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CLINICAL TRIAL STUDY ARTICLE

The effect of ACT on Self-Esteem and Self-Efficacy of Women with Breast Cancer in Iran

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ARTICLE HISTORY

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Abstract: ***Background*:** Today, breast cancer is the second major cause of cancer deaths in women.

***Objective*:** The present study aimed to determine the effect of acceptance and commitment therapy (ACT) on self-esteem and self-efficacy of cancer adaptation behaviors in women.

***Methods*:** The present study was a randomized educational trial (IRCT Registration number: IRCT2016100430140N1) based on intervention and control groups including 30 patients with breast cancer who were referred to Cancer comprehensive center of Imam Khomeini Hospital in Sari 2017. The intervention group participated in ACT sessions for 8 weeks held as 8 sessions. In the control group, there was no intervention and only chemotherapy was carried out. Self-esteem and self-efficacy of cancer adaptation behaviors were assessed using Rosenberg Self-esteem Scale and Cancer Behavior Inventory before and after the intervention and one month later. Data analysis was tested by repeated measurement, ANOVA and Tukey post-hoc tests.

***Results*:** The mean of self-esteem before and after intervention and one month later was 13.46 ± 1.12, 16.86 ± 0.91, 15.86 ± 0.99 in ACT group, and 14 ± 1, 14.40 ± 0.98, 14.20 ± 1.08 in the control group, respectively ($F_{(2,27)}$=11.90, P=0.001). The mean of self-efficacy of cancer adjustment behaviors before and after the intervention and one month later was 104.40 ± 20.19, 218.20 ± 15.32, 214.86 ± 16.97 in ACT group, and 96.86 ± 15.04, 97.06 ± 18.61, 94.53 ± 14.69 in the control group, respectively ($F_{(2,27)}$=8.26, P=0.001).

***Conclusion*:** This counseling approach can be used as an easy, non-invasive and helpful method to increase self-esteem and self-efficacy among patients for adaptation to cancer.

Keywords: Acceptance and commitment therapy (ACT), self-esteem, self-efficacy, breast cancer, reproductive health, counseling approach.

1. INTRODUCTION

Breast cancer is the most prevalent cancer among women and affects 2.1 million women each year. It is the main factor of cancer-related deaths among women. In 2018, approximately 627,000 women died from breast cancer that includes 15% of all cancer deaths among women. The rate of cancer is increasing across the globe, being higher among women in more developed regions [1, 2]. In the Islamic Republic of Iran, the rate of breast cancer is 21% of all cancers with an annual incidence of 22 per 100 000 women. The age of diagnosis in most cases is between ages 35 and 44 years, which is about 10 years younger than in West [3, 4].

Although the extensive advances in the treatment of breast cancer have increased the survival rate and longevity among these patients [5, 6], most of these treatments are associated with side effects such as lymphedema, weakness, pain, fatigue and lethargy, and psychiatric disorders all of which significantly reduce the physical and mental capacity of the patient [7-9]. Moreover, as the person copes more with the disease and its treatments, she can better tolerate the disease and experience a higher quality of life [8, 10, 11]. Many studies have shown that self-efficacy is a key psychological source in adapting to chronic diseases [12]. Self-efficacy in cancer patients leads to better adaptation with cancer diagnosis, improves the quality of life and reduces the symptoms of cancer in patients [13, 14]. Patients with high self-efficacy have fewer psychological disorders such as depression and tend to create more realistic goals. The self-efficacy related to the disease involves a sense of control and active involvement of the person in the treatment, resulting in greater

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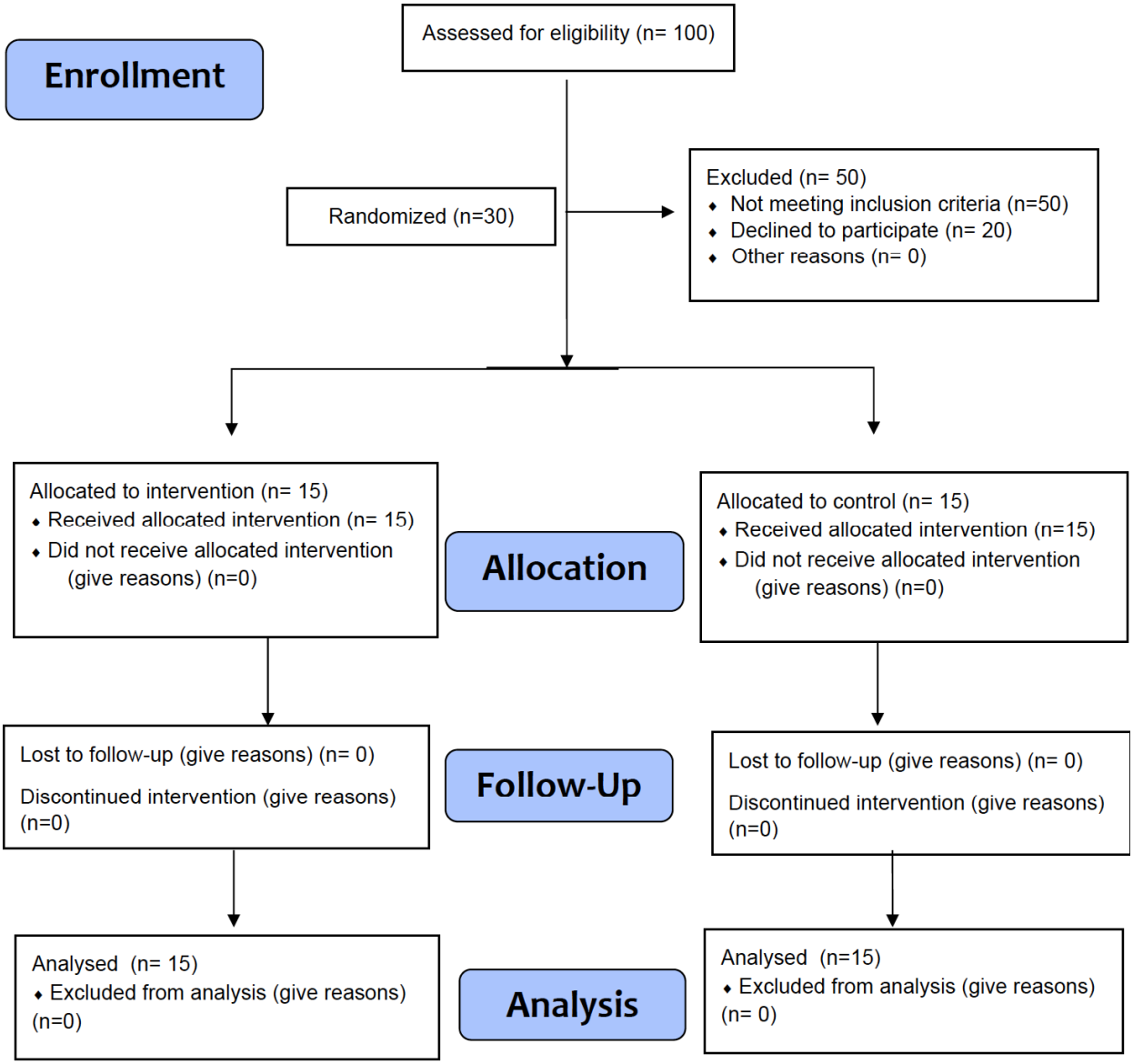

Fig. (1). ????

patient satisfaction, adherence to treatment, and self-care [15-18]. It seems that in addition to the impact of self-efficacy in coping with psychiatric complications of cancer, self-esteem also plays an important role in cancer care behaviors [19, 20]. In order to adapt to the treatment process in cancer patients, emphasis on counseling and education can play an important role in increasing self-efficacy and improving the self-esteem of patients [21, 22]. One of the third-generation counseling techniques is Acceptance and Commitment Therapy (ACT), which helps people recognize what really matters to them and asks them to use their values for behavioral change in life. ACT also helps the client to accept what is beyond their control and commit to a practice that enriches their life [23-25]. Considering that no study has been conducted on the effect of ACT on self-efficacy and self-esteem of breast cancer patients, therefore, the present study aimed to determine the effect of ACT on self-efficacy and self-esteem among women with breast cancer.

2. MATERIALS AND METHODS

The present study is a randomized educational trial with a control group, using pre-test and post-test. This research is a Master's thesis for midwifery counseling. This research is funded by Arak University of Medical Sciences and Health Services, and the approved research project approved by Arak University of Medical Sciences with the approval number IR.ARAKMU.REC.1396.35. The study population included women with breast cancer who referred to the Comprehensive Cancer Imam hospital in Sari in 2017. 30 patients after written consent form were included by one of the researchers in the study (Fig. **1**). The inclusion criteria were: 1) 30-50 years of age; 2) being under chemotherapy; and 3) literacy. Exclusion criteria included: 1) absence of more than 1 session; and 2) the patient's unwillingness to continue to participate in the study. Sampling was done based on convenience and subjects with the inclusion criteria

filled in the research questionnaires. 30 subjects who were willing to attend all the sessions were randomly assigned to intervention (15 people) and control (15 people) groups using "A" and "B" block randomization. The sample size for the two groups was calculated 27 people according to the sample size formula in an interventional study using $P_1 = 0.52$, $P_2 = 0.48$, confidence level of 95% and test power of 80%, which was increased to 30 subjects considering the 10% probability of drop-outs.

Data collection tools included demographic characteristics questionnaire (age, level of education, occupation, marital status, household economic level, residence status, type of insurance, type of treatment), Rosenberg Self-esteem Scale, and Cancer Behavior Inventory.

The Rosenberg Self-esteem Scale had 10 items evaluated by a 4 degrees Likert scale and was scored as (+1) for an agreed answer, and (-1) for disagreed answer to each item of the scale. The total score of +10 indicates a high level of self-esteem and -10 indicates low self-esteem [26]. The other questionnaire is the Cancer Behavior Inventory, designed by Merluzzi *et al*. in 1997. This tool evaluates the self-efficacy of patients in physical and mental adaptation with cancer in 7 areas of maintenance of activity and independence (5 items) seeking and understanding medical information (5 items), stress management (5 items), coping with treatment-related side effects (5 items), accepting cancer and maintaining a positive attitude (5 items), affective regulation (5 items) and support seeking (3 items) designed on a 9 degrees Likert scale. Its total score ranges from 33-297 and a higher score indicates higher self-efficacy in the ability to perform a specific behavior for coping with cancer. Cronbach's alpha coefficient was 0.88 [10].

After sampling and before the intervention, the questionnaires (demographic characteristics questionnaire, Rosenberg Self-esteem Scale, and Cancer Behavior Inventory) were completed by both groups. In the intervention group, ACT sessions were performed in 8 sessions of 90 minutes each week. It should be noted that at the end of every session, the subjects at the intervention group received an assignment

Table 1. The structure and content of the ACT sessions.

1	Establishing the first interaction, ensuring confidentiality of information, expressing group rules, goals and features of work, asking clients about their expectations of ACT sessions, explanations about breast cancer, signs and symptoms, drugs and non-pharmacological treatments and their effects on lives of patients
2	Creating creative desperation; that is, the client ultimately achieves the insight that so far any kind of effort that has made to solve his/her problem has been void, and instead of self-blaming, uses new methods to change the situation. Using allegory (human in the well, a tug of war with a monster, a hungry tiger) the client understands that avoiding or any other control method only strengthens the importance and role of what s/he avoids; eliciting feedback and giving an assignment
3	The main purpose of this session is to educate and understand that control is the problem itself, not the solution. Explaining that internal events cannot be controlled like external events, teaching how to recognize personal events are being controlled such as thoughts and memories, recognition of the inappropriate and ineffective controlling strategies, teaching how to accept painful personal events without conflict and not controlling them using allegories (Polygraph and falling in love), receiving feedback and submit an assignment
4	The main goal is encouraging the client to find a better substitute for controlling; teaching how to accept all internal events, explaining about avoiding painful experiences and its consequences using the allegory of uninvited guests and the cat's leg in a hank. Changing the concepts of language using allegory (allegory of lion, milk), teaching mindfulness techniques, exercising mindfulness, a guide to mindfulness, receiving feedback and giving an assignment
5	Expressing the concept of cognitive defusion using the allegory of bus with the ultimate aim of creating a gap between the client and his/her thoughts, emotions, memories and physical sensations, and ultimately observing the sources of internal reactions as an observer, for example I'm getting anxious.
6	Explaining the concepts of role and background, seeing oneself as a platform and interacting with oneself using chess allegory, awareness of different sensory perceptions, and separation from emotions with subjective content. In these exercises, the participants learn how to focus on their activities (such as breathing, walking) and be aware of their condition at every moment; when their emotions, senses, and cognition are processed, they are observed without judgment. When the participants find that the mind is wandering in thoughts, memories, or imaginations, they will return their attention to the present time, if possible, regardless of their content or nature. Receiving feedback and giving assignment
7	Explaining the concept of values and expressing the difference between values, goals and needs; clarifying the values of the clients; creating incentives for change and empowering the client for a better life; helping the client to focus on living effectively. In fact, in this meeting, a distinction is made between value as a feeling and value as an action; giving exercises to identify the values of the clients such as the exercise of self-funeral and filling the form of rating the values; eliciting feedback and giving assignment Feedback and assignment
8	Teaching commitment to action, identification of behavioral schemes consistent with values, and making commitment to act based on them, that is, the client must make a distinction between the desire and want; using the allegory of the beggar at the door, this is done empirically, and ultimately the client reaches this conclusion that avoiding our desires would not relieve the mind; concluding and answering the questions of members and evaluating the whole sessions; thanking and appreciating the members for attending the sessions; performing the post-test

Table 2. Demographic characteristics in two groups of intervention and control in women suffering from cancer referring to the cancer comprehensive center.

Variable	Characteristics	Intervention Group		Control Group		P value
Age group	35 to 40 years old	5	(33)	4	(27)	0.89
	41 to 45 years old	4	(27)	5	(33)	
	46 to 50 years old	6	(40)	6	(40)	
Education level	Elementary	8	(53)	7	(46)	0.11
	Diploma	4	(27)	4	(27)	
	Academic	3	(20)	4	(27)	
Job	housewife	12	(80)	11	(73)	0.66
	employee	3	(20)	4	(27)	
Life companions	Parents	-	(0)	1	(7)	0.511
	Spouse	4	(27)	5	(33)	
	spouse and children	11	(73)	9	(60)	
Kind of covered insurance	Urban	4	(27)	4	(27)	0.56
	rural	11	(73)	11	(73)	

which was checked by the researcher at the following session. In the following, a summary of the sessions held for the intervention group is provided in Table **1**.

At the end of the 8th session, the post-test questionnaires (Rosenberg Self-esteem Scale, Cancer Behavior Inventory) were completed by the intervention group. In the control group, no intervention was done and if they wanted the treatments, counseling and care instructions were provided for them.

SPSS 21 was used to analyze the collected data. Descriptive statistics including mean ± SD and inferential statistical tests including repeated measures analysis of variance (ANOVA) and Tukey post-hoc test were used for the main outcomes. To compare the age of the two groups, an independent t-test was used; and to compare the level of education, occupation, marital status, household economic level, residence status, type of insurance and type of treatment χ^2 statistical test was used.

3. RESULTS

The characteristics of the patients are shown in Table **2**. Considering that the effect was significant over time, The Tukey post hoc test showed that there was a significant difference between time 1,2 (p=0.001) and time 1,3 (p=0.003) in self-esteem. The post-hoc test in self-efficacy showed that there was a significant difference between time 1,2 (p= 0.001), and 1,3 (p=0.001). The results also showed that the mean difference in measurements at different time points was significant in all subscales of self-efficacy (p=0.001) (Table **3**). The results of the test showed that the effect of time on both variables of self-esteem and self-efficacy is significant, *i.e.* the difference in mean of measurements at different time points (self-esteem: F=15.70, df=2, sig.=0.001) and (self-efficacy: F=250.64, df=2, sig.=0.001) (Table **4**).

The interactive effect of time and intervention was also significant for self-esteem (F=4.97, df=2, sig.=0.010) and self-efficacy (F=756.37, df=2, sig.=0.001). Intergroup changes in self-esteem (p=0.003) and self-efficacy (p=0.001) showed a significant difference between the two groups (Table **3**).

4. DISCUSSION

The present study showed that using the ACT approach for reinforcing a patient's ability, beliefs, emotions and emphasis on values can improve the sense of worthiness and self-efficacy in cancer coping behaviors [24, 27, 28]. On the other hand, research findings have shown that if educational and counseling interventions increase self-efficacy, there will be a positive impact on health behaviors, symptoms control, adherence to cancer treatments, and quality of life [22, 29].

Studies show that the sense of worthiness reduces negative body image in patients with breast cancer [30, 31].

It was reported that lack of ability to cope with cancer during cancer treatment has a significant effect on patient's self-care level [29]. In a study in Turkey on the relation between self-efficacy and psychological symptoms showed that self-efficacy had a negative relationship with the psychological symptoms of chemotherapy. Researchers recommended that nurses should be equipped with the capabilities of psychosocial interventions to work on self-efficacy [27]. According to the present study, it seems that ACT with the mindfulness technique provides this opportunity to health care providers in order to help reduce patients' stress.

ACT approach and the mindfulness technique teach a person how to live at the moment and temporarily frees

Table 3. Comparison of the mean and standard deviation of self-esteem, self-efficiency score and self-efficiency subscales in three times before intervention, immediately after intervention and one month after intervention in two groups of intervention and control in women suffering from cancer referring to the cancer comprehensive center.

Variable	Group	Mean ±SD in three Times before, Immediately and one Month Later (1, 2 and 3) *			Analysis of Variance with Repeated	Tukey's Follow-up Test Result ** (1 and 2, 1 and 3, 2 and 3)		
		(1)	(2)	(3)	(1,2,3)	(1,2)	(1,3)	(2,3)
Self-esteem	Intervention	13.46±1.12	16.86±0.91	15.86±0.99	0.001	0.001	0.003	08800
	Control	14±1	14.40±0.98	14.20±1.08	0.119	0.890	0.994	00994
Self-efficiency	Intervention	104.40±20.19	218.20±15.32	214.87±16.97	0.001	0.001	0.001	0.994
	Control	96.86±15.04	97.06±18.61	94.53±14.69	0.085	0.990	0.999	0.998
Maintain activity and independence	Intervention	15.86±3.33	33.66±5.31	33.46±4.37	0.001	0.001	0.001	0.902
	Control	14.60±2.79	14.20±2.73	14.13±2.50	0.657	0.695	00634	0.945
The interest in obtaining medical information and the ability to understand it	Intervention	17.26±3.61	31.80±5.64	32.20±4.95	0.001	0.001	0.001	0.821
	Control	17±2.53	17.13±3.81	16.40±2.55	0.780	0.911	0.525	0.541
Ability to manage stress	Intervention	15.66±3.84	32.73±5.06	31.33±5.23	0.001	0.001	0.001	0.425
	Control	14.46±3.29	15±4.30	14±3.35	0.489	0.706	0.704	0.484
Coping with the side effects of the done treatments	Intervention	16.20±5.05	33.73±3.75	33.66±5.30	0.001	0.001	0.001	0.970
	Control	13.73±2.46	13.66±2.25	13.40±2.26	0.715	0.939	0.702	0.749
Cancer acceptance and maintaining a positive attitude despite the disease	Intervention	15.06±4.26	33.40±3.41	31.60±6.10	0.001	0.001	0.001	0.303
	Control	15.46±2.13	15.06±1.98	14.93±2.42	0.539	0.599	0.872	0.534
Emotional setting	Intervention	15.40±4.62	33.66±40.67	32.80±4.85	0.001	0.001	0.001	0.618
	Control	13.80±2.45	14.66±4.93	13.86±2.85	0.538	0.548	0.591	0.946
Social support request	Intervention	15.40±4.62	33.66±40.67	32.80±4.85	0.001	0.001	0.001	0.961
	Control	13.80±2.45	14.66±4.93	13.86±2.85	0.865	0.856	0.848	0.850
*** (1) before, (2) one week later, (3) one month later**		** (1 and 2) before and one week later (1 and 3) before and one month later (2 and 3) immediately and one month later						

Table 4. Comparison of the effect of time, group and interaction between group and time on self-esteem and self-efficacy in women suffering from cancer referring to the cancer comprehensive center in Sari in 2017.

Time Effect		Group Effect		Interaction between Time and Group		Variables
F	P value	F	P value	F	P value	
15.70	0.001	10.69	0.003	4.97	0.010	self-esteem
120.4	0.001	250.64	0.001	765.37	0.001	self-efficacy

him/herself from the attitudes and beliefs that are rooted in the past or fears of the future [28, 32]. A study by Khashouei *et al*., in 2016 was done to evaluate the effectiveness of ACT on self-efficacy, perceived stress, and flexibility in type 2 diabetic patients. The results showed that after the intervention, the scores of self-efficacy and perceived stress were reduced in all stages compared to the control group ($P < 0.05$) [24]. The main purpose of ACT is increasing the acceptance rate of negative thoughts and feelings associated with cancer as well as enhancing the psychological flexibility which leads to such changes in patients [33, 34].

In the present study, stress management, which was one of the sub-scales of self-efficacy of cancer coping behaviors, was significantly higher than the control group. A study conducted by Bahar *et al*. n 2015 aimed at determining the effectiveness of ACT group therapy on depression and anxiety in patients with breast cancer. The intervention group re-

ceived 8 sessions of 90-minute ACT intervention, however, the control group did not receive an intervention. The results showed that anxiety and depression in the intervention group decreased significantly [35]. Research has shown that people affected by chronic illness use catastrophizing as an avoiding coping belief and avoid daily life activities; thereby leading to increased negative outcomes of stressful situations. It seems that mindfulness and ACT reduce such inappropriate coping strategies [36]. Also, in the present study, there was a significant increase in the individual's sense of independence and interest in obtaining information which were the components of self-efficacy in this research. The study by Shelby *et al*. found that women with high self-efficacy can continue their coping attempts and daily activities, even when experiencing harsh problems [37]. Finally, interventions based on acceptance and commitment not only help patients the possibility to accept emotions but also provides them get rid of their useless methods for controlling and eliminating negative emotions and experiences, leading them to commitment to action based on values; this process helps increase self-esteem and self-efficacy in women with breast cancer [38].

CONCLUSION

Regarding the improvement of self-esteem and self-efficacy of breast cancer patients, this method can be introduced as an easy, non-invasive and helpful approach that can be utilized in specialized cancer centers for patients with counseling services.

The limitation of this study was not conducting a long-term follow-up of these patients, which is recommended to be carried out in future studies. Moreover, self-care behaviors and ultimately the quality of life of these patients were not investigated by this method, which is recommended to be conducted in future studies.

LIMITATIONS OF THIS RESEARCH

It should be noted that this research had limitations such as few cancer patients in this city and a lack of variety in staging cancer and low sample size. Due to the lack of follow-up of these patients in the long-term, it is recommended to do more researches by follow-up of patients, as well as self-care behaviors and ultimately the quality of life of these patients should be evaluated by this method.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This research was approved by Arak University of Medical Sciences, Iran with the approval number IR.ARAKMU.REC.1396.35.

HUMAN AND ANIMAL RIGHTS

No Animals were used for studies that are the basis of this research. The reported experiments on women are in accordance with the Helsinki Declaration of 1975, as revised in 2013 (http://ethics.iit.edu/ecodes/node/3931).

CONSENT FOR PUBLICATION

Written informed consent has been obtained from all the patients.

STANDARD OF REPORTING

CONSORT guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The source of data and materials will not be shared because we were not allowed by Arak University of Medical Sciences to share it.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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