Research Square

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Brief Tele-Mindfulness Based Intervention: A Randomized Controlled Multicenter Trial

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Abstract

Background: To enhance psychological wellbeing of health care providers (HCP) who look after patients with COVID-19. This study is a psychological intervention in COVID19 pandemic to check at what extent can interventions based on mindfulness affect psychological resilience and anxiety of HCP.

Methods: This is a randomized controlled trial study that was conducted from July to August 2020 at King Fahad Hospital and Qateef Central Hospital in Saudi Arabia. 147 COVID19 frontline HCP were randomized to a 2-week virtual intervention with brief mindfulness-based intervention (BMM) or to progressive muscle relaxation(PMR).

Pre and post intervention assessment were done using the (state trait anxiety–20 Item Scale), the (Connor-Davidson Resilience Scale (CD-RISC-10), and WHO – 5 Well-Being Index.

Results: The two groups had significant improvement results in the psychological wellbeing and reduction of the sate anxiety but not the trait anxiety nor the resiliency. Improved cases was higher among group BMM (81.3%) than among group PMR (51.8%), (X2=12.9, p=0.0001), concerning psychological wellbeing.

Conclusions: Brief mindfulness-based intervention has improved the psychological wellbeing and reduced the anxiety of frontline health care providers during COVID19 pandemic.

Trial registration: Clinicaltrial.gov identifier: NCT04656626

https://clinicaltrials.gov/ct2/show/NCT04656626?cond=Mindfulness&cntry=SA&draw=2&rank=1

Background

Coronavirus Disease 2019 has infected millions around the world with a potentially fatal illness. This pandemic has caused anxiety, creating a substantial risk of harmful consequences on health care providers' (HCP) mental health [1].

HCP mental wellbeing protection is of prime importance for the long-lasting ability to cope pandemics, providing HCP with psychological care is an important challenge [2].

In China, frontline HCPs caring for COVID-19 patients are more likely to have stress, anxiety, and insomnia as well as mental health issues that are more severe in comparison to those in roles considered inferior in terms of the extent of the exposure to the frontlines [3, 4, 5].

On the other hand, some studies have found a higher prevalence of psychological distress among non-frontline HCP, which is why support measures are needed for all HCP, regardless of their level of viral exposure to the virus [6].

Mindfulness can be defined as directing focus and attention on experiences occurring in the present and techniques that revolve around self-compassion and the avoidance of self-rumination [7]. There are numerous methods in which an individual can enter this trance-like state. These methods can be collectively defined as Mindfulness-based interventions (MBIs) which can be classified as being brief interventions (mostly eight sessions) that are short-term and done in a group, such as mindfulness meditation training. Of the myriad number of methods available, Mindfulness-Based Cognitive Therapy (MBCT) [8] and Mindfulness-Based Stress Reduction (MBSR) [9] can be considered as the most popular and frequently used. Therefore, people with better mindfulness capabilities are less probable of being affected by painful emotions such as anxiety [10, 11] and depression [12, 13, 14].

Up to our knowledge this is the first psychological intervention study done during COVID19 pandemic. This aim is to evaluate the effectiveness of brief mindfulness-based interventions to frontline HCP in coping for (COVID19) and improving their psychological wellbeing.

Our specific objectives are: To measure front line HCP's level of anxiety, resilience, and how mindfulness-based interventions affect anxiety and psychological resilience of HCP.

Materials And Methods

Design

A double blinded randomized controlled multicenter clinical trial. With an allocation ratio of 1:1.

Settings And Participants

This clinical trial was done on healthcare professionals in the forefront of dealing with COVID19, including physicians, nurses, and respiratory therapists.

We excluded those with concurrent psychotherapy, dependence on substances or their abuse within the last 6 months, significant personality disorder, current severe neurotic disorder, or history of psychotic disorder

The trial was virtually conducted in the largest two Eastern province hospitals using mp3 audible recordings and electronic questionnaires that were filled before and after the intervention. These were all delivered and monitored via a website designed and customized for this sole purpose (produced June 2021). The trial consisted of a 2-week intervention interval (started in July 2021) followed by follow-up period of 2 weeks.

Sampling Technique And Sample Size

All the COVID19 frontliners (n = 785) at the hospitals under investigation during the study period were approached through their human resources departments (145 Physicians, 46 respiratory therapists, and 594 nurses).

We enrolled the consenters who agreed to participate in the study and initially conformed to the inclusion criteria (n = 348). Through their hospitals' human resources department, we sent them a link to an electronic survey that started with an online written consent, then questions about demographic data and the inclusion and exclusion criteria. Then, 201 were excluded either due to an exclusion criterion or were not interested.

In the end, 147 were left to be randomized to the intervention and control groups. The data sheet of those participants was imported into the system developed to conduct the trial. All details are shown in Fig. 1.

The minimum number of participants necessary to achieve a statistical power of 80% and detect an effect as small as Cohen's *d = 2*.5 using repeated measures ANOVA, at an alpha level = 0.05, was calculated using G*power3.1.9.7 to be 64 for each group*)*

Randomization/ Allocation Concealment

Through a customized website, central sequence generation randomization was performed using block randomization based on specialty (physicians, nurses and RA) and gender of participants.

Blindness

Conduction of the study was triple blinded. Besides delivery and tracking the interventions through a customized website, the participants and biostatistician involved in measuring the results and outcomes were blinded to their respective assignment.

The whole trial, namely, informed electronic consent, mp3 audios and pre/post electronic questionnaires, delivery, daily reminders, and tracking was done via a customized website for this purpose. The outcome was measured using the following tools.

Measurements

Outcomes

Primary outcomes are: psychological wellbeing assessed by WHO-5, level of psychological resilience assessed using the Connor-Davidson Resilience Scale (CD-RISC-10) and anxiety symptom severity assessed using the (state trait anxiety–20 Item Scale).

The WHO – 5 Well-Being Index. The World Health Organization Well Being Index (WHO-5) was used to measure the well-being index. This can be visualized in the form of a percentage that is calculated by multiplying the raw score that ranges from 0 to 25 by 4. A percentage at the lower extreme (0) indicates the worst quality of life, whereas the highest extreme (100) suggests the best possible quality of life. A score that is less than 13 is indicative of poor overall wellbeing and highly associated with the need to screen for depression [15].

Connor-Davidson Resilience Scale 10 (CD-RISC-10). The CD-RISC-10 is a self-reported scale made up of 10 statements describing resilience and its different aspects. Although mainly a measure of hardiness, other themes are also included such as flexibility, the ability to regulate one's emotions, optimism and one's outlook on life, cognitive focus, and the ability to maintain emotions under distress. Each item is scored via a Likert score that ranges from 0 to 4, with 0 suggesting that the resilience statement is definitely not true and a score of 4 indicating it is true most of the time. A cumulative measure is made where each of the 10 items answered is tallied and therefore ranges from 0 to 40. Scores that are higher indicate greater resilience, or a better ability to get back up after adverse events and lower scores suggest less resilience. A score below 33 possibly suggests difficulty in coping with stress or bouncing back from adversity [16].

The State-Trait Anxiety Inventory (short form) (STAI-AD) The STAI-AD is an instrument used for measuring anxiety in adults. It differentiates between the "state anxiety and "trait anxiety." The STAI has 20 questions, split into 2 subscales of 10 items each a range of four possible responses to each. States of anxiety can be described as having a subjective feeling of tension, apprehension, worry, and nervousness, in addition to the stimulation of the autonomic nervous system. The score ranges between 20 and 80. The weights were reversed for items indicating positive feelings. Then all were added to give a score out of 40 each (the state anxiety and the trait anxiety). As the score increases, the degree of anxiety is higher [17]. An accumulative score of 40 usually indicates clinical levels of anxiety.

Interventions

Intervention group (BMM)

Due to the obstacles of traditional physical mindfulness meditation therapy in terms of time, effort, and availability of psychologists. Brief mindfulness interventions have become more convenient and popular and have also been proven as being an effective technique in overall improvement of health care providers` well-being and positively affect a variety of aspects associated with health [18, 19]

For this trial, the intervention arm participants (BMM) received brief mindfulness-based audio recording sessions, an mp3 audible recording of brief 20-minute session of mindfulness was given to them and participants had the option of accessing the audio directly from any personal device of their choice including laptops and their own smart phones.

The daily 20-minute mindfulness sessions occur over a period of 2 weeks and involve the following meditation commands: 1. Begin by focusing on a primary object, such as your breath. 2. Bring your attention to every movement, e.g., the feeling of your breath as you inhale and exhale. 3. As your mind begins to slowly drift into thinking (mind wandering); notice you are thinking, focus back onto the primary object, e.g., your breathing pattern. 4. When you begin to feel an intense feeling of emotion, again, acknowledge it and return your focus slowly onto your breath. 5. As you gain confidence, you may practice maintaining this focus while observing thoughts flowing through your mind or sensations in your body while showing no concern for the content; you may practice this anytime throughout your day. 6. You may even label your thoughts, i.e., thinking, planning, worrying, or your feelings, i.e., anger, fear, love, anxiety, etc., or your body sensations, i.e., hot, cold, sharp, tight, tingly. At any point you may shift your attention back to your breath or object of focus while still being aware of your thoughts and feelings. 7. Thank yourself for your efforts and for taking this time [19].

Control Group (Pmr)

The control group was handed an mp3 audible recording lasting for 20-minutes that was composed of instructions on how to initiate staged progressive muscle relaxation which can be accessed through the device of their liking.

These daily sessions occur of a span of 2 weeks and involve tensing up a group of muscles, keeping them in that state of contraction for a moment, after which the participants slowly release the tension and relax their muscles.

For the duration of the study, the control group and intervention group simultaneously went through similar number of follow-up sessions at the same time. The mindfulness sessions were given virtually to be done at home via Emails and SMS messages. If support was required, coaching staff were available to guide both groups if assistance was required.

Statistical analysis

Statistical analysis was done using 'IBM SPSS Statistics for Windows, version 21', and the statistical significance level was predetermined to be set at 0.05 (two-tailed). The actual numbers upon which analysis was performed were 64 BMM:61PMR

Sample characteristics were described by demonstrating categorical data as numbers and percentages while numerical data in this case were the final results of all three scales and demonstrated as minimum, maximum and average. Normality of the scores was tested by utilizing both skewness and kurtosis coefficients (a value < 0.25 and 2.5, respectively was counted as normal), besides box plots. The intervention and its effects along with the numerous aspects related to the degree of change in all the three different scales were studied by the General linear models (repeated measures ANOVA). Further investigation was performed to showcase the percentage and degree of improvement in each different

scale. Any changes of the scores were computed as post-pre scores, positive improvement was considered if the WHO-5 and resilience change was more than zero and if change in anxiety scores was less than zero. Logistic regression was utilized to assess possible factors related to improvement of each scale. Bivariate analyses were performed by performing independent samples t-test and Mann Whitney u test, one-way ANOVA (for relations with numerical variables) and chi square test (for testing association between categorical variables).

Information Technology And Cybersecurity

A new system was developed for the sake of this study to be utilized for the purpose of data collection, intervention delivery and execution of study. The system was designed in the form of an electronic questionnaire along with audible recordings that were automatically sent to the participants' phones via SMS and personal Email (Figure S1), each individual participant receives a link unique to them. To ensure proper adherence, daily reminders were sent to the participants for the entire duration of the study (Figure S2).

Each participant has a link to the site that contains their own audio file and after listening each participant will fill their own survey. The system was designed with a separate site for admins with a dashboard (Figure S3) that allowed them several editorial functions such as the ability to create, correct, and oversee participants, groups, and hospitals (Figure S4). Participants' adherence to the study can also be tracked by monitoring the frequency and duration of their stay as shown in Figure S4. Additionally, the admin site eased the ability in which the collected data can be downloaded on a excel file (Figure S5) and then imported to SPSS later.

Initial assessment of the website was done by using the GreenBone Vulnerability Assessment System. Additionally, GreenBone was also used to generate and configure the server's IP address and was designed to visualize different scenarios on the tested server accordingly based on the requirement and specifications for the assessment.

Results

In the current study, 147 COVID 19 front line healthcare givers agreed to participate in the study. Block randomization by specialty and gender resulted in their allocation to group BMM (77) and Group PMR (70). Yet 22 of them (13 (16.8%) of group BMM and 9 (12.8%) of group PMR, $z = 0.68$ $p = 0.496$) didn't complete the post intervention questionnaire Shown in (Fig. 1). There was no statistically significant difference between the dropouts and those who completed the study as regards all baseline characteristics.

The results were performed on the 125 who completed the post questionnaire. The baseline characteristics are displayed by intervention groups (Table 1); there were no statistically significant difference between both groups as regards any of the studied demographic nor the work characteristics.

Who-5 Well-being Index

The baseline score ranged from 0 to 100 with an average 58.2 ± 21.5 (95%CI [54.4,61.9]), no statistically significant difference was found between both BMM and PMR groups. The score was higher in older age and those more experienced. Nurses had a higher score (63.8 ± 19) than physicians (50.5 ± 23.2) and respiratory therapists (41.6 ± 16.1), $F_{(2,121)} = 7.47$, $p = 0.001$.

After intervention, the average score raised to 69.9 ± 18.9 (95%CI [66.8,73.2]), this was statistically significant (Pillai's trace F (1,111) = 10.2, p = 0.002). Shown in (Fig. 2). No significant between-subject effect was detected to any of the factors. With further investigation of change in WHO-5 wellbeing, improvement was detected in 88 of the cases (66.4%). The percent of improved cases was higher among group BMM (52, 81.3%) than among group PMR (31, 51.8%), $X^2 = 12.9$, $p = 0.0001$. Adjusted OR, 95%CI = 4.19[1.5–11.6]. Also, those with lower baseline score improved a little more Adjusted OR, 95%CI = 0.939 [0.939–0.966] Shown in (Table 2).

Table 1
Demographic and work characteristics of COVID19 FRONTLINE HEALTH CARE WORKERS in the eastern province of KSA, 2020

		Group						p-value
		BMM (n = 64)		PMR (n = 61)		Total (n = 125)		
		No.	%	No.	%	No.	%	
Age (in years)		16–52		23–61		16–61		.068
Min-max		32 ± 7		34 ± 8		33 ± 7		
Mean ± SD								
Specialty / gender								
medicine/surgery	male	16	66.7%	8	40.0%	24	54.5%	
	female	8	33.3%	12	60.0%	20	45.5%	.077
nursing	male	5	13.9%	5.1%	7	9.3%		
	female	31	86.1%	37	94.9%	68	90.7%	.193[a]
respiratory therapy	male	1	25.0%	0	0.0%	1	20.0%	
	female	3	75.0%	1	100.0%	4	80.0%	.576[a,b]
Type of participation								
staff		56	87.5%	57	93.4%	113	90.4%	
volunteer		8	12.5%	4	6.6%	12	9.6%	.260
Years of experience		1–32		1–30		1–32		0.231
Min-max		5		7		6		
median								
Hours of duty /week		12–480		0-384		0-480		.785
Min-max		48		48		48		
median								
Average number of COVID-19 patients seen daily		0–60		0–50		0–60		.659
Min-max		2		2		2		
median								
Marital status								

	Group						p-value
	BMM (n = 64)		PMR (n = 61)		Total (n = 125)		
	No.	%	No.	%	No.	%	
single	19	29.7%	24	39.3%	43	34.4%	
married	42	65.6%	34	55.7%	76	60.8%	
separated	2	3.1%	3	4.9%	5	4.0%	
widow	1	1.6%	0	0.0%	1	0.8%	.071
Have kids	33	51.6%	30	49.2%	63	50.4%	.790
Have elders at home	27	42.2%	22	36.1%	49	39.2%	.483
Have separate room at home	43	67.2%	47	77.0%	90	72.0%	.220
Chronic medical disease	10	15.6%	3	4.9%	13	10.4%	.05

Table 2
Logistic regression for factors associated with improvement in WHO-5 wellbeing among COVID19 Frontline health care workers in the Eastern province of KSA, 2020

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
BMM Group	1.432	.521	7.548	1	.006	4.186	1.507	11.622
Female gender	.645	.616	1.096	1	.295	1.906	.570	6.375
Specialty	.170	.550	.095	1	.758	1.185	.403	3.486
Years of experience	− .020	.035	.332	1	.564	.980	.915	1.050
Hours of duty /week	− .001	.002	.210	1	.647	.999	.994	1.004
COVID19 patients/day	− .014	.033	.178	1	.673	.986	.925	1.051
Number of sessions	− .030	.065	.207	1	.649	.971	.854	1.104
who5wellbeing index pre-intervention	− .063	.015	18.456	1	.000	.939	.912	.966
Constant	3.028	1.441	4.418	1	.036	20.663		
Exp(B): adjusted Odds Ratio; B: regression coefficients; SE: standard error								
Hosmer and Lemeshow X^2 = 13.291, p = 0.102								
Omnibus Tests of Model Coefficients X^2 = 44.292, p = 0.0001								

Resilience

The baseline score ranged from 0 to 40 with an average 26.2 ± 7.5, there was no statistically significant difference between both groups. The score was higher in older age and those more experienced. Nurses had a higher score (27.5 ± 7.4) than physicians (24 ± 7.7), $F_{(2,121)}$ = 3.09, p = 0.045, average score of respiratory therapists was 24.2 ± 3.5. The baseline score was higher among staff (26.7 ± 7) than among volunteers (20.9 ± 10.1), t = 2.6, p = 0.01. About 79% had a score below 33, no significant difference between both intervention groups.

After intervention, the average score was 26.8 ± 8.7, the difference was not statistically significant (Pillai's trace F (1,105) = 0.246, p = 0.621). No significant between-subject effect was detected to any of the factors.

Further investigation of change in resilience, improvement was detected in 60 of the cases (48%). The percent of improved cases was higher among group PMR 32 (52.5%) than among group BMM 28(43.8%),

yet $X^2 = 0.94$, p = 0.33. Also, the percent of improved cases was higher among physicians 24 (54.5%) than among nurses 34(45.3%), yet $X^2 = 2.53$, p = 0.282

Of those who had score below 33, 21.3% of group PMR improved to a score higher than 33 versus 9.6% of group BMM, yet the difference was not statistically significant (z = 1.62, p = 0.105).

Those with lower baseline score improved a little more Adjusted OR, 95%CI = 0.943 [0.893–0.996].

Anxiety

State anxiety

The baseline score ranged from 10 to 39 with an average 21.5 ± 6.1(95%CI [20.4,22.6]), no statistically significant difference was found between both groups. The score was lower in older age and those more experienced and those with higher hours of duty /week. Nurses had a lower score (20.2 ± 6) than physicians (23.2 ± 5.8), $F_{(2,121)} = 5.17$, p = 0.007, average score of respiratory therapists was 26 ± 5. State anxiety score of those who had a separate room at home ranged from 10–39 with an average of 21, while score of those who did not have a separate room ranged from 10–31 with an average of 25, Mann-Whitney z = 2.2, p = 0.027 (Figure S6). The baseline score was lower among staff (21.1 ± 6) than among volunteers (24.9 ± 4.4), t = 2.08, p = 0.04 Shown in (Fig. 3).

After intervention, the average state anxiety score dropped to 18.4 ± 5.7 (95%CI [17.4,19.4]), this was statistically significant (Pillai's trace F (1,82) = 15.7, p = 0.0001). Between-subject effect was detected to staff/volunteer (p = 0.029) and having separate room (p = 0.045). Further investigation of change in state anxiety, improvement was detected in 80 of the cases (64.5%). Those with higher baseline score improved more Adjusted OR, 95%CI = 1.15 [1.06–1.25].

Trait anxiety

The baseline score ranged from 10 to 35 with an average 19.9 ± 5.2, no statistically significant difference was found between the two groups. The score was lower in older age and those more experienced. Nurses had a lower score (18.9 ± 4.8) than physicians (21.3 ± 5.6), $F_{(2,121)} = 3.49$, p = 0.034, average score of respiratory therapists was 22 ± 3. Trait anxiety score of those who had a separate room at home ranged from 10–35 with an average of 18.5, while score of those who did not range from 10–31 with an average of 21, Mann-Whitney z = 2.04, p = 0.041.

After intervention, the average trait anxiety score dropped to 18.7 ± 5.3, yet the difference was not statistically significant (Pillai's trace F (1,82) = 0.246, p = 0.232). No significant between-subject effect was detected to any of the factors.

Further investigation of change in trait anxiety score, improvement was detected in 70 of the cases (56.5%). Those with higher baseline score improved more Adjusted OR, 95%CI = 1.16 [1.06–1.27].

Discussion

To the best of our knowledge, this is the first mindfulness-based randomized controlled trial intervention to enhance well-being, resilience and reduce anxiety among frontline HCP fight against COVID-19. Previous studies have reported that frontline healthcare workers were suffering from depression, anxiety, burnout, post-traumatic stress disorder, depersonalization, and fear of unknown or becoming infected [20]. The current study was focusing on how to diminish the frontline HCP's psychological impact and improve psychological wellbeing during this pandemic. The importance of the current study was to address the mental health of Frontline HCP who are at high-risk and experienced adverse psychological impact than other group of people [2].

Researchers were focusing on resilience and anxiety and as a consequence of which how they experience mental well-being as an outcome of the mindfulness-based intervention. The analysis of demographic variables shows that investigators recruited an equal number of research subjects from each category of the selected professions. In addition to that, researchers collected data about years of experience, hours of duty, number of COVID-19 patients seen daily, marital status, the presence of kids and elders at home, availability of separate room at home, and chronic medical disease, which were considered as moderating and protective factors associated with COVID-19 in HCP [21].

The analysis of the well-being index reveals that both intervention and control group HCP benefited from the intervention and observed a significant difference between them. Nevertheless, older age group and experienced HCP's post intervention score improved. A study conducted in China reported that young women HCP were affected greatly than older HCP [22]. Similarly, nurse's well-being index score was better than physicians and respiratory therapists. Nurses were experiencing poor quality of well-being compared to the other HCP during the pandemic [3]. After the intervention the average well-being index score improved from 58.2 ± 21.5 to 69.9 ± 18.9 ($P = 0.002$, $P < 0.05$) and 66.4% of the participants well-being improved. Improvement founded due to support received from the intervention, which allow intensive devotion in their immediate practice [7].

The analysis of resilience indicates that 60 participants had improvement in resilience score of after the intervention, even though there is no significant statistical difference ($P = 0.62$, $P > 0.05$) observed between intervention and control group. Resilience plays a significant role to enhance the HCP' mental health. The ability to bounce back after an adverse event is a key characteristic of resilience. It is considered as a protective factor of an individual to face the challenging situation [23]. Similarly, A smartphone delivered mindfulness intervention among HCP augments the well-being and resilience [24].

Another primary outcome to reduce the anxiety among frontline HCP through online delivered mindfulness-based intervention. Post intervention average state anxiety score was dropped from 21.5 ± 6.1 to 18.4 ± 5.7. There was a significant change that was observed between pre and post mindfulness-based intervention ($P = 0.0001$, $P < 0.001$). Another observation was the difference in average state anxiety of HCP, who had separate room and no separate room at home. The state anxiety score was slightly less among HCP who had separate room compared to no separate room at home ($P = 0.027$, $P <$

0.05). It may be due to fear of uncertainty and apprehension for spreading COVID-19 with other family members as the participants were frontline HCP. Similarly, another difference was observed in mean state anxiety score between low among staff (21.1 ± 6) and volunteers (24.9 ± 4.4). The difference was significant ($p = 0.04$, $P < 0.05$). It can be due to the COVID-19 induced insecurity promoted state anxiety. Anxiety score was low in staff, which can be explained as frontline HCP who were habituated through frequent exposure by managing the COVID − 19 cases, whereas the volunteer's exposure was very limited or nil. Significant improvement was observed in 64.5% participants' state anxiety and 56.5% participants' trait anxiety score. The significant improvement in the state anxiety compared with the insignificant improvement in the trait anxiety is justified by the duration of the intervention; giving that the brief intervention (2 weeks intervention) most probably will not be enough in terms of time to affect the trait which needs time to be improved compared with the state anxiety. A methodologically robust 85 randomized controlled trial that involved short-term, brief mindfulness-based intervention reported that it produces a significant psychological outcome in anxiety [16]. Another study measured anxiety of healthcare workers using State Trait Anxiety Inventory (STAI) showed that significant changes after mindfulness intervention were present [25].

Limitation of the study

1. Could not conduct further follow-up to evaluate how they are sustaining the changes made through the intervention
2. As it was an online based intervention, therapeutic relationship was lacking in this intervention, which may influence the intervention.

Conclusion

These results suggest that brief mindfulness-based intervention has improved the psychological wellbeing measured by the WHO-5 Wellbeing scale and reduced the state anxiety of frontline health care providers during COVID19 pandemic. The same outcome was discovered in the PMR group; however, the psychological wellbeing was way significantly improved in the BMM group than the control one.

Abbreviations

HCP
health care providers
CD-RISC-10
Connor-Davidson Resilience Scale
WHO-5
World Health Organization Well Being Index
STAI-AD
The State-Trait Anxiety Inventory
MBI

Mindfulness-based interventions
MBCT
Mindfulness-Based Cognitive Therapy
MBSR
Mindfulness-Based Stress Reduction
IP
Internet Protocol
SPSS
Statistical Package for Social Sciences
OR
Odds Ratio
S.E
Standard Error
C.I
Confidence Interval.

Declarations

Ethical approval and consent to participate: All authors confirm that every procedure that contributed to this work fully comply with the ethical standards of the relevant national and institutional committees on human experimentation and agree with the Helsinki Declaration of 1975, as revised in 2008. The Institutional Review Board of Imam Abdulrahman bin Faisal University approved of this study in May 2020 (Approval Number: IRB2020-01-166) and was registered in Clinicaltrial.gov (Identifier Number: NCT 04656626 07/12/2020). Consent was obtained from the participants.

Consent for publication: Not applicable in this study.

Availability of data and materials: All data generated or analysed during this study are included in this published article [and its supplementary information files]. All primary data has been deidentified and consent to publish has been taken from the participants. Should additional information be required, please contact the corresponding author.

Competing Interest: None to declare.

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Author's contributions:

Conceptualization: AA1, AE, MW, YA, AA2, JA, SO, FA1, FA2, KA. Design of the work: AA1, AE, MW, AA2. Data interpretation: MW, AA1, KA, SO, FA1. Creation of new software: KA, AA1, MW. Drafted the work: FA2,

AA1, MW, JA, FA1, YA. All authors revised the final draft and approved the submitted version. All authors agree to be both personally accountable for the author's own contributions.

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Figures

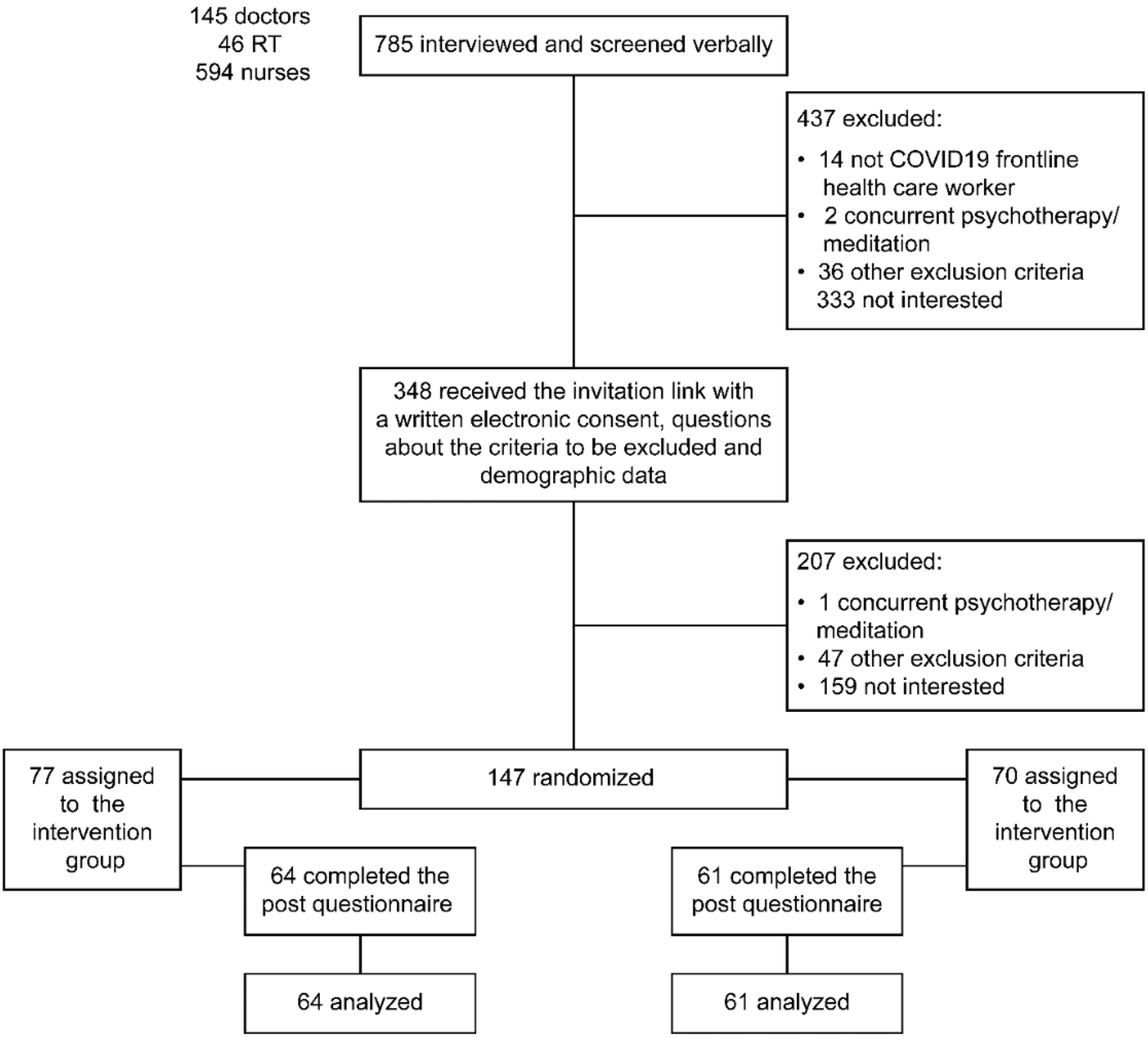


Figure 1

CONSORT diagram showing the flow of COVID19 frontline health care professionals through the study from invitation to participate till analysis of data.

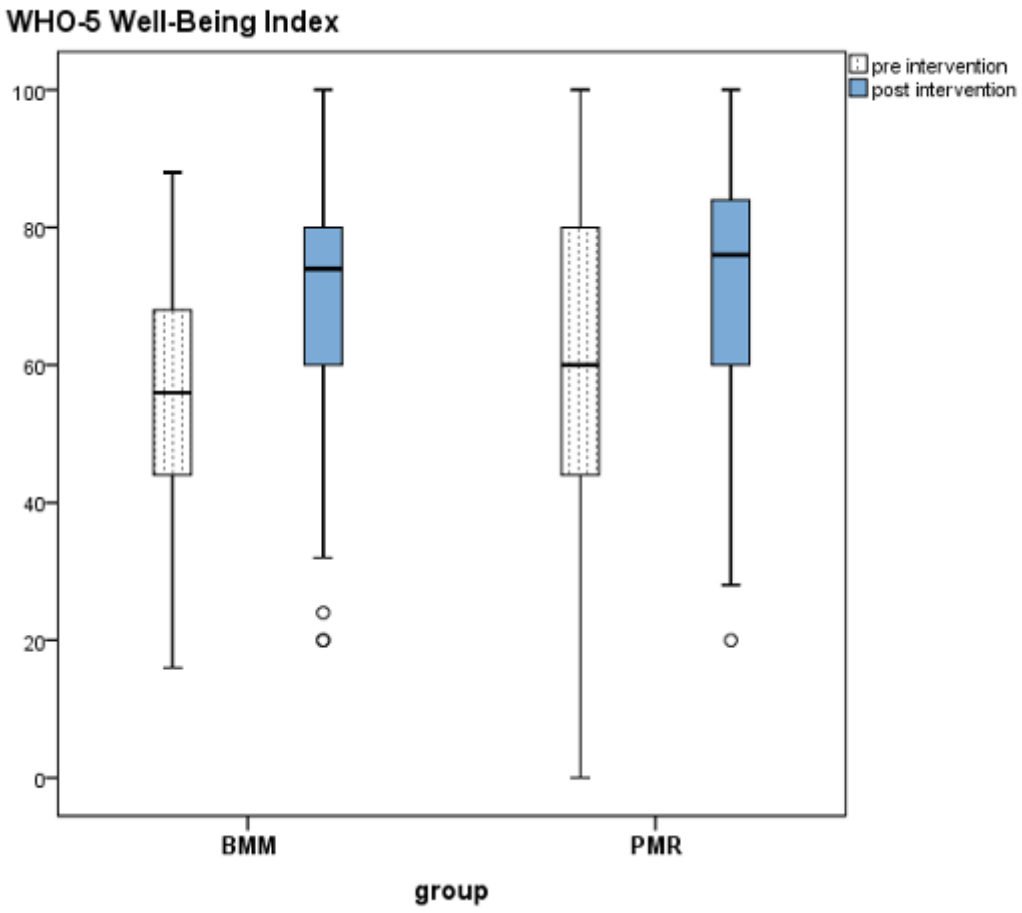


Figure 2

WHO-5 Well-Being Index before and after intervention by groups.

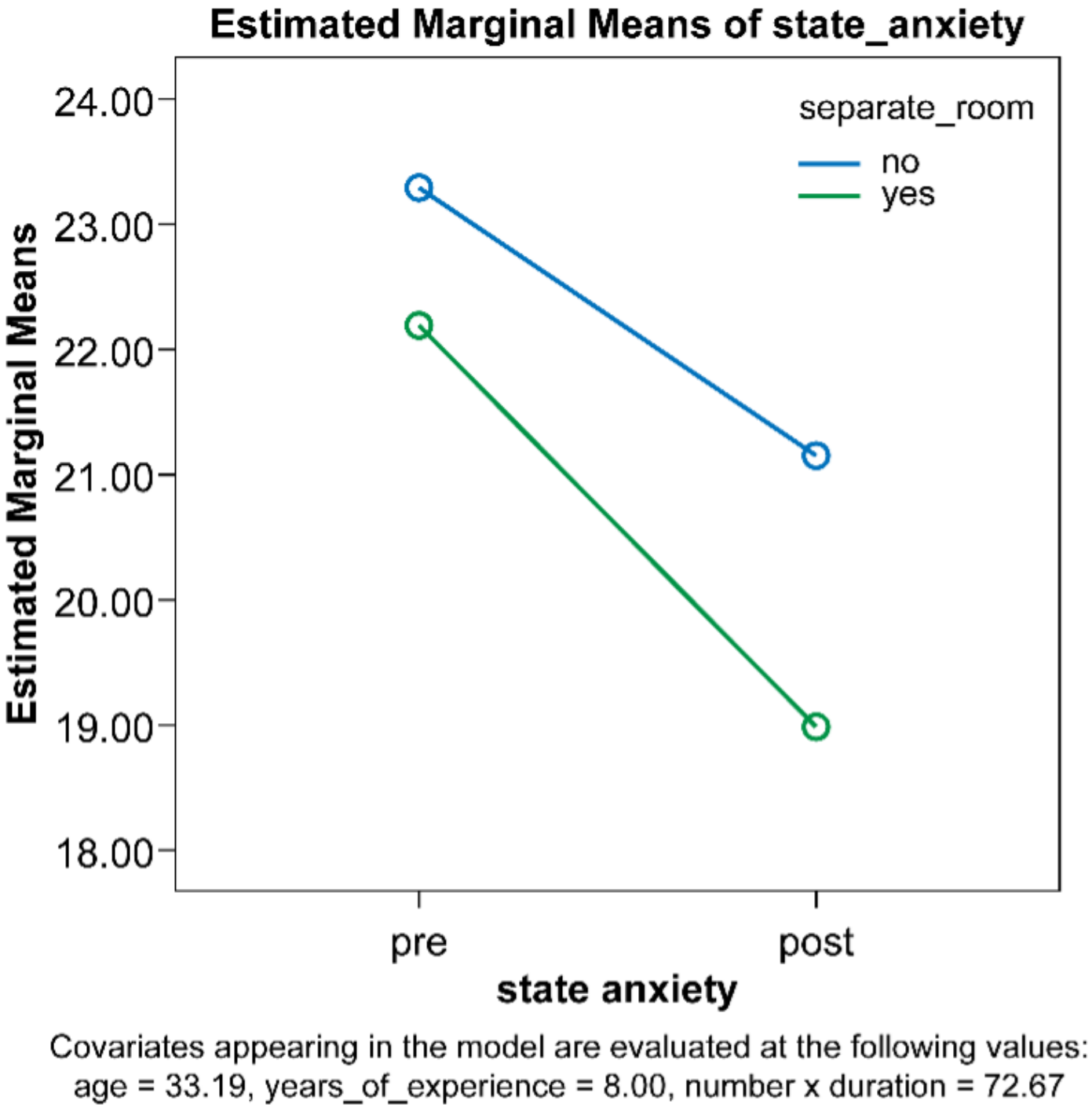


Figure 3

State anxiety before and after interventions by type of participation

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Rawdatafromquestionnaires.xlsx