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Article

Effects of Mindfulness Meditation on Anxiety, Self-Efficacy, and Quality of Life in Patients after Coronary Artery Bypass Transplantation

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Abstract

Objective: This study aimed to determine the effects of mindfulness meditation on the anxiety, self-efficacy, and quality of life of patients after coronary artery bypass grafting (CABG). **Methods**: Data of 124 patients who underwent CABG in our hospital from May 2020, to May 2022, were collected. In accordance with the presence or absence of mindfulness meditation, the patients were divided into control group (n = 64, conventional cardiac rehabilitation) and observation group (n = 60, conventional cardiac rehabilitation + mindfulness meditation). The Hamilton Anxiety Scale (HAMA), General Self-Efficacy Scale (GSES), quality of life, and postoperative complications were compared between the two groups. **Results**: No significant difference was observed in the HAMA, GSES, and quality-of-life scores between the two groups after operation ($p > 0.05$). After the intervention, the HAMA score of the observation group was lower than that of the control group ($p < 0.05$), and the GSES and quality of life scores of the observation group were higher than those of the control group ($p < 0.05$). The total incidence of postoperative complications in the observation group (5.00%) was lower than that in the control group (7.81%), without significant difference ($p > 0.05$). **Conclusions**: The use of mindfulness meditation for patients undergoing CABG is beneficial to relieve anxiety and improve their self-efficacy and quality of life, hence worthy of adoption.

Keywords

coronary artery bypass grafting; mindfulness meditation; emotion of anxiety; quality of life

Background

With the emphasis on patient care in the medical field, mindfulness meditation nursing has gradually attracted wide attention from clinical scholars [1–3]. Coronary artery bypass grafting (CABG), as a common treatment for coronary heart disease, has made significant achievements in improving the cardiovascular status of patients, but patients often experience anxiety, decreased self-efficacy, and impaired quality of life after surgery [4–7]. Jackson *et al.*'s study [8] showed that 20% of patients had anxiety after CABG, and 31% of patients had anxiety at 6–12 months after surgery. Anxiety is closely related to the poor prognosis of patients with cardiovascular disease, and the self-efficacy and quality of life of patients play a key role in the rehabilitation process. Yuan *et al.* [9] showed that self-efficacy as a mediator that plays a key role in the process of behavioral change and an important factor to maintain and improve the quality of life and clinical recovery of patients. As a psychological intervention, mindfulness meditation has shown potential benefits in coping with the psychological problems of patients with chronic diseases [10–12]. Previous studies have shown that mindfulness meditation may improve the mental health of patients by adjusting the autonomic nervous system, reducing the level of inflammation, and improving psychological resilience [13–15]. However, the specific effects on patients after CABG, especially the comprehensive effects on anxiety, self-efficacy, and quality of life, still need more in-depth and comprehensive discussion.

Therefore, this study aimed to systematically evaluate the effects of mindfulness meditation on the anxiety, self-efficacy, and quality of life of patients after CABG through a retrospective cohort study. By understanding these effects, more comprehensive and individualized rehabilitation interventions could be provided to patients undergoing CABG, which could help improve their mental health, enhance their self-efficacy, improve their quality of life, and ultimately promote the overall effect of cardiovascular rehabilitation.

Materials and Methods

General Information

A retrospective cohort study design was used to select patients who underwent CABG surgery in our hospi-

Table 1. Specific operation process of routine cardiac rehabilitation.

Steps	Specific operation process
Lung training	Starting on postoperative day 1, patients were encouraged to perform respiratory exercises until discharge, including abdominal breathing training, pursed lips breathing training, and deep breathing therapy.
Limb training	From postoperative day 1, passive or active limb mobilization was performed in bed under the supervision of medical staff. Afterwards, the patients were gradually transitioned from active physical activities in bed to bedside activities, walking in the ward, and walking up and down stairs every day. The exercise equivalent was controlled at 2–4 metabolic equivalent (MET).
Aerobic training	Walking was performed as far as the patient could tolerate. The exercise time was gradually increased from 5 minutes to 10–20 minutes. During exercise, the patients' symptoms, signs, and electrocardiogram were closely monitored. The respiration rate (RR) of the patients was controlled at 11–13, and the maximum heart rate during exercise was controlled to not exceed the resting heart rate by 20 beats/min.
Shoulder joint training	From postoperative day 1, appropriate shoulder mobility was performed two times a day without causing discomfort until the patient was discharged from the hospital.

tal from May 2020, to May 2022, by reviewing the medical records and rehabilitation files of patients after CABG. The patients were divided into control group (conventional cardiac rehabilitation) and observation group (conventional cardiac rehabilitation + mindfulness meditation). Their medical records were collected through the hospital medical record management system. This study was approved by the Ethics Committee, and obtaining informed consent from the patients was not necessary because the data collected were from medical records and rehabilitation files (approval number: S2024-229-01).

The inclusion criteria were as follows: (1) patients who underwent CABG surgery; (2) left ventricular ejection fraction (LVEF) $>$ 40%; (3) patients aged 18–75 years; (4) complete clinical data.

The exclusion criteria were as follows: (1) patients with malignant tumors or other serious systemic diseases; (2) patients with comorbid psychiatric diseases or cognitive impairment; (3) contraindication of cardiac rehabilitation, such as thrombophlebitis or recent thromboembolism, uncontrolled heart failure, and severe arrhythmia.

Methods

The control group underwent routine cardiac rehabilitation, which consisted of four steps, including lung training, limb training, aerobic training, and shoulder joint training. The routine cardiac rehabilitation lasted for 8 weeks. The specific operation process is shown in Table 1. The observation group underwent mindfulness meditation and regular cardiac rehabilitation training. Mindfulness meditation consists of six steps: training, practice course, practice in daily life, personalized meditation, and application. The meditation courses lasted for 8 weeks, 4–5 times a week, 30 min each time. The details are given in Table 2.

Observation Indicators

(1) Comparison of general data: the following information of patients were collected: Basic demographic characteristics, including age, gender, body mass index, disease duration, marital status, educational level, occupation, smoking history, and drinking history; disease information, such as heart function classification, diabetes, hypertension, hyperlipidemia, use of diuretics, antidiabetic drugs, systolic blood pressure, and diastolic blood pressure.

(2) Hamilton Anxiety Scale (HAMA) [16]: The anxiety of patients was evaluated on the first day after operation and at discharge, with a total score of 54, $<$7 indicated no anxiety, 7–17 indicated mild anxiety, 18–24 indicated moderate anxiety, and $>$24 indicated severe anxiety. The higher the score, the better the psychological state. The Cronbach's α coefficient was 0.891.

(3) General Self-Efficacy Scale (GSES) [17]: The self-efficacy level of patients on the first day after operation and at discharge was evaluated, including 10 dimensions. Each dimension had 4 points, and the total score was 40 points. The higher the score, the higher the self-efficacy of patients. The Cronbach's α coefficient was 0.877.

(4) SF-36 health survey [18]: The quality of life of patients was assessed on the first day after operation and at discharge, including physical function, physical function, bodily pain, social function, emotional function, and mental health. The full score of each item was 100, and the higher the score, the higher the quality of life of patients. The Cronbach's α coefficient was 0.868.

(5) The complications of the two groups during 1 month of follow-up were recorded, including postoperative hypoxemia, arrhythmia, low cardiac output syndrome, and acute myocardial infarction.

Statistical Processing

IBM SPSS Statistics for Windows (version 27.0, IBM Corp., Armonk, NY, USA) was used for statistical analysis. Measurement data conforming to normal distribution were expressed as ($\bar{x} \pm$ s), and then statistical analysis was performed by *t* test. Those who did not conform to the normal distribution were expressed as M[P25, P75], and then

Table 2. Specific operation process of mindfulness meditation.

Steps	Specific operation process
Mindfulness meditation training	Initial mindfulness meditation training was conducted by a professional meditation instructor who explained the concepts, principles, and basic techniques of mindfulness meditation. How to practice mindfulness meditation was explained, that is, by focusing on breathing, body sensations, and emotional awareness.
Mindfulness meditation practice course	A mindfulness meditation practice session was scheduled 4–5 times a week for 30 min each, led by a professional meditation instructor. The course content included different forms of mindfulness meditation, such as sitting meditation and walking meditation, to meet the individual differences of patients.
Mindfulness practice in daily life	Mindfulness meditation was emphasized to be not limited to class time, and the patients were encouraged to perform brief mindfulness exercises at any time in their daily lives. A range of simple mindfulness techniques, such as breathing adjustment and emotional observation, was provided so that the patients could implement them in any setting.
Personalized meditation guidance	Individualized meditation guidance was provided on the basis of patient feedback and needs to help them better cope with anxiety and cope with life challenges.
Mindfulness meditation recording and feedback	The patients were encouraged to record their experience of each meditation session, including feelings, emotions, and thoughts. A regular feedback mechanism was provided, with the meditation instructor sharing observed progress with the patients and providing personalized advice.
Application of mindfulness meditation	The patients were taught how to apply mindfulness meditation to cope with anxiety, manage stress, and improve self-efficacy, with emphasis on the utility of mindfulness meditation in daily life such as at work, at home, and in social situations.

statistical analysis was performed by rank-sum test. Count data, expressed as [n (%)], were compared using χ^2 test. When the total sample size was greater than 40, Pearson's test was used when $n \geq 5$, and continuously corrected chi-square test was used in the case of $1 \leq n \leq 5$. Fisher's test was used for $n < 1$ for a total sample size of less than 40. $p < 0.05$ was considered statistically significant.

Results

Comparison of General Data

A total of 124 patients who underwent CABG surgery and met the inclusion criteria were included in this study. The observation and control groups had 60 and 64 cases, respectively. All the enrolled patients were not lost to follow-up, and no one withdrew from the study. Significant differences were found between the two groups in terms of smoking history ($p < 0.05$), but no significant differences were observed in age, gender, body mass index, course of disease, marital status, educational level, occupation, heart function classification, diabetes, hypertension, hyperlipidemia, use of diuretics, use of antidiabetic drugs, drinking history, systolic blood pressure, diastolic blood pressure, and other general information ($p > 0.05$, Table 3).

Comparison of Anxiety Scores

No significant difference was found in the anxiety score between the two groups on the first day after operation ($p > 0.05$), and the anxiety score of the observation group was lower than that of the control group on discharge ($p < 0.05$), as shown in Table 4.

Comparison of GSES Scores

No significant difference was observed in the GSES scores between the two groups on the first day after operation ($p > 0.05$). At discharge, the scores of the observation group were higher than those of the control group ($p < 0.05$), as shown in Table 5.

Comparison of Quality-of-Life Scores

No significant difference was noted in the quality-of-life scores between the two groups on the first day after operation ($p > 0.05$). At discharge, the scores of the observation group were higher than those of the control group ($p < 0.05$), as shown in Table 6.

Comparison of Postoperative Complications

The total incidence of postoperative complications in the observation group (5.00%) was lower than that in the control group (7.81%), but no significant difference was found between the two groups ($p = 0.786 > 0.05$), as shown in Table 7.

Discussion

Coronary heart disease is one of the most common cardiovascular diseases in clinical practice, posing a huge challenge to human health and life safety and possessing a high incidence. As of 2019, 11.39 million people suffer from coronary heart disease in China. As a result, the incidence of coronary heart disease has increased significantly [19–21]. Clinically, CABG has become the main diagnosis

Table 3. Comparison of general data of patients.

Group		Observation group (n = 60)	Control group (n = 64)	χ^2/t	p
Average age (years)		34.21 ± 5.42	34.85 ± 5.48	0.653	0.515
Gender (n, %)	Male	31 (51.67)	39 (60.94)	0.175	0.676
	Female	29 (48.33)	25 (39.06)		
Body mass index	18–23.9 kg/m²	35 (58.33)	34 (53.13)	0.340	0.560
	≥24 kg/m²	25 (41.67)	30 (46.87)		
Average duration of disease (years)		3.62 ± 0.36	3.53 ± 0.35	1.411	0.161
Cardiac function classification (n, %)	Grade II	21 (35.00)	23 (35.94)	0.012	0.994
	Grade III	19 (31.67)	20 (31.25)		
	Grade IV	20 (33.33)	21 (32.81)		
Education level (n, %)	Junior high school and below	20 (33.33)	23 (35.94)	0.425	0.809
	High school	24 (40.00)	22 (34.38)		
	College or above	16 (26.67)	19 (29.69)		
Marital status (n, %)	Married	25 (41.67)	28 (43.75)	0.055	0.815
	Other	35 (58.33)	36 (56.25)		
Occupational status (n, %)	Workers	28 (46.67)	31 (48.44)	0.064	0.969
	Farmer	20 (33.33)	20 (31.25)		
	Other	12 (20.00)	13 (20.31)		
Diabetes mellitus (n, %)	Yes	22 (36.67)	20 (31.25)	0.406	0.524
	None	38 (63.33)	44 (68.75)		
Hypertension (n, %)	Yes	18 (30.00)	22 (34.37)	0.271	0.602
	None	42 (70.00)	42 (65.63)		
Hyperlipidemia (n, %)	Yes	10 (16.67)	14 (21.87)	0.821	0.365
	None	50 (83.33)	50 (78.13)		
Using diuretics (n, %)	Yes	28 (46.67)	27 (42.19)	0.252	0.616
	None	32 (53.33)	37 (57.81)		
Using anti-diabetic drugs (n, %)	Yes	17 (28.33)	14 (21.88)	0.689	0.407
	None	43 (71.67)	50 (78.12)		
Drinking history (n, %)	Yes	20 (33.33)	32 (50.00)	3.533	0.060
	None	40 (66.67)	32 (50.00)		
Smoking history (n, %)	Yes	42 (70.00)	30 (46.87)	6.801	0.009
	None	18 (30.00)	34 (53.13)		
Systolic blood pressure (mmHg)		132.25 ± 13.25	131.11 ± 13.40	0.476	0.635
Diastolic blood pressure (mmHg)		78.88 ± 8.01	79.12 ± 8.11	0.166	0.869

Table 4. Comparison of anxiety scores (scores, $\bar{x} \pm s$).

Group	N	Post operation	At discharge
Observation group	60	20.22 ± 2.12	15.25 ± 1.56
Control group	64	20.20 ± 2.10	16.33 ± 1.85
t	-	0.053	3.503
p	-	0.958	0.001

Table 5. Comparison of GSES scores (scores, $\bar{x} \pm s$).

Group	n	Postoperative 1 d	At discharge
Observation group	60	18.66 ± 1.86	27.02 ± 2.86*
Control group	64	18.75 ± 1.87	25.32 ± 2.61*
t	-	0.269	14.234
p	-	0.789	<0.001

Note: Compared with 1 day after surgery, *$p < 0.05$.

and treatment method, but due to the influence of postoperative complications, it has a serious effect on the postoperative clinical recovery of patients, resulting in anxiety, which further affects their quality of life and self-efficacy [22–24]. Therefore, scientific and effective nursing methods for patients receiving CABG are the focus of medical staff.

With its rising popularity in medical contexts, mindfulness meditation, which is practiced widely for stress reduction and promotion of health, exerts beneficial effects on physical health, mental health, and cognitive performance [25]. Clinical evidence suggests that mindfulness meditation modulates the activity of neural substrates associated with the regulation of mood and social preferences, thereby reducing anxiety, depression, and stress and improving mood regulation [26]. Loucks *et al.* [27] demonstrated that mindfulness is positively associated with cardiovascular health in a cross-sectional population-based study. In a word, mindfulness seems to be a good treatment to reduce stress and relieve the distress of patients with chronic and serious diseases.

Table 6. Comparison of quality of life scores (scores, $\bar{x} \pm s$).

Group	n	Physiological enginery		Physiological function		Body pain		Social function	
		Postoperative 1 d	At discharge	Postoperative 1 d	At discharge	Postoperative 1 d	At discharge	Postoperative 1 d	At discharge
Observation group	60	60.25 ± 6.52	73.85 ± 7.77	62.32 ± 6.58	71.85 ± 7.90	63.32 ± 6.38	73.15 ± 7.85	62.83 ± 6.95	73.88 ± 7.91
Control group	64	60.23 ± 6.54	69.75 ± 7.25	62.35 ± 6.29	67.75 ± 7.53	63.10 ± 6.31	69.33 ± 7.54	62.95 ± 6.94	69.85 ± 7.31
t	-	0.017	3.040	0.026	2.959	0.193	2.764	0.096	2.948
p	-	0.986	0.003	0.979	0.004	0.847	0.007	0.924	0.004
Group	n	Emotional function		Mental health		Vitality		General health	
		Postoperative 1 d	At discharge	Postoperative 1 d	At discharge	Postoperative 1 d	At discharge	Postoperative 1 d	At discharge
Observation group	60	61.29 ± 6.85	72.92 ± 8.17	60.40 ± 6.23	73.52 ± 7.92	62.15 ± 6.28	74.09 ± 7.85	61.23 ± 6.23	70.65 ± 8.01
Control group	64	61.43 ± 6.94	68.98 ± 7.56	60.45 ± 6.28	69.83 ± 7.42	62.18 ± 6.31	69.52 ± 7.32	61.33 ± 6.35	66.23 ± 7.56
t	-	0.121	2.789	0.044	2.679	0.027	3.350	0.088	3.161
p	-	0.904	0.006	0.965	0.008	0.979	0.001	0.930	0.002

Table 7. Comparison of postoperative complications (n, %).

Group	n	Postoperative hypoxemia	Arrhythmia	Low cardiac output syndrome	Acute myocardial infarction	Overall incidence	χ^2	*p*
Observation group	60	1 (1.67)	1 (1.67)	1 (1.67)	0 (0.00)	3 (5.00)	0.074	0.786
Control group	64	2 (3.13)	2 (3.13)	1 (1.56)	0 (0.00)	5 (7.81)		

This study showed no significant difference in the HAMA, GSES, and quality-of-life scores between the two groups on the first day after operation ($p > 0.05$). After the intervention, the HAMA score of the observation group was lower than that of the control group ($p < 0.05$), whereas the GSES and quality-of-life scores of the observation group were higher ($p < 0.05$). The results showed that mindfulness meditation is beneficial to relieve the anxiety of patients and improve their self-efficacy, gratitude, and quality of life, possibly because after operation, the use of anesthetic drugs is reduced. Postoperative pain can induce anxiety and other negative emotions, coupled with postoperative complications and other factors that affect the postoperative rehabilitation of patients, resulting in the reduced self-efficacy and quality of life. Previous studies have shown that the hypothalamic–pituitary–adrenal gland further alters the levels of neurohormones in the limbic system of the brain due to stress stimuli by increasing the production of cortisol and catecholamines. These cells cause a series of physiological changes in the body. Mindfulness meditation can increase the patients' learning and easy ability. The activities of θ-1, θ-2, and α-1 waves in the midline frontal lobe and central region of the patients in meditation state significantly increased. The θ wave is a sleepy state, whereas the α wave is a resting and quiet state of the brain, which enhances the synchronization of α and θ waves in the prefrontal region. It also causes a wide range of changes in the frequency of gamma waves, thereby reducing the anxiety symptoms of patients [28]. Previous studies have found that positive meditation helps individuals to re-evaluate negative or threatening time, relieve pressure, help regain confidence, improve their cognition of physical and mental conditions, positively affirm their comprehensive ability, strengthen their confidence, and improve their self-efficacy [29–31]. In addition, mindfulness meditation can reduce the negative mental effects of anxiety through its positive effect, thus effectively improving the quality of life of patients [30].

According to the data of this study, the total incidence of postoperative complications in the observation group (5.00%) was lower than that in the control group (7.81%), without significant difference ($p > 0.05$), indicating that mindfulness meditation intervention based on routine cardiac rehabilitation cannot improve the postoperative complications of patients to a certain extent. However, the data from this study did not show whether mindfulness meditation directly affects the postoperative complications of patients. The incidence of postoperative complications in the observation group was relatively lower than that in the control group, may be due to the improvement of anxiety of patients via mindfulness meditation, thereby affecting postoperative complications. According to previous studies, some patients undergoing surgery experience anxiety, pain, and stress, which are related factors causing postoperative complications, delayed postoperative recovery, and prolonged hospital stay [32]. In the present study, mindfulness meditation was used to relieve patients' anxiety to have a certain effect on complications.

Although this study has achieved a certain degree of clinical significance, it has certain limitations. First, patients who underwent CABG in our hospital were selected within a specific time frame, which may have led to a limited sample. Second, this study used a retrospective study design, which could not completely exclude potential confounding factors and information bias. However, other information of the two groups were collected, showing that both groups were comparable. Third, mindfulness meditation requires a professional instructor, which may increase the medical burden for patients. In the future, randomized controlled trials and intention-to-treat analysis are needed to evaluate the clinical feasibility and economy of this treatment. Finally, the study had a single-center design and was conducted in one specific healthcare setting. The special characteristics of this setting may have limited the generalizability of the findings to other healthcare settings with diverse backgrounds and care practices. Future studies can make up for these limitations through a more elaborate design and multicenter studies with larger sample size. Despite these limitations, this study provides substantial support for the use of mindfulness meditation in patients undergoing CABG. This simple and feasible clinical intervention is expected to be widely used in practical nursing to improve the overall postoperative rehabilitation experience of patients.

Conclusions

The use of mindfulness meditation in patients undergoing CABG is beneficial to relieve their anxiety and improve their self-efficacy and quality of life. Therefore, mindfulness meditation has clinical application value, and promoting its use is advocated.

Availability of Data and Materials

Datasets used and/or analyzed for this study are available from the corresponding author upon appropriate request.

Author Contributions

SW and YC designed the research study. SW and JW performed the research. HX analyzed the data. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study has been approved by the Medical Ethics Committee of PLA General Hospital and was performed in accordance with the principles of the Declaration of Helsinki. Approval No.: S2024-229-01. All participants included in this study gave informed consent.

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Conflict of Interest

The authors declare no conflict of interest.

References

[1] Green AA, Kinchen EV. The Effects of Mindfulness Meditation on Stress and Burnout in Nurses. Journal of Holistic Nursing: Official Journal of the American Holistic Nurses' Association. 2021; 39: 356–368.

[2] Malin Y, Gumpel TP. Short Mindfulness Meditation Increases Help-Giving Intention Towards a Stranger in Distress. Mindfulness. 2022; 13: 2337–2346.

[3] Kwon CY, Chung SY, Kim JW. Mindfulness meditation program for the elderly in Korea: A preliminary review for planning the program. Integrative Medicine Research. 2021; 10: 100451.

[4] Zanini M, Nery RM, de Lima JB, Buhler RP, da Silveira AD, Stein R. Effects of Different Rehabilitation Protocols in Inpatient Cardiac Rehabilitation After Coronary Artery Bypass Graft Surgery: A RANDOMIZED CLINICAL TRIAL. Journal of Cardiopulmonary Rehabilitation and Prevention. 2019; 39: E19–E25.

[5] Sweity EM, Alkaissi AA, Othman W, Salahat A. Preoperative incentive spirometry for preventing postoperative pulmonary complications in patients undergoing coronary artery bypass graft surgery: a prospective, randomized controlled trial. Journal of Cardiothoracic Surgery. 2021; 16: 241.

[6] Beerkens FJ, Claessen BE, Mahan M, Gaudino MFL, Tam DY, Henriques JPS, *et al*. Contemporary coronary artery bypass graft surgery and subsequent percutaneous revascularization. Nature Reviews. Cardiology. 2022; 19: 195–208.

[7] Silva M, Rong LQ, Naik A, Rahouma M, Hameed I, Robinson B, *et al*. Intraoperative graft flow profiles in coronary artery bypass surgery: A meta-analysis. Journal of Cardiac Surgery. 2020; 35: 279–285.

[8] Jackson AC, Rogerson MC, Amerena J, Smith J, Hoover V, Alvarenga ME, *et al*. Unraveling the Complexity of Cardiac Distress: A Study of Prevalence and Severity. Frontiers in Psychiatry. 2022; 13: 808904.

[9] Yuan Y, Xu HW, Zhang S, Wang Y, Kitayama A, Takashi E, *et al*. The mediating effect of self-efficacy on the relationship between family functioning and quality of life among elders with chronic diseases. Nursing Open. 2021; 8: 3566–3574.

[10] Shukla R, Gupta M, Agarwal N, Bajpai A. Mindfulness Meditation as Adjunctive Therapy to Improve the Glycemic Care and Quality of Life in Patients with Type 1 Diabetes. Medical Sciences (Basel, Switzerland). 2021; 9: 33.

[11] Simonsson O, Stenfors CUD, Goldberg SB, Hendricks PS, Osika W. Altered states of leadership: mindfulness meditation, psychedelic use, and leadership development. Frontiers in Psychology. 2023; 14: 1151626.

[12] Hansell AK, Olmstead R, López Maya E, Banijamali S. Stress reduction for paid home care aides: A feasibility study of mindfulness meditation and Tai Chi interventions. Home Health Care Services Quarterly. 2023; 42: 328–346.

[13] Matiz A, Crescentini C, Boaro E, Piani F, Fabbro F. Studio di follow-up sulla riduzione dei livelli di burnout con la meditazione mindfulness in professionisti socio-sanitari [Follow-up study on the reduction of burnout levels through mindfulness meditation in health care professionals.]. Giornale Italiano di Medicina del Lavoro ed Ergonomia. 2020; 42: 102–108. (In Italian)

[14] Aisenberg-Shafran D, Shturm L. The effects of mindfulness meditation versus CBT for anxiety on emotional distress and attitudes toward seeking mental health treatment: a semi-randomized trial. Scientific Reports. 2022; 12: 19711.

[15] Day MA, Matthews N, Davies JN, Walker C, Bray N, Kim J, *et al*. Outcome Expectancies, Effects, and Mechanisms of Brief Training in Mindfulness Meditation vs. Loving-Kindness Meditation vs a Control Condition for Pain Management: A Randomized Pilot Study. Journal of Pain & Palliative Care Pharmacotherapy. 2023; 1–11.

[16] Yap WS, Dolzhenko AV, Jalal Z, Hadi MA, Khan TM. Efficacy and safety of lavender essential oil (Silexan) capsules among patients suffering from anxiety disorders: A network meta-analysis. Scientific Reports. 2019; 9: 18042.

[17] Iwanowicz-Palus G, Mróz M, Bień A. Quality of life, social support and self-efficacy in women after a miscarriage. Health and Quality of Life Outcomes. 2021; 19: 16.

[18] Burns JF, Hurwitz LM, Levie KE, Caumont F, Brand TC, Rosner IL, *et al*. Impact of Subsequent Biopsies on Comprehensive Health Related Quality of Life in Patients with and without Prostate Cancer. The Journal of Urology. 2019; 201: 916–922.

[19] Sabatine MS, Bergmark BA, Murphy SA, O'Gara PT, Smith PK, Serruys PW, *et al*. Percutaneous coronary intervention with drug-eluting stents versus coronary artery bypass grafting in left main coronary artery disease: an individual patient data meta-analysis. Lancet (London, England). 2021; 398: 2247–2257.

[20] Holm NR, Mäkikallio T, Lindsay MM, Spence MS, Erglis A, Menown IBA, *et al*. Percutaneous coronary angioplasty versus coronary artery bypass grafting in the treatment of unprotected left main stenosis: updated 5-year outcomes from the randomised, non-inferiority NOBLE trial. Lancet (London, England). 2020; 395: 191–199.

[21] Ma J, Liao HJ, Shi FW, An JH, Zhao SG, Ma QL. Effects of off-pump coronary artery bypass graft on the clinical efficacy, surgical indicators, and cardiac function of patients with coronary heart disease. Annals of Palliative Medicine. 2021; 10: 597–605.

[22] Hayashi J, Nakajima H, Asakura T, Iguchi A, Tokunaga C, Takazawa A, *et al*. Validity of Ipsilateral Internal Mammary Coronary Artery Bypass Graft of Arteriovenous Fistula. Heart, Lung & Circulation. 2022; 31: 1399–1407.

[23] Nguyen L, Choi C. Intraoperative Transesophageal Echocardiography During Coronary Artery Bypass Graft Surgery (CABG): A Major Step Toward Improving Outcomes in Cardiac Surgery. Journal of Cardiothoracic and Vascular Anesthesia. 2022; 36: 1–3.

[24] Allahwala UK, Ekmejian A, Mughal N, Brieger D, Nour D, Ciofani JL, *et al*. Impact of coronary artery bypass grafting (CABG) on coronary collaterals in patients with a chronic total occlusion (CTO). The International Journal of Cardiovascular Imaging. 2021; 37: 3373–3380.
[25] Tang YY, Hölzel BK, Posner MI. The neuroscience of mindfulness meditation. Nature Reviews. Neuroscience. 2015; 16: 213–225.
[26] Iwamoto SK, Alexander M, Torres M, Irwin MR, Christakis NA, Nishi A. Mindfulness Meditation Activates Altruism. Scientific Reports. 2020; 10: 6511.
[27] Loucks EB, Britton WB, Howe CJ, Eaton CB, Buka SL. Positive Associations of Dispositional Mindfulness with Cardiovascular Health: the New England Family Study. International Journal of Behavioral Medicine. 2015; 22: 540–550.
[28] Kaushik M, Jain A, Agarwal P, Joshi SD, Parvez S. Role of Yoga and Meditation as Complimentary Therapeutic Regime for Stress-Related Neuropsychiatric Disorders: Utilization of Brain Waves Activity as Novel Tool. Journal of Evidence-Based Integrative Medicine. 2020; 25: 2515690X20949451.
[29] Xu T, Zhu P, Ji Q, Wang W, Qian M, Shi G. Psychological distress and academic self-efficacy of nursing undergraduates under the normalization of COVID-19: multiple mediating roles of social support and mindfulness. BMC Medical Education. 2023; 23: 348.
[30] Alhawatmeh H, Alshammari S, Rababah JA. Effects of mindfulness meditation on trait mindfulness, perceived stress, emotion regulation, and quality of life in hemodialysis patients: A randomized controlled trial. International Journal of Nursing Sciences. 2022; 9: 139–146.
[31] Molero Jurado MDM, Pérez-Fuentes MDC, Barragán Martín AB, Soriano Sánchez JG, Oropesa Ruiz NF, Sisto M, *et al*. Mindfulness in Family Caregivers of Persons with Dementia: Systematic Review and Meta-Analysis. Healthcare (Basel, Switzerland). 2020; 8: 193.
[32] Kakar E, Ista E, Klimek M, Jeekel J. Implementation of music in the perioperative standard care of colorectal surgery: study protocol of the IMPROVE Study. BMJ Open. 2021; 11: e051878.