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The effect of relaxation education intervention on stress, anxiety, and depression in female teachers during the COVID-19 pandemic

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Abstract:

BACKGROUND: The high levels of job stress, anxiety, and depression among teachers, which affect their job and quality of life, necessitate using methods to cope with these issues. The present study aimed to determine the effect of relaxation education intervention on stress, anxiety, and depression in female teachers in 2020.

MATERIALS AND METHODS: This research is semi-experimental. Herein, 100 female teachers were studied. Data collection was performed using the Depression, Anxiety, and Stress Scale-42 items (DASS-42) questionnaire that was completed three times by the teachers: before the intervention, 10 days after the intervention, and 1 month following it. Relaxation education intervention was conducted online and offline based on the bioenergy economy model and by doing psychosomatic exercises. The data obtained from the questionnaire were analyzed by the independent *t*-test, paired *t*-test, and R. M. analysis of variance (ANOVA).

RESULTS: Before the intervention, there was no significant difference between the intervention and control groups in terms of stress ($P = 0.385$), anxiety ($P = 0.168$), and depression ($P = 0.554$) scores. The mean scores of stress, anxiety, and depression decreased significantly in the intervention group 10 days after the intervention; however, there was no significant change in the control group. The reduction in depression, stress, and anxiety remained constant in the intervention group during the 1-month follow-up. The results indicated that among the relaxation exercises, diaphragmatic breathing and meditation techniques were performed by the teachers for a longer period than other techniques.

CONCLUSION: Results obtained suggested teaching short-term relaxation techniques as highly recommended to all school teachers. These techniques include diaphragmatic breathing and meditation. They can reduce their stress, anxiety, and depression, improve their mental health, and empower them to control their tensions and negative emotions.

Keywords:

Anxiety, COVID-19, depression, relaxation, school teachers, stress disorders

Introduction

Stress or tension is an important factor affecting mental health.[1] Disorders like stress, anxiety, and depression are prevalent diseases of the current century, despite technological advances and industrialization.[2] Nowadays, the coronavirus disease 2019 (COVID-19) pandemic is an important issue that has aggravated stress and anxiety; it has not only affected the physical health of the public, but also their mental health and has led to occupational, personal, and social complications such as stress and anxiety. Depression is a consequence of high stress in people.[3,4] Stress and anxiety affect

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teachers' work and quality of life, weakening their ability to perform professional activities and daily life tasks.[5]

Stress greatly affects the health of working people, including teachers. Teaching itself is a stressful job due to the presence of several stressful stimuli. According to Geving,[6] one-third of teachers in developed countries, such as the USA, Australia, New Zealand, and England, considered this profession highly stressful. Numerous studies have indicated that the prevalence of stress is more than 50% among teachers worldwide.[7-9] Statistics have reported a high prevalence of stress among teachers in Iran.[10,11] In this profession, stress not only threatens teachers' physical health, well-being, and psychological health, but also has a negative effect on students and the learning environment.[12,13]

Anxiety is another factor with a high prevalence among teachers.[5] Various foreign studies have indicated that anxiety is significantly high among teachers and female teachers experience higher levels of anxiety than their male counterparts.[14-16] In the capital of Iran, Tehran, 75% of teachers experienced a certain degree of anxiety.[17] Severe anxiety causes serious harm to the body, mind, social relations, job, and education and deprives people from enjoying good health in life.[17]

Being sad and depressed can also be symptoms of depression.[18] This disorder can be considered as one of the most important causes of disability in most countries.[19] Various domestic and foreign studies have reported high statistics of depression among teachers.[16,20,21] Depression can lead to changes in efficiency, handling responsibilities, and acceptance of responsibility among people in a society.[18]

Given the high prevalence of stress, anxiety, and depression among teachers, it is very important to develop strategies to improve the health of this sensitive group. Therefore, relaxation training could be regarded as a strategy to control stress, anxiety, and depression.[22]

Relaxation training is a nonpharmacological intervention and a systematic technique for releasing body and soul from stressors. It is also an effective auxiliary treatment for depression, anxiety, and perceived stress and for obtaining deep physical and mental calmness, which improves the health-related quality of life.[22] The bioenergy economy (BEE) model, which uses diaphragmatic breathing, tension-release technique, cue-controlled technique, vibrational exercises, grounding, and meditation techniques, is a relaxation method that releases the body and soul from stressors and, as a result, from anxiety and depression. The BEE is an integrated, evolutionary, and body-centered care approach in line with the sustainable development of happiness.[23,24] It is a nondrug and harmless treatment for reducing anxiety and depression.[24,25] The BEE is a therapeutic method controlling the mind and body, which is based on energy. This approach has a systematic view of the human beings and considers the human status to be the function of interaction among the physical, energy, spiritual, and psychological systems within the human being. In this approach, health is the outcome of the interaction of these four systems in humans.[26] Relaxation includes techniques, namely, diaphragmatic breathing, tension-release technique, cue-controlled technique, vibrational exercises, grounding, and meditation; it has been reported to decrease stress, anxiety, and depression in various studies.[27-29]

A great body of domestic research has highlighted the effectiveness of relaxation (diaphragmatic breathing, tension-release technique, cue-controlled technique, vibrational exercises, grounding, and meditation) on depression, anxiety, and stress.[24,30,31] A study in Mashhad (2019) found that depression and anxiety significantly decreased after six intervention sessions using the BEE model and performing the vibrational exercises, grounding, and meditation techniques.[25] Derakhshan *et al*.[32] also found that the BEE model and the tension-release technique, cue-controlled technique, vibrational exercises, and grounding techniques in this model could significantly decrease anxiety and depression. Various papers published from countries worldwide have confirmed the effectiveness of relaxation techniques on depression, anxiety, and stress.[29,33,34] A study in New Zealand (2019) reported that stress and tension decreased and relaxation increased by performing several relevant techniques, including diaphragmatic breathing, tension release, and meditation.[28] Another study in America indicated that performing diaphragmatic breathing, tension-release technique, and meditation techniques caused a significant reduction in depression and anxiety symptoms.[27]

Stress, anxiety, and depression are highly prevalent among teachers; therefore, it is necessary to control these disorders having devastating effects.[10,11,17,21] Moreover, BEE, training in this field, and its techniques are highly effective in reducing stress, anxiety, and depression.[25,27,28] The relaxation exercises in this article are based on the BEE model and in the form of a package that includes six techniques, which have not been discussed so far in studies, especially involving teachers. The spread of COVID-19 has aggravated stress and anxiety among teachers as a social class. On the other hand, such an intervention has not been conducted for teachers in Isfahan to date. Hence, this study aimed to determine the effect of relaxation training intervention on stress, anxiety, and depression in female teachers during the COVID-19 pandemic.

Materials and Methods

Study design and setting

The present research was a single-blinded semi-experimental study with a pretest–posttest design with control and intervention groups.

Study participants and sampling

For sampling, one district (Department of Education of district 3 of Isfahan) was randomly selected from six educational districts in 2020. Afterward, 25 schools were selected from the schools in the third district of Isfahan, following which the Depression, Anxiety, and Stress Scale-42 items (DASS-42) was completed by the teachers of these schools. Finally, 100 teachers were recruited, whose scores on each of the subscales, stress, anxiety, and depression, were average or higher; 50 individuals were randomly assigned to each of the intervention and control groups. Inclusion criteria of the study were as follows: obtaining moderate or higher score in each of the stress, anxiety, and depression subscales based on the questionnaire, willingness to participate in the study, and not suffering from major mental and physical illnesses that prevented training exercises. The exclusion criteria were desire to withdraw from the study, failure to participate in the project, and incomplete questionnaire.

Data collection tool and technique

The data collection instrument of the research was a two-part questionnaire. The first part included demographic characteristics with open and closed questions including age, marital status, number of children, history of service, type of housing, number of students, second job, spouse's job, educational level, income level, students' behavior, maintaining order and discipline in the classroom, workload, history of illness, and experience of consulting with a consultant and educational exercises questions which contained open and closed questions about duration of educational exercise. The second part, however, focused on DASS-42. The validity and reliability of the questionnaire were confirmed in a study by Lovibond and Lovibond and its Cronbach's alpha coefficient was 0.90 for stress, 0.84 for anxiety, and 0.91 for depression.[35] and Validity and reliability were confirmed in the Persian study of Afzali *et al*.[36]

DASS-42 consists of four-choice questions rated on a scale where the quantitative value of each question ranges from 0 to 3. This questionnaire includes 14 questions about stress, 14 about anxiety, and 14 about depression. A score of 15–18 on the stress subscale indicates mild stress, 19–25 moderate stress, 26–33 severe stress, and a score of higher than 34 refers to very severe stress. A score of 8–9 on the anxiety subscale represents mild anxiety, 10–14 moderate anxiety, 15–19 severe anxiety, and over 20 very severe anxiety. A score of 10–13 on the depression subscale shows mild depression, 14–20 moderate depression, 21–27 severe depression, and over 28 very severe depression. The questionnaires were completed by both intervention and control groups three times before the intervention, 10 days after the intervention, and 1 month following it.[25,32]

Training intervention

The educational intervention for the intervention group was held in six educational sessions (online and offline). Offline sessions, which included training videos on relaxation exercise, audio files of the recorded theory concepts, and online question-and-answer sessions, were held on a weekly basis for 6 weeks. Before the first session of the intervention, the teachers were provided with a suitable educational booklet prepared by the health educator, which was designed using various psychological and bioenergy books.[37,38] Educational intervention sessions and educational concept and techniques are specified in Table 1.

All the theoretical concepts and content of the sessions were recorded as audio files and given to the teachers in the same session through a virtual group on WhatsApp, so that the teachers could listen to the content at the right place and time with greater concentration. The training videos prepared based on the training exercises of each session were also sent to their files on WhatsApp in the same training session; hence, they could use the training video and do the exercises at any time. In this intervention, six online sessions were held by a psychosomatic specialist and a health educator; the duration of each session ranged from 50 to 60 min. These online sessions were in the form of questions and answers, in which people talked about the topics they had been taught, exercises, and their effectiveness. In these sessions, they also asked their questions about exercises and presented content. They received appropriate answers to clear their doubts in the field. Every week, an educational message according to the educational content was sent to the individuals by the health educator.

To remind people to do the exercises, a reminder message was sent to them on a daily basis. To make sure that they continued the exercises, the health educator asked the participants to send a message to the health educator if they did the exercises. In addition to the mentioned points in the recorded audio file on WhatsApp, the WhatsApp virtual group was used to follow-up the participants, inform the sessions, and express their educational questions and doubts.

Ethical consideration

The educational intervention was planned and carried

Table 1: Educational intervention sessions and educational concepts and techniques

Sessions	Workshop's name	Concepts and theoretical contents	Practical exercise	The duration of training techniques and the trainer
First session	Bioenergy economy	The concepts and theoretical contents were explained by a psychosomatic expert for 45 min	Diaphragmatic breathing technique (diaphragmatic breathing is a form of breathing that emphasizes the downward expansion of the chest cavity)	Diaphragmatic breathing technique was taught by a health educator in the form of an educational video for 10 min
Second session	Road map or energy patterns	The concepts and theoretical contents of this session were explained by a psychosomatic specialist for 30 min	Tension-release technique (this training is the process of muscle activation and the body muscles enter the contraction state [5 s] and release [30–40 s] one after another in this exercise)	Tension-release technique was taught by a health educator in the form of an educational video for 10 min
Third session	Body awareness	Concepts and theoretical contents were explained by a psychosomatic specialist for 35 min	The cue-controlled technique (the cue-controlled technique focuses on breathing [five inhales and exhales, then rest, and repeats], in which a connection was created between a word as a cue and breathing)	The cue-controlled technique was instructed by a health educator in the form of an educational video for 5 min
Fourth session	The Body, Great Wisdom	Concepts and theoretical contents were explained by a psychosomatic specialist for 30 min	The technique of vibrational exercises (in vibrational motion, muscle vibrations start from a point and then vibrate to other organs)	The technique of vibrational exercises was then taught by a health educator in a 20-min training video
Fifth session	Grounding	The theoretical concepts and contents of this session were explained by a psychosomatic specialist for 30 min	The grounding technique (balance and equilibrium are created in the body in both longitudinal and transverse in grounding techniques)	The grounding was explained by a health educator in a 10-min educational video
Sixth session	Attunement	The concepts and theoretical contents were explained by a psychosomatic specialist for 30 min	The meditation technique (attention is focused on different phenomena such as breathing, a visual object, or a repeated phrase in meditation)	The meditation was then taught by a health educator in the form of an educational video for 10 min

out after registering this intervention in Iranian Registry of Clinical Trials (IRCT) and getting a code (IRCT20200312046754N1). The present study was confirmed by the Ethics Committee of Isfahan University of Medical Sciences under the ethical code IR.MUI.RESEARCH.REC.1399.204. Also, before the implementation of the project, the informed consent form was completed by the teachers.

Statistical analysis

After collecting data and coding the questionnaires, we entered data into the computer using IBM Statistical Package for the Social Sciences (SPSS) statistics version $SPSS_{25}$ (SPSS Inc., Chicago, IL, USA). The data were analyzed with descriptive statistics, including the calculation of mean, standard deviation, frequency distribution, and frequency percentage calculations, and through analytical statistics, including the independent *t*-test for comparing the means in the intervention and control groups. We also utilized the paired *t*-test and Repeated measures (R. M.) analysis of variance (ANOVA) for comparing the means at different times after determining the data normality.

Results

In the present research, we recruited 100 female primary school teachers of district 3 of Isfahan, whose average age was 46.16 ± 10.46 years in the intervention group and 45.42 ± 8.003 years in the control group; no significant difference was observed between the two groups ($P = 0.692$). As shown in Table 2, there were no significant differences between the intervention and control groups concerning any of the demographic factors, such as marital status ($P = 0.564$), having a job other than teaching ($P = 0.079$), spouse›s job ($P = 0.535$), education level ($P = 0.226$), income level ($P = 0.580$), or workload ($P = 0.749$). As shown in Table 3, the mean of stress, anxiety, and depression decreased significantly 10 days and one month after the intervention [Table 3].

Results showed that the mean duration of the diaphragmatic breathing technique was 16.6 ± 12.43 min per week in the intervention group 10 days after the intervention, which reached 12.90 ± 9.90 min at 1 month after the intervention. The paired *t*-test indicated that the difference was significant ($P < 0.05$). In the tension-release technique, the mean of exercise in the intervention group declined from 15.24 ± 13.63 to 11.56 ± 10.84 min, showing a decrease in exercise. The paired *t*-test in the intervention group suggested a significant difference between the mean time of performing the cue-controlled technique 10 days and 1 month after the intervention ($P < 0.05$); this mean declined from 12.96 ± 13.57 to 10.22 ± 10.86 min. In the vibrational exercise technique, the mean exercise time was 12.24 ± 14.27 min in the intervention group 10 days after the intervention, which decreased to 8.98 ± 10.87 min after a month. In addition to the mentioned cases, the paired *t*-test revealed a significant difference between the mean scores of grounding and

Table 2: Frequency distribution of the participants in the intervention and control groups according to their marital status, job other than teaching, spouse's job, education level, income level, communication with colleagues, and workload

Variable		Intervention group Frequency (%)	Control group Frequency (%)	Significance test
Marital status	Single	8 (16%)	6 (12%)	0.564
	Married	42 (84%)	44 (88%)	
Job other than teaching	Yes	3 (6%)	0 (0%)	0.079
	No	47 (94%)	50 (100%)	
Spouse's job	Without spouse	8 (16%)	6 (12%)	0.535
	Self-employed	12 (24%)	16 (32%)	
	Governmental	26 (52%)	20 (40%)	
	Unemployed	1 (2%)	3 (6%)	
	Retiree	3 (6%)	5 (10%)	
Educational level	High school diploma	4 (8%)	0 (0%)	0.226
	Associate degree	13 (26%)	10 (20%)	
	Bachelor	26 (52%)	34 (68%)	
	Master	7 (14%)	6 (12%)	
	Ph.D.	0 (0%)	0 (0%)	
Income level	Under 1,500,000 tomans	16 (32%)	7 (14%)	0.580
	1,500,000–2,500,000 tomans	12 (24%)	24 (48%)	
	Over 2,500,000 tomans	22 (44%)	19 (38%)	
Workload	Weak	1 (2%)	0 (0%)	0.749
	Moderate	18 (36%)	21 (42%)	
	High	31 (62%)	29 (58%)	

Table 3: Comparison of the mean scores of depression, stress, and anxiety in the intervention and control groups before, 10 days after, and 1 month after the intervention

	Time Group	Before the intervention (Mean±SD)	10 days after the intervention (Mean±SD)	One month after the intervention (Mean±SD)	Results of R. M. ANOVA	*F*
Depression	Intervention	16.68±7.41	9.16±6.51	9.08±6.50	*P*<0.001	199.17
	Control	17.54±7.08	15.50±9.78	15.44±9.23	*P*<0.001	201.46
	Result of the independent *t*-test	*P*=0.554	*P*<0.001	*P*<0.001		
Stress	Intervention	25.36±5.57	14.22±7.78	13.28±7.96	*P*<0.001	433.21
	Control	24.32±6.32	22.56±8.94	22.66±8.76	*P*<0.001	599.02
	Result of the independent *t*-test	*P*=0.385	*P*<0.001	*P*<0.001		
Anxiety	Intervention	14.56±6.66	8.02±4.89	7.58±5.22	*P*<0.001	234.57
	Control	16.46±7.00	14.14±8.21	14.16±7.99	*P*<0.001	225.12
	Result of the independent *t*-test	*P*=0.168	*P*<0.001	*P*<0.001		

ANOVA=analysis of variance, SD=standard deviation

meditation techniques in the intervention group 10 days and 1 month following the intervention ($P < 0.05$). The mean of the grounding technique decreased from 13.44 ± 13.75 to 10.18 ± 11.16 min per week, and the mean of the meditation technique declined from 15.80 ± 13.83 to 11.66 ± 10.89 min per week.

Discussion

The present study, indicated that the relaxation intervention had an effect on depression, stress, and anxiety, and the mean of depression, stress, and anxiety decreased 10 days and 1 month after the intervention; also, among the relaxation exercises, diaphragmatic breathing and meditation techniques were performed by the teachers for a longer period than the other techniques.

Based on the results of the present research and given the significant reduction in depression in the intervention group compared to that in the control group after the implementation of the BEE model in the form of virtual education, depression decreased in the intervention group 10 days after the intervention. This suggests the effectiveness of relaxation techniques, especially diaphragmatic breathing, meditation, and tension-release techniques, which were performed for 16.6, 15.80, and 15.24 min, respectively, by teachers in order to reduce depression; they were performed by teachers more frequently than the other techniques. The

results of the present study are consistent with those of Derakhshan *et al*.[32] and Goli *et al*.[25] They reported that the BEE intervention with certain techniques, such as vibrational exercises, grounding, tension-release technique, cue-controlled technique, and meditation, can reduce depression and improve the self-efficacy and inner peace in people. In addition to the aforementioned techniques, the diaphragmatic breathing technique was also used and well welcomed by the teachers in our study, which was found to be an effective exercise in reducing depression. The effect of the diaphragmatic breathing technique was also proven in Vázquez *et al*.'s[27] study. In a study using diaphragmatic breathing, meditation, and progressive muscle relaxation at least three times a week, Hampson *et al*.[39] found that depression decreased in 30% of the participants after the intervention, and also, depression decreased in a 5-week follow-up period, showing the effect of relaxation exercises on depression. Meanwhile, depression remained unchanged in our study during the 1-month follow-up period probably because no training was considered for people during the follow-up. Furthermore, there was not any regular follow-up on a daily basis during this period. The results reported by Merakou *et al*.[33] and Matiz *et al*.[34] in female teachers during the COVID-19 outbreak are consistent with those of the present study. In these papers, it was reported that performing certain techniques like meditation and tension-release technique decreased depression and improved the well-being and quality of life. Herein, more techniques, such as diaphragmatic breathing, vibrational exercises, and grounding, were used compared to other studies, in order to obtain a greater and faster effect on reducing depression, considering the importance of the target group and the special conditions of teachers during the prevalence of coronavirus in Iran, when they had to use the virtual education system, which was associated with several problems, including lack of familiarity with e-learning and the lack of a suitable platform in the virtual space.

In the present study, relaxation exercises decreased stress 10 days after the intervention, which is consistent with the findings of Nasiri *et al*.[31] In their research, progressive muscle relaxation exercises were used and the subjects performed exercises for 20 min daily for 6 weeks. However, in our study, it was observed 10 days after the intervention that the teachers did relaxation exercises for over 80 min per week, and several relaxation exercises were used in our study. The study results of Merakou *et al*.[33] and Ozgundondu and Gok Metin[40] revealing that stress significantly decreased on using progressive muscle relaxation training for 8 weeks are also consistent with ours. Nonetheless, teaching a set of several relaxation exercises was done during 6 weeks in our study. The cause of this stress reduction appeared to be the decrease in the activity of the sympathetic system as a result of relaxation exercises, which contributes to peace of mind. Our work is consistent with that of Masih *et al*.[28] because meditation and tension-release exercises were performed in both investigations; such exercises resulted in changes in the mind and reduced stress and mental tensions. Stress decreased in the present study, which was also reported in the study by Hayes-Skelton *et al*.;[41] diaphragmatic breathing, tension-release, and cue-controlled exercises were used in this study, and it indicated that such exercises were effective in reducing stress. Also, a study by Thephilah Cathrine *et al*.[42] on teachers showed that burn out and stress decreased after 6 weeks of diaphragmatic breathing and progressive muscle relaxation. On the other hand, the results of the research by Calder Calisi[43] were inconsistent with ours. Their work was carried out with a diaphragmatic breathing technique in nurses. No statistically significant relationship was reported between job stress levels and the well-being of nurses before and after the intervention, which could be due to the small number of samples.

The results of the present study revealed a reduction in anxiety 10 days after the intervention, which is consistent with the results of Derakhshan *et al*.[32] In their study, tension-release exercises, cue-controlled technique, vibrational exercises, and grounding exercises were held in 10 training sessions, one session per week. Herein, more exercises were provided during six training sessions. In a study by Keyvanipour *et al*.,[24] the tension-release technique, vibrational exercises, grounding, and meditation techniques were utilized once a week for 6 weeks, which showed that these exercises were effective in reducing anxiety; their findings are also consistent with ours. In muscle techniques, people feel the differences between tension and release, which leads to a reduction in anxiety. Our findings are in agreement with those reported by Liu *et al*.,[29] who conducted the study in COVID-19 pandemic, and İnangil *et al*.,[44] who used progressive muscle relaxation and diaphragmatic breathing techniques. The reduction in anxiety was on account of progressive muscle relaxation and diaphragmatic breathing techniques that could reduce the activity of the sympathetic nervous system and anxiety. Teachers can control the sympathetic system and achieve relaxation by contracting and relaxing the muscles.

Limitations and recommendation

The limitations of the present study included the teachers' lack of time, which reduced their tendency to complete the questionnaire. Moreover, half of the educational activities were performed through the use of a live program via Adobe connect software online. Due to the lack of a suitable online platform, we recorded the live programs and prepared a recorded audio file for the teachers. However, it is suggested to use

live or pre-recorded programs as much as possible to decrease or solve internet-related problems. Given the importance of teachers› health, it could be suggested that they apply such techniques during their break time at school. In addition to specialized education for teachers, these relaxation techniques can be used as a part of intraschool education in order to improve their mental health. School health counselors and educators can also consider relaxation technique teaching as a part of their educational interventions at schools.

Conclusions

Results of the present study showed that stress, anxiety, and depression decreased after doing relaxation exercises. Improving teachers' health and their stressful jobs is of paramount importance. Moreover, stress, anxiety, and depression have highly negative effects, while short-term relaxation interventions could be remarkably effective in reducing stress, anxiety, and depression and could improve the mental health of teachers, enabling them to better control tensions and negative emotions. Thus, it is suggested that short-term relaxation techniques be taught to all teachers to reduce their stress, anxiety, and depression and improve their mental health. Therefore, education officials and policymakers are suggested to apply relaxation techniques based on diaphragmatic breathing, cue-controlled technique, and meditation techniques in the in-service training programs for teachers or present a training package to teachers with the content of relaxation exercises. They could spend some time conducting and teaching the relaxation methods in collaboration with service officials and the school principal when the teachers are at school.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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