

## Original article

# The effects of yoga and mindful meditation on elderly care worker's burnout: a CONSORT-compliant randomized controlled trial

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## Abstract

**Objectives:** This study aims to investigate the effects of mindful meditation and yoga on reducing burnout and stress in care workers who assist elderly individuals. Knowing how to reduce burnout is important because that of care workers is associated with the quality of client care, worker productivity, and job turnover.

**Patients and Methods:** The participants included 44 care workers who worked for elderly care facilities in rural Fukuoka. They were randomly assigned to one of three intervention groups: control, yoga, or mindfulness. In the yoga intervention group, a certified yoga instructor taught a 60-minute yoga session each week for six weeks. In the mindfulness group, an experienced medical doctor instructed a mindful meditation program for the same length. Participants were asked to complete the Japanese Burnout Scale (JBS), and the research team collected the level of  $\alpha$ -amylase in saliva using NIPRO: T-110-N pre- and post-interventions.

**Results:** MANOVA was performed with each intervention (control, yoga, mindfulness) as the independent variable on the three subscales of the JBS (emotional exhaustion, depersonalization, and personal achievement) and a biomarker of stress level ( $\alpha$ -amylase). The results indicated a significant main effect of interventions, and a follow-up ANOVA showed a significant effect of interventions on emotional exhaustion and personal achievement.

**Conclusion:** The results indicate that practicing mindful meditation or yoga for 60 minutes once a week for six weeks can reduce care workers' burnout. This study was notable because the biomarker of stress also improved. It is strongly recommended and encouraged that institutions caring for the elderly population provide mindful meditation or yoga intervention to reduce burnout, which benefits not only care workers but also their clients.

**Keywords:** care workers for elderly, burnout reduction, yoga, mindful meditation,  $\alpha$ -amylase

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## Introduction

The world is aging fast and furious. Among these aging societies, that of Japan is the oldest in the world. According to D'Ambrogio<sup>1)</sup>, 28.7% of Japan's population is 65 years or older, and it is on track to reach 40% by 2050<sup>2)</sup>. In Japa-

nese society in the past, informal assistants, such as families and relatives, were responsible for the care of frail elderly individuals. Today, however, the demand for informal care for elderly individuals has increased due to the increase in nuclear families, job mobility, female employment, and the changing patterns of family roles<sup>3)</sup>. Thus, care facilities for the elderly population and those who work for such institutions play a fundamental role in shouldering responsibilities for providing care for today's aging societies.

Although the elderly population is still increasing and the demand for formal care institutions is rampant, the two major social concerns in Japan today are the shortage of care workers to assist the elderly and securing stable employment for these workers<sup>4)</sup>. Securing stable employment to meet demands is particularly difficult in Japanese rural areas because young workers tend to migrate from rural to

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urban areas to seek a variety of job opportunities<sup>5</sup>). However, numerous studies have revealed that care workers who work for facilities for elderly individuals have a high turnover rate<sup>4</sup>). In one study, approximately 65% of the facilities for the elderly reported that they faced a shortage of care workers, and 90% of the participants answered that these shortages exist because facilities are unable to secure new hires and thereby, experience a quick turnover<sup>6</sup>). Some researchers attest that one of the reasons for quick turnover is burnout<sup>4</sup>). Therefore, reducing care workers' burnout is critical for providing good services for the elderly.

Burnout is defined as a syndrome resulting from chronic workplace stress, which has not been successfully managed. It is characterized by three dimensions: feelings of energy depletion or exhaustion, increased mental distance from one's job or feelings of negativism or cynicism related to one's job and reduced professional efficacy<sup>7</sup>). It is important to understand care workers' burnout because it relates to negative consequences—having not only higher turnover rates but also a lower quality of care for clients, reduced productivity, and increased occurrence of mental health problems<sup>8</sup>). Therefore, investigating effective interventions to reduce burnout is critical to diminish such negative consequences. Recently, some meta-analyses have shown that nonpharmacological interventions, such as exercise, yoga, and meditation, can improve psychiatric symptoms, specifically anxiety and/or depression<sup>9</sup>). For instance, using yoga as a monotherapeutic modality has been shown to improve symptoms of depression and anxiety, although it is preferred as an adjunctive treatment<sup>10</sup>). Furthermore, mindful meditation has been shown to have clinically significant effects on reducing the symptoms of anxiety and depression, and such effects were maintained for an average of 29 weeks after the intervention<sup>11</sup>). Another study also revealed that these interventions were extremely effective in reducing not only psychiatric problems but also stress and burnout<sup>12</sup>). These studies have shown that yoga and mindful meditation offer a promising impact on psychological well-being. However, the majority of research on the effectiveness of nonpharmacological interventions on stress and burnout reduction has been conducted on medical and nursing students<sup>12</sup>). Therefore, the purpose of the present study was to examine the effects of mindful meditation and yoga interventions on reducing burnout in care workers who assist elderly individuals in rural areas in Japan. Additionally, this study investigated the roles of mindful meditation and yoga on a biomarker of stress, namely  $\alpha$ -amylase in saliva, rather than perceived stress.

## Patients and Methods

### Participants/Procedure

The research team obtained approvals from the direc-

tors of three care service facilities for the elderly in a rural area of Fukuoka Prefecture, Japan, and recruitment flyers were posted at the employers' offices at those facilities. The purpose of the study and the inclusion and exclusion criteria for participation were indicated in the flyer. The participants in the present study were care providers who were aged between 20 and 65 years, worked for their facilities between 30 and 40 hours a week, had worked for more than one year as caregivers for the elderly, and held a current license as a care worker, helper, or nurse. It was ensured that no individuals who had been diagnosed with or were receiving treatment for cardiovascular/respiratory diseases, who had musculoskeletal problems in which the symptoms could be exacerbated by exercising, who were advised not to exercise, or were taking medications that may impact the results, such as sleeping pills, participated in the study. These criteria were based on medical doctors who specialized in cardiovascular/respiratory diseases and sports medicine. Furthermore, a recent study has shown that individuals who exercise twice a week tend to have lower stress levels<sup>13</sup>); thus, individuals who exercised more than twice a week were excluded. The researchers interviewed potential participants, all of whom were nurses before they were enrolled in the present study to ensure that they met the inclusion/exclusion criteria. Additionally, they were asked about their willingness to be randomly assigned to one of the three groups: control (no intervention), mindfulness (60 minutes weekly participation in a mindful meditation program), and yoga (60 minutes weekly participation in a yoga program). The duration of the intervention was consistent with that of the previous research<sup>14</sup>). Those in the mindfulness and yoga groups participated in their weekly group activities for six weeks. The participants were asked to complete questionnaires immediately before the first and after the last session of the program. Table 1 presents the participants' demographic information. Before the interventions began, the Research Ethics Committee of Fukuoka University Medical School in Japan granted ethical approval. The purpose and method of this research were explained to the participants in the present study, and the protection of their privacy was assured. All participants gave their informed consent.

### Interventions

**Yoga group.** For this study, the researchers selected the practice of hatha yoga to improve physical, emotional, and spiritual health. Its practice incorporates breath awareness and bodily postures that focus on improving strength, flexibility, and balance<sup>13</sup>). Those who regularly practice hatha yoga perform postures and breathing exercises, which are frequently integrated throughout each session<sup>15</sup>).

Fifteen care workers were assigned to the yoga group. This group was led by a health fitness programmer who held a doctoral degree in health fitness programming and was

**Table 1** Demographic Information as Function of Group

	Control n=12		Yoga n=17		Mindful n=17	
Gender	n	%	n	%	n	%
Male	2	20.0%	1	5.9%	3	17.6%
Female	10	80.0%	16	94.1%	14	82.4%
Age (years)						
Mean (SD)	47 (11.54)		50.41 (10.15)		47.24 (12.45)	
Marital Status						
Single	4	33.3%	7	41.2%	7	41.2%
Married	8	66.7%	10	58.8%	10	58.8%
How long licensed (months)						
Mean (SD)	265 (138.5)		229.5 (164.7)		207.8 (137.1)	

licensed to create effective yoga programs. The instructor conducted the yoga program once a week, which consisted of three parts: (1) adjusting external and internal stimuli (e.g., temperature, humidity, sound, smell, light), (2) practicing yoga poses, and (3) performing deep relaxation and awakening. Each yoga session took approximately 60 minutes. One individual declined to participate in this group, so 14 individuals completed the six-week yoga program without any physical problems. All participants were instructed not to participate in any other yoga program.

**Mindfulness group.** Kabat defined mindfulness as non-judgmental attention to experiences in the present moment, which involves the regulation of attention and orientation of curiosity, openness, and acceptance<sup>16</sup>. There are many forms of mindful meditation. However, a majority of forms involve being attentive to internal experiences while detaching observations of bodily sensations, emotions, and thoughts that may increase behavioral flexibility<sup>17</sup>. Meditation is a state that enables one to focus on the present moment, leading to a state of thoughtless awareness, which is typically achieved by intentionally altering one's breathing pattern<sup>9</sup>.

Seventeen care workers were randomly assigned to the mindfulness group. A licensed medical doctor, who was trained in mindful meditation, instructed a 60-minute session each week for six weeks. Each participant completed the program. Furthermore, all participants were told not to exercise or participate in any yoga program.

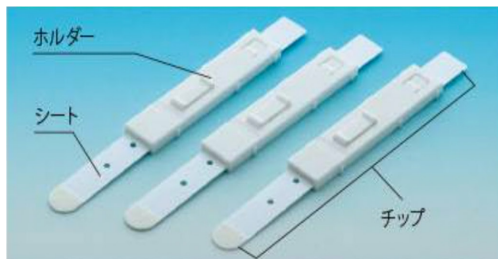
**Control group.** Twelve caregivers were randomly assigned to the control group. The participants in this group were told not to exercise or attend yoga programs. They were simply requested to work for their usual facilities. Three participants dropped out of the program.

### Measurements

The Japanese Burnout Scale (JBS). The 17-item Japanese Burnout Scale (JBS) has been commonly used in a variety

of settings in Japan, and studies with Japanese adults as participants have reported its acceptable validity and reliability<sup>18</sup>. Tao and Kubo<sup>19</sup> developed the JBS in 1994 based on the Maslach Burnout Inventory (MBI), a widely used scale. The JBS is designed to assess occupational burnout. Similar to the MBI, the JBS consists of three subscales: emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). EE refers to feelings of being overstretched and exhausted by one's emotional and physical resources. DP refers to developing negative and excessively detached reactions to one's job or to losing an emotional/cognitive involvement with one's work. PA represents increased feelings of incompetence and lack of achievement, as well as reduced work productivity. Each item was rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*) in response to whether the respondents experienced each of these symptoms and feelings. These three subscales are measured in such a way that higher scores represent greater experience in burnout. The internal consistency for the total score in the present study was 0.88, while the internal consistencies for EE, DP, and PA were 0.91, 0.85, and 0.85, respectively.

**Level of  $\alpha$ -amylase.** To evaluate the level of human stress, salivary  $\alpha$ -amylase activity was used as a biomarker of stress. It was measured using NIPRO: T-110-N, which was developed at NIPRO Corporation in Osaka, Japan, and its validity and reliability have been previously reported<sup>20</sup>. It was designed to quantify the level of  $\alpha$ -amylase in saliva and is known to be easy to use with no burden to participants. NIPRO: T-110-N consists of a test strip, a saliva transcription device, and an optical analyzer with a monitor. The response time for salivary  $\alpha$ -amylase is within two minutes, and there is no evidence on how long the response will last; thus, we collected saliva immediately after the intervention<sup>21</sup>. A higher level of  $\alpha$ -amylase indicates that the participants have experienced greater stress (Figure 1).



**Figure 1** NIPRO: T-110-N.



## Data analyses

As a preliminary analysis to check that there was no difference among the three groups on all the dependent variables at the pre-interventions, the researchers performed a MANOVA on the subscales of the JBS (EE, DP, PA) and the level of  $\alpha$ -amylase in saliva. To test the hypothesis that there would be group differences in the level of burnout and stress, the researchers employed another MANOVA with burnout and stress biomarker levels as dependent variables and the intervention group as the independent variable. They also performed Tukey's post hoc analysis.

## Results

### The effects of yoga and mindfulness meditation on perceived burnout and biomarker of stress

The MANOVA in the preliminary analysis showed that there was no main effect of the intervention on the dependent measures ( $F [8, 76]=0.77, P=ns$ ). This analysis indicated that there was no significant difference in the dependent variables among the three groups before the intervention, and the participants were randomly assigned. Further, the participants' gender and marital status may influence the level of burnout and amylase in saliva; thus, other preliminary analyses were performed using a t-test with gender and marital status on all dependent variables. No significant impact of gender or marital status was found. To test the effects of the interventions, namely yoga, and mindful meditation, on the three subscales of the JBS (EE, DP, and PA) and the level of  $\alpha$ -amylase in saliva, the researchers performed another MANOVA. The results indicated a significant main effect of intervention ( $F [8, 66]=3.71, P=0.001$ ). A follow-up ANOVA showed that there was a significant effect of intervention on EE ( $F [2, 39]=4.57, P=0.008$  using one-tailed test) and PA ( $F [2, 39]=3.52, P<0.02$  using one-tailed test). The results also revealed that there was a significant effect of the intervention on the level of  $\alpha$ -amylase ( $F [2, 39]=6.95, P=0.002$  using a one-tailed test). However, there was no effect of an intervention on DP ( $F [2, 39]=1.27, P=ns$ ). The researchers performed Tukey's post hoc analysis. Regarding EE, this analysis revealed that there was no significant difference between the yoga ( $M=11.57, SD=3.06$ ) and mindfulness group

( $M=13.41, SD=3.99$ ). However, there were significant differences between the mindfulness group ( $M=13.41, SD=3.99$ ) and the control group ( $M=17.63, SD=7.21, P=0.01$ ), indicating that participants in the mindfulness group were less likely to be emotionally overextended and exhausted by assisting elderly individuals in comparison to the control group. There was also a significant difference between the yoga group ( $M=11.57, SD=3.06$ ) and the control group ( $M=17.63, SD=7.21, P=0.007$ ), indicating that participants in the yoga group were significantly less likely to be emotionally burned out in comparison to the control group.

The researchers performed Tukey's post hoc analysis on PA. This analysis revealed that there were no significant differences between the yoga group ( $M=20.93, SD=4.38$ ) and the mindfulness group ( $M=19.18, SD=5.21, P=ns$ ) and between the yoga group ( $M=20.93, SD=4.38$ ) and the control group ( $M=24.25, SD=2.19, P=ns$ ), respectively. However, there was a significant difference between the mindfulness group ( $M=19.18, SD=5.21$ ) and the control group ( $M=24.25, SD=2.19, P=0.02$ ), indicating that participants in the mindfulness group were less likely to have reduced feelings of competence and achievement in their work in comparison to the control group. As for the level of  $\alpha$ -amylase, Tukey's post hoc analysis further revealed that there was no significant difference between the yoga group ( $M=36.86, SD=23.44$ ) and the mindfulness group ( $M=35.53, SD=22.68, P=ns$ ). However, there were significant differences between the mindfulness group ( $M=35.53, SD=22.68$ ) and the control group ( $M=75.75, SD=38.78, P=0.002$ ) and between the yoga group ( $M=11.57, SD=3.06$ ) and the control group ( $M=75.75, SD=38.78, P=0.004$ ), respectively, indicating that compared to the control group, participants in both the mindfulness and yoga groups tended to show less stress, using the biomarker. All means and standard deviations for the dependent measures as a function of the group are summarized in Table 2.

## Discussion

The purpose of this study was to investigate the effects of mindful meditation and yoga in reducing burnout and stress among care workers who assist elderly individuals in a ru-

**Table 2** Comparison of dependent measure for group differences

Group comparison	EE	DP	PA	Amylase
	Mean Diff. (SD)	Mean Diff. (SD)	Mean Diff. (SD)	Mean Diff. (SD)
Control vs. Yoga	<b>6.05 (2.00)**</b>	2.27 (1.54)	3.31 (1.98)	38.89 (11.88)**
Control vs. Mindfulness	<b>4.21 (1.94)**</b>	2.13 (1.49)	<b>5.07 (1.91)*</b>	40.22 (11.45)**
Yoga vs. Mindfulness	1.84 (1.64)	0.14 (1.25)	1.75 (1.61)	1.38 (9.68)

\* $P < 0.05$ ; \*\* $P < 0.01$ ; EE: Emotional Exhaustion; DP: Depersonalization; PA: Personal Achievement.

ral area of Japan. Burnout is significantly associated with the quality of care delivered to patients and the productivity and mental health of care workers; thus, examining effective interventions to ameliorate burnout is crucial and worthy of investigation. Furthermore, one of the main differences between yoga and mindfulness practices is that the former involves physical movement while the latter does not. We believe that it is important to compare the differing patterns of impact between yoga and mindfulness on burnout and biomarkers of stress, given that some individuals are unable to engage in physical movements. We hope that the results of this investigation will provide effective and appropriate interventions for not only physically able individuals but also individuals who may not be able to move much.

The results of the present study reveal that care workers who practice yoga and mindful meditation interventions can significantly reduce their emotional exhaustion, such as feelings of frustration, being emotionally drained, and working too hard, as well as the biomarker of stress level while increasing the feelings of competence and achievement in their work. The results also show that both interventions showed no significant impact on DP, which is unsympathetic and soulless responses toward elderly clients with regards to the care worker's services and the client's care. The top reason why more than 25% of the care workers leave their work is the difficulty and subsequent stress that comes from dealing with other people in their workplace<sup>22</sup>. Individuals with high emotional exhaustion tended to feel that working with people was stressful and straining; thus, reducing care workers' emotional exhaustion may also reduce the likelihood that they leave their workplace<sup>23</sup>. The present study did not show any significant impact of yoga or mindful meditation on DP. Brady<sup>23</sup> reported that the average physician was more likely to experience PA and increased EE, while DP symptoms were unlikely to be reported. To date, the cut-off scores for the subscales of the JBS have not been reported, and the DP subscale of the original MBI is lower than that of other subscales. As such, the flooring effect can be the reason for not showing a significant impact. One of the notable findings from this study is that the impact of yoga and mindfulness on reducing burnout was supported by using the biomarker of stress levels. That is, the burnout scale is a self-report scale that evaluates one's

perceived feeling of burnout. Using the  $\alpha$ -amylase in saliva as a biomarker of stress revealed that the effectiveness of the two interventions was supported by not only perceived feelings of burnout but also physical levels of stress. Mindful meditation was the only intervention that had a significant impact on personal achievement in comparison to the control group. Personal achievement is crucial for elderly care; the behavioral correlates of the feelings of personal achievement are to have a greater understanding of how patients feel and being able to deal with patients' problems easily and effectively<sup>23</sup>. Elliot and McGregor<sup>24</sup> attest that the feeling of higher personal achievement creates greater work motivation; consequently, the feeling of responsibility and the ability to carry out work in a satisfactory manner result in better organizational productivity and performance.

Watanabe<sup>25</sup> suggested that some care workers are more vulnerable to burnout from their work. These individuals worked three years or more, or four years or less, as regular workers (*seiki-koyou*) in their care facilities. We suggest that mindful meditation or yoga intervention be given to the most vulnerable care workers to reduce their burnout. Some disadvantages of providing yoga or mindful meditation to all care workers include the costs of such interventions and time constraints. For instance, the present study utilized a licensed yoga instructor and an experienced medical doctor to teach and assist participants, which may be extremely costly. Furthermore, spending 60 minutes on the intervention every week may not be feasible. However, researchers recently conducted a randomized control experiment to examine the effects of a mindful meditation program delivered via a smartphone application (app) to improve psychological well-being and reduce job strain during the workday. Each guided audio meditation session lasted 10–20 minutes, and the program included 45 prerecorded sessions. Participants completed one meditation session per day for eight weeks. The researchers found that the intervention program was significantly effective in reducing job strain and stress, improving the participants' psychological well-being<sup>26</sup>. Mindfulness and meditation practices translate well from face-to-face programs to online or smartphone apps. Providing these programs via apps can be a cost- and time-effective method to reduce burnout, especially during the COVID-19 pandemic. While this study of utilizing mindfulness and

meditation programs via apps has yet to be replicated in Japan, such intervention programs look promising.

The present study had some limitations. The number of care workers who participated was small and not optimal; therefore, one must interpret these results with caution. A limitation of studies, such as this one, that utilize yoga and mindful meditation interventions is the practical overlap between the two. While various yoga and meditation traditions differ in practice and theoretical orientation, they share some similarities<sup>27</sup>). Both yoga and meditation focus on looking inward, and both pay attention to one's breathing, which is one of the basic ways to attain inner peace. Furthermore, there are various types of yoga (e.g., hatha yoga, isometric yoga) and meditations (e.g., mindful, spiritual, and movement). Future research should examine the interventions that are distinctively different.

## Conclusion

This study aimed to investigate the impact of yoga and mindful meditation on burnout among elderly care workers using a randomized control experimental design. The present study is important because the burnout of care workers

for elderly clients is associated with a quick turnover, poor quality of care, and lowered productivity. In addition, securing employment stability and good care quality is crucial in today's aging society, such as that of Japan. The results of the present study indicate that practicing mindful meditation or yoga for 60 minutes once a week for six weeks can reduce care workers' burnout. This study was notable because a biomarker of stress was also improved. We strongly recommend and encourage institutions caring for elderly populations to provide mindful meditation or yoga interventions for vulnerable care workers to reduce burnout, which benefits not only care workers but also their clients.

**Conflicts of interest:** The authors declare no conflict of interest.

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