


# The effects of face-to-face and online Hatha yoga-based mindfulness trainings on the subjective well-being and distress tolerance among housewives during the covid-19 pandemic

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Article Info	Abstract
<p>Original Article</p> <p><b>Article history:</b> Received: 21 January 2023 Revised: 28 February 2023 Accepted: 02 March 2023 Published: 01 July 2023</p> <p><b>Keywords:</b> emotional distress, housewives, mindfulness, subjective well-being.</p>	<p><b>Background:</b> Housewives build a significant part of society. They play a key role in strengthening the foundation of the family and nurturing the next generation of any country, so it is very important to pay attention to mental health of this population.</p> <p><b>Aim:</b> This study investigated effects of a period of Hatha yoga-based mindfulness practice on distress tolerance and subjective wellbeing of housewives.</p> <p><b>Materials and Methods:</b> Participants were 38 housewives between 31 to 52 years who were randomly divided into two experimental groups including face-to-face (i.e., presence on the grass, n=17) and online (via Sky room, n=21). A 6-week Hatha Yoga-based mindfulness training was held simultaneously in twelve sessions for both groups. Distress Tolerance Scale (DTS) and Keyes and Magyar-Moe's Subjective Well-being Scale were used.</p> <p><b>Results:</b> The results of analysis of covariance showed that all subscales of distress tolerance and subjective well-being of housewives in the face-to-face group were significantly higher than the online group. Moreover, the results of paired t-test showed that the means of post-test of all subscales of distress tolerance and subjective well-being of housewives were significantly higher than the means of pre-test. But in the online group, the means of pre-test and post-test did not differ significantly in all variables.</p> <p><b>Conclusion:</b> Our findings emphasize that, in order to improve metacognitive processes, yoga-based mindfulness training in online method cannot replace face-to-face method.</p>

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## 1. Introduction

Mental health is a successful mental function for constructive activity, proper communication and adaptation to critical situations, and also having a healthy and constructive relationship with other people in society [1]. Various approaches to resolving conflicts and psychological trauma have been proposed by psychologists and researchers. One of which is mindfulness interventions [2]. Mindfulness increases person's ability to pay more attention to their thoughts, emotions and behavior, and as a result, he experiences less stress. Mindfulness means paying attention without judgment and it happens in the present [3].

Research has shown that mindfulness training affects depression and anxiety and self-esteem [4]. Mindfulness increases and improves physical and mental well-being, emotional well-being, and improves the quality of life [5, 6, 7].

Warhel et al. (2018) showed positive effects of mindfulness training on increased pain tolerance and improved mental health of injured athletes [8]. Reich et al. (2017) showed that mindfulness can reduce mental illness and stress [9]. Brown et al. (2010) stated that teaching mindfulness as behavioral and cognitive strategies in the process of focused attention prevents the causes of negative thoughts and the tendency to have positive emotions and thoughts [10].

There are different techniques for mindfulness interventions, such as careful body examination, meditation, sitting or walking, and yoga. In present study, we focused on Hatha-yoga. Yoga refers to the science of controlling the waves of the mind and controlling the powers of the mind in order to fully master its potential [11]. Today, the effects of yoga on the mind and

body are not hidden from anyone. Those who do yoga have a higher awareness of their body than those who do not do yoga due to the increased connection between mind and body [11, 12].

Hatha yoga, one of many forms or paths yoga focuses on the overall fitness of the body through the combination of three types of exercises Pranayama (breath control exercises), Asanas (physical movements) and Shavasana (meditation or Relaxation). Like other forms of yoga, Hatha yoga is used to calm the mind and focus of people, however, among types of yoga, the importance of physical fitness is further emphasized in Hatha yoga [13].

A person will experience health in the body and mind by doing Hatha yoga exercises, and will achieve increasing ability, life force, flexibility, balance and peace. Also, relaxation in Hatha yoga by affecting the autonomic nervous system and controlling emotions leads to a feeling of health in a person. These exercises reduce the activity of the central and automatic nervous system during stressful situations [14].

The exerciser tries to concentrate on the part that is being stretched, and this enables the first foundations of thought concentration, and the stretching is done very calmly and gently, and these physical exercises affect the glands, muscles, and nerve centers and activate them. They make and make the body healthy and energetic [15].

In Hatha yoga, all yoga postures are based on the condition of the elderly as a beginner who has little flexibility and strength; It can be adjusted [16].

Researches have shown that Hatha yoga exercises can reduce the feeling of hunger and appetite and obesity indices in 45-35-year-old overweight women [13].

reduce cortisol hormone and stress in middle-aged women [17], reduce stress, anxiety and depression in hemodialysis patients [14]. Sleep and mental health of middle-aged women [15] improve static balance, body stability and dynamic balance of elderly women [16] improving anxiety and self-efficacy of women [18]; and improving static balance of middle-aged women [19]. Therefore, according to the objectives of our research, we chose Hatha yoga for intervention.

Subjective well-being is a general attitude towards the environment and conditions and consists of two components: Cognitive and emotional [20]. The cognitive component expresses the degree of satisfaction with life and the emotional component expresses the maximum positive emotion and the minimum negative emotion in the individual. The feeling of satisfaction with life as well as women's emotions in the family and at the community level is very important and their achievement to higher levels of subjective well-being depends on changing their attitudes and increasing their level of awareness.

Today, all societies have gained the awareness that subjective well-being and attention to its health issues are necessary for human growth and development, and human beings make great efforts to reach the desired levels of subjective well-being, as well as people with positive attitudes in education, occupation, sports and their social and family lives are more successful [8]. Because people can feel happy on their own (which is one of the hallmarks of subjective well-being), it seems that sports like yoga can correlate with subjective well-being.

The findings of Götman and Bechtoldt (2021) indicate the differential effects of

subconscious components in coping and subjective well-being [21]. Soysa et al. (2021) also showed that higher tendency mindfulness predicts significantly less stress and higher subjective well-being, as well as inner refuge and acceptance. Overall, they found that in addition to the mindfulness-oriented aspects of happiness and acceptance, they significantly predicted greater subjective well-being [22].

Zollars et al. (2019) found that mindfulness meditation improves the overall subjective well-being of participants uniformly and independently, and the data showed that for all scales, the intervention was associated with increased mindfulness and psychological well-being and reduced perceived stress [23].

Telles et al. (2018) also showed that after 15 days of participating in residential yoga program, primary school teachers cover all aspects of subjective well-being and state anxiety [24]. In another study, a systematic study of the effect of yoga-based exercise on subjective well-being in people over 60 years of age found that yoga interventions resulted in minor to moderate improvements in subjective well-being in people over 60 years of age [25].

Distress tolerance is a type of negative mental state that results from the failure of adaptive and coping processes to maintain psychological and physiological homeostasis in the body. In today's world, increasing stress and distress tolerance has brought the world into a phase of life where the need for exercise and mindfulness is clearly evident. Anxiety tolerance is a person's ability to experience and tolerate a negative emotional state that affects a person's judgment, and as an important factor in the onset of mental illness and also to prevent and eventually treat it, there is a positive relationship between distress

tolerance and mental health [26]. Because distress tolerance and control are mental ability and relieving a negative emotional state is a person's attempt to control his mind, and on the other hand, mindfulness is in the direction of controlling and dominating the mind in the moment, a desirable level of behavior control can be achieved by increasing mindfulness in distress tolerance and critical situations. Distress tolerance and physiological changes due to negative emotions, increasing stress and inability to control the mind show the need to increase mindfulness in today's society.

In a study that examined the effect of yoga on depressed women, it was found that by identifying and correcting the initial maladaptive schemas and distress tolerance through yoga therapy, the level of hope and life satisfaction in depressed women can be increased.

Another interesting review study examined the effect of yoga therapy on infertile women undergoing treatment, who also suffered from mental disorders. Yoga therapy may be potentially helpful in improving anxiety scores among women suffering from infertility; and yoga therapy has been shown to be useful in managing anxiety, depression, and mental distress [27].

Another study that examined the status of cancer patients and modified mediation analyzes examined the direct and indirect effects of aspects of mindfulness on quality of life and quality of sleep through the burden of symptoms and emotional distress, using conscious action as a modifier. This study showed a longitudinal relationship between mindfulness and performance in cancer patients through the burden of symptoms and distress tolerance [28].

In another study involving two studies,

more mindfulness was associated with less negative cognitive bias and less perceived stress, which in turn was associated with less emotional distress, and the results showed that both stress reduction and negative cognitive bias may be underlying mechanisms, through which mindfulness benefits psychological well-being [29].

Housewives make a significant part of society. They play a key role in strengthening the foundation of the family and nurturing the next generation of any country, so it is very important to pay attention to health of this population. One of the most important aspects of health is its mental aspect. Psychological changes such as fear, psychological turmoil, uncertainty, obsessive-compulsive disorder, interpersonal sensitivity, morbid anxiety, tendency to psychosis, negative emotion under the current global conditions had abnormal effects on the individual, family and society. Trying to eliminate or reduce the effects of these factors in a person's life reveals the need for research for appropriate solutions.

### *1.1. Subjective:*

In recent years, due to the conditions of the Covid-19 pandemic, people were in home lockdown and were not allowed to attend sports clubs. Therefore, off-site or online exercises could be an alternative to compensate for people's inactivity at home. For this reason, the use of the online method has recently received a lot of attention [30, 31]. Due to the lack of sufficient research in this field, also according to the mentioned researches and the importance of Hatha yoga-based mindfulness interventions on mental health factors, the purpose of present study is to compare the effectiveness of Hatha yoga-based mindfulness exercises in the form of two training methods, face-to-face and online in improving mental well-

being and distress tolerance of housewives.

## 2. Materials and Methods

This research is applied research and semi-experimental. The design of this study includes pre-test and post-test.

### 2.1. Participation

Determination of the number of subjects in the study was made with the G\*Power 3.1 program.

According to the power analysis result, the minimum number of samples was found to be 15 with a margin of error of 0.05 and a power of 0.95, and an effect size of 0.15. However, it is aimed to reach the maximum number of participants by considering the possibility of the subject falling, 42 people (age range 31 to 52 years) were randomly selected and divided into two equal groups. But four people from the face-to-face group refused to continue training due to illness. Two groups included face-to-face (n=17) and online (n=21) groups. Inclusion criteria included: 1. Lack of previous experience in mindfulness exercises and yoga, 2. No history of physical illness, 3. No underlying disease, 4. Approximate 31 to 52 years old, 5. No specific disorders or mental illness, 6. Do not take psychological drugs, and 7. No menopause of subjects.

### 2.2. Instrument

**Distress Tolerance Scale (DTS).** This scale was developed in 2005 by Simon and Gaher. Their purpose was to assess the degree of tolerance of distress tolerance in critical situations in individuals, which examines various dimensions including tolerance, absorption, evaluation, and regulation [32]. This questionnaire has 15 questions in 5-point Likert scale from strongly agree to strongly disagree. Simon and Gaher reported alpha coefficients for this scale of 0.82 [32]. Mahmoudpour et al. (2022)

showed that the whole scale has high internal consistency reliability ( $\alpha=0.89$ ) and the subscales have moderate reliability (for tolerance 0.79, for absorption 0.64, for evaluation 0.82 and for regulation 0.81) [33].

**Subjective Well-Being Scale (SWS).** This scale with 45 questions was presented by Keyes and Magyar-Moe's (2003) to assess emotional, psychological and social well-being. Alpha coefficient for this scale was 0.88 [34]. Hashemian et al. (2007) showed the reliability of the overall mental well-being scale (0.75), emotional well-being subscale (0.76), psychological well-being (0.64) and social well-being (0.76). Cronbach's alpha was also calculated for each of them (0.80, 0.86, 0.80, 0.64, respectively), which indicates the appropriate internal consistency of the scale [35].

### 2.3. Procedure

In the pretest, both groups filled the distress tolerance and the subjective well-being questionnaires. Two groups were including face-to-face (n=17) and online (n=21) groups. Participants then underwent yoga-based mindfulness intervention in 12 1-hour sessions twice a week. In these sessions, exercises were done on all the main muscles and chakras because stress starts first from the face and continues to the head, armpits, then the sides and finally the waist. Therefore, meditation begins from the skin of the face and continued to the pelvis. But most of the activities were done on chakra number 1 (heart) and chakra number 4 (pelvis), because the release of these chakras could prepare the person for the present. Chakra No. 1 was closed when a person is under stress, and the housewife tends to move forward due to housework, breastfeeding, shoulders, and body, and over time the chest collapses. Chakra No. 4 was closed and the person is involved in



grief. It causes grief and depression and as a result loses the ability to be present in the moment. In all these sessions, the muscles, arteries and pelvis were worked on more specifically. All programs were presented in a specialized way to increase the level of mindfulness of the participants [18, 36].

Participants completed the research questionnaires in the post-test phase immediately after the intervention sessions. Appendix shows yoga-based mindfulness exercises in 12 sessions. In the face-to-face method, learners attend sports classes and perform the prescribed interventions together. In online methods, learners are given exercises to do on their home via Sky room.

#### 2. 4. Statistic

The data of this study was analyzed using SPSS software version 26 at both descriptive and inferential levels. Mean

values and standard deviation were calculated at the descriptive level. Shapiro-Wilk's test was used to check the normality of data distribution. Analysis of covariance (MANCOVA) was used to compare the performance of participants between the two groups of participants. Significant level was set at the level of 0.05.

### 3. Results

Mean age of participants of the face-to-face group were  $40.18 \pm 4.68$  years, and online group were  $39.76 \pm 5.41$  years. Independent sample t-test showed that there was no significant difference between the mean age of two groups ( $F_{36} = 0.26$ ,  $t = 0.24$ ,  $P = 0.80$ ).

The results of Shapiro-Wilk's test showed that all the variables had a normal distribution; Therefore, parametric statistical tests were used. Table 1 shows the mean and standard deviation of the studied variables.

**Table 1.** Mean and standard deviation of research variables by group

Variable	Subscales	Pre-test				Post-test			
		Face-to-Face		Online		Face-to-Face		Online	
		M	SD	M	SD	M	SD	M	SD
Distress tolerance	Tolerance	3.07	1.26	3.04	0.71	4.09	0.78	3.14	1.16
	Absorption	3.13	1.35	3.77	0.99	4.13	0.54	3.47	1.24
	Evaluation	3.50	0.89	3.47	0.78	4.11	0.40	3.28	1.10
	Regulation	2.11	1.04	1.82	0.88	3.17	0.84	1.98	.99
	Overall	2.96	0.96	3.03	0.63	3.98	0.39	2.99	0.79
Subjective wellbeing	Emotional well-being	2.57	0.65	2.47	0.63	3.39	0.87	2.40	0.68
	Psychological well-being	2.87	0.58	2.73	0.44	3.54	0.95	2.74	0.65
	Social welfare	3.66	0.71	3.46	0.65	3.87	1.02	3.06	0.81
	Overall	9.12	1.80	8.67	1.44	11.05	2.34	7.93	1.27

M=Mean, SD=standard deviation

#### 3. 1. Distress tolerance

The results of MANCOVA in Table 2 showed that the main effect of the group with 95% confidence, had a significant difference between the post-test scores of the subscales of tolerance, absorption, evaluation and regulation of participants in the online group. Table 3 shows the results of the LSD test to compare the mean scores

of the post-test scores of distress tolerance subscales between the face-to-face and online groups. The results of the LSD test for the distress tolerance showed that the adjusted mean scores of the subscales of tolerance, absorption, evaluation and regulation of the participants in the face-to-face group were significantly higher than the online group ( $P < 0.05$ ).

**Table 2.** Results of multivariate analysis of covariance for the distress tolerance variable

Subscales	Source of changes	Sum of squares	df	Mean of squares	F	P*
<b>Tolerance</b>	Group	5.35	1	5.35	6.50	0.01
	Error	26.37	32	0.82	-	-
<b>Absorption</b>	Group	5.53	1	5.53	6.04	0.02
	Error	29.29	32	0.91	-	-
<b>Evaluation</b>	Group	4.27	1	4.27	5.89	0.02
	Error	23.22	32	0.72	-	-
<b>Regulation</b>	Group	8.04	1	8.04	9.73	0.00
	Error	26.46	32	0.82	-	-

\* Significant at 0.05 level

**Table 3.** LSD test results to compare post-test means of distress tolerance subscales between face-to-face and online training groups

Subscales	Group	Mean	P*
<b>Tolerance</b>	Face-to-face	4.04	0.01
	Online	3.18	
<b>Absorption</b>	Face-to-face	4.25	0.02
	Online	3.38	
<b>Evaluation</b>	Face-to-face	4.08	0.02
	Online	3.31	
<b>Regulation</b>	Face-to-face	3.09	0.00
	Online	2.04	

\* Significant at 0.05 level

### 3. 2. Subjective well-being

The results of MANCOVA test in Table 4 showed that there was a significant difference in the subjective well-being of the participants in the face-to-face and online groups. That is, a period of Hatha yoga-based mindfulness had a different and significant effect on the subjective well-being (emotional, psychological, and social well-being) of housewives. The results of post hoc test (LSD) in Table 5 showed that the modified means of scores of all

subscales of subjective well-being (emotional well-being, social well-being, psychological well-being) of the participants of the face-to-face training group were significantly higher than the online group ( $P < 0.05$ ).

### 3. 3. Supplementary analysis within the group

In a supplementary analysis of the data, in-group comparison of face-to-face and online methods was performed using paired t-test (Table 6).

**Table 4.** Results of multivariate analysis of covariance for the subjective well-being variable

Subscales	Source of changes	Sum of squares	df	Mean of squares	F	P*
<b>Emotional well-being</b>	Group	8.77	1	8.77	13.79	0.00
	Error	20.99	33	0.63	-	-
<b>Psychological well-being</b>	Group	5.13	1	5.13	7.95	0.00
	Error	21.31	33	0.64	-	-
<b>Social well-being</b>	Group	4.79	1	4.79	5.74	0.02
	Error	27.56	33	0.83	-	-

\*Significant at 0.05 level

**Table 5.** LSD test results to compare the adjusted means of post-test scores of subjective well-being subscales in the face-to-face and online group

Subscales	Group	Mean	P*
Emotional well-being	Face-to-face	3.39	0.001
	Online	2.41	
Psychological well-being	Face-to-face	3.52	0.001
	Online	2.77	
Social well-being	Face-to-face	3.83	0.022
	Online	3.10	

\* Significant at 0.05 level

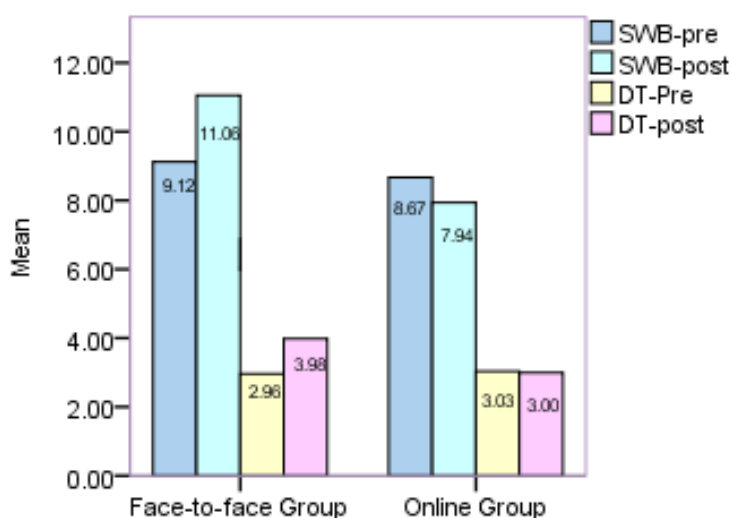
The results showed that after a period of face-to-face Hatha yoga-based mindfulness, the mean of post-test of all subscales of distress tolerance and subjective well-being of housewives was significantly higher than the means of pre-test ( $P < 0.05$ ). Also, the results of paired t-

test showed that after a period of Hatha yoga-based mindfulness in online method for all subscales of distress tolerance and subjective well-being of housewives, the mean of the post-test was not significantly different from the mean of the pretest ( $P > 0.05$ ; Figure 1).

**Table 6.** Results of paired t-test to evaluate the effect of a Hatha yoga-based mindfulness in face to face method on distress tolerance and subjective well-being of housewives

Variable	Mean		Average pairs	df	t	P*
	Pre-test	Pos-test				
Tolerance	3.07	4.09	-1.07	16	-4.02	0.001
Absorption	3.13	4.13	-1.00	16	-3.77	0.002
Evaluation	3.50	4.11	-0.61	16	-3.43	0.003
Regulation	2.11	3.17	-1.06	16	-2.79	0.01
Overall	2.96	3.98	-1.02	16	-4.48	0.001
Emotional well-being	2.57	3.39	-0.82	16	-2.95	0.009
Psychological well-being	2.87	3.54	-0.67	16	-2.82	0.01
Social well-being	3.66	3.87	-0.21	16	-0.85	0.40
Overall	9.12	11.05	-1.93	16	-4.48	0.01

\*Significant at 0.05 level



**Figure 1.** Comparison of overall subjective well-being (SWB) and distress tolerance (DT) between two groups



#### 4. Discussion

The aim of this study was to investigate the effects of a course of mindfulness exercises based on yoga in face-to-face and online methods on distress tolerance and subjective well-being of housewives. The results showed that all subscales of distress tolerance and subjective well-being of housewives in the face-to-face group due to a period of yoga-based mindfulness were significantly higher than the online group. Also, as a result of this period of mindfulness training, the mean of post-test of all subscales of distress tolerance and subjective well-being of housewives was significantly higher than the mean of pre-test. But in the online group, the mean of pre-test and post-test did not differ significantly in all variables. The present study emphasized the effectiveness of mindfulness interventions in improving the subjective well-being and distress tolerance of housewives through face-to-face rather than online methods.

Distress tolerance, which refers to the capacity of individuals to resist the emotional experiences they face, plays an important role in improving individuals' mental and emotional states. Emotions in the two groups of face-to-face and online yoga training in the post-test are significantly different. In other words, in the face-to-face training group, distress tolerance was higher. Results of the present study indicate a significant effect of cognitive therapy-based mindfulness (MBCT) on the tolerance of emotional distress and bloating, and are in line with those of previous studies [37, 38].

The results of Fetzner et al. (2014) on emotional distress tolerance and symptoms of post-traumatic stress indicate a high correlation between them and is consistent with the results of the present study on

emotional distress [39]. The higher the emotional distress, the higher the anxiety tolerance scale in individuals.

The present study is in line with the results of Williams et al. (2013) on the significant relationship between anxiety tolerance and the severity of depression [40]. A similar study has not been conducted to compare the scores of emotional distress tolerance, but according to the results of the present study and previous studies, the face-to-face training method is more effective. The reason for this result can be considered to be in the atmosphere of the training class, which is more serious than online, more direct transfer of concepts and exercises, and activities within a group. Since housewives spend most of their time at home, it can be stated that attending training classes is a good variety for them and has increased their tolerance for emotional distress.

The results of this study proved that a course of mindfulness based on yoga in face-to-face method and in online has a different and significant effect on the subjective well-being of housewives. Also, more positive effects were observed in the face-to-face group than the online group.

Ryan and Deci (2001) considered subjective well-being to have two approaches to hedonism with a focus on increasing happiness by creating positive emotions and eliminating negative emotions and life satisfaction, as well as virtue based on the flourishing of human capabilities and ideal life [41].

The results of this study are in line with the those of previous studies [42, 43] based on the mindfulness meditation in subjective well-being and life satisfaction, which increased significantly in the experimental group compared to the control group. Also, an increase in subjective well-being scores

indicates an increase in the level of subjective well-being in the individuals. The present study, in line with previous studies [42, 43] showed that there is a significant relationship between subjective well-being and quality of life. In explaining this issue, it can be stated that in the subjective well-being variable for its positive effects in person, better results can be obtained. Increasing the subjective well-being of housewives has a significant impact on their quality of life. Therefore, face-to-face yoga exercises play an important role in subjective well-being and happiness in housewives. The results also show that there is a significant difference between the face-to-face and online groups in the subscales of subjective well-being (emotional, psychological, and social well-being) and the results of a yoga-based mindfulness course in the face-to-face group. There is no observation between pre-test and post-test, so it can be concluded that in the subjective well-being variable, it is better to use face-to-face courses to obtain better results. In subjective well-being, the higher the scores of the subscales and the total score, the higher the subjective well-being of the individual.

A strength of this study was that we examined both types of face-to-face and virtual yoga training as an intervention. Here, we can suggest that future studies may examine the effects of some other kinds of training such as recreational play, parachute games, stickygym games, or teaching games [44, 45] on mental health of women of various age ranges. As a limitation in this study, it can be stated that we have not measured some important factors such as fitness or motivation. Future studies may include these factors in the study for presenting a more comprehensive view.

## 5. Conclusion

In general, it can be concluded that a Hatha yoga-based mindfulness training intervention in the form of face-to-face method has significant effects on emotional distress tolerance and subjective well-being than the online method. In relation to Hatha yoga-based mindfulness, the face-to-face method is much more useful than the online method. The reasons for the ineffectiveness of mindfulness intervention in online course are the lack of face-to-face training and the lack of intergroup communication, limited means of communication.

## Conflict of interest

The authors declared no conflicts of interest.

## Authors' contributions

All authors contributed to the original idea, study design.

## Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc. Protocol of this study was approved by Institute Ethical Committee (Code: IR.SSRI.REC.1400.1084; [https://ethics.ssrc.ac.ir/article\\_3118\\_3dbf4872e1c6855ff8daaefc4bf0e7eb.pdf](https://ethics.ssrc.ac.ir/article_3118_3dbf4872e1c6855ff8daaefc4bf0e7eb.pdf)).

## Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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**Appendix: Yoga-based mindfulness exercises in 12 sessions**

Session	Yoga Exercises
1	Pranayama status: Abdominal breathing training - Breathing awareness training Position of the Asanas: 1. Tadasana, 2. Tyriacatadasana (simple side stretch), 3. Four-sided sitting stretches (anti-anxiety cycle), 4. Dandasana, 5. Badakonasa butterfly, 6. Opening the shelf with strap, 7. Head bridge, 8. Sleeping page, 9. Cradle.
2	Pranayama status: Three-step breathing training - Awareness training on raising and lowering breathing Position of Asanas: 1. Four-way stretches (anti-anxiety cycle), 2. Dandasana, 3. Hamstring stretch, 4. Cattle cat position, 5. Butterfly and forward bend (for pelvis), 6. Janusharshana (sitting forward), 7. Paschimoban Asana, 8. Shoulder bridge.
3	Pranayama position: Abdominal breathing practice and three-step breathing Position of Asanas: 1. Four-way stretches (anti-anxiety cycle), 2. Dandasana, 3. Hamstring stretch, 4. Cattle cat position, 5. Butterfly and forward bend (for pelvis), 6. Janusharshana (sitting forward), 7. Paschimoban Asana, 8. Shoulder bridge.
4	Pranayama status: Anuloma (breathing) - Navayoga (inside silence) Position of Asanas: 1. Conscious walking with toe and heel, 2. Anti-anxiety cycle, 3. Opening of Anahata Chakra with bricks while lying down, 4. Sleeping screws, 5. Position of cow cat, 6. Anhata Asana, 7. Anjani Asana 8. Badakonasana, 9. Leaning forward with open legs (preparation and asana), 10. Cradle, 11. Stubana Asana.
5	Pranayama status: Practice Anolosa, Antermona meditation Position of Asanas: 1. Anxiety cycle, 2. Opening the chest with a strap, 3. Neck stretches, 4. Stretching the hamstring with the help of a strap, 5. Boganga asana and key, Vavitation with all variations (to open the chest chakra), 6. Supata Badakonasana and cradle in the same position, 7. Hand mill, 8. Anganyasana actively 9. Yutasana, 10. Bend back, 11. Tricatadasana, 12. Stubanadasana.
6	Pranayama position: Three-step breathing practice (Bakumbak and Bayakombak meaning sense of breath and exhalation), meditation according to breathing and repetition of Santra Soham Status of Asanas: 1. Anxiety cycle, 2. Sapta Padangasta, 3. Pavan Moktasana 4. Lying screws, 5. Sitting screws, 6. Dynamically activated Asana with Sasang Asana and Going Down Dog and Up Dog, 7. Otan Asana, 8. Triangle position, 9. Goddess position, 10. Janusius Asana or Paschimutan Asana, 11. Basic training to stand on the shoulder.
7	Pranayama status: Kombak and Bayakombak training in breathing - Anuloma - Meditation going back to memories and coming back. Asanas position: 1. Anxiety cycle, 2. Sitting on one leg to open the hamstring, 3. Asani Asani and going to the Dog Upside Down and the Dog Upside Down, active prostration, 4. Otana Asana, 5. Scissors position, 6. Bend back, 7. Simple crescent, 8. Ostovo Asana, 9. Savwang Asana, 10. Matsi Asana.
8	Pryanama state: Breathing anuloma with sense - Apana meditation Asanas status: 1. Anxiety cycle, 2. Hamstring stretches, 3. Cattle cat status, 4. Anahata Asana, 5. First half of the sun, 6. Tricon Asana, 7. Tree status, 8. Asana beast, 9. Savwang Asana, 10. Matsi Asana, 11. Sitting screw.
9	Pryanama position: Three-step breathing exercise with sense of breath and sense of exhalation Asanas status: 1. Anxiety cycle, 2. Hamsing stretches, 3. Cattle cat position, 4. Screwdriver, 5. Hello to the full sun, 6. Tricon Asana, 7. Weir Rasasana, 8. Janosirsasana, 9. Capt. Asana, 10. Plow condition, 11. Stuband Asana, 12. Metsi Asana.
10	Pryanama status: Kapalabathi training - Upper body meditation Position of Asanas: 1. Anxiety cycle, 2. Hamstring stretches, 3. Cow cat position, 4. Sitting screw, 5. Leaning forward with open legs, 6. Hail to the sun, 7. Goddess position and strengthening the quadriceps, 8. Variety of Bojang Asana, 9. Dand Asana, 10. Sarwang Asana, 11. Halasana, 12. Metsi Asana.
11	Pryanama situation: Caplabathi exercise - Lumbar breathing meditation, Soham Mantra Asanas status: 1. Anxiety cycle, 2. Sapta Padangost Asana, 3. Lotus semi-status and related screws, 4. Malasana and related screws, 5. Suryanamaskara, 6. Tricon Asana, 7. Otkatasana, 8. Eagle status, 9. Paschimutan Asana, 10. Sarwang Asana, 11. Hala Asana, 12. Metsi Asana.
12	Pryanama Status: Kapalabathi exercise-Aneloma Viloma - Lumbar breathing Mantra meditation Asanas status: 1-. Anxiety cycle, 2. Variety of hamstring stretches, 3. Cattle cat status, 4. Half pigeon status, 5. Surya Nama Sakara, 6. Trichon Asana, 7. Garudasana, 8. Arc status, 9. Paschimutan Asana, 10. Sunrise, 11. Capt. Asana, 12. Metsi Asana, 13. Abdominal and head breathing.

**References**

[1] Campbell TL. "The effectiveness of family

interventions for physical disorders". *J Marital Fam Ther.* 2003; 29(2): 263-281. PMID: 12728782. doi: [10.1111/j.1752-0606.2003.tb01204.x](https://doi.org/10.1111/j.1752-0606.2003.tb01204.x).

- [2] Yoshimasu K, Oga H, Kagaya R, Kitabayashi M, Kanaya Y. "Parent-child relationships and mindfulness". *Nihon Eiseigaku Zasshi*. Japan J Hyg. 2012; 67(1): 27-36. PMID: 22449819. doi: [10.1265/jjh.67.27](https://doi.org/10.1265/jjh.67.27).
- [3] James K, Rimes KA. "Mindfulness-based cognitive therapy versus pure cognitive behavioural self-help for perfectionism: A pilot randomised study". *Mindfulness*. 2018; 9: 801-814. PMID: 29875882. PMCID: [PMC5968046](https://pubmed.ncbi.nlm.nih.gov/PMC5968046/). doi: [10.1007/s12671-017-0817-8](https://doi.org/10.1007/s12671-017-0817-8).
- [4] Goldin PR, Gross JJ. "Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder". *Emotion*. 2018; 10(1): 83-91. PMID: 20141305. PMCID: [PMC4203918](https://pubmed.ncbi.nlm.nih.gov/PMC4203918/). doi: [10.1037/a0018441](https://doi.org/10.1037/a0018441).
- [5] Colle KFF, Vincent A, Cha SS, Loehrer LL, Bauer BA, Wahner-Roedler DL. "Measurement of quality of life and participant experience with the mindfulness-based stress reduction program". *Complement Ther Clin Pract*. 2010; 16(1): 36-40. PMID: 20129408. doi: [10.1016/j.ctcp.2009.06.008](https://doi.org/10.1016/j.ctcp.2009.06.008).
- [6] Wood AW, Gonzalez J, Barden SM. "Mindful caring: using mindfulness-based cognitive therapy with caregivers of cancer survivors". *J Psychosoc Oncol*. 2015; 33(1): 66-84. PMID: 25397963. doi: [10.1080/07347332.2014.977418](https://doi.org/10.1080/07347332.2014.977418).
- [7] Piran N. "The experience of embodiment construct: Reflecting the quality of embodied lives". *Handbook of Positive Body Image & Embodiment*. 2019; 11-21. doi: [10.1093/med-psych/9780190841874.001.0001](https://doi.org/10.1093/med-psych/9780190841874.001.0001).
- [8] Warhel AM, Athanasios P, Dinkar SH. "Effect of Mindfulness Based Stress Reduction (MBSR) in increasing pain tolerance and improving the mental health of injured athletes". *Front Psychol*. 2018; 9(72): 78-92. PMID: 29867682. PMCID: [PMC5963333](https://pubmed.ncbi.nlm.nih.gov/PMC5963333/). doi: [10.3389/fpsyg.2018.00722](https://doi.org/10.3389/fpsyg.2018.00722).
- [9] Reich RR, Lengacher CA, Alinat CB, Kip KE, Paterson C, Ramesar S, Han HS, Ismail-Khan R, Johnson-Mallard V, Moscoso M, Budhrani-Shani P. "Mindfulness-based stress reduction in post-treatment breast cancer patients: Immediate and sustained effects across multiple symptom clusters". *J Pain Symptom Manag*. 2017; 53(1): 85-95. PMID: 27720794. PMCID: [PMC7771358](https://pubmed.ncbi.nlm.nih.gov/PMC7771358/). doi: [10.1016/j.jpainsymman.2016.08.005](https://doi.org/10.1016/j.jpainsymman.2016.08.005).
- [10] Brown TA, O'Leary TA, Barlow DH. *Clinical Handbook of Psychological Disorders* (ed). New York: Guilford Press. 2010.
- [11] Daubenmier JJ. "The relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating". *Psychol Women Q*. 2005; 29(2): 207-219. doi: [10.1111/j.1471-6402.2005.00183.x](https://doi.org/10.1111/j.1471-6402.2005.00183.x).
- [12] Mahlo L, Tiggemann M. "Yoga and positive body image: A test of the Embodiment Model". *Body Image*. 2016; 18: 135-142. PMID: 27434106. doi: [10.1016/j.bodyim.2016.06.008](https://doi.org/10.1016/j.bodyim.2016.06.008).
- [13] Fateh S, Zarneshan A, Ghorbanian B. "The effect of Hatha yoga training on nesfatine-1, appetite and obesity indices in overweight women". *Metabolism and Exercise*. 2022 Mar 21; 12(1). doi: [10.22124/jme.2023.23946.245](https://doi.org/10.22124/jme.2023.23946.245). [in Persian]
- [14] Tayyebi A, Babahaji MA, Sadeghisherme M, Ebadi AB, Eynollahi BE. "Study of the effect of Hatha Yoga exercises on stress, anxiety and depression among hemodialysis patients". *IJCCN*. 2011 Jan 1; 4(2): 67-72. [in Persian]
- [15] Hajfiroozabadi M, Sahbaee F, Amiri S. "The effect of Hata yoga on mental health of women referring to yoga training centers in Tehran". *Alborz University Medical Journal*. 2018 Sep 10; 7: 73-80. doi: [10.29252/aums.7.7:supplement.3-supple.73](https://doi.org/10.29252/aums.7.7:supplement.3-supple.73). [in Persian]
- [16] Jannati S, Sohrabi M, Attarzadeh Hoseini SR. "The effect of selective Hata yoga training on balance of elderly women". *Salmand: Iranian Journal of Ageing*. 2011; 5 (4). [in Persian]
- [17] Alimohammadpour Koshki L, Zarneshan A, Fakhrpour R. "The effectiveness of physical-mental hatha yoga exercises on telomerase, cortisol and stress in middle-aged women". *Journal of Practical Studies of Biosciences in Sport*. 2023 Dec 22; 11(28): 64-74. doi: [10.22077/jpsbs.2022.5243.1709](https://doi.org/10.22077/jpsbs.2022.5243.1709). [in Persian]
- [18] Evin A, Khojasteh F, Ansari H. "The effect of hatha yoga on anxiety and self-efficacy of primiparous women in labor". *Open Complement Med J*. 2019; 9(1): 3546-59. [in Persian]
- [19] Babaei Khorzoghi M, Maleki Vasegh M, Rasekh SA. "The effect of a course of yoga with the approach of ultimate-fit and HathaYoga exercises on static balance in middle-aged women". *Journal of Rehabilitation Research in Nursing*. 2021; 7(4): 9-17. doi: [10.22034/IJRN.7.4.9](https://doi.org/10.22034/IJRN.7.4.9). [in Persian]
- [20] Diener E, Heintzelman SJ, Kushlev K, Tay L, Wirtz D, Lutes LD, Oishi S. "Findings all psychologists should know from the new science on subjective well-being". *Canadian Psychology/ Psychologie Canadienne*. 2017; 58(2):87. doi: [10.1037/cap0000063](https://doi.org/10.1037/cap0000063).
- [21] Götmann A, Bechtoldt MN. „Coping with COVID-19–Longitudinal analysis of coping strategies and the role of trait mindfulness in mental well-being". *Pers Individ Differ*. 2021; 175: 110695. PMID: [33531724](https://pubmed.ncbi.nlm.nih.gov/33531724/). PMCID: [PMC7843110](https://pubmed.ncbi.nlm.nih.gov/PMC7843110/). doi: [10.1016/j.paid.2021.110695](https://doi.org/10.1016/j.paid.2021.110695).
- [22] Soysa CK, Zhang F, Parmley M, Lahikainen K. "Dispositional mindfulness and serenity: Their unique relations with stress and mental well-being". *J Happiness Stud*. 2021; 22(3): 1517-1536. PMID: [29387263](https://pubmed.ncbi.nlm.nih.gov/29387263/). PMCID: [PMC5770488](https://pubmed.ncbi.nlm.nih.gov/PMC5770488/). doi: [10.1007/s12671-017-0762-6](https://doi.org/10.1007/s12671-017-0762-6).
- [23] Zollars I, Poirier TI, Pailden J. "Effects of mindfulness meditation on mindfulness, mental well-being, and perceived stress". *Curr Pharm Teach Learn*. 2019; 11(10): 1022-1028. doi: [10.1016/j.cptl.2019.06.005](https://doi.org/10.1016/j.cptl.2019.06.005).
- [24] Telles S, Gupta RK, Bhardwaj AK, Singh N, Mishra P, Pal DK, Balkrishna A. "Increased mental well-being and reduced state anxiety in teachers after participation in a residential yoga program". *Med Sci Monit Basic Res*. 2018; 24:



105. PMID: [30061552](#). PMCID: PMC6083945. doi: [10.12659/MSMBR.909200](#).
- [25] Tulloch A, Bombell H, Dean C, Tiedemann A. "Yoga-based exercise improves health-related quality of life and mental well-being in older people: a systematic review of randomised controlled trials". *Age Ageing*. 2018; 47(4): 537-544. PMID: 29584813. doi: [10.1093/ageing/afy044](#).
- [26] Howell AJ, Digidon NL, Buro K, Sheptycki AR. "Relations among mindfulness, well-being, and sleep". *Pers Individ Differ*. 2008; 45(8): 773-777. doi: [10.1016/j.paid.2008.08.005](#).
- [27] Dumbala S, Bhargav H, Satyanarayana V, Arasappa R, Varambally S, Desai G, Bangalore GN. "Effect of yoga on psychological distress among women receiving treatment for infertility". *Int J Yoga*. 2020; 13(2): 115. PMID: 32669765. PMCID: [PMC7336944](#). doi: [10.4103/ijoy.IJOY 34 19](#).
- [28] Fong TC, Ho RT. "Mindfulness facets predict quality of life and sleep disturbance via physical and emotional distresses in Chinese cancer patients: A moderated mediation analysis". *Psychooncol*. 2020; 29(5): 894-901. PMID: 32065693. doi: [10.1002/pon.5363](#).
- [29] Ford CG, Shook NJ. "Negative cognitive bias and perceived stress: independent mediators of the relation between mindfulness and emotional distress". *Mindfulness*. 2019; 10(1): 100-110. doi: [10.1007/s12671-018-0955-7](#).
- [30] Miller R, Lambert J. "Effects of face-to-face and online yoga instruction on anxiety and flexibility". *Scientific Journal of Sport and Performance*. 2023 Jan 17; 2(2): 119-31. doi: [10.55860/VWDQ3051](#).
- [31] Callahan CE, Beisecker L, Zeller S, Donnelly KZ. "LoveYourBrain mindset: feasibility, acceptability, usability, and effectiveness of an online yoga, mindfulness, and psychoeducation intervention for people with traumatic brain injury". *Brain Injury*. 2023 Apr 16; 37(5): 373-82. doi: [10.1080/02699052.2023.2168062](#).
- [32] Simons JS, Gaher RM. "The distress tolerance scale: Development and validation of a self-report measure". *Motiv Emot*. 2005; 29(2): 83-102. doi: [10.1007/s11031-005-7955-3](#).
- [33] Mahmoudpour A, Shariatmadar A, Borjali A, Shafiabadi A. "Psychometric properties of the Distress Tolerance Scale (DTS) in the elderly". *Quarterly of Educational Measurement*. 2022; 12(46): 49-64. doi: [10.22054/jem.2022.65915.3341](#). [in Persian]
- [34] Keyes CL, Magyar-Moe JL. "The measurement and utility of adult subjective well-being". *Handbook of Models and Measure*. Edited by Lopez SJL and Snyder R. Washington, DC: American Psychological Association. 2003. doi: [10.1037/10612-026](#).
- [35] Hashemian K, Pourshahriar M, Bani Jamali S, Golestani Bakht T. "Study of subjective well-being and happiness based on demographic characters in Tehran population". *Psychological Studies*. 2007; 3(9): 11-20. [in Persian]
- [36] Cagas JY. "Physiological and psychological responses to different yoga styles". *Yoga Mimamsa*. 2018 Jul 1; 50(2): 53-9. doi: [10.4103/ym.ym 15 18](#).
- [37] Hoppes K. "The application of mindfulness-based cognitive interventions in the treatment of co-occurring addictive and mood disorders". *CNS Spectr*. 2006; 11(11): 829-851. PMID: 17075556. doi: [10.1017/s1092852900014991](#).
- [38] Bernier M, Thienot E, Codron R, Fournier JF. "Mindfulness and acceptance approaches in sport performance". *J Clin Sport Psychol*. 2009; 3(4): 320-333. doi: [10.1123/jcsp.3.4.320](#).
- [39] Fetzner MG, Peluso DL, Asmundson GJ. "Tolerating distress after trauma: Differential associations between distress tolerance and posttraumatic stress symptoms". *J Psychopathol Behav Assess*. 2014; 36(3): 475-484. doi: [10.1007/s10862-014-9413-6](#).
- [40] Williams AD, Thompson J, Andrews G. "The impact of psychological distress tolerance in the treatment of depression". *Behav Res Ther*. 2013; 51(8): 469-475. PMID: 23787227. doi: [10.1016/j.brat.2013.05.005](#).
- [41] Ryan RM, Deci EL. "On happiness and human potentials: A review of research on hedonic and eudaimonic well-being". *Annu Rev Psychol*. 2001; 52(1): 141-166. doi: [10.1146/annurev.psych.52.1.141](#).
- [42] Bansal R, Gupta M, Agarwal B, Sharma S. "Impact of short-term yoga intervention on mental wellbeing of medical students posted in community medicine: A pilot study". *Indian J Community Med*. 2013; 38(2): 105. PMID: [23878424](#). PMCID: PMC3714937. doi: [10.4103/0970-0218.112445](#).
- [43] Bohlmeijer E, Prenger R, Taal E, Cuijpers P. "The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: A meta-analysis". *J Psychosom Res*. 2010; 68(6): 539-544. PMID: 20488270. doi: [10.1016/j.jpsychores.2009.10.005](#).
- [44] Mir, F., Abdoshahi, M., Shamsipour Dehkordi, P. "The effect of a mindfulness-based yoga training course on the mental toughness of athletes with different skill levels". *The Scientific Journal of Rehabilitation Medicine*. 2022; 10(6): 1214-1227. doi: [10.32598/SJRM.10.6.7](#). [in Persian]
- [45] Mir F, Abdoshahi M, Shamsipour P. "The effect of mindfulness-based yoga exercises on resilience and anger control of female student-athletes". *Sports Psychology*, 2023; 1401(2). doi: [10.29252/mbsp.2021.210420.0](#). [in Persian]