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Participation in Plogging as an Eco-Friendly Physical Activity: The Partial Role of Environmental Awareness and Social Responsibility

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Abstract

Background: Given the global importance of addressing sedentary lifestyles and environmental challenges, this study aimed to explore the role of environmental awareness in encouraging participation in plogging—an eco-friendly physical activity—while examining the mediating influence of social responsibility.

Methods: The research was both descriptive and correlational. The research sample consisted of 290 active ploggers selected through purposive sampling. Data were collected using a validated and reliable questionnaire in November and December 2024. The conceptual framework centered on three key constructs: environmental awareness, participation in plogging, and social responsibility. To assess the model's validity and test the hypotheses, structural equation modeling (SEM) was employed using AMOS 22.

Results: Environmental awareness had a significant positive effect on both plogging participation and social responsibility. Additionally, social responsibility positively influenced plogging participation. The findings also indicated that environmental awareness indirectly affects plogging participation by influencing social responsibility.

Conclusion: Overall, the study suggests that increasing awareness of environmental issues and fostering a sense of social responsibility can significantly enhance engagement in plogging as an eco-friendly form of physical activity. These insights could be valuable for developing strategies to promote healthier lifestyles and supporting environmental conservation.

Keywords: Exercise, Latent class analysis, Sedentary behavior, Social responsibility

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Introduction

The modern world, with its significant achievements, has also introduced serious challenges into people's lives. Decrease in physical activity and environmental crises are considered key issues in the modern world that have endangered the present and future of different societies (1). In the meantime, it is expected that the international community, along with public and volunteer institutions, will play a more effective role in reducing and addressing these challenges and will implement preventive measures to address them. The importance of the issue means that public and government institutions should adopt strategies that have the greatest effect at the least cost to reduce the damage caused by these two phenomena. To address this issue, urgent measures to develop critical policies are inevitable (2). On the one hand, health-related concerns have led many researchers across various health fields to consider physical activity (3), because active participation in sports and physical activities is of great significance for people's physical, social, and psychological health (4,5). On the other hand, ecological challenges are considered among the most urgent issues in the modern world (6). This challenge threatens the lives of people worldwide, and urgent, effective responses are needed to prevent catastrophic change (7).

Plogging is a voluntary physical activity that originated in Stockholm in 2016 and has since become an international phenomenon focused on environmental concerns (8). It is a recreational activity that combines jogging with garbage collection. Plogging is both an

attractive physical activity and an environmentally beneficial program that protects the environment (9). Therefore, promoting plogging as a green initiative can contribute to environmental sustainability; on the other hand, it is a unique and innovative concept that combines the benefits of physical activity with environmental care (1). Plogging is a socio-cultural phenomenon that can help improve people's health and the environment (10), a new sustainable movement that combines physical activity, such as jogging, with environmental awareness (11).

Plogging is a unique form of exercise and physical activity that is rapidly expanding due to its positive environmental impacts (12). Many non-governmental organizations and associations have been established worldwide in recent years to turn plogging into an attractive social activity (13). Paying attention to the ever-increasing need for social activities in the management of natural resources suggests that focusing on plogging, a physical activity compatible with the environment, can have significant strategic value (14). In such a situation, Ploggers can play a valuable role in developing physical activities and supporting a sustainable environment (1). With the growing need to understand why people might devote their time to such an activity (15), identifying the reasons and motivations of bloggers for joining plogging programs can provide significant knowledge for establishing and developing more effective physical activity and environmental programs. Environmental awareness and social responsibility can be driving factors in plogging participation. Undoubtedly, it is not possible to participate in plogging volunteer programs without serious concerns and awareness of the current situation, as well as a sense of responsibility on the part of citizens towards their community and their surroundings. Therefore, studying the role of such concepts in the development of plogging and in increasing people's participation in this physical environmental activity can serve as a basis for creating effective movements to address problems related to immobility and the environment.

In the last two decades, improving the general level of environmental awareness across society has become one of the main social goals, achieving a rare level of social and political consensus (16). Environmental awareness refers to people's understanding of the environmental effects of their actions and of the broader environmental challenges the planet faces (17). Nature defines both our existence and our relationship with the world, so developing environmental awareness can change our relationship with nature and, in turn, lead to more responsible behavior and greater respect for the environment (18). Increasing public awareness of environmental care is of great importance, as current environmental issues will intensify without preventive measures (1). Promoting environmental awareness is considered a fundamental goal in contemporary education, critical for following eco-friendly behaviors (19). With increasing awareness of environmental issues, demand for environmentally friendly practices has grown; in other words, people's support for environmental protection depends on their level of environmental awareness (20). Previous research has demonstrated that the implementation of environmental management practices is influenced by existing and potential stakeholder groups, including external pressures from regulators, environmental groups, financial institutions, and suppliers, as well as internal pressures from employees' and owner/manager's attitudes and knowledge (21). The higher people's environmental awareness, the more they tend to engage in environmentally friendly behaviors (22). In fact, the level of environmental awareness in a particular nation can be influenced by education, cultural differences, economic well-being, and the biological and psychological need to live in harmony with nature (biophilia hypothesis) (23). The studies of Daoud et al showed that environmental awareness can lead to effective initiatives and creativity in environmental activities (24). Crotty and Hall (2014) found that environmental awareness is effective in achieving sustainable development (25). In addition, the study by Gadenne et al revealed that laws increase public awareness of the environment, leading organizations to change their business processes and environmental strategies (21). Duroy's findings showed that the degree of urbanization, the level of mental well-being, and the level of income equality have a direct effect on environmental awareness, while education, population pressure, and happiness are significantly correlated with environmental behavior (23). The findings of Xie et al emphasized the importance of stakeholder demands, environmental ethics, and environmental awareness in encouraging green innovation and increasing environmental performance (26). Liu and Madni found that environmental awareness serves as a basis for environmentally friendly behavior and consumption (27). According to Sharma and Sarkar (2024), environmental awareness is one of the most important elements in achieving sustainable and responsible development (28). The findings of Salhi and Emamgholi (2018) also revealed that environmental awareness influences behavioral responses towards the environment (29).

Social and environmental responsibilities have attracted increasing attention from researchers (30). Concepts such as social responsibility emphasize win-win cooperation on social and environmental issues (31). Social responsibility refers to social and environmental concerns and their integration with the activities and interactions of community members (32). Social responsibility refers to goals that go beyond national and industry standards that support ecological balance (33). Social responsibility includes initiatives with long-term goals that contribute to sustainable development at the local and global level

(34). In many cases, social responsibility practices have been developed to achieve sustainable performance in response to rapid environmental degradation (35). Shiri and Jafari–Sadeghi (2022) found that initiatives related to social responsibility affect green behaviors (36). Afsar and Umrani (2019) found that ethical issues and environmental commitment partially mediate the relationship between perceived social responsibility and pro-environmental behavior (37). In the studies by Khan et al, the authors emphasized the effects of social responsibility and environmental awareness on organizations' credibility and benefits (38). Chuah et al showed that environmental concerns influence people's citizenship behavior (39).

Creating attractiveness for both physical activity and voluntary environmental activities is a key factor; therefore, creating favorable conditions to increase their attractiveness can be considered a practical approach for both sectors. White et al believe that significant physical and recreational activities occur in the natural environment (40). Therefore, connecting the environment to physical activities can make them more attractive and sustainable. To follow this approach, focusing on the association and continuity of these two concepts can be highly valuable in promoting physical and environmental activities. Green physical activities (41) can be considered practical approaches to promoting behavior change that benefit nature and encourage physical activity in society. Therefore, the use of creative, people-oriented approaches and programs is among the practical strategies that can be significant in reducing problems related to inactivity and the environment. One initiative that combines physical activity with environmentally friendly behaviors is plogging. Plogging has been proposed as an initiative and active response to environmental issues, and as a physical activity that is increasingly developing and gaining popularity worldwide (42).

Environmental crises and issues related to inactivity and health are considered among the main challenges of human life in the modern world, and addressing them across these two important areas can be crucial to responding to threats to human life. In this situation, it is necessary to support a growing movement advancing effective initiatives that promote physical activity and address environmental concerns. A greater tendency among citizens towards physical and environmental activities can lead to effective confrontation with two of the main challenges of modern life. Plogging is a phenomenon that, by combining an attractive physical activity with environmental programs, can simultaneously address two main challenges of the modern world. Therefore, the effort to develop and promote plogging can be considered a priority for both research and implementation. The study of plogging and its related dimensions can provide the necessary groundwork for promoting this physical activity program and its consequences for citizens' health and the environment, and further introducing and promoting this eco-friendly physical activity. In this regard, it should be emphasized that plogging is a powerful tool for increasing society's environmental awareness (42). The novelty and contribution of this study lie in elucidating the mediating role of social responsibility in the relationship between environmental awareness and participation in plogging, an emerging eco-friendly physical activity. Physical activity and the environment have long been key topics in previous studies. However, a review of the literature shows that no study has specifically examined plogging participation and its relationship with environmental awareness and social responsibility. Therefore, this study sought to answer the following question: What effect do environmental awareness and social responsibility have on participation in plogging as an eco-friendly physical activity?

Based on the literature review, the following hypotheses were developed:

- Hypothesis 1. Environmental awareness positively affects ploggers' participation in plogging programs.
- Hypothesis 2. Environmental awareness positively affects ploggers' social responsibility.
- Hypothesis 3. Social responsibility positively affects Ploggers' participation in plogging programs.

In the next section, the author describes the research methodology and subsequently presents the findings. In the final section, the author discusses the findings, implications, and limitations and provides future research directions.

Materials and Methods

Research Model

According to the existing literature, a hypothesized model including social responsibility, environmental awareness, and participation in plogging was developed (Figure 1). The research model can extend the literature on the plogging context by presenting a great justification of how participating in plogging as an eco-friendly physical activity can be developed through social responsibility and environmental awareness. The research model was developed as follows:

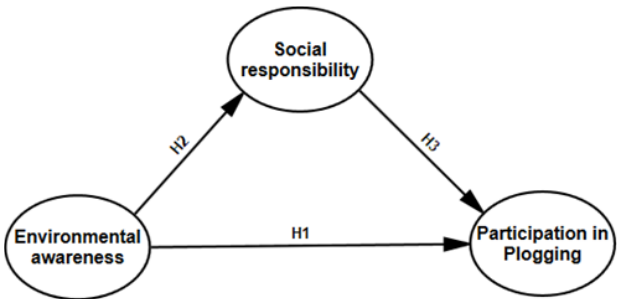

Figure 1. Research model

Methodology

A field study, along with a quantitative approach, was conducted among the ploggers participating in plogging programs. This was an applied, descriptive-survey, correlational, and cross-sectional study conducted in the field. Both library and field methods were used to collect the required data. In the library method, information on websites, internet information portals, books, articles, theoretical literature reviews, and past research background was reviewed. The field method involved combining valid standard questionnaires. The survey instruments were adapted from validated scales used in previous studies, and a researcher-developed scale was used for measuring participation in plogging. Cvetković et al's seven-item scale was borrowed (adapted) to measure environmental awareness (17). Park et al's six-item scale was adapted to measure social responsibility (43), and a researcher-developed six-item scale was used to measure plogging participation. The research tool consisted of 19 items used to collect data. Questionnaires were designed using a five-point Likert scale (from completely disagree to completely agree). The research population comprised all active ploggers who participated in plogging through NGO activities worldwide in May and June 2024. Due to the lack of accurate participant organization in plogging programs and reliable statistics on ploggers, the required sample size for the present research was estimated using the formula for determining the appropriate sample size for structural equation modeling. Based on the formula for determining the number of samples for the structural equation method ($5q \leq N \leq 15q$), where q is the number of items and N is the sample size, the required sample size ranged from 95 to 285 people. Given the research goal and the questionnaire items, the purposeful sampling method was used in this study. The selection criteria for the research sample included at least 2 years of experience in plogging programs and sufficient knowledge to understand the questionnaire items. To identify participants, the researchers posted messages in various virtual spaces relevant to plogging (Telegram, Instagram, and WhatsApp) and invited volunteers to participate in the research project. The active participants were identified through virtual pages, and after confirming their eligibility and obtaining their consent to participate, the surveys were distributed via the virtual space. A cover letter explaining the research objectives was attached to each survey. To collect the research data, the questionnaires were distributed virtually (via virtual space) by the research team. To obtain a suitable and sufficient number of samples, given the possibility of non-return of questionnaires or their invalidity for various reasons, 290 questionnaires were distributed to participants. Of the distributed questionnaires, 223 were returned (return rate estimated at 80.4 percent), and after the initial review, 214 were found eligible for use in calculations and analyses. According to the formula for determining sample size, this sample size was estimated to be suitable for conducting research (within the acceptable range). The questionnaire took 10–12 minutes to complete. Subjects ($n = 214$) were members of plogging associations in Sweden ($n = 26$), South Korea ($n = 17$), Malaysia ($n = 22$), Singapore ($n = 28$), Russia ($n = 19$), Iran ($n = 31$), the United States ($n = 24$), Australia ($n = 29$), and Finland ($n = 18$). Demographic data on experience with plogging, time allocated to plogging in the week, education, marital status, age, nationality, gender, and employment status were collected. The research questionnaires were distributed and completed over five weeks in November and December 2024.

After obtaining the original texts of the questionnaires, the researchers revised them based on the opinions of 15 experts in sport and sociology to ensure the questionnaire's face and content validity. Cronbach's alpha was used to assess the scales' reliability. To evaluate reliability, a preliminary study (pre-test) distributed 30 questionnaires to the participants. The reliability values based on Cronbach's alpha are presented in Table 1. In addition, confirmatory factor analysis was used to assess the instrument's construct validity. The results of the confirmatory factor analysis indicated the scales' structural validity (all items' factor loadings were greater than 0.05). The estimate of coefficient α above 0.70 and the composite reliability above 0.70 in Table 1 indicate proper internal consistency (44). The item loadings were higher than the recommended threshold of 0.70 (45), and the AVE for each construct ranged from 0.65 to 0.74 (Table 1), which was higher than the suggested threshold of 0.50 (46). These estimates showed proper convergent validity for all constructs.

The results of the measurement model constructs are presented in Table 1.

As shown in Table 1, the indices all reach acceptable levels, indicating a good model fit.

SPSS version 20 and AMOS version 22 were used for descriptive and inferential data analysis. To assess the general validity of the research model and the relationship among the research variables, structural equation modeling (SEM) was conducted.

Results

Two hundred fourteen participants collected the data. The demographic features of the research sample are presented in Table 2.

In the inferential findings section, to determine the acceptable level for each index in the measurement models, the measurement models were first analyzed separately. Four measurement models for the variables were tested separately. The general fit indices for the measurement models are presented in Table 3.

According to Table 3, the measurement models show

Table 1. Factor loadings, Cronbach's alpha values, composite reliability, and average variance extracted

Construct	Items	OL (>0.70)	α (>0.70)	CR (>0.70)	AVE (>0.50)
Social responsibility	I strive to raise funds for social causes	0.81[a]	0.81	0.83	0.76
	I encourage employees/partners to participate in voluntary activities in local communities	0.79[a]			
	I support sports and cultural events.	0.83[a]			
	I try to participate in environmental campaigns.	0.85[a]			
	I attempt to reduce waste and use environmentally friendly products.	0.86[a]			
	I try to reduce energy and resource consumption.	0.82[a]			
Environmental awareness	Humanity's survival hinges on access to natural resources.	0.78[a]	0.83	0.85	0.78
	Individuals significantly influence the environment.	0.83[a]			
	Environmental conditions profoundly impact human health.	0.85[a]			
	Humanity is responsible for environmental damage	0.88[a]			
	Knowledge fosters environmental awareness.	0.84[a]			
	Collective action protects nature.	0.81[a]			
Participation in plogging	I try to participate in plogging programs regularly	0.87[a]	0.84	0.88	0.79
	It is an honor for me to participate in plogging programs.	0.82[a]			
	I encourage others to participate in plogging programs.	0.80[a]			
	I convey positive comments about plogging	0.77[a]			
	I try to develop plogging in virtual and real space	0.83[a]			
	I recommend the plogging exercise to others	0.86[a]			
	I encourage others to participate in plogging programs.	0.88[a]			

Notes: a: $P<0.05$; OL = outer loading; α = Cronbach's alpha; CR: composite reliability; AVE: average variance extracted.

Table 2. Demographic features of the research sample

Demographic features		Percent %
Allocating time to plogging in the week	Two hours/ less than two hours	97.20%
	More than two hours	2.8%
Gender	Male	61%
	Female	39%
Age	15–20	9.81%
	20–25	32.24%
	25–30	41.12%
	≥30	16.82%
Education	University degrees	84%
	Diploma & high school degrees	16%
Experience in plogging	Less than 2 years	47.20%
	Between 2 and 5 years	51.87%
	More than 5 years	0.94%
Marital state	Married	24.5%
	Not married	75.5%

good fit, and the general indicators confirm that the data support the models well.

After examining and verifying the measurement patterns in the first step, the second step used structural equation modeling to test the research hypotheses. Table 4 presents the general fit indices for the structural equation model.

The results in Table 4 indicate that the collected data support the model well. The research's structural equation model, along with the regression coefficients, is presented in Figure 2.

After examining and verifying the model, two partial indices of critical value and *P* were used to test the significance of the hypotheses. The critical value is the ratio of the "regression weight estimate" to the "standard error." Based on the significance level of 0.05, the critical value should be more than 1.96. For values below this threshold, the corresponding parameter in the model is not considered important, and *P*-values below 0.05 indicate a significant difference from zero at the 0.95 confidence level. The hypotheses, regression coefficients, and partial index values related to each hypothesis are given in Table 5.

According to the statistics presented in Table 5 (a higher critical value of 1.96 and a *P*-value less than 0.05), all the hypotheses in the research model have been confirmed. According to the findings, in addition to the direct effect, environmental awareness also has an indirect effect through the social responsibility variable, with an effect coefficient of 0.216 on participation in plogging (0.45×0.48). In other words, social responsibility can facilitate environmental awareness and participation in plogging, and the total effect in this model is 0.646 ($0.216 + 0.43$).

Discussion

Given the importance of concerns related to physical activity and the environment, and in line with the

Table 3. General fit indices of measurement models

Index	CMIN/ *df*	GFI	AGFI	NFI	CFI	RMSEA
Social responsibility	2.86	0.921	0.925	0.929	0.926	0.085
Environmental awareness	2.79	0.915	0.917	0.919	0.917	0.090
Participation in plogging	2.81	0.920	0.919	0.913	0.910	0.088
Acceptable	<3	>0.90	>0.90	>0.90	>0.90	<0.10

Table 4. General fit indices of the research model

Index	CMIN/ *df*	GFI	AGFI	NFI	CFI	RMSEA
Final model	2.84	0.914	0.910	0.916	0.911	0.089
Acceptable	<3	>0.90	>0.90	>0.90	>0.90	<0.10

Table 5. Structural model test results for research hypotheses

Hypothesis		Path		Coefficient	*t*-value	*p*	Result
H1	Environmental awareness	→	Participation in plogging	0.43	9.98	***	Supported
H2	Environmental awareness	→	Social responsibility	0.45	11.24	***	Supported
H3	Social responsibility	→	Participation in plogging	0.48	12.35	***	Supported

*** $P<0.001$.

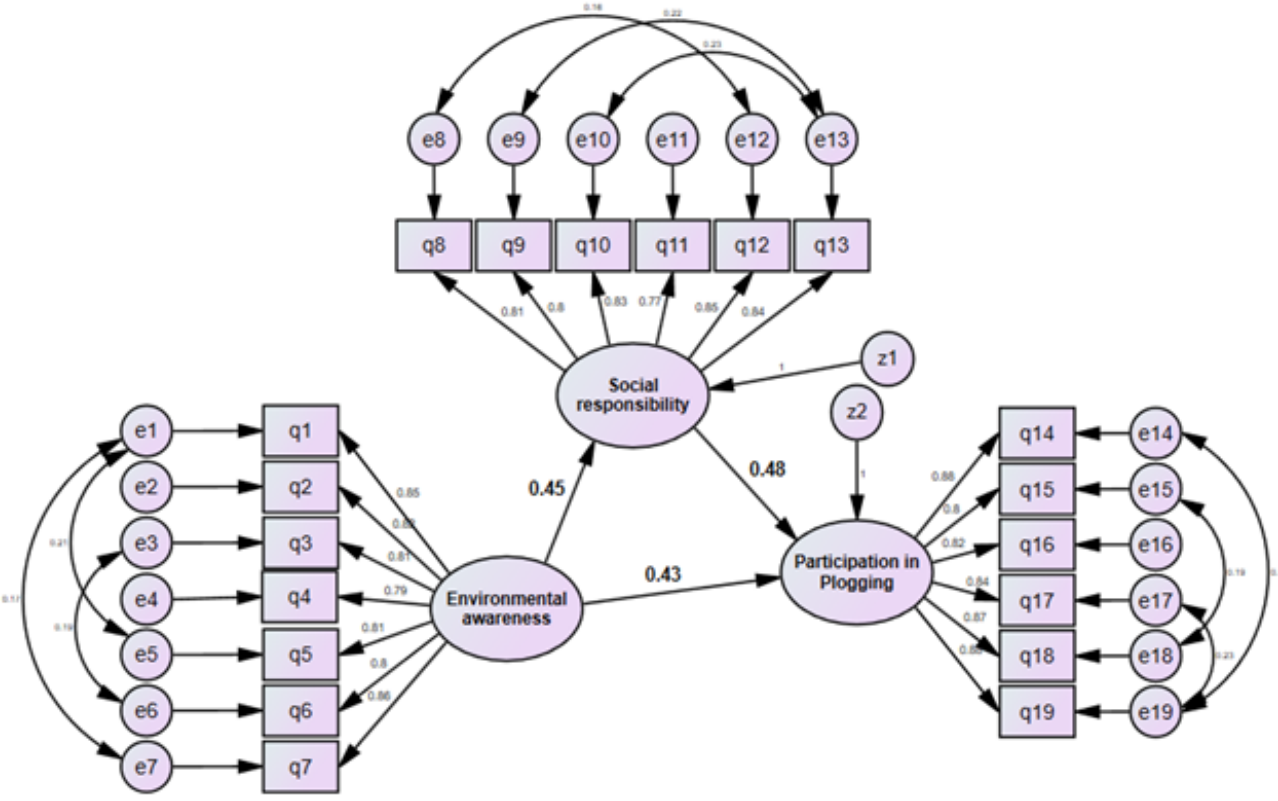

Figure 2. Structural model results

research's primary purpose, this study was designed to test an integrative model explaining the effects of environmental awareness and social responsibility on participation in plogging, an eco-friendly physical activity.

The research findings showed that "environmental awareness" has a positive and significant effect on "participation in plogging." The more people become aware of the environmental and health benefits of plogging, the more likely they will participate in plogging programs. The development of environmental awareness can help change our relationship with nature and thus encourage more responsible behavior towards the environment (18). Increasing public awareness of environmental care is of great importance, as current environmental problems will intensify without preventive measures (1). People's support and protection of the environment depend on the

level of environmental awareness (20). Previous research has shown that the implementation of environmental management practices is influenced by people's attitudes and knowledge (21). The higher people's environmental awareness, the more inclined they are to behave in an environmentally friendly way (22). The study of Daoud et al showed that environmental awareness can lead to initiatives and creativity in environmental activities (24).

Xie et al also emphasized the importance of stakeholder demands, environmental ethics, and environmental awareness in encouraging green innovation and increasing environmental performance (26). Liu and Madni also showed that environmental awareness acts as a basis for environmentally friendly behavior and consumption (27). With increasing environmental awareness, more people will support plogging projects and events, and start plogging collections, which in turn can help increase participation in plogging programs. The more citizens become aware of the impact of waste on the environment, such as the pollution of waterways and damage to wildlife, the higher the motivation and willingness to participate in environmental activities, and specifically in environmental sports. If citizens are more aware of environmental challenges, such as climate change and pollution, they will be more motivated to engage in environmental activities and behaviors, including plogging events. Environmental awareness can foster a sense of common purpose and shared goals, encouraging people to participate in social activities such as environmental protection events and people-organization volunteer associations.

Another part of the research findings showed that "environmental awareness" has a positive and significant effect on "social responsibility." Awareness of environmental conditions can help people feel more responsible for their society and living environment, and this sense of responsibility can lead them to take action, such as participating in plogging, to create change and improve physical and environmental health. In this regard, Rahman et al also believe that environmental awareness can provide a basis for increasing individuals' social responsibility (47). Environmental concerns and awareness can lead to increased communication and cooperation among people with common concerns, and create opportunities to participate in social and voluntary activities such as plogging. When people are aware of the environmental impact of their own and others' actions, they are more likely to engage in socially responsible behaviors such as recycling, reducing energy consumption, and supporting sustainable products and services. Sufficient awareness and knowledge of environmental challenges will influence people's attitudes and views on various issues and make people feel more responsible for their environment. Environmental awareness can foster a sense of social responsibility for environmental problems and encourage people to take action through volunteering, donating to environmental causes, and advocating for environmental policy change. In this part of the findings, the environmental awareness variable was classified in the field of knowledge, and social responsibility was classified in the field of attitude. This issue can be justified and interpreted based on the behavior change cycle. This means that in the cycle of behavior change, having knowledge and awareness in a field leads to a change in people's attitudes towards the issues around them, which, in turn, leads to the emergence of behavioral examples and, in other words, a change in people's behavior.

Another part of the research findings showed that "social responsibility" affected "participation in plogging." In other words, greater participation in plogging programs can be influenced by a society's sense of social responsibility. Social responsibility can help sustainable development at the local and global scale (34). It can help maintain and develop physical health and the environment, which are among the factors playing critical roles in sustainable development. Consistent with this proposition, it should be taken for granted that social responsibility has been developed in many cases to achieve sustainable performance in response to environmental degradation (35). Wu et al's study also showed that social responsibility initiatives affect the green behavior of women and men (48). Afsar and Umrani found that ethical issues and environmental commitment partially mediate the relationship between perceived social responsibility and pro-environmental behavior (37). Chuah et al showed that environmental concerns affect people's behaviors and citizenship (39). The findings of Salhi and Emamgholi also indicated the effect of environmental awareness on outcomes of behavior towards the environment (29). In addition to the direct effect of social responsibility on citizens' and volunteers' participation in plogging activities, growing concerns about social responsibility among citizens and public institutions can lead to social demands and pressure on institutions to be more sensitive to sports and the environment. In this regard, McCormick argues that people-institutional groups have collectively played an important role in shaping the nature of various international regimes and have become significant sources of pressure for international action in environmental management (49). The results of Gadenne et al also show that laws increase public awareness of the environment, leading organizations to change their business processes and environmental strategies (21).

Given that increasing people's awareness of the environmental and health benefits of plogging will boost participation in plogging programs, efforts to strengthen awareness in different ways can be practical in this field. Increasing the activities of various media to raise people's awareness and the active presence of famous figures in public awareness can be effective in this regard. In this

context, it is essential to address the problems caused by inactivity, alongside environmental challenges, and to raise awareness among diverse groups of the consequences and impacts of these problems on personal, social, and environmental health. Plogging, as an environmentally friendly sport, can be placed at the center of active cultural, social, and media attention as an innovative phenomenon to address both areas. In this regard, public health trustees in the field of environment and physical activities should fulfill their inherent and legal duties and work to raise awareness and create suitable conditions. Educational and cultural institutions, such as educational institutions and other custodians of the country's cultural arena, should also take an active role in education, culture, and action to raise awareness in these fields. Media, associations, and social activists can raise awareness across different strata and lay the groundwork for greater participation in plogging activities to promote environmental and lifestyle concerns. The participation of institutions in the development and promotion of plogging across various fields, such as sports and physical activities, health, and volunteer cultural-social activities, can foster synergy and drive the growth of this eco-friendly physical activity.

The impact of environmental awareness and social responsibility on people's participation in plogging confirms the adaptation of knowledge, attitudes, and behaviors. Environmental awareness, knowledge-based social responsibility, and participation in plogging are also considered behavioral examples of ploggers. This study provides policymakers and managers with valuable insights to strengthen citizens' and environmentalists' behavior in physical and environmental activities through the development of plogging sports, and to inspire social responsibility and citizen awareness.

Paying special attention to the findings of this research in order to promote the compatibility of measures related to public health and environmental protection can be of considerable importance. In addition to the results this research can bring to the fields of science, health, and the environment, this research also has limitations. The limited scope of the community investigated in this research is a limitation; therefore, conducting further research to understand the experiences of different strata with diverse views and attitudes is of great importance. Carrying out case studies of active associations in the field of plogging, both from a sports and an environmental perspective, can be effective in providing a more accurate and complete understanding of plogging's dimensions. Not using the opinions of experts and managers, who are directly or indirectly involved in these activities, in the fields of sports and the environment, is another limitation of this research and could be the subject of future research. By studying and drawing on the experiences of people involved in plogging and describing their diverse experiences, managers and stakeholders in sports and the environment can address challenges related to lifestyle, health, and the environment more effectively. More detailed studies can deepen the understanding of this field, strengthen plogging activities in the implementation arena, and enrich the research field. Given the novelty of plogging research, in-depth qualitative studies can yield rich insights.

Conducting additional experimental and longitudinal research is required to provide a comprehensive understanding of participation in plogging programs. Because the findings may be environmentally sensitive and might vary across contexts, cross-validation or cross-country comparisons are suggested for future studies. Incorporating control and mediating variables in the proposed research model is recommended to address the issue in more detail. Accordingly, quantitative and qualitative studies with an open-ended essay-style question are proposed to explain the different aspects of plogging and ploggers' behaviors. Extending the model used in this research by including other variables can provide a better understanding of the issue. Participants in this study were active ploggers involved in plogging programs; therefore, future research from the perspective of potential participants with less prior plogging experience is recommended.

Conclusion

Considering the importance of addressing challenges related to active lifestyles, health, and the environment, and the need to develop plogging as an environmentally friendly sport, this research examines the relative role of environmental awareness in participation in eco-friendly physical activity. This study contributes to the growing research on plogging participation by examining environmental awareness and social responsibility to explain ploggers' behaviors. The findings of this study support our basic proposition that environmental awareness and social responsibility interact to affect participation in plogging. The research findings provide a lens for understanding the roles of environmental awareness and social responsibility in contributing to participation in plogging and Ploggers' behaviors. This study contributes to the plogging literature in two significant ways: the first and major contribution is that it is one of the first studies conducted in the plogging context, a burgeoning field. The second contribution of the research is to highlight the dominant role that environmental awareness and social responsibility play in explaining participation in plogging as an eco-friendly physical activity. This study also provided a platform for future researchers to advance knowledge in plogging.

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Authors' contributions

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Competing interests

The authors declare no conflict of interest.

Ethical issues

The authors have adhered to all ethical considerations. Ethical code: IR. KMU. Rec. 1403.601

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