Research Article | Medical Education

A Different Approach to Breast Self-Examination Training: Family Training

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Abstract

Background. Breast self-examination (BSE) is an effective, cost-free, early diagnosis method that enables women to take responsibility for their own health in the early diagnosis of breast cancer, which is the most common cause of death in women.

The objective of the study was to determine the effect of BSE training given by female nursing students to their mothers and sisters on their BSE behavior and self-esteem.

Materials and Methods. This study is of one-group pretest-posttest quasi-experimental design. It was carried out at the Faculty of Health Sciences of Erzincan University in Turkey between December 2019 and May 2020. The universe of the study consisted of 140 third- and fourth-year female students over the age of 18 enrolled in the Department of Nursing, Faculty of Health Sciences, Erzincan University, Turkey. The total number of mothers and sisters in the study sample was 126. The data were collected in two stages, before and one month after family training. IBM SPSS Statistics 22 software package was used for statistical data analysis. The percentage, mean, standard deviation, and Student's t-test were used for statistical processing. The p-value of 0.05 was considered statistically significant for all tests.

Results. The knowledge level of study participants about breast cancer and BSE was analyzed, and the source of their knowledge was assessed. Applying family training approach showed a significant increase in BSE knowledge level of participants one month after training. It was accompanied by increasing BSE skills and self-esteem levels (according to the mean values of the Rosenberg Self-Esteem Scale).

Conclusions. Training for family members is an effective method to increase women's knowledge and skills in BSE. In addition, BSE training enabled female students and their families to participate in BSE practice.

Keywords
Breast Self-Examination; Family Training; Students, Self-Esteem

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Introduction

Breast cancer is a serious health problem with high mortality rates among women around the world [1]. It is the second most common type of cancer worldwide; approximately 2.09 million new cases (accounting for 11.6% of all cancer types) were determined in 2018 and 627,000 women died [2, 3]. In Turkey, it was the most common cancer type in 2018; 22,345 new cases (accounting for 10.6% of all cancer types) were identified and 5,452 women lost their lives [3]. Early diagnosis and effective treatment are the most important factors that can reduce the morbidity and mortality rates associated with breast cancer [4]. Breast self-examination (BSE) is a useful method for early diagnosing breast cancer as it is a simple, cost-free, and non-invasive method with no side effects that can be applied by an individual without the need for technical equipment [5]. BSE is a useful method to raise awareness of breast cancer signs and symptoms such as breast skin redness, changes in breast or nipple size, lump in the armpit or breast, pain in the armpit or breast, rash in the breast, bleeding or discharge, nipple retraction [6]. The aim of this method is enabling women to become familiar with the appearance and feel of their breasts as early as possible so they can easily determine changes in their breasts [7].

Self-esteem is an important factor that affects BSE behaviors [8]. According to Rosenberg [9], self-esteem is the way individuals evaluate positive or negative attitudes towards their selves and assess their own feelings and thoughts about themselves in general. High self-esteem increases positive health behaviors [8]. Previous studies have shown that women who practice BSE have higher self-esteem than those who do not practice BSE [8, 10, 11].
Although BSE is a useful method in the early detection of breast cancer, women worldwide lack the knowledge and practice of BSE [12–17]. Training programs play a key role in increasing women’s knowledge and practices of BSE, and different training methods such as individual training, brochure training, peer education, video-based training, breast model training, and group training have been used in previous research [12, 18, 19]. Another training method is training individuals in the environment where they live, i.e., family training method. In the literature, there are very few studies using this method.

This study was aimed to evaluate the effectiveness of BSE and self-esteem when applying family training approach.

Materials and Methods

Purpose, Type, Population and Sample of the Study

The research is a quasi-experimental study conducted between December 2019 and May 2020 to determine the effect of BSE training given to mothers and siblings by nursing students on BSE behavior and self-esteem. The study population included: third- and fourth-year female students (studying at the Department of Nursing, Faculty of Health Sciences, Erzincan University, Turkey), these students’ mothers and sisters over the age of 18 years. Inclusion criteria were as follows: the person to be trained had to be over 18 years old; the trainer had to be a sister or a mother to the student, with no history of mastectomy. Females with diagnosed breast pathology and those undergoing any kind of breast-related treatment were excluded. A sample of 126 participants who accepted to participate in the study and met the research criteria were formed.

Data Collection Tools

The data were collected using a Questionnaire Survey, the BSE Skill Survey, and the Rosenberg Self-Esteem Scale (RSES).

Questionnaire Survey

Questions to determine the participants’ socio-demographic characteristics, BSE and breast cancer knowledge were designed by the researchers via scanning the literature. The questionnaire form included a total of 14 questions: 4 questions about the socio-demographic characteristics of women (age, level of income, etc.), 5 questions about BSE and breast cancer (whether they had information about breast cancer, where they got it, whether they had a family history of breast cancer, etc.); 5 questions about BSE practice (whether they practiced BSE, frequency of practice, etc.) [4, 6, 7, 10, 12, 13, 20–22].

BSE Skill Survey

This form included 13 questions related to whether the participants practiced BSE steps in order. The form was scored as (1) point for “Yes” answer and (0) point for “No” answer. The total scale score varied between 0 and 13. Cronbach alpha of the BSE skill form was determined as 0.74. The form was prepared in line with the literature, considering expert opinions in Turkey (one public health specialist and two specialists in the field of women’s health problems) [23, 24].

Rosenberg Self-Esteem Scale

The scale was developed by Rosenberg [9] (to evaluate self-esteem levels of individuals) and adapted into Turkish by Çuhadaroğlu [25]. The scale includes 63 items and 12 sub-tests. These are “self-esteem”, “continuity of self-concept”, “sensitivity to criticism”, “participation in discussions”, “feeling threatened in interpersonal relationships”, “trusting people”, “depressive affect”, “dreaming”, “parental interest”, “relationship with father”, “psychic isolation”, and “psychosomatic symptoms”. In this study, only a 10-item self-esteem sub-test was used. The positively and negatively charged items were listed sequentially. Items 1, 2, 4, 6, 7 were positive, while items 3, 5, 8, 9, 10 were negatively charged. The overall scale score varied between 0 and 6. The total score was evaluated as high (0-1 point), medium (2-4 points) and low (5-6 points) self-esteem. The RSES consists of twelve sub-domains and its first ten items affect self-esteem measures. High scores on the scale indicate low self-esteem, and low scores indicate high self-esteem. Cronbach alpha of the scale was found to be 0.71.

Data Collection Method

The research was completed in three stages.

Stage I: Student Trainer Selection

Third- and fourth-year female students of the Department of Nursing were asked whether they would like to voluntarily become a trainer within the scope of the "Breast Self-Examination Training: A Different Approach to Family Training" research. A total of 79 female students volunteered to participate in the research as trainers.

Stage II: Student Trainer Training

Student trainers were trained with the training-group method. The training involved lectures with presentations and brochures prepared by the researchers, including the frequency of breast cancer in our country, risks factors for breast cancer, early detection methods for breast cancer, breast cancer symptoms, importance of breast cancer awareness and early diagnosis of breast cancer, BSE subject headings [6, 12, 23, 24]. The topics of the training were lectured to students in three sessions to minimize any researcher and student bias. Each session lasted about 30–40 minutes on average. Each female student who attended three training sessions became a student trainer. After receiving BSE training, students practiced under the supervision of trainers. Student trainers were given brochures to be used in trainings and questionnaires for women they would train.

Stage III: Family Member Training by Student Trainers

Each student trainer informed their mothers and sisters about the research before starting their trainings and obtained their verbal and written consent. Each student trainer asked their mothers and sisters to complete pre-training questionnaires individually at home. Afterwards, they gave practical training on the subject in a single session that lasted 30 minutes, asked them to practice on their own
body, and at the end of the training, the brochure describing BSE steps prepared by the relevant researchers was given to each participant. One month after training, student trainers re-administered the questionnaire to their mothers and sisters.

**Data Analysis and Assessment**

IBM SPSS Statistics 22 software package was used for statistical data analysis. The percentage, mean, standard deviation, McNemar’s test, Student’s t-test, and Wilcoxon’s test were used for statistical processing. The p-value of 0.05 was considered statistically significant for all tests. The normality of data distribution was evaluated by the Shao’s method. Accordingly, age, BSE skills before family training, mean RSES score before and one month after family training demonstrated normal distribution, and the skewness and kurtosis values ranged between -3 and +3. One month after family training, the mean scores of BSE skills did not show a normal distribution, and the skewness and kurtosis values showed no distribution between -3 and +3.

**Results**

The descriptive characteristics of study participants are presented in Table 1. The average age of women was 36.43 ± 12.74 years; the proportion of those who were married and those who were married with children was 65.1%; 72.2% of women had equal income and expenses; 75.4% of women were in the pre-menopausal period.

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>82</td>
<td>65.1</td>
</tr>
<tr>
<td>Single</td>
<td>44</td>
<td>34.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income &lt; expenses</td>
<td>24</td>
<td>19.0</td>
</tr>
<tr>
<td>Income = expenses</td>
<td>91</td>
<td>72.2</td>
</tr>
<tr>
<td>Income &gt; expenses</td>
<td>11</td>
<td>8.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Menstrual status</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before menopause</td>
<td>95</td>
<td>75.4</td>
</tr>
<tr>
<td>After menopause</td>
<td>31</td>
<td>24.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher education</td>
<td>126</td>
<td>100</td>
</tr>
</tbody>
</table>

The knowledge levels of women about breast cancer and BSE behaviors are presented in Table 2. Of all the participants, 57.1% received no information about breast cancer before, 62.5% received information from healthcare personnel, 96% did not have first-degree relatives with a history of breast cancer; 52.4% received information about BSE before, 68.2% received information from medical personnel.

Table 3 presents the comparison of the BSE knowledge levels among women before and after family training. Before family training, 37.3% of women performed BSE, whereas month after family training, this rate was found to be 85.7%. Prior to family training, a total of 51.9% of women stated that they did not do BSE regularly because they did not know how to do it, while one month after family training, 55.6% of women stated that they did not do it because they forgot. Before family training, 35.7% of women answered the question “What is the right age for a woman to start BSE?” that they should start BSE after the age of 20, while one month after family training, this rate increased to 90.5%. Before family training, 68.1% of women answered the question “How often should I do BSE?” that they should do it occasionally, whereas one month after family training, 98.1% of them mentioned that it should be done once a month. Before family training, 70.2% of women answered the question “What is the best time to perform BSE?” that they should do it whenever it came to their mind, while one month after family training, 98.1% of women stated that they should do it 5-7 days after menstrual bleeding.

The mean scores for BSE skills and RSES are given in Table 4. The Wilcoxon’s test was applied to compare the mean score for BSE skills among women participating in the study before and one month after family training. According to the test results, there was a statistically significant difference between the mean scores of women before and after family training (p < 0.05). A paired t-test was applied to compare the mean RSES scores of women before and one month after family training. According to the test results, the mean RSES scores of women increased significantly from 0.93 ± 0.56 to 1.04 ± 0.37.

Table 5 presents the comparisons of women’s skills related to BSE steps before and one month after family training. There was found a statistically significant difference between their skills related to BSE steps before and one month after family training (p < 0.01). According to the results, women’s skills related to BSE steps improved.
Table 3. Knowledge level regarding breast self-examination among women before and one month after family training.

<table>
<thead>
<tr>
<th>Level of BSE knowledge</th>
<th>BSE performing</th>
<th>Reason for not performing BSE</th>
<th>What is the right age for a woman to start BSE?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>before training</td>
<td>after training</td>
<td>Number</td>
</tr>
<tr>
<td>BSE performing</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Reason for not performing BSE</td>
<td></td>
<td></td>
<td>I don’t know how to do it</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I am afraid that something bad will happen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I didn’t think I should do it</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I forgot</td>
</tr>
<tr>
<td>What is the best time to perform BSE?</td>
<td></td>
<td></td>
<td>Whenever it comes to my mind</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Before menstrual bleeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>During menstrual bleeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A certain day of every month</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Five-seven days after menstrual bleeding</td>
</tr>
</tbody>
</table>

Table 4. Knowledge level regarding breast self-examination among women before and one month after family training.

<table>
<thead>
<tr>
<th>BSE Skills</th>
<th>Before family training</th>
<th>After family training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median(Min-Max)</td>
<td>4 (0-13)</td>
<td>13 (0-13)</td>
</tr>
<tr>
<td>p</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>RSES</td>
<td>Mean±SD</td>
<td>p</td>
</tr>
<tr>
<td>Before family training</td>
<td>0.93±0.56</td>
<td>0.033</td>
</tr>
<tr>
<td>After family training</td>
<td>1.04±0.37</td>
<td>0.033</td>
</tr>
</tbody>
</table>

Discussion

In this study, the effect of BSE training given by female nursing students to their mothers and sisters on BSE behavior and self-esteem was discussed, and the data obtained were discussed in line with the literature.

The study found that 57.1% of women received information on breast cancer before (Table 2). The rate of women getting information related to breast cancer was found to be 39.9% in a study carried out by Yurt et al. [12], 71.2% in a study conducted by Oliveira et al. [26], and 44% in a study carried out by Al-Sabah et al. [19] Although early screening and diagnosis were very important, women’s knowledge of breast cancer was not at the desired level; hence, women’s knowledge and awareness of breast cancer should be increased. Raising breast cancer awareness among women is thought to positively affect BSE practices.

When evaluating women’s sources of information about breast cancer, it was seen that 62.5% of them received information from healthcare personnel (Table 2). The rate of women getting information from medical personnel was found to be 10.9% in a study carried out by Yurt et al. [12] and 30.6% in a study conducted by Esfahani et al. [27]. Yurt et al. [12] stated that among the sources from which women received the most information about breast cancer, there were the Internet, the media and family, and then medical personnel; in a study by Esfahani et al. [27], as in our research, health personnel came first as a source of information about breast cancer. These results proved that medical personnel were important sources of information about breast cancer.

Of all the participants, 96% had no first-degree relatives with breast cancer (Table 2). The rate of women having no first-degree relatives with breast cancer was 90.2% in a study carried out by Yurt et al. [12], 91.7% in a study conducted by Avci [4], 89.3% in a study carried out by Dewi et al. [29], and 89.9% in a study conducted by Getu et al. [20] The study findings were similar to the literature.

The study found that 52.4% of women received information about BSE behavior before (Table 2). A study carried out in Turkey found that 39.2% of women received BSE information before [12]. Another study carried out with teachers abroad found that 38.5% of them received BSE information before [13]. According to Joyce et al. [15], 58.6% of women had BSE knowledge. It could be mentioned that the rates of BSE knowledge and practice in this study and other studies were low. Despite the benefits of BSE, many women did not practice BSE because of their low level of knowledge of BSE practice.

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Table 5. Breast self-examination skills of women before and one month after family training.

<table>
<thead>
<tr>
<th>BSE Behavior Skill Form</th>
<th>Level of BSE knowledge before training</th>
<th>Level of BSE knowledge after training</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge n</td>
<td>No Knowledge n</td>
<td>Knowledge n</td>
</tr>
<tr>
<td>Standing in front of a mirror that points above the waist.</td>
<td>59</td>
<td>46.8</td>
<td>67</td>
</tr>
<tr>
<td>The breasts are observed from the mirror in terms of shape, size, and appearance, with arms on both sides, arms on waist, raising both arms above the head.</td>
<td>42</td>
<td>33.3</td>
<td>84</td>
</tr>
<tr>
<td>Hands are tightly pressed on the hips, shoulders and elbows are pulled forward, leaning slightly towards the mirror and the breasts are observed in terms of shape, size and appearance.</td>
<td>25</td>
<td>19.8</td>
<td>101</td>
</tr>
<tr>
<td>The nipple is visually checked in terms of abnormality, or any discharge by its gently squeezing by hand.</td>
<td>74</td>
<td>58.7</td>
<td>52</td>
</tr>
<tr>
<td>In palpation, the examination is made with the flat portions of the 2nd, 3rd and 4th fingertips of the hand. During the examination, the fingers should be kept together.</td>
<td>53</td>
<td>42.1</td>
<td>73</td>
</tr>
<tr>
<td>The area to be examined is the lower bra line, the collarbone, the middle of the rib cage and the border running along the middle of the armpit.</td>
<td>43</td>
<td>34.1</td>
<td>83</td>
</tr>
<tr>
<td>The examination is done carefully and slowly around the entire breast with circular, vertical and pinching motions.</td>
<td>53</td>
<td>42.1</td>
<td>73</td>
</tr>
<tr>
<td>During the examination, all the breast tissues are tried to be felt gradually by applying light, then medium and then firm pressure. Each breast is examined for at least 5 minutes.</td>
<td>36</td>
<td>28.6</td>
<td>90</td>
</tr>
<tr>
<td>Manual examination is done both in the upright or lying down position.</td>
<td>26</td>
<td>20.6</td>
<td>100</td>
</tr>
<tr>
<td>While standing in the shower, the right breast is examined with the left hand and the left breast with the right hand.</td>
<td>62</td>
<td>49.2</td>
<td>64</td>
</tr>
<tr>
<td>In the shower, the arm on the side of the breast to be examined is placed up or behind the head.</td>
<td>51</td>
<td>40.5</td>
<td>75</td>
</tr>
<tr>
<td>While lying down, a small pillow or folded towel is placed under the shoulder on the breast side to be examined.</td>
<td>23</td>
<td>18.3</td>
<td>103</td>
</tr>
<tr>
<td>Examination is performed by palpation of the axillary area in the standing or lying position.</td>
<td>50</td>
<td>39.7</td>
<td>76</td>
</tr>
</tbody>
</table>

Note: * - Mc Nemar Test.

When evaluating the right age for a woman to start BSE, the time and frequency of its practicing before family training, it was found that of all the participants, 62.7% did not do it, 51.9% did not do BSE because they did not know how to do it, 68.1% did BSE occasionally and 70.2% did BSE whenever they thought of it. The results of our study showed that the participants’ levels of BSE knowledge were weak (Table 2). Other studies found that women’s marital status and self-confidence [32], a history of breast cancer in their relatives [34], age and self-efficacy [35, 36], knowledge and attitudes towards BSE [37], BSE knowledge and peer exposure [38], physical activity [33], low spouses’ knowledge scores, spouses’ use of mammograms and BSE [39] had the effect on BSE knowledge. As BSE behaviors of study participants were insufficient, it could be considered that their knowledge level of BSE was weak, the majority of them were married, there was no history of breast cancer in their first-degree relatives, the printed materials and mass media were not used effectively or were insufficient in raising BSE awareness and maintaining BSE behavior.

When evaluating the knowledge (age of starting BSE, the time and frequency of BSE) and applying BSE one month after training, a significant increase in its knowledge and practices were observed (Table 3). A study in Turkey found an increase in BSE knowledge among midwifery students during training provided for these students [22]. Similarly, Yurt et al. [12], found that peer education of university students proved a significant increase in the level of students’ knowledge about BSE and breast cancer. A study
carried out by Alsaraireh et al. [19] specified that women’s knowledge of breast cancer and BSE increased significantly due to training. Another study in Nigeria found that adolescents’ knowledge of BSE improved significantly when they were taught the knowledge, attitudes, towards, and practices of BSE [40]. The study findings were similar to the literature.

When evaluating the mean scores for BSE skills among women one month after family training, a significant increase in BSE skills was observed (Table 4). According to Tuzcu et al. [14], the rate of BSE skills among women in the study group was significantly higher than that in the control group. According to Yurt et al. [12], there was a significant increase in BSE practices of students who were trained with peer education method. A study carried out in Nigeria found a significant increase in BSE behavior during training given to women in the intervention group [40]. Similarly, Alsaraireh et al. [19] stated that there was a significant increase in BSE practices after trainings given to women. In this study, the scores of BSE skills among women before training were quite low; however, the increased sense of belief and motivation after family training raised the practice rates in the short term. For this reason, women should be encouraged to regularly perform BSE on a long-term basis, increasing the number of training programs.

A significant increase was found when comparing the mean scores of women’s self-esteem before and one month after family training (Table 4). Similarly, a study carried out in Turkey found a significant increase in women’s self-esteem before and after BSE training [41]. According to Wojtyna et al. [8], cognitive therapy training given to women diagnosed with breast cancer provided a significant increase in women’s self-esteem. Self-esteem was an important part of personality, it was a subjective phenomenon that resulted from individual’s self-assessment and self-satisfaction, and it shaped individual’s behaviors affecting all aspects of their life. In accordance with this definition, the individuals who loved and were satisfied with their bodies were considered to shape their behaviors accordingly and follow healthy life behaviors.

The study found a significant increase in women’s skills related to BSE practicing steps after family training. Yurt et al. [12] found a significant increase in BSE performances of women due to peer education. Similarly, Beydağ et al. [22] observed a significant increase in the knowledge, attitudes towards, and practices of BSE among female students after training program. Another study carried out in Iran found that integrated model-based training program given to women increased their BSE performance [5]. According to Alsaraireh et al. [19], breast cancer awareness program had a positive effect on the knowledge, attitudes towards, and practices of BSE. These results emphasized that healthcare training programs were an important factor in increasing the level of BSE knowledge among individuals, as well as in improving their attitudes towards BSE, motivation, and BSE skills.

Limitations of the Study
This study is limited to its participants, since only the mothers and sisters of the students enrolled in the Faculty of Health Sciences were included. The study was limited to structures in the form of data source information questioning the socio-demographic characteristics, breast cancer and BSE information. The levels of women’s self-esteem were limited to structures in the RSES. In addition, mothers’ and sisters’ education levels were not included in inclusion or exclusion criteria. Even though there was no pressure to report an increase in BSE performance, the participants could be biased, knowing that the expected action took place after training.

Conclusions
Previous studies assessed the effectiveness of different training programs such as individual training, group training, video-based training, brochures, and peer education to evaluate the effect of the training program on BSE knowledge and practice. This research used a different method called family training. With this method, female students applied BSE training to their mothers and sisters over 18 years old. The choice of the environment where study participants lived together with their siblings or daughters when practicing family training method encouraged them to display BSE behavior and helped women gain positive health behavior feeling responsible towards their siblings or daughters. In the short term, BSE training program conducted by female nursing students to their mothers and sisters resulted in a significant increase in the women’s BSE knowledge and skills regarding BSE application steps.

Ethical Statement & Informed Consent
The institutional Human Research Ethics Committee approved the study prior to its starting (Letter No. 02/02 dated December 03, 2019). In addition, the permission from the institution where the study would be conducted (Letter No. 11327278-804.01-E.59006 dated December 10, 2019) was obtained. The women participating in the research were informed that they were free to participate in the research after explaining the purpose of the research and what they should do. In addition, they were assured that their personal information would not be disclosed to others or used anywhere else, and they had right to leave the study at any time they wanted. Written and verbal consent was obtained from participants before starting the study.

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Conflict of Interest
The authors declare that no conflicts exist.
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