to explore the degree to which individuals feel grateful for the life they have. An example of scale items is "I have so much in life to be thankful for" and the internal consistency score was reported to be .82. The internal consistency score for the Turkish translation by Imamoğlu was found to be .70 (Imamoğlu et al., 2014). In the present study, participants reported how true each item was for them on a 7-point Likert-type scale (1 = Strongly disagree, 7 = Strongly agree). Higher scores indicate greater gratitude for one's life.

Emotion Regulation Skills Questionnaire (ERSQ, Berking & Znoj, 2008) The ERSQ is a 27-item scale used to measure general emotion-regulation skills. It has nine different subscales, which are awareness, sensation, clarity, understanding, acceptance, resilience, compassionate self-support, readiness to confront, modification of negative emotions, and tolerance. Examples of scale items are, "I was clear about what emotions I was experiencing", "I did what I intended to do despite my negative feelings." and "I tried to reassure myself during distressing situations.". Participants reported how frequent each item was for them on a 7-point Likert-type scale (1 = Almost never, 7 = Almost always). In the current study, a total score was calculated by taking the average of all items. The internal consistency score of the Turkish form was found to be .89 (Vatan & Kahya, 2018). Higher scores indicate better emotion regulation skills.

Procedure

Ethical approval for the study was obtained from Middle East Technical University (Approval no: 273-ODTU-2020). All participants were gathered through an online announcement on social media channels and network messages within the scope of the Mindfulness Teachers' Association, Türkiye (MINDED, www.mindedtr.com). Researchers first reached out to the accre-

Table 2. Mindfulness-Based Stress Reduction Weekly-Based Themes

Week- 1	Exploring mindfulness & awareness (main practices: body scan, raising exercises)
Week- 2	How do we see the world? Attention & perception (main practices: body scan, breathing, seeing meditation)
Week- 3	Being in the body (main practices: breathing, mindful movement)
Week- 4	Stress: Responding vs. reacting (main practices: sitting with body & breathing)
Week- 5	Stress reaction: Dealing with unpleasant emotions, thoughts & sensations (main practices: sitting meditation)
Week- 6	Mindful Communication (main practices: structured communication practices)
Silence Day	4 hour-length meditation flow
Week- 7	Taking care of yourself (main practices: body scan, yoga, sitting)
Week- 8	Conclusion (and new beginnings) (main practices: body scan, sitting)

ditioned teachers through these channels, and then they kindly asked teachers to announce the invitation for this study in their newly starting MBSR groups. The participants, who were interested and volunteered for this study, were informed online about the content of the study. MBSR was offered by different accredited MBSR teachers in different sections. All these MBSR teachers were trained within the scope of the same MBSR Teachers' Training Program. Thus, the traditional MBSR procedure was applied in a structured and standardized way, including the pre-interview before the MBSR regarding the screening for psychopathology and informing the content of the program. As these programs were also a source of income for these teachers, all participants, including the volunteers of the study, paid a fee to participate in these programs. All participants filled out all the questionnaires twice, before the intervention and at the end of the eight weeks. Themes of each week within the scope of the eight-week intervention are presented in Table 2.

Statistical Analysis

After the end of the data collection, mean scores for pretest and posttest were calculated separately for each participant. Data was checked for outliers and missing values. No outlier or missing values were detected. Before the pretest-posttest comparisons, Pearson correlations were calculated for study variables. Second, in order to examine changes between pretest and posttest scores, repeated measures ANOVA is used since it is a robust method for comparing means in the within-subjects design and allowing to determine the effectiveness of the intervention.

RESULTS

Correlation patterns generally align with theoretical expectations, demonstrating positive relationships between psychological well-being and other well-being-related measures. At pretest, psychological well-being scores showed positive correlation with well-being related measures such as presence of meaning in life, mindfulness, self-compassion, emotion regulation skills, except search for meaning in life and gratitude scores. At the posttest, psychological well-being scores showed a positive correlation with all well-being-related measures. Table 3 presents the Pearson cor-

relation coefficients for study variables.

To test the study hypotheses, repeated measures ANOVAs, comparing pre and posttest results, were conducted. As the study design includes only two time points, the repeated measures ANOVA does not need to account for sphericity. Thus, results were directly proceeded by the ANOVA findings. In regard to psychological well-being, participants reported significantly higher levels of psychological well-being scores at posttest compared to pretest ($F_{(1, 26)} = 6.088, p = .021$). For the two subdimensions of meaning in life variables, there were significant increases for search for meaning in life ($F_{(1, 26)} = 8.737, p = .007$) and presence of meaning scores in posttest ($F_{(1, 26)} = 9.652, p = .005$). Participants also reported significant increase regarding cognitive and affective mindfulness, self-compassion, emotion regulation and gratitude scores ($F_{(1, 26)} = 11.701, p = .002$; $F_{(1, 26)} = 9.664, p = .005$; $F_{(1, 26)} = 14.636, p = .001$; $F_{(1, 26)} = 6.611, p = .016$, respectively; See Table 4 for all means, standard deviations). Overall, these results indicated that the online MBSR program produced similar outcomes as in the in-person MBSR programs in increasing the well-being of participants.

DISCUSSION

The current study aimed to examine the influence of an online-based MBSR program on psychological well-being during the times called 'new normal' after the COVID-19 Pandemic. In this regard, several specific aspects of the current study might be considered to be valuable in literature on both mindfulness-based interventions and psychological well-being. First, there are lots of studies focusing on the effect of MBSR on different dimensions of psychological well-being. Although only a few of the studies focus on the effectiveness of an online-provided MBSR, which is quite a newly emerging area in literature. Even more limited is the number of studies providing MBSR online and with the exact original structure, including eight sessions lasting 2.5 hours and a 4–6-hour silence retreat. To this end, this study examined the effect of MBSR through an online system with the exact structure. Second, even though many studies have focused on the association between mindfulness-based intervention models and different aspects of psychological well-being, this study has addressed psychological well-

Table 3. Within-Condition Pearson Correlation Scores

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	----															
2. Experience in m-based practices	-.12	----														
3. W1 Psychological well-being	.19	.09	----													
4. W1 Search for meaning in life	-.16	-.27	-.14	----												
5. W1 Presence of meaning in life	.38*	.16	.44*	-.24	----											
6. W1 Mindfulness	.18	.29	.74**	-.27	.53**	----										
7. W1 Self-compassion	.34	.18	.55**	-.32	.58**	.58**	----									
8. W1 Gratitude	.01	.37	.23	-.19	.34	.48*	.36	----								
9. W1 Emotion regulation skills	.17	.20	.47*	-.45*	.61**	.58**	.51**	.18	----							
10. W2 Psychological well-being	-.05	.56**	.30	-.06	.40*	.54**	.23	.48*	.19	----						
11. W2 Search for meaning in life	-.19	-.04	-.33	.57**	-.23	-.39*	-.28	-.50**	-.37	.05	----					
12. W2 Presence of meaning in life	.14	.43*	.25	-.37	.65**	.55**	.35	.45*	.53**	.72**	-.28	----				
13. W2 Mindfulness	-.15	.33	.25	-.02	.33	.50**	.05	.43*	.34	.67**	-.02	.57**	----			
14. W2 Self-compassion	.10	.38*	-.08	-.10	.23	.20	.21	.57**	.23	.58**	-.06	.50**	.61**	----		
15. W2 Gratitude	-.13	.37	.01	.12	.25	.09	-.02	.72**	-.06	.52**	.01	.30	.57**	.63**	----	
16. W2 Emotion regulation skills	.10	.37	.01	-.17	.49**	.23	.17	.52**	.35	.55**	-.09	.63**	.72**	.78**	.66**	----

Note. W1 = pretest, W2 = posttest, * $p < .05$. ** $p < .01$.

Table 4. Descriptive Statistics for Pretest and Posttest Scores

	Pretest		Posttest	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Age	31.56	9.55	-	-
2. Experience in mindfulness-based practices	2.63	1.28	-	-
3. Psychological well-being	5.08 _A	.53	5.38 _B	.52
4. Search for meaning in life	4.33 _A	1.16	4.10 _B	1.19
5. Presence of meaning in life	4.58 _A	.97	5.04 _B	.87
6. Mindfulness	4.37 _A	.85	4.93 _B	.85
7. Self-compassion	3.90 _A	1.14	4.66 _B	.84
8. Gratitude	5.46 _A	.91	5.78 _B	.81
9. Emotion regulation skills	4.41 _A	.79	5.05 _B	.73

Note 1. Variable 2 was tested on a 7-point Likert-type scale (1 = *I have no experience at all*, 7 = *I have a lot of experience*). **Note 2.** Variables 3-9 were tested on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). **Note 3.** Pretest posttest comparisons are indicated by subscripts across each row such that different subscripts indicate a significant ($p < .05$) mean difference.

being in a broad spectrum, focusing on different dimensions from well-being literature, which is valuable as a conceptual underpinning for the emerging both face-to-face and online-MBSR literature. Lastly, the online MBSR sessions in the current study were provided by different accredited MBSR teachers, who had undergone the same teachers' training. Thus, possible biases of the instructors that may affect the findings were minimized by offering the exact content with a standardized structure by different accredited instructors.

The findings were in line with the literature regarding the positive associations between MBSR and mindfulness-based interventions and the improvement of psychological well-being (Sanilevici et al., 2021), mindfulness skills regarding handling stress (Khoury et al., 2015), self-compassion skills (Birnie et al., 2010), emotion regulation skills (Sanilevici et al., 2021), and finding meaning in life (Chu & Mak, 2020). In other words, the findings of the current study showed that online MBSR intervention, like face-to-face-offered-MBSR as examined by previous studies, is positively associated with an increase in psychological well-being, search of and presence of meaning in life, mindfulness-, self-compassion-, and emotion-regulation-skills. These findings are in tune with the content of mindfulness-based interventions, which consist of experiential learning tools and practices of becoming aware of and not acting on thought-, emotion-, body-, behavior-processes, and autopilot reactions, which increase the stress reactions of a person (Kabat-Zinn, 2003; Segal et al., 2002).

During the COVID-19 pandemic, synchronous online MBSR interventions have shown promising results in increasing mental well-being and emotion regulation, highlighting the effectiveness of online delivery methods (Sanilevici et al., 2021). For instance, Sanilevici et al. (2021) investigated the effects of an 8-week online MBSR program on mental health during the initial wave of COVID-19 with 92 participants who showed interest in the program. Their findings demonstrated that the MBSR program significantly enhanced mindfulness, reduced anxiety and stress, and improved emotion regulation, with these benefits persisting one month after the program concluded. Their additional analyses suggest that online MBSR programs have the potential to improve mental health by enhancing emotion regulation during difficult times like the pandemic. Although our study design did not allow us to explore the underlying mechanisms behind the increase in well-being, our findings on improved emotion regulation skills are consistent with their results.

Although this study has important contributions to the literature, there were certain limitations within the scope of the current study, which might be valuable to consider for further studies. First, the number of participants in the current study did not allow for more

complex analyses, and therefore, it may be advisable for future studies to reach a larger number of participants. Second, the qualitative methodology, in addition to the questionnaires, might also be used to eliminate as much as possible the bias of the results since the same scales were used even though there were eight weeks in between (e.g., open-ended interviews and content analysis in the first and the last week, and maybe even in the middle of the intervention). The design of the MBSR program precluded the inclusion of a control group in this study. Consequently, the results should be interpreted with caution due to the absence of a control group. Future research should aim to incorporate a control group to enhance the validity and reliability of the findings. In addition, future studies should examine the impact of online MBSR programs across diverse demographic groups, including various age ranges, socio-economic backgrounds, and cultural contexts. Understanding how different populations respond to these interventions will provide insights into the program's adaptability and effectiveness for a broader audience, ensuring that it can meet the unique needs of different individuals. Additionally, evaluating the outcomes of hybrid MBSR models that combine online and in-person sessions is crucial. Researching whether a blended approach enhances engagement and effectiveness could reveal optimal strategies for delivering mindfulness-based interventions and maximizing the benefits of both online and face-to-face interactions. This exploration can help develop more comprehensive and flexible mental health support systems that are accessible and effective for diverse populations.

Future researchers who aim to expand upon this study should explore the underlying mechanisms that contribute to the effectiveness of the MBSR program. Specifically, further investigation into the role of emotion regulation and other potential mediators in improving mental health outcomes could provide valuable insights. Additionally, researchers might consider applying the MBSR program to different populations or settings to assess its broader applicability and effectiveness. Studies that examine the impact of the program on other psychological variables, such as resilience or coping strategies, would also contribute to a more comprehensive understanding of the program's benefits.

The study findings on the effectiveness of the online MBSR program have significant implications for mental health practitioners planning to implement the MBSR program. Although the MBSR program is a structured intervention, therapists should consider tailoring the program to the specific needs of participants, especially during challenging times such as a pandemic. For example, therapists could incorporate additional mindfulness exercises that focus on managing feelings of uncertainty and fostering a sense of connection, even in a virtual environment. This could

involve guided meditations that emphasize grounding techniques for coping with anxiety related to the unpredictable nature of the pandemic or mindfulness practices that encourage participants to cultivate self-compassion during moments of isolation or stress. By integrating these context-specific elements, therapists can enhance the relevance and effectiveness of the MBSR program for participants navigating the unique difficulties presented by the pandemic.

Although the context of the current study mostly focused on the pandemic, the online MBSR program could be implemented in various conditions, such as for individuals who have experienced natural disasters. The applicability of the online MBSR program demonstrates its potential to increase accessibility, allowing individuals who may face geographical, physical, or time constraints to benefit from mindfulness-based interventions. This is particularly relevant in enhancing the reach of mental health support services to underserved or remote populations. Secondly, the equivalence in effectiveness between online and in-person MBSR programs suggests that online delivery can help scale mental health initiatives efficiently, addressing larger populations with fewer resources. This scalability is crucial in meeting the growing demand for mental health services without proportionately increasing costs or logistical challenges. It might be concluded that this study is promising based on the implications of online-provided MBSR in the field of public mental health, especially in today's new world, where the online system is so widespread and inevitable, and well-being is so vulnerable.

DECLARATIONS

Compliance with Ethical Standards Ethical approval for the study was obtained from Middle East Technical University (Approval no: 273-ODTU-2020). In the writing and publication process of this study, the publication principles of the American Psychological Association (Publication Manual of the American Psychological Association-7th Edition, 2020) were strictly followed. All researchers contributing to this study adhered to the writing and publication principles outlined in this manual.

Conflict of Interest All authors of this article declare that they have no conflict of interest regarding the article.

Informed consent Informed consent was obtained from all participants included in the study.

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Data Sharing/Availability Data is available upon reasonable request.

Authors' Contributions Both authors contributed to the conception and design of the study. The first author conducted the intervention and was responsible for data collection. The second author performed the statistical analyses. Both authors collaboratively wrote and revised the manuscript and approved the final version.

Use of Artificial Intelligence AI was used only for grammar and spell-checking purposes. No AI-generated content was involved in the study design, data analysis, interpretation of findings, or the writing of the manuscript.

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