OPEN ACESS
Journal of National Kinesiology

ORIGINAL RESEARCH

Does an 8-week ınterventıon change levels of nature connectedness, physical activity enjoyment, natural area recreation self-efficacy, and social ınterest?

[1]Ahmet Yılgın, [2]Faruk Güven, [3]Ali Çevik, [4]Aytekin Alpullu

[1]Kilis 7 Aralık University, School of Physical Education and Sports, Coaching Education, Kilis, Türkiye.
[2]Karamanoğlu Mehmetbey University, Faculty of Applied Sciences, Recreation Management, Karaman, Türkiye.
[3]Kilis 7 Aralık University, School of Physical Education and Sports, Physical Education and Sports, Kilis, Türkiye.
[4]Marmara University, Faculty of Sports Sciences, Sports Management, Istanbul, Türkiye.

Received:
May 3, 2025

Accepted:
Jun 07, 2025

Online Published:
Jun 12, 2025

Keywords:
Recreation, Physical Activity Connection, Self-Efficacy, Social Interest.

Abstract. The aim of this study is to investigate whether there is any change in nature attachment, enjoyment of physical activities, natural area recreation self-efficacy, and social interest levels among students of the Coaching Education Department after participating in physical activities in natural environments. This study follows a quasi-experimental research model and was conducted over an 8-week program. The participants were a group of 30 students from the Coaching Education Department at Kilis 7 Aralık University School of Physical Education and Sports. The data collection tools included a personal information form and four different scales: Nature Attachment Scale, Enjoyment of Physical Activities Scale, Natural Area Recreation Self-Efficacy Scale, and Social Interest Scale. Data were collected through pre-test and post-test measures and analyzed using the JASP statistical program. The results showed no significant changes in nature attachment, enjoyment of physical activities, or natural area recreation self-efficacy. However, a significant increase in social interest levels was observed ($p<0.05$). These findings suggest that physical activities performed in natural environments may enhance social interest levels, but longer interventions may be necessary for the development of other psychological factors.

Introduction

Connection to Nature

Nature is a system that encompasses countless elements made up of both living and non-living beings, which possess the ability to change, influence, and renew, with boundaries that cannot be defined (Tağrikulu, 2021). The concept of nature plays an important role in shaping the universe (Mcphie & Clarke, 2020). Especially humans must relate to natural conditions to continue their lives. This is because the life cycle occurs through adapting to nature (Gül, 2013). The harmony with nature offers various opportunities to people, such as seeking excitement, having fun, resting, curiosity, and increasing the ability to manage time effectively, engage in sports, and renew themselves (Gürer & Mermer, 2023). In addition, when activities in nature are applied properly, it is expected to have positive effects on people's behaviors, relationships, skills, and social interactions, as well as environmental sustainability (Dyment & Potter, 2015; Prince, 2017). Thus, humans will realize that they are a part of nature, will protect nature, and will believe in the necessity of being a nature-connected being (Schultz et al., 2004; Çınar & Duran, 2021). Nature connectedness is the ability to make the relationship between an individual and nature meaningful. At its core, it is not just about the positive feelings individuals have toward nature, but understanding its qualities as a whole (Nisbet et al., 2009). Ecologists and eco-psychologists have long studied the psychological relationships humans have with the natural world. As a result of these studies, it has been revealed that nature connectedness not only fosters ecological behavior but also increases the sense of belonging to the natural community (Roszak, 2001; Fisher, 2003; Mayer & Frantz, 2004). Moreover, living closely with nature and maintaining that connection can increase people's nature experiences and, through physical activities conducted in nature, contribute to their physical, mental, and psychological well-being (Mitchell, 2013; Martyn & Brymer, 2016). Conversely, when the connection with nature is lost, individuals may experience

✉ Corresponding Authors: A. Çevik Email: alicevik1020@gmail.com
To cite : Yılgın, A., Güven, F., Çevik A., Alpullu A., 2024. Does an 8-week ınterventıon change levels of nature connectedness, physical activity enjoyment, natural area recreation self-efficacy, and social ınterest?, Journal of National Kinesiology. 6(1), 28-39.

unhappiness (Nisbet et al., 2011). To prevent the formation of such unhappiness, individuals need to engage in various physical activities that provide enjoyment.

Enjoying Physical Activities

Enjoyment is seen as the source of inner feelings (Murrock et al., 2016). When individuals engage in an activity that they enjoy, they start to experience enjoyment, leading them to desire to repeat the activity. As a result, they motivate themselves and may experience the "flow" experience (Perttula et al., 2017). Enjoyment is also associated with feelings of happiness and fun, which positively affect individuals' life quality (Teques et al., 2020). On the other hand, enjoyment plays an important role in determining people's relationships with friends, consumption desires, and career choices, and it can also influence physical, mental, and social behaviors. This situation is also valid for participating in physical activities (Ertaş & Aktaş, 2019). Enjoying physical activities refers to the experiences gained during and after the activity, leading individuals to feel pleasure. Actions such as pleasure and fun can coordinate individuals' behavioral components and motivate them to achieve their goals (Özkurt et al., 2022). Physical activities provide not only momentary but also lasting and continuous satisfaction, offering a more prosperous life (Peker et al., 2023). Particularly, young people enjoying physical activities can be decisive in their healthy aging and academic success (Singh et al., 2019). Additionally, young individuals who regularly participate in physical activities may not only see positive effects on their bodies but also experience reductions in stress, anxiety, and depression, which can help increase their sense of security, self-esteem, and self-efficacy. Consequently, people are expected to have positive relationships with their surroundings (Janssen & Leblanc, 2010). Therefore, one of the best ways to enjoy physical activities is through recreational activities conducted in natural settings.

Outdoor Recreation and Self-Efficacy

The concept of outdoor or natural space refers to using the natural environment and understanding its value (Martin et al., 2024). Priest and Gass (2018) define outdoor recreation as the activities individuals engage in within nature, without the aid of motorized or animal power, combining their own capacity, skills, and conditioning to overcome challenges in nature. Sports activities in nature, nature sports, and outdoor recreation activities are conducted in rural or natural areas (Demirel et al., 2009; Ardahan & Lapa, 2011; Aslan & Yıldız, 2024). Outdoor recreation activities involve individual, environmental, and social factors, including skills, preferences, experiences, expectations, goals, perceived risks, and threats (Ewert & Sibthorp, 2014). These activities affect individuals' emotional states and provide opportunities for better coping strategies in the face of challenges (Burke & Utley, 2013; Vilarroig & Bernardo, 2017; Powell et al., 2023). At the same time, these activities are linked to social benefits that support internal and interpersonal development (Eigenschenk et al., 2019). Furthermore, outdoor recreation activities increase participants' self-efficacy (Llewellyn et al., 2008). Gürer and colleagues (2020) emphasize that self-efficacy is important before making critical decisions or behaviors, especially in nature sports where risks must be considered. Self-efficacy is a social-cognitive approach related to understanding and explaining behaviors based on one's beliefs (Smith et al., 2022). It is also defined as the confidence individuals feel when performing a specific action, such as in work or hobbies, or their belief that they can perform an action correctly or reach a certain goal. When individuals have high self-efficacy, their ability to perform tasks is higher, and they continually strive to improve their abilities; thus, performance and self-efficacy are directly related. Self-efficacy is an important factor in explaining goals, actions, and outcomes (Lee et al., 2024). Moreover, self-efficacy plays a crucial role in shaping emotional states and controlling the environment in people's lives (Mater, 2020). Particularly, activities like outdoor recreation, which encourage active participation, significantly contribute to increasing individuals' belief in their physical activity participation and strengthening their self-efficacy (Jones & Hinton, 2007; Taniguchi et al., 2017). In this way, individuals can approach societal events or phenomena with greater interest, thanks to the self-efficacy gained from participating in outdoor recreational activities.

Social Interest

Nikelly (1991) defines social interest as the individual's empathy, identification, adaptation, responsibility, and cooperation with society, alongside integration with the universe. Adler (2008) argues that social interest is not an innate instinct but a force that can be shaped consciously or unconsciously by culture within the society lived. Kaplan (1991) discusses social interest in three different dimensions: cognitive, affective, and behavioral. The cognitive dimension concerns individuals' attitudes, knowledge, and beliefs about society. The affective dimension is composed of people's feelings towards others, such as empathy,

sympathy, and sensitivity. The behavioral dimension is related to the benefits and contributions individuals make for society. All three dimensions thoroughly examine how individuals communicate with society. People with developed social interest possess qualities such as values, tolerance, and cooperation, while those lacking social interest tend to prioritize their own interests over society's (Corey, 2019). Social interest also encompasses the connection between individuals and the world, including their interaction with nature (Adler, 2000). The relational boundaries of individuals are not only limited to themselves but extend to a sense of interconnectedness with all life. Human-nature interaction and the ecosystem are whole (Schultz, 2000). To function effectively in society, the sense of responsibility and harmony must be maintained (Smith & Lazarus, 1990). Various studies have been conducted on nature connectedness, producing different results (Zhang et al., 2014; Barton et al., 2016; Musitu-Ferrer et al., 2019). Studies examining the relationship between outdoor recreation, self-efficacy, and physical activities have shown meaningful links and concluded that outdoor recreation physical activities maintain individuals' overall health, reduce stress, and increase self-efficacy (Goldenberg et al., 2010; Sweet et al., 2012; Weng & Chiang, 2014; Fallahpour et al., 2016; Shellman & Hill, 2017). In social interest studies, Greever and colleagues (1973) found that women had higher social interest scores than men in the social interest scale; Leak and Williams (1991), in their study on family relationships and social interest, observed that family members who were helpful and supportive showed greater social interest.

Materials and Methods

Hypotheses

H1: Is there a significant difference between the participants' attachment to nature, enjoyment of physical activities, self-efficacy in natural area recreation, and social interest status and the gender variable?

H2: Was there a significant difference between the participants' attachment to nature, enjoyment of physical activities, self-efficacy in natural area recreation, and social interest levels between the pre-test and post-test?

Objective of the Study and Researach Group

This study aims to examine whether there are differences in nature-connectedness, enjoyment of physical activities, natural area recreation self-efficacy, and social interest levels among students of the Coaching Education department after engaging in physical activities in natural settings. The study sample consists of 30 students enrolled in the Mountaineering II course at Kilis 7 Aralık University's 2024-2025 School of Physical Education and Sports.

Research Model

A semi-experimental method was applied with a pre-test and post-test design for a single group, implementing an 8-week program. Semi-experimental studies are those in which the conditions cannot be fully controlled and participants are not randomly assigned. These studies are particularly challenging to apply in fieldwork with respect to variables (Cook, 1979).

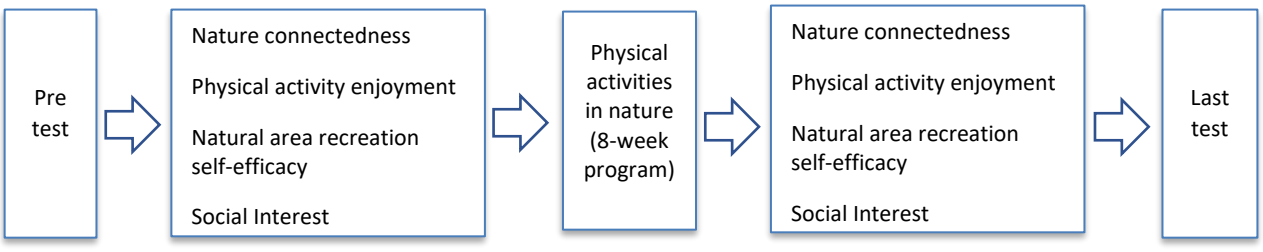

Figure 1. Working model

Table 1. 8 Weeks and 2 Hours of Application Design in Mountaineering II Course

Week	Target	Practice	Aim
1	Sharing information and explanations about this activity	1. Pre-testing the surveys before announcing the activity 2. Making statements about what kind of application will be made for the coming weeks	Trying to be impartial in the reliability of the pre-information tests and providing information about the application content
2	Routines, Calling, Creating groups (8-10 people) Group orientation	Location: Inside the university campus 1.Group attendance registration 2.Group orientation and explanations 3.Warm-up exercises before nature walk 4.40-60 minutes of walking in the campus in groups of two and checking the environment 5.Daily evaluation, 10 minutes of activity, practice, group etc. opinions and suggestions.	1.Introduction, integration, determination of symbols, names, etc. 2. Creating team spirit 3. Walking awareness work 4. Developing physical, social, behavioral harmony
3	1.Introduction, integration, determination of symbols, names, etc. 2. Creating team spirit 3. Walking awareness work 4. Developing physical, social, behavioral harmony Check-up, Team belonging, Awareness of nature	Location: University and mountain walk 1. Attendance registration of groups 2. Determining a tree for groups to create a bond within the group 3. Warm-up exercises before nature walk 4. Walking in groups for 40-60 minutes on campus and in nature 5. Daily evaluation 10 minutes of opinions and suggestions about activities, practices, groups, etc.	1. Determining a tree that belongs to the group on campus 2. Organizing and owning the area around this tree 3. Making a circle around the tree and explaining everyone's feelings and thoughts about the soil, tree type-features and why this tree is there 4. Daydreaming about the environment while walking 5. At the end of the application, closing your eyes and briefly visualizing the activity from beginning to end for 1-3 minutes 6. Developing physical, social and behavioral harmony
4	Routines, Checklist, Visit a tree, Plant a seed,	Location: University and mountain walk 1. Group attendance registration 2. Group tree visit 3. Placing natural soil in a paper cup and planting a seed 4. Warm-up exercises before nature walk 5. Walking in groups for 40-60 minutes on campus and in nature 6. Daily evaluation 10 minutes of activity, practice, group etc. opinions and suggestions	1. Visiting a tree belonging to the group and creating a circle of love 2. Planting a predetermined seed in a paper cup with natural soil 3. Conversations about producing dreams and hopes about the seed 4. Physical capacity-developing walk on small hills in and around the campus and environmental perception work 5. At the end of the practice, closing the eyes and briefly visualizing the activity done today from beginning to end for 1-3 minutes 6. Developing physical, social and behavioral adaptation
5	Routines, Checklist, Visit trees and seeds, Identify an animal	Location: University and mountain walk 1. Group attendance record 2. Bonding with the tree and checking the seed 3. Groups choosing an animal to bond with within the group 4. Tree and animal therapy 5. Warm-up exercises before the nature walk 6. Walking in the campus and nature for 40-60 minutes in groups 7. Daily evaluation 10 minutes of activity, practice, group, etc. opinions and suggestions	1. An activity to share feelings and thoughts based entirely on love by checking trees and seeds belonging to the group on campus 2. Determining an animal that we can see in the environment and that everyone agrees on; bird, cat, dog, anthill, bee nest, butterfly, etc. 3. Group members expressing their feelings and thoughts about the animal they have determined 4. Natural and challenging walking activity outside of the path 5. At the end of the application, close your eyes and briefly visualize the activity done today from beginning to end for 1-3 minutes 6. Developing physical, social, behavioral harmony
		Location: University and mountain walk 1. Attendance registration of groups	1. A tree determined on campus, a seed planted by individuals (melon-watermelon) and bonding with an animal

6	Routines, Checklist, Tree and animal therapy Discharge activity	2. Bonding with trees, seeds and animals 3. Warm-up exercises before nature walk 4. Walking in groups for 40-60 minutes on campus and in nature 5. Discharge with music in the middle of the walk 6. Daily evaluation 10 minutes of activity, practice, group etc. opinions and suggestions	2. Teaching climbing steep slopes and risk perception, controlled movement 3. Music activity for students individually and in groups 4. Observation activity while returning from the path or main road 5. At the end of the application, closing the eyes and briefly visualizing the activity done today from beginning to end for 1-3 minutes. 6. Developing physical, social and behavioral adaptation
7	Routines, Checklist, Tree, seed and animal therapy Nature waste collection	Location: University and mountain walk 1. Attendance registration of groups 2. Bonding with trees, seeds and animals 3. Warm-up exercises before nature walk 4. Walking in groups for 40-60 minutes on campus and in nature 5. Collecting waste materials from nature on the way back from the walk 6. Daily evaluation 10 minutes of activity, practice, group etc. opinions and suggestions	1. A tree determined on campus, a seed planted by individuals (melon-watermelon) and bonding with an animal 2. Brisk walking on a natural or path 3. Developing environmental sensitivity and awareness by collecting waste on the return of the groups' walk 4. Observing nature while returning from a path or natural environment 5. Closing the eyes at the end of the application and briefly visualizing the activity done today from beginning to end for 1-3 minutes 6. Developing physical, social and behavioral adaptation
8	Routines, Checklist, Tree, seed and animal therapy Breath (Yoga Style) activity	Location: University and mountain walk 1. Attendance registration of groups 2. Bonding with trees, seeds and animals 3. Warm-up exercises before nature walk 4. Walking in groups for 40-60 minutes on campus and in nature 5. Breathing exercises for 3-5 minutes before returning from the walk 6. Daily evaluation 10 minutes of activity, practice, group etc. opinions and suggestions	1. A tree determined on campus, a seed planted by individuals (melon-watermelon) and bonding with an animal 2. Climbing and walking activity on steep slopes 3. Breathing exercises, opening-stretching exercises and physical awareness and behavioral adaptation work at the summit before returning 4. Zig-zag descent work on the path or natural environment 5. At the end of the application, closing the eyes and briefly visualizing the activity done today from beginning to end for 1-3 minutes 6. Developing physical, social and behavioral adaptation

Data Collection

The data for this study was collected using a face-to-face survey method in the form of a pre-test, and post-test data was gathered after an 8-week intervention program from the 30 participants who consistently attended the program. Students who were unable to maintain continuous participation were excluded from the pre-test. The first part of the study utilized a personal information form, while the second part involved the application of the following scales, with permission, to assess the effects of outdoor physical activities on students.

Personal Information Form

The personal information form, created by the researchers, included questions about gender, age, prior participation in nature sports, whether the student had ever kept animals, had ever cultivated plants or flowers, and whether they had ever been involved in group activities.

Form Nature Connectedness Scale (NCS)

The "Nature Connectedness Scale" developed by Mayer and Frantz (2004) and adapted into Turkish by Bektaş et al. (2017) consists of two subdimensions and 8 items. The first subdimension is “integration with nature,” and the second subdimension is “being a part of nature.” The scale uses a 5-point Likert scale, ranging from "Strongly Disagree (1)" to "Strongly Agree (5)". In the adaptation study, the Cronbach Alpha value was found to be $\alpha = 0.88$, and in this study, it was $\alpha = 0.774$.

Enjoyment of Physical Activities Scale (EPAS)

The "Enjoyment of Physical Activities Scale" developed by Mullen et al. (2011) and adapted into Turkish by Özkurt et al. (2022) consists of 8 items.

The scale uses a 7-point Likert scale, ranging from "Strongly Disagree (1)" to "Strongly Agree (7)". In the adaptation study, the Cronbach Alpha value was α = 0.93, and in this study, it was α = 0.990.

Natural Area Recreation Self-Efficacy Scale (NARSES)

The "Natural Area Recreation Self-Efficacy Scale" developed by Mittelstaedt and Jones (2009) and adapted into Turkish by Dinç and Tez (2019) consists of two subdimensions and 13 items. The first subdimension is "skill and competence," and the second subdimension is "pleasure and success." The scale uses a 10-point Likert scale, ranging from "Not True at All (0)" to "Very True (10)". In the adaptation study, the Cronbach Alpha values for the subdimensions were α = 0.93 for "skill and competence" and α = 0.83 for "pleasure and success," while in this study, the Cronbach Alpha value was α = 0.946.

Social Interest Scale (SIS)

The "Social Interest Scale" developed by Greever et al. (1973) and adapted into Turkish by Soyer (2004) consists of a single dimension and 52 items. The scale uses a 4-point Likert scale, ranging from "Generally Appropriate (4)" to "Not Appropriate at All (0)". In the adaptation study, the Cronbach Alpha value was α = 0.82, and in this study, it was α = 0.857.

Data Analysis

The data obtained in the study was analyzed using the JASP statistical software, with a significance level set at 0.05. The normal distribution of the data was assessed using the Shapiro-Wilk test, homogeneity of variances was checked using Levene's test, and descriptive statistics were computed (mean, standard deviation, percentage, and frequency analysis). For comparisons involving two independent variables, the Mann-Whitney U test was used, and Paired Sample T-test was applied for comparisons of pre-test and post-test total scores.

Result

Table 2. Demographic Information of the Study Group

Variables	Groups	N	%	X	Std. dev
Gender	Female	15	50	1.500	0.509
	Male	15	50		
Age	18 – 22 Years	16	53.33	1.467	0.507
	23 – Over	14	46.66		
Have you ever participated in outdoor sports?	Yes	13	43.33	1.567	0.504
	No	17	56.66		
Have you ever had a pet before?	Yes	22	73.33	1.267	0.450
	No	8	26.66		
Have you ever had a tree, plant, or flower before?	Yes	24	80	1.200	0.407
	No	6	20		
Have you ever been involved in group activities before?	Yes	23	76.66	1.233	0.430
	No	7	23.33		

Table 3. Pre-Post Test and Last Test Analysis Results Between Groups for Gender Variable

Pre-Post	Gender	N	X	SS	t	df	p
Nature Attachment	Female	15	3.408	0.512	-2.138	28	**0.041***
	Male	15	3.892	0.710			
Physical Activity Enjoyment	Female	15	5.533	1.845	-0.340	28	0.736
	Male	15	5.775	2.043			
Natural Area Recreation Self-Efficacy	Female	15	8.110	1.854	-1.920	28	0.065
	Male	15	9.157	1.013			
Social Interest	Female	15	3.140	0.339	-1.282	28	0.210
	Male	15	3.319	0.423			
Last Test							
Nature Attachment	Female	15	3.800	0.635	-0.619	28	0.541

	Male	15	3.975	0.892			
Physical Activity Enjoyment	Female	15	5.558	2.001	-2.002	28	0.055
	Male	15	6.642	0.623			
Natural Area Recreation Self-Efficacy	Female	15	11.631	10.833			
	Male	15	9.690	1.814	0.684	28	0.499
Social Interest	Female	15	3.371	0.460			
	Male	15	3.568	0.474	-1.157	28	0.257

*p<0.05

Table 4. Study Group Pre-Post and Last Test Analysis Results

Pre-Post	Last Test	N	X	SS	t	df	p
Nature Attachment	Nature Attachment	30	3.650	0.656	-1.424	29	0.165
			3.888	0.766			
Physical Activity Enjoyment	Physical Activity Enjoyment	30	5.654	1.916	-1.121	29	0.271
			6.100	1.557			
Natural Area Recreation Self-Efficacy	Natural Area Recreation Self-Efficacy	30	8.633	1.561	-1.405	29	0.171
			10.661	7.695			
Social Interest	Social Interest	30	3.229	0.388	-3.042	29	**0.005***
			3.469	0.470			

*p<0.05

In Table 2, the demographics of the participants show that the gender distribution is equal, with 50% (15) male and 50% (15) female students. Regarding age groups, 53.3% (16) are between 18-22 years old, and 46.6% (14) are aged 23 and above. In terms of prior participation in outdoor sports, 43.3% (13) have participated, while 56.6% (17) have not. When asked about pet ownership, 73.3% (22) own pets, and 26.6% (8) do not. Regarding the cultivation of trees, plants, or flowers, 80% (27) have done so, while 20% (6) have not. Lastly, in terms of participation in group activities, 76.6% (23) have been involved, and 23.3% (7) have not participated in any group activities.

In Table 3, in the pre-test analysis results of the gender variable of the study group, it was determined that there was a significant difference within the group according to the gender variable of the nature attachment scale (p>0.041), while there was no significant difference in the other three scales (p<0.05). In the post-test analysis results of the study group, it was understood that there was no significant difference in all scales. In the pre-test results of the study, it was understood that men (x: 3.892) were more attached to nature than women (x: 3.408) in the nature attachment scale. It was seen that there was no significant difference in the post-test data (p<0.05).

In the pre-test and post-test analysis results of the study group in Table 4, no statistically significant difference was found in the scales of attachment to nature (p<0.165), enjoyment of physical activities (p<0.271) and natural area recreation self-efficacy (p<0.171) (p<0.05). In the social interest scale of the study, it was understood that there was a statistically significant borderline difference between the pre-test (x: 3.229) and post-test (x: 3.469) resuts.

Discussion

This study, involving an 8-week randomized controlled intervention, examined nature connectedness, enjoyment of physical activities, natural area recreation self-efficacy, and levels of social interest. The findings revealed significant insights into these variables, supported by previous research. Regarding gender differences, the pre-test analysis showed a significant difference in nature connectedness based on gender (p > 0.041), with males (mean=3.892) being more connected to nature than females (mean=3.408). However, by the post-test, the scores for both males (mean = 3.800) and females (mean=3.975) were nearly identical, suggesting that females had increased their connection to nature during the intervention, aligning

with males. No significant statistical differences were found in nature connectedness ($p<0.165$), enjoyment of physical activities ($p<0.271$), and natural area recreation self-efficacy ($p<0.171$) between the pre- and post-test results. However, the social interest scale showed a borderline statistical difference, with a slight increase from pre-test (mean=3.229) to post-test (mean = 3.469). This indicates that the intervention likely had a moderate impact on social interest, supporting previous findings that nature interaction can positively influence psychological well-being (Helliwell et al., 2020). Nature-based recreational activities are known to strengthen social bonds and increase community engagement (Pretty et al., 2007), which aligns with the increase in social interest observed in this study. Although no significant changes were found in enjoyment of physical activities and self-efficacy in natural areas, this suggests the need for interventions with stronger strategies to motivate physical activity. Research on exercise motivation indicates that social support and environments that promote physical activity participation can enhance program effectiveness (Ryan & Deci, 2000; Lippke et al., 2009). Additionally, strengthening social connections and creating supportive environments are crucial strategies for increasing physical activity motivation (Deci & Ryan, 2008). The significant increase in social interest indicates that nature-based group activities can effectively strengthen interpersonal bonds. This finding is consistent with studies examining the role of social interaction and belongingness in psychological health (Haslam et al., 2009; Jetten et al., 2017), showing that nature-themed group activities may foster a sense of community and belonging. The study's findings also underline the importance of considering gender differences. Pre-test data revealed that males had a higher connection to nature compared to females. However, by the post-test, this gender gap had narrowed, suggesting that the intervention equally impacted both genders. Literature supports the idea that gender differences may influence psychological well-being, but interventions can help reduce these disparities (Nolen-Hoeksema, 2012). The study's limitations include the small sample size and the homogeneity of the demographic group, which limit the generalizability of the findings. Additionally, the short duration of the intervention precludes the assessment of long-term effects. Future studies with larger samples and longer interventions could provide more robust results and further validate these findings. In conclusion, while the study observed improvements in social interest, the results emphasize the need for nature-based interventions that better engage participants in physical activity and strengthen social connections, which could enhance overall well-being.

Conclusion

This study investigated the effects of an 8-week randomized controlled intervention on participants' nature connectedness, enjoyment of physical activities, natural area recreation self-efficacy, and social interest levels. The demographic analysis of participants provided detailed information regarding their gender, age, participation in nature sports, pet ownership, plant cultivation, and involvement in group activities. In terms of gender differences, the pre- and post-test analyses showed that males exhibited a higher connection to nature than females at the beginning of the study. However, by the post-test, no significant differences between genders were observed. Additionally, there were no notable differences between genders on the enjoyment of physical activities, natural area recreation self-efficacy, or social interest scales. Regarding the pre- and post-test results for the entire group, there were no significant changes in nature connectedness, enjoyment of physical activities, or natural area recreation self-efficacy ($p>0.05$). However, a statistically significant increase was observed in social interest levels ($p<0.05$), indicating that participants showed greater interest in social engagement over the course of the intervention. This suggests that nature-based interventions may have a positive impact on certain social and psychological aspects, particularly fostering social interest, but may require longer durations to produce meaningful changes in other areas like nature connectedness or physical activity enjoyment. These findings indicate that while 8 weeks may be insufficient to significantly enhance nature connectedness, enjoyment of physical activities, or self-efficacy in natural area recreation, nature-based activities can have a positive impact on social interest. It also suggests that longer intervention periods may be necessary to see more substantial improvements in these other areas. Consequently, future research should explore extended interventions to better assess the long-term effects of nature-based programs on a broader range of psychological and social skills.

Suggestions

- Since no significant changes were observed in factors such as nature connectedness, enjoyment of physical activities, and natural area recreation self-efficacy, it is recommended to implement longer-duration interventions

(e.g., 12 weeks or more) that include a variety of nature activities. Allowing participants more time to interact with nature may help assess long-term impacts more effectively.

- Tailoring nature and physical activity programs to suit the individual characteristics of participants can facilitate their development at their own pace. For beginners, starting with simpler, lower-intensity activities could be beneficial to ensure gradual progress and sustained engagement.
- The study was conducted on a specific group of participants. Future research could explore the effects of similar interventions across different age groups, socio-economic levels, or lifestyles. This would enable the generalization of findings to a broader population.
- To increase interest in nature and physical activities, providing motivational support is essential. This could include rewards, group support, and educational guidance, helping participants enjoy the process more and successfully complete the program.
- While an improvement in social interest was observed, further enhancement can be achieved through group activities, social events, and programs focusing on social skill development. These initiatives could foster greater social interaction and strengthen social bonds among participants.
- Encouraging a closer relationship with nature may also involve focusing on environmental factors. Increasing the accessibility of local parks, walking trails, and natural spaces could encourage more time spent outdoors, enhancing the participants' connection with nature and encouraging physical activity.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors declare that there is no conflict of interests.

Ethical Approval

Ethical approval was obtained from the Kilis 7 Aralık University Ethics Committee on 03.05.2024, with the approval number E.50481.

Authors' Contribution

Study Design: FG, AÇ, AY, AA.
Data Collection: FG, AÇ, AY, AA.
Statistical Analysis: FG, AÇ, AY.
Manuscript Preparation: FG, AÇ, AY, AA.
Funding Acquisition: FG, AÇ, AY, AA.

References

Adler, A. (2000). Psychological Activity: *A Sense of Superiority and Social Interest*, Trans: Belkıs Çorakçı, Say Publishing.

Adler, A. (2008). Neurotic Problems: *Social Emotion Deprivation and Masculine Protest*, Trans: Ali Kılıçoğlu, Say Publishing.

Ardahan, F., & Lapa, T. Y. (2011). Outdoor Recreation: Reasons for Nature Sport Participation and Benefits Obtained by Cyclists and Hikers. *International Journal of Human Sciences*, 8(1), 1327-1341.

Aslan, E., & Yıldız, K. (2024). Nature Athletes' Self-Efficacy Perceptions, Sense of Responsibility, and Behaviors: A Study. *Sportive*, 7(2), 70-81.

Barton, J., Bragg, R., Pretty, J., Roberts, J., & Wood, C. (2016). The wilderness expedition: An effective life course intervention to improve young people's well-being and connectedness to nature. *Journal of Experiential Education*, 39(1), 59-72.

Bektaş, F., Kural, B., & Orçan, F. (2017). Turkish adaptation of the Nature Connectedness Scale: Validity and reliability study. *Journal of Physical Education and Sports Sciences*, 11(1), 77-86.

Burke, S. M., & Utley, A. (2013). Climbing towards recovery: Investigating physically injured combat veterans' psychosocial response to scaling Mt. Kilimanjaro. *Disability and Rehabilitation*, 35(9), 732-739 https://doi.org/10.3109/09638288.2012.707743.

Cook, T. D. (1979). Quasi-experimentation: *Design and analysis issues for field settings*, Rand McNaly College Publishing.

Corey, G. (2019). Psychological Counseling: *Psychotherapy Theories and Practices*, Trans: Tuncay Ergene, Mentis Publishing.

Çınar, B., & Duran, A. (2021). The effect of connection to nature on participation motivation in nature walks. *Turkish Journal of Tourism Research*, 5(1), 754-766.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, 49(3), 182.

Demirel, M., Gürbüz, B., & Karaküçük, S. (2009). The effect of participation in recreational activities on attitudes towards the environment and the validity and reliability of the New Ecological Paradigm Scale. *Spormetre Journal of Physical Education and Sports Sciences*, 7(2), 47-50.

Dinç, S. C., & Tez, Ö. Y. (2019). Natural Area Recreation Self-Efficacy Scale: Validity and reliability study. *Gaziantep University Journal of Sports Sciences*, 4(3), 394-410.

Dyment, J. E., & Potter, T. G. (2015). Is outdoor education a discipline? Provocations and possibilities. *Journal of Adventure Education and Outdoor Learning*, 15(3), 193-208.

Eigenschenk, B., Thomann, A., McClure, M., Davies, L., Gregory, M., Dettweiler, U., & Inglés, E. (2019). Benefits of outdoor sports for society. A systematic literature review and reflections on evidence. *International Journal of Environmental Research and Public Health*, 16(6), 937.

Ergüner Tekinalp, B. & Terzi, Ş. (2016). Coping, social interest, and psychological birth order as predictors of resilience in Turkey. *Applied Research in Quality of Life*. 11(2), 509-524.

Ertaş, M., & Aktaş, G. (2019). Rekreatif gruplara üyelik: Motosiklet grupları üzerine bir inceleme. *Anatolia: Turizm Araştırmaları Dergisi*, 30(1), 19-30.

Ewert, A. W., & Sibthorp, J. (2014). Outdoor adventure education: *Foundations, theory, and research*, Human Kinetics.

Fallahpour, M., Borell, L., Luborsky, M., & Nygård, L. (2016). Leisure-activity participation to prevent later-life cognitive decline: a systematic review. Scandinavian *Journal of Occupational Therapy*, 23(3), 162-197.

Fisher, A. (2003). Radical Ecopsychology: Psychology in the service of Life. *Human Ecology Review*, 10(2), 187.

Goldenberg, M., Soule, K., Cummings, J., & Pronsolino, D. (2010). Longitudinal participant outcomes associated with Outward Bound and National Outdoor Leadership School: A means-end investigation. *Research in Outdoor Education*, 10(1), 57-73.

Greever, K. B., Tseng, M. S., & Friedland, B. U. (1973). Development of the Social Interest Index. *Journal of Consulting and Clinical Psychology*, 41(3), 454.

Gül, F. (2013). Environmental problems and philosophy in the context of the human-nature relationship. *Pamukkale University Journal of Social Sciences Institute*, (14), 17-21.

Gürer, B., & Mermer, K. K. (2023). Environmental awareness, environmental sensitivity, and connection to nature: A study on teachers. *Journal of Sports and Performance Research*, 14(3), 349.

Gürer, B., Ünal, S., & Arıkan, V. B. (2020). The effect of outdoor sports on individuals' general self-efficacy on problem-solving skills. *Spormetre Journal of Physical Education and Sports Sciences*, 18(2), 13-26.

Haslam, C., Jetten, J., Postmes, T., & Haslam, S. A. (2009). Social identity and health: *Perspectives in Social Psychology*. Psychology Press.

Helliwell, J. F., Layard, R., & Sachs, J. (2013). World Happiness Report 2013, Sustainable Development Solutions Network.

Helliwell, J. F., Layard, R., & Sachs, J. (2020). World Happiness Report 2020, Sustainable Development Solutions Network.

Helvacı, F. (2012). Romantik ilişkilerde sorun çözme ve sosyal ilginin aşka ilişkin tutumlarla ilgisi (Yayınlanmamış yüksek lisans tezi). Ondokuz Mayıs Üniversitesi, Eğitim Bilimleri Enstitüsü, Samsun.

Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7: 1-16.

Jetten, J., Haslam, C., & Haslam, S. A. (2017). The Social Cure: *Identity, Health and Well-Being*, Psychology Press.

Jones, J. J., & Hinton, J. L. (2007). Study of Self-Efficacy in Freshman Wilderness Experience Program: Measuring General Versus Specific Gains. *Journal of Experiential Education, Symposium on Experiential Education Research*, 29(3), 382-385.

Kaplan, H. B. (1991). Sex differences in social interest. *Individual Psychology: Journal of Adlerian Theory, Research & Practice*, 34(2), 206.

Kidd, S., & Shahar, G. (2008). Resilience in homeless youth: the key role of self-esteem. *American Journal of Orthopsychiatry*, 78(2), 163.

Leak, G. K., & Williams, D. E. (1991). Relationship between Social Interest and Perceived Family Environment. *Individual Psychology: The Journal of Adlerian Theory, Research & Practice*, 47(1), 159.

Lee, S. Y., Kim, S. M., Lee, R. S., & Park, I. R. (2024). Effect of participation motivation in sports climbing on leisure satisfaction and physical self-efficacy. *Behavioral Sciences*, 14(1), 76.

Lippke, S., Ziegelmann, J. P., & Schwarzer, R. (2009). Modeling physical activity and its outcomes: A review of the literature. *International Journal of Behavioral Medicine*, 16(1), 1-10.

Llewellyn, D. J., Sanchez, X., Asghar, A., & Jones, G. (2008). Self-efficacy, risk taking and performance in rock climbing. *Personality and Individual Differences*, 45(1), 75-81.

Martin, B., Breunig, M., Wagstaff, M., & Goldenberg, M. (2024). Outdoor leadership: *Theory and practice*, Human Kinetics.

Martyn, P., & Brymer, E. (2016). The relationship between nature relatedness and anxiety. *Journal of Health Psychology*, 21(7), 1436-1445.

Mater, M. E. (2020). Participation in recreation camps and its relation to self-efficacy and positive future view at Mansoura University students. *International Journal of Sports Science and Arts*, 15(015), 81-103.

Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24(4), 503-515.

Mcphie, J., & Clarke, D. A. (2020). Nature matters: Diffracting a keystone concept of environmental education research–Just for kicks. *Environmental Education Research*, 26(9-10), 1509-1526.

Mitchell, R. (2013). Is physical activity in natural environments better for mental health than physical activity in other environments?. *Social Science & Medicine*, 91: 130-134.

Mittelstaedt, R. D., & Jones, J. J. (2009). Outdoor recreation self-efficacy: Scale development, reliability and validity. *Journal of Outdoor Recreation, Education, and Leadership*, 1(1), 97-120. https://doi.org/10.7768/1948-5123.1006.

Mullen, S. P., Olson, E. A., Phillips, S. M., Szabo, A. N., Wójcicki, T. R., Mailey, E. L., ... & McAuley, E. (2011). Measuring enjoyment of physical activity in older adults: invariance of the physical activity enjoyment scale (paces) across groups and time. *International Journal of Behavioral Nutrition and Physical Activity*, 8(1), 103.

Murrock, C. J., Bekhet, A., & Zauszniewski, J. A. (2016). Psychometric evaluation of the physical activity enjoyment scale in adults with functional limitations. *Issues in Mental Health Nursing*, 37(3), 164-171.

Musitu-Ferrer, D., León-Moreno, C., Callejas-Jerónimo, J. E., Esteban-Ibáñez, M., & Musitu-Ochoa, G. (2019). Relationships between parental socialization styles, empathy and connectedness with nature: Their implications in environmentalism. International *Journal of Environmental Research and Public Health*, 16(14), 2461.

Nikelly, A. G. (1991). Social Interest: A Paradigm for Mental Health Education. Individual Psychology: *The Journal of Adlerian Theory, Research & Practice*, 47(1), 79-88.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior*, 41(5), 715-740.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2011). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, 12: 303-322.

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual Review of Clinical Psychology*, 8: 161-187.

Özkurt, B., Küçükibiş, H. F., & Altın, Y. (2022). An investigation of high school and university students' enjoyment levels in physical activities. *Sivas Cumhuriyet University Journal of Sports Sciences*, 3(3), 91-98.

Özkurt, B., Küçükibiş, H. F., & Eskiler, E. (2022). The Physical Activity Enjoyment Scale (PAES): Adaptation to Turkish culture, validity, and reliability study. *Anemon Muş Alparslan University Journal of Social Sciences*, 10(1), 21-37.

Peker, H., Teke, C., Çakar, B., Kabadayı, Y., & Caner, N. (2023). The relationship between physical activity enjoyment, intention to re-participate, and happiness: A case of university students participating in campus recreation. *International Journal of Current Education Research*, 9(2), 206-220.

Perttula, A., Kiili, K., Lindstedt, A., & Tuomi, P. (2017). Flow experience in game based learning – a systematic literature review. *International Journal of Serious Games*, 4(1), 57-72.

Powell, S. M., Carpenter, K. E., Novik, M. G., & Gibson, H. M. (2023). Exploring the Influence of Self-Efficacy and Autonomy on Outdoor Recreation Behaviors during the COVID-19 Pandemic. *Journal of Outdoor Recreation, Education, and Leadership*, 15(2).

Pretty, J., Peacock, J., Hine, R., Sellens, M., & South, N. (2007). Green exercise in the UK countryside: Effects on health and psychological well-being, and implications for policy and planning. *Journal of Environmental Psychology*, 27(3), 281-291.

Priest, S., & Gass, M. (2018). *Effective leadership in adventure programming*, 3E Human Kinetics.

Prince, H. E. (2017). Outdoor experiences and sustainability. *Journal of Adventure Education and Outdoor Learning*, 17(2), 161-171.

Roszak, T. (2001). The voiceof the earth: *An exploration of ecopsychology*. Phanes Press.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.

Schultz, P. W. (2000). New environmental theories: Empathizing with nature: The effects ofPerspective taking on concern for environmental issues. *Journal Of Social İssues*, 56(3), 391-406.

Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, 24(1), 31-42.

Shellman, A., & Hill, E. (2017). Flourishing through resilience: the impact of a college outdoor education program. *Journal of Park and Recreation Administration*, 35(4), 59-68.

Singh, A. S., Saliasi, E., Van Den Berg, V., Uijtdewilligen, L., De Groot, R. H., Jolles, J., ... & Chinapaw, M. J. (2019). Effects of physical activity interventions on cognitive and academic performance in children and adolescents: a novel combination of a systematic review and recommendations from an expert panel. *British Journal of Sports Medicine*, 53(10), 640-647.

Smith, A. P., Metcalf, E. C., Nesbitt, H. K., Leonard, H. J., Cummins, T. M., Metcalf, A. L., & Graefe, A. R. (2022). Confidence, community & conservation: Exploring the relationship between self-efficacy and experience in female hunters. *Journal of Outdoor Recreation and Tourism*, 40: 100568.

Smith, C. A., & Lazarus, R. S. (1990). Emotion and adaptation. Handbook of personality: *Theory and research*, 21: 609-637.

Soyer, M. (2004). Adaptation of social interest scale: Validity and reliability studies. *Turkish Journal of Psychological Counseling and Guidance*, 3(21), 29-34.

Sweet, S. N., Fortier, M. S., Strachan, S. M., & Blanchard, C. M. (2012). Testing and integrating self-determination theory and self-efficacy theory in a physical activity context. *Canadian Psychology*, 53(4), 319–327.

Tağrikulu, P., Gül, A. C., & Çobanoğlu, E. O. (2021). Determining the levels of nature connectedness of teacher candidates. *Ondokuz Mayis University Journal of Education Faculty*, 40(1), 441-458.

Taniguchi, S. T., Bennion, J., Duerden, M. D., Widmer, M. A., & Ricks, M. (2017). Self-efficacy of risk taking in outdoor recreation as a predictor of the self-efficacy of risk taking in essay writing. *Journal of Outdoor Recreation, Education, and Leadership*, 9(4), 425-438.

Teques, P., Calmeiro, L., Silva, C., & Borrego, C. (2020). Validation and adaptation of the Physical Activity Enjoyment Scale (PACES) in fitness group exercisers. *Journal of Sport and Health Science*, 9(4), 352-357.

Vilarroig, J. V., & Bernardo, M. P. R. (2017). Programa asistido con caballos para la atención psicopedagógica de un adolescente con tda-h. *Quaderns digitals: Revista de Nuevas Tecnologías y Sociedad*, 84: 142-155.

Weng, P., & Chiang, Y. (2014). Psychological restoration through indoor and outdoor recreation activities. *Journal of Leisure Research*, 46(2), 203–217.

Zhang, J. W., Howell, R. T., & Iyer, R. (2014). Engagement with natural beauty moderates the positive relation between connectedness with nature and psychological well-being. *Journal of Environmental Psychology*, 38: 55-63.