



The Effect of an Educational Intervention Based on an Integrated Social Cognition Model on Waste Recycling at the Source Among Housewives in Lahijan City: A Quasi-Experimental Study

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Abstract

Background: Recycling is proposed as an economic model for saving raw material and energy costs, pollution reduction, reducing waste, resource depletion, and situation improvement in a range of environmental pollution issues.

Objectives: The present study aimed to investigate the effect of educational interventions based on an integrated social cognition model (ISCM) on waste recycling at the source among housewives in Lahijan City, Iran.

Methods: In this quasi-experimental study, a total of 144 women who sought health care services in Lahijan were selected using a multistage random sampling method. The participants were then evenly divided into intervention and control groups, with each group consisting of 72 women. The study was conducted between 2021 and 2022. Data collection tools included demographic information questionnaires, awareness questions, and ISCM constructs about waste recycling at the source. The total mean scores for the content validity ratio (CVR; 0.84) and content validity index (CVI; 0.83), Cronbach's alpha coefficient (0.85), and internal consistency (0.84) were measured to evaluate the validity and reliability of the questionnaire. Educational content based on ISCM constructs was prepared and carried out in the intervention group in six 60-90-minute sessions virtually via mobile phone using WhatsApp messenger over 6 consecutive weeks. The data were collected before and 1 month after the educational intervention and analyzed using descriptive statistics, Chi-square, independent t-test, paired t-test, and analysis of covariance (ANCOVA) using SPSS version 25.

Results: The mean age of the participants was 38.9 ± 12.1 years. Before the study, the 2 groups had no statistically significant difference regarding all demographic variables, awareness, and ISCM constructs ($P > 0.05$). The 2 groups showed a statistically significant difference in the mean scores of awareness, attitude, subjective norms, perceived behavioral control, self-efficacy, behavioral intention, and action and coping planning after the intervention ($P < 0.001$). The mean \pm SD of the behavior score increased from 17.25 ± 4.96 before the intervention to 25.78 ± 4.95 after the intervention ($P < 0.001$).

Conclusions: The design and implementation of educational interventions based on ISCM have the potential to enhance housewives' performance in waste management and recycling while also increasing their awareness levels.

Keywords: Integrated Social Cognition Model, Waste Management, Women, Education, Self-Efficacy

1. Background

The mass production of waste is a global urban problem, primarily due to the rapid expansion of urban societies, particularly in metropolises, and the lack of comprehensive waste disposal policies (1). European countries have an average per capita waste production of 200 to 350 g per day, while Iranians produce a staggering

40 thousand tons of waste per day and 16 million tons per year, double the global standard (1). In Gilan Province alone, daily waste production amounts to 2 000 to 2 200 tons. Rasht City, upon examination, revealed a per capita daily waste production of approximately 931 g (2). Solid waste management has become a significant challenge in cities worldwide, particularly in developing countries (3).

According to the report by the world health organization (WHO), solid waste management encompasses the entire process from waste generation to collection, transportation, treatment, and disposal. The challenges associated with solid waste management include issues such as inadequate waste collection systems and improper waste disposal practices (4). Waste separation is one of the vital components of an integrated waste management system (5). Recycling is proposed as an economic model that offers several benefits, including the conservation of raw materials and energy, reduction of pollution, waste reduction, mitigation of resource depletion, and overall improvement in various environmental pollution issues (6). The spread of urban waste in water, soil, and air causes diseases, such as hydatid cysts, cholera, skin diseases (like leishmaniosis), and certain cancers (7). Most countries involve citizens in waste management by encouraging waste reduction and source separation as efficient and cost-effective practices (8-10). Previous studies indicate that several factors such as attitude, cost of recycling, knowledge of recycling, social norms, subjective norms, access, and financial incentives may be effective in separating recycling from the source; in addition, studies have indicated that educating citizens about environmental issues increases awareness, positive attitudes, and active participation in waste separation and overall waste management (7, 11-14). Moreover, the efficacy of health education programs heavily relies on the correct application of theories and models in education (15). The integrated social cognition model (ISCM) serves as a behavior analysis theory for health promotion interventions, incorporating elements, such as attitude, subjective norm, perceived behavioral control, self-efficacy, behavioral intention, action planning, and behavior constructs. This model combines 2 existing models, namely, the theory of planned behavior (TPB) (16, 17) and health action process approach (HAPA) (18). These ISCMs are frequently referred to as hybrid models because they combine elements and relationships from multiple existing theories to develop a new theory or a more comprehensive model. These models place particular emphasis on the influence of motivational and voluntary factors in driving desired behaviors (19).

2. Objectives

Considering the significant role of urban households in waste recycling and separation, as well as the limited research on educational interventions for waste recycling and separation among housewives in Lahijan, the current study aimed to investigate the impact of an educational intervention based on ISCM on waste.

3. Methods

3.1. Research Type and Sample Selection Process

In this quasi-experimental study, 144 housewives from Lahijan City were selected using multistage random sampling from January 2021 to September 2022. In this way, 4 of the 6 health centers in Lahijan were randomly selected. Then, after explaining the objectives of the research to the person in charge of each center, a list of all women was prepared according to the study entry criteria. In the next step, 2 centers were allocated to the intervention group and 2 centers to the control group; then, 36 women were selected from each center using the random number table. Finally, 72 women were in the control group, and 72 women were in the intervention group. Once the centers were selected, the researchers visited them to identify and contact eligible women. During phone calls, the researchers explained the research goals to the participants and administered the questionnaires before the intervention using WhatsApp if the participants consented. This approach was adopted due to the limitations imposed by COVID-19. Inclusion criteria include informed consent to participate in the study, ability to read and write, residency in Lahijan, ownership of a mobile phone, and installation of WhatsApp on their phones. Exclusion criteria consisted of non-consent to continue with the study, missing more than 1 session of the educational program, and the presence of physical diseases or mental disorders that could hinder accurate responses to the questions. The sample size of 72 per group was determined based on a previous study conducted by Hosseini et al. (11), considering a confidence limit of 95%, a test power of 80%, and a loss rate of 25%. The standard deviation (SD) formula for 2 independent populations was used for this calculation.

3.2. Data Collection Method

The data collection tool in this study was a researcher-made questionnaire, including (a) demographic characteristics with 8 questions (age, marital status, education level, spouse's education level, economic status, spouse's job, and home ownership status), (b) an awareness assessment questionnaire consisting of 9 questions, and (c) questions related to the constructs of the ISCM, comprising 47 questions (Table 1).

3.3. Validity and Reliability of the Tool

The content validity of the tools was evaluated by measuring the content validity index (CVI) and content validity ratio (CVR) based on the opinions of 10 experts

Table 1. Characteristics of Measurement Scales of the ISCM Constructs

Construct	Number of Items, Scoring (Range)	Sample of Items	Validity		Reliability	
Awareness: Learning facts and gaining insight about actions, people, or situations	9 items, False = 0, True = 1, (0 - 11)	Hospital and medical waste must be collected together with other waste.	0.81	0.84	-	0.84
Attitude: Individuals' belief about favorable or unfavorable consequences of a behavior	8 items, from 1 completely disagree to 5 completely agree (8 - 40)	My culture and personality make me feel good after wasting separation at home.	0.79	0.85	0.74	0.82
Subjective Norms: Individuals' belief that significant others support the behavior	4 items, from 1 completely disagree to 5 completely agree (4 - 20)	People who are important to me (like my family, friends, and others) ask me to separate waste at home.	0.94	0.95	0.93	0.85
Perceived Behavioral control: A person's belief about the extent to which people feel that performing or not performing a behavior is under their control	6 items, from 1 completely disagree to 5 completely agree (6 - 30)	Waste separation at home is entirely under my control.	0.78	0.80	0.81	0.78
Self-Efficacy: Individuals' confidence in their ability to adopt and pursue a behavior	6 items, from 1 completely disagree to 5 completely agree (6 - 30)	I know how to separate different wastes such as paper, plastic, metal, and glass.	0.82	0.85	0.87	0.83
Action Planning: A facilitative self-regulatory strategy facilitates the performance of a desired behavior by prospectively planning how, where, and when to perform the behavior	5 items, from 1 completely disagree to 5 completely agree (5 - 25)	I have planned the time and place of waste separation at home.	0.80	0.77	0.86	0.87
Coping Planning: It refers to the making of specific plans to overcome anticipated barriers that may hinder individuals from enacting their intentions	5 items, from 1 completely disagree to 5 completely agree (5 - 25)	If I'm busy, I have a specific plan for separating and recycling waste.	0.81	0.83	0.87	0.83
Intention: It indicates how strongly people want to perform and strive for the behavior	3 items, from 1 completely disagree to 5 completely agree (3 - 15)	I will separate all types of waste at home in the next month.	0.96	0.94	0.96	0.92
Behavior: In this study, it refers to individuals' participation in urban waste management and recycling due to intention or perceived behavioral control	7 items, from 1 completely disagree to 5 completely agree (7 - 35)	How much paper and cardboard waste have you separated and recycled in the past month, such as magazines, cardboard, and newspapers?	0.79	0.77	0.79	0.84

(health education, health promotion, and environmental health). The total mean score for CVI was 0.83, and the total mean for CVR was 0.84. This study assessed the ISCM's reliability using internal consistency and stability. The internal consistency of the tool and its subscales were calculated using Cronbach's alpha coefficient based on a sample of 20 individuals not part of the primary research sample. Cronbach's alpha coefficients for the domains ranged from 0.74 to 0.96. Additionally, the test-retest method was used to assess the tool's stability. A sample of 20 individuals completed the tool again after 2 weeks, and the correlation coefficient between the scores of the 2 tests was calculated. The correlation coefficient for the tool areas ranged from 0.82 to 0.92 (Table 1).

3.4. Intervention Program

After conducting a pretest to assess educational needs, an educational program was developed based on the ISCM framework. The program was implemented in the intervention group through six 60- to 90-minute

sessions over 6 consecutive weeks. The delivery of educational content was facilitated using mobile phones and WhatsApp. The educational material was presented in various formats, including 3- to 5-minute educational video clips, PowerPoint presentations, pamphlets, and booklets. To ensure maximum participation in the virtual education sessions, the researcher conducted a survey and collaborated with the participants to determine the most convenient time for holding the sessions and using incentives (free internet) to increase participation. Additionally, a reminder message was sent to individuals in the intervention group a day before each session, emphasizing the start time of the classes and encouraging their continued participation. Furthermore, 2 educational messages summarizing the content of each session were sent to all participants in the intervention group daily.

3.5. The Structure and Strategies of Each Session

First session: Increasing awareness about urban waste management and recycling (including definitions,

familiarization with different materials, and their impact on health and the environment).

Second session: Attitude (identifying negative and positive beliefs associated with urban waste management and recycling).

Third session: Subjective norms and perceived behavioral control (the role and influence of important others in the creation and continuation of behavior (family influences, friends), identifying mental and physical barriers that hinder the adoption of waste management behaviors).

Fourth session: Self-efficacy (enhancing personal abilities in waste management, such as the use of persuasion and encouragement and providing a role model, providing feedback, and strengthening individual motivations during the program).

Fifth session: action planning (identifying the appropriate time, place, and methods for implementing municipal waste management and recycling behaviors, providing an operational plan on how to recycle waste from the source and personalizing it)

Sixth session: Coping planning (identifying facilitators of waste management behaviors, expressing problems, exploring potential solutions, identifying obstacles, and providing solutions, such as introducing Behrob software and how to sell dry waste at home).

Also, telephone calls and WhatsApp were used to motivate and support the implementation of individualized action planning and any doubts or questions raised by participants. One month after the completion of the educational intervention, participants in both the intervention and control groups were asked to complete the questionnaires once again. At the end of the study, participants in the control group participated in a 2-session training program virtually via the WhatsApp application.

3.6. Data Analysis

The collected data were subjected to various statistical analyses using SPSS version 25 (SPSS Inc, Chicago, IL, USA). These included the Kolmogorov-Smirnov test to assess the normality of data distribution, chi-square test to examine relationships between qualitative variables, paired *t*-test to compare the mean differences of quantitative variables within a group before and after the educational intervention, and independent *t*-test to compare the mean differences of quantitative variables between 2 independent groups. The significance level for this study was set at $P < 0.05$.

3.7. Ethical Considerations

The present manuscript is derived from a project approved by the Ethics Committee of Qazvin University of Medical Sciences (code: [IR.QUMS.REC.1400.390](#)). Participants were provided with information about confidentiality and the purpose of the project, and they were included in the study after signing informed consent forms.

4. Results

The 2 groups exhibited homogeneity regarding all demographic variables, and no differences were observed. The mean age of the intervention group was 38.25 ± 12.08 years, while the mean age of the control group was 39.46 ± 11.61 years ($P = 0.542$). [Table 2](#) presents information about the demographic variables of both groups ([Table 2](#)).

No significant differences were found in the mean scores of awareness and each construct of the ISCM between the 2 groups prior to the educational intervention ($P > 0.05$). However, after the educational intervention, a statistically significant difference was observed between the intervention and control groups in terms of awareness and all constructs of ISCM ([Table 3](#)).

The results of the analysis of covariance (ANCOVA) are presented in [Table 4](#). According to these results, the eta-squared values also indicated that the highest and lowest percentages of variance resulting from the ISCM-based educational intervention were related to attitudes toward behavior and behavioral intention, respectively.

5. Discussion

In the present research, an educational program based on ISCM constructs was found to increase the behavior of recycling waste at the source among homemakers in Lahijan compared to the control group. Regarding awareness, the mean scores in both groups before the intervention indicated low awareness, and the educational program significantly increased the mean score of awareness in the intervention group. This finding is consistent with previous studies ([20](#)). The results highlight the importance of awareness as an essential component of behavioral change, emphasizing the need to provide sufficient information about health behavior to facilitate behavior change interventions ([21](#)). Environmental awareness and knowledge can positively influence environmental behavior and attitudes ([19](#)). Given this issue and recognizing that the success of any waste management plan relies on citizens' commitment

Table 2. Comparison of Demographic Characteristics of Women Participating in the Study in the Intervention and Control Groups Before the Intervention (n = 144)^a

Variables	Intervention Group	Control Group	X ² (df); P-Value
Age, year			4.072 (3); 0.254
18 - 25	12 (16.7)	19 (26.4)	
26 - 35	10 (13.9)	11 (15.3)	
36 - 45	32 (45.8)	22 (30.6)	
46 - 60	17 (23.6)	20 (27.8)	
Marital status			4.268 (3); 0.234
Married	68 (94.4)	65 (90.3)	
Single	4 (5.6)	7 (9.7)	
Education level			5.628 (3); 0.131
Primary school	10 (13.9)	5 (6.9)	
Middle school	12 (16.7)	8 (11.1)	
High school	36 (50.0)	34 (47.2)	
University	14 (19.4)	25 (34.7)	
Spouse's education level			1.3019 (3); 0.729
Primary school	6 (8.3)	5 (6.9)	
Middle school	12 (16.7)	8 (11.1)	
High school	28 (38.9)	33 (45.8)	
University	26 (36.1)	26 (36.1)	
Spouse's job			3.269 (3); 0.352
Unemployed	5 (6.9)	2 (2.8)	
Official	14 (19.4)	20 (27.8)	
Self-employment	51 (70.8)	46 (63.9)	
Retired	2 (2.8)	4 (5.6)	
Economic status			4.548 (3); 0.208
Weak	4 (5.6)	7 (9.7)	
Medium	46 (63.9)	36 (50.0)	
Good	22 (30.6)	27 (37.5)	
Excellent	0 (0)	2 (2.8)	
Home ownership status			4.150 (3); 0.246
Personal	53 (73.6)	51 (70.8)	
Rental	19 (26.4)	17 (23.6)	
Organizational	0 (0)	2 (2.8)	
Others	0 (0)	2 (2.8)	

^a Values are expressed as No. (%).

and participation, raising public awareness and providing relatively specialized knowledge about economic, social, health, and environmental consequences, as well as promoting sustainable consumption and behavior (such as waste reduction, reuse, and recycling at home), are sustainable solutions that ensure citizen participation in this field. Consequently, supporting and providing

collection machines by the municipality is a profitable investment for society. Since the educational intervention in this research was based on the ISCM model, relevant constructs were investigated. Accordingly, attitude before and 1 month after the educational intervention showed a statistically significant difference between the intervention and control groups compared to the time

Table 3. Comparison of Mean Score of ISCM Constructs in Intervention and Control Groups Before and After Training^a

Variable and Evaluation Time	Intervention Group	Control Group	P-Value
Attitude			
Before intervention	21.57 ± 1.96	21.17 ± 2.23	0.251
After intervention	21.58 ± 1.61	21.42 ± 2.17	< 0.001
P-value	< 0.001	P= 0.063	
Subjective norms			
Before intervention	10.25 ± 3.13	10.69 ± 2.94	0.382
After intervention	17.21 ± 2.78	11.03 ± 2.41	< 0.001
P-value	< 0.001	0.131	
Perceived behavioral control			
Before intervention	17.32 ± 3.38	16.64 ± 3.78	0.257
After intervention	23.11 ± 2.54	17.04 ± 3.42	< 0.001
P-value	< 0.001	0.116	
Self-efficacy			
Before intervention	17.75 ± 3.59	17.36 ± 3.73	0.525
After intervention	16.42 ± 3.01	17.57 ± 3.30	< 0.001
P-value	< 0.001	0.262	
Action planning			
Before intervention	12.45 ± 2.67	13.06 ± 2.32	0.344
After intervention	16.42 ± 3.78	12.11 ± 3.11	< 0.001
P-value	< 0.001	0.251	
Coping planning			
Before intervention	15.64 ± 4.48	15.26 ± 3.86	0.591
After intervention	19.71 ± 3.57	15.53 ± 3.41	< 0.001
P-value	< 0.001	0.169	
Intention			
Before intervention	8.25 ± 1.93	7.75 ± 1.61	0.092
After intervention	11.88 ± 2.21	7.96 ± 1.42	< 0.001
P-value	< 0.001	0.066	
Behavior			
Before intervention	17.25 ± 4.96	18.32 ± 4.83	= 0.192
After intervention	25.78 ± 4.95	18.56 ± 4.36	< 0.001
P-value	< 0.001	0.123	

^a Values are expressed as mean ± SD.

before the intervention. This finding is consistent with similar studies (11, 22). Raimondo et al. demonstrated that attitudes affected the intention of consumers to decrease the use of plastic drinking bottles (23). The change in attitude after increasing awareness is a natural outcome of educational interventions. Positive attitudes toward the results of a behavior lead to the intention to adopt that behavior (24, 25). The investigation into the effects

of education on ISCM constructs revealed that the mean scores of subjective norms in the intervention group increased after the intervention. Studies by Wang et al. and Rosenthal found that increased subjective norms were associated with increased behavioral intention and recycling behavior (22, 26). In general, the reduction in women's performance can be attributed to the lack of space in the home environment and the lack of

Table 4. The ANCOVA Results of the Educational Intervention Effect on the Average Score of ISCM Variables in the 2 Groups in the Posttest Stage

Variable and Source Index of Changes	Sum of Squares	df	Mean SQUARE	Coefficient F	P-Value	Eta Coefficient (Effect Size)
Attitude						
Pre-test	339.414	1	336.414	269.489	0.000	0.657
Group	424.036	1	424.036	424.036	< 0.001	0.750
Total	80666.000	141	-	-	-	-
Subjective norms						
Pre-test	291.739	1	291.739	62.130	0.000	0.306
Group	1462.069	1	1462.069	311.370	< 0.001	0.688
Total	31031.000	141	-	-	-	-
Perceived behavioral control						
Pre-test	780.868	1	780.868	217.114	0.000	0.606
Group	1128.421	1	1128.421	313.748	< 0.001	0.690
Total	60655.000	141	-	-	-	-
Self-efficacy						
Pre-test	1056.281	1	1056.281	414.433	0.000	0.746
Group	829.688	1	829.688	325.529	< 0.001	0.698
Total	60633.000	141	-	-	-	-
Intention						
Pre-test	165.646	1	165.646	73.192	0.000	0.342
Group	460.266	1	460.266	203.374	< 0.001	0.591
Total	15198.000	141	-	-	-	-
Action planning						
Pre-test	1290.479	1	1290.479	1003.402	0.000	0.877
Group	742.081	1	742.081	579.999	< 0.001	0.804
Total	31413.000	141	-	-	-	-
Coping planning						
Pre-test	1242.611	1	1242.611	358.880	0.000	0.718
Group	550.728	1	550.728	159.056	< 0.001	0.530
Total	47057.000	141	-	-	-	-
Behavior						
Pre-test	2284.406	1	2284.406	402.719	0.000	0.741
Group	2332.817	1	2332.817	411.254	< 0.001	0.745
Total	75718.000	141	-	-	-	-

cooperation of other family members in the home. Perceived behavioral control before and 1 month after training in the intervention group showed a significant difference compared to the control group. Perceived behavioral control moderates the relationship between intention and behavior (26, 27). Other studies, such as those of Shen et al. (28) and Khani et al. (29), were consistent with ours, showing an increase in perceived behavioral control after the intervention. Also, Pakpour

et al. reported that participants scored high for perceived behavioral control, indicating that recycling was generally not perceived to be a difficult or inconvenient task (30). In this study, online education significantly increased the mean scores of self-efficacy in the intervention group. Several studies (31-33) have reported findings consistent with these results. Lauren et al., in their exploration of the correlation between self-efficacy and pro-environmental behaviors among Australian

residents, concluded that self-efficacy plays a crucial role in driving environmental behaviors and encouraging participation in challenging pro-environmental behaviors (34). Therefore, individuals with higher self-efficacy are more likely to translate their intention into action (22, 24) and more likely to be sustained behavioral intention aids individuals in specifically planning their desired behavior (26). Action planning before and 1 month after training in the intervention group showed a significant difference compared to the control group. As a facilitative self-regulation strategy, action planning makes it easier for individuals to perform the desired behavior by prospectively planning the manner, location, and time (35, 36). Although action planning can effectively initiate behavior, it may not be sufficient for behavior maintenance. Thus, individuals at this stage require strategies to safeguard against unexpected obstacles or competing behavioral tendencies (e.g., habit) (37). Therefore, according to the existence of basic conditions in people (awareness and attitude level), which is usually increased through education, it is crucial to devise strategies that motivate people's behavior as well. Creation of incentive programs, including the creation of waste recycling stations, which in exchange for the delivery of recycled materials, people receive items such as: money, health products, detergents, etc., can be paid more attention.

Coping self-efficacy before and 1 month after training in the intervention group showed a significant difference compared to the control group. In fact, self-efficacy is essential in both stages of intention formation and behavior change. The results of Moghimi et al. (38) and Ranjbaran et al. (39) showed that coping self-efficacy after the intervention, having been consistent with our results. However, the results of 1 study (40) are not consistent with those of the present study. This difference in the results could be due to the difference in the target group of the study and type of behavior. This significant difference could be attributed to proper training, motivational text messages, and identifying facilitators of waste management behaviors, such as introducing Behrob software and how to sell dry waste at home). The research results indicate that implementing 6 online education sessions based on ISCM significantly increased the mean score of behavioral intention and recycling behavior at the source in the intervention group. Babazadeh et al. (5) in Iran and Zhang et al. (19) in China showed that behavioral intention plays a crucial role in predicting waste separation behavior. These findings showed that increased intention of waste separation behavior can significantly improve the behavior. Liu et al. also conducted an educational intervention based on

planned recycling behavior among the citizens of New York State, and their mean scores of recycling behavior significantly increased after the educational intervention (41). In Iran, recycling is mandated under the waste management law, stating that the government has the responsibility to protect the environment from the harmful effects of waste. This includes setting standards and adopting policies for recycling and reduction of waste, the production and consumption of goods that are more easily recyclable, and increasing the use of recyclable raw materials in production (29). Therefore, Iran has a framework in place for encouraging household waste reduction behaviors, including a requirement for education. However, implementation of these efforts will not be successful if public participation is low.

5.1. Conclusions

The design and implementation of an educational intervention based on ISCM could enhance the levels of awareness and performance among housewives regarding waste management and recycling at the source. Therefore, it is suggested that educational programs be developed based on the ISCM to increase waste recycling from the source. The results of this research can be used to change the usual methods of training women or to change the training mission of health care workers.

5.2. Strengths and Limitations

The strengths of this study were the virtual training on the WhatsApp platform to implement the training program for housewives and the use of an integrated model (ISCM) in the intervention program. The limitations of the present study are as follows: (1) the short-term follow-up of individuals. It is suggested that follow-up assessments be conducted over an extended period of time to examine the continuity and permanence of the behavior; (2) The coincidence of the study with the outbreak of COVID-19 and the impossibility of conducting face-to-face intervention sessions; (3) Some participants in the intervention group showed less enthusiasm to engage in source recycling, which can be attributed to the infrequent visits of dry waste collection machines.

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Footnotes

Authors' Contribution: All authors contributed to this work and commented on the manuscript at all stages, and the last version was approved for publication.

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Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

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