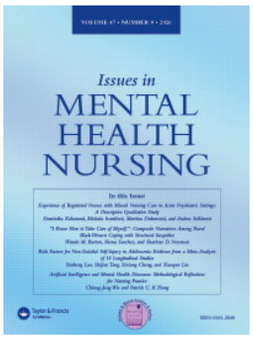

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The Solastalgia Scale: Turkish Validity and Reliability Study

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ABSTRACT

This study aimed to adapt the Solastalgia subscale of the Environmental Distress Scale (EDS) into Turkish and evaluate its validity and reliability among Turkish-speaking adults. A cross-sectional psychometric validation design was employed. The adaptation process followed standard translation procedures, expert review, and pilot testing. Data were collected from 439 adults. Exploratory and confirmatory factor analyses were conducted in two randomly split independent subsamples to cross-validate the factor structure. The Turkish Solastalgia Scale demonstrated a robust unidimensional structure explaining 53.5% of the total variance. Confirmatory factor analysis indicated good model fit (χ^2/df = 3.839, CFI = 0.968, RMSEA = 0.081). Internal consistency was high (Cronbach's α = 0.91), test–retest reliability was strong (r = 0.88), and convergent validity with the Climate Change Worry Scale was substantial (r = 0.82). Solastalgia scores were significantly higher among individuals with stronger attachment to nature and greater climate-related concern. The Turkish version of the Solastalgia Scale is a valid and reliable instrument for assessing psychological distress associated with environmental degradation.

Introduction

Solastalgia is a term introduced by Glenn Albrecht (2005) to describe emotional and psychological distress individuals feel when their home environment degrades, even though they have not physically relocated (Albrecht et al., 2007). Derived from "solace," "algos" (pain), and "nostalgia," it encapsulates grief, loss, and powerlessness when familiar landscapes are transformed. Solastalgia is closely linked to place attachment and place identity; as climate change effects intensify, especially among younger adults, rising levels of anxiety, helplessness, and existential worry are being documented (Weiß et al., 2024). The concept of "anticipatory solastalgia" has additionally emerged, to capture distress stemming from expected future environmental losses (Stanley, 2023).

Global environmental crises, such as climate change, biodiversity loss, and habitat destruction, are increasingly recognized not only for their physical but also for their mental health impacts. Studies show that exposure to drought, wildfires, habitat loss, and other ecological threats leads to psychological distress (Cunsolo Willox et al., 2012; McNamara & Westoby, 2011; Sartore et al., 2008).

Among the earliest quantitative tools for assessing such distress is the Environmental Distress Scale (EDS) developed by Higginbotham et al. (2007). The EDS outlines four response phases: perception of environmental risk, cognitive appraisal, emotional/physical reaction, and coping, and includes a Solastalgia subscale which targets emotions such as grief, helplessness, and loss triggered by local environmental degradation. In Turkey, tools like the Climate Change Worry Scale (Özbay & Alci, 2021) and the Eco-Anxiety Scale (Uzun et al., 2022) exist, but they focus largely on general or future-oriented environmental worry rather than lived, place-based distress.

The Solastalgia subscale of EDS provides a more grounded framework, capturing place-based grief, disrupted belonging, and erosion of identity (Cunsolo Willox et al., 2012). To date, however, empirical work on solastalgia in Turkey is limited, mostly conceptual or qualitative, and lacks a culturally validated quantitative scale (Armağan, 2024; Özkan, 2025). Although solastalgia has been described through multiple psychological manifestations—including place-based distress, grief, disrupted belonging, loss of place identity, and emotional responses to environmental degradation—these experiences are not conceptualized as independent psychological dimensions. Rather, they are regarded as interrelated expressions of a single underlying construct reflecting distress arising from environmental change. The original Environmental Distress Scale conceptualizes solastalgia as one coherent latent construct, with each item representing a different manifestation of the same emotional experience rather than

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distinct subdomains. Consequently, a unidimensional factor structure was theoretically expected in the present study, consistent with the original scale development and subsequent psychometric evaluations. The purpose of the exploratory factor analysis was therefore not to identify multiple dimensions of solastalgia, but to examine whether the theoretically proposed unidimensional structure could be replicated within the Turkish cultural context. Therefore, this study aims to adapt the Solastalgia subscale of EDS into Turkish and evaluate its psychometric properties among Turkish-speaking adults. Establishing a valid and reliable instrument is important for understanding how environmental degradation affects mental health in Turkey and for informing public health policy and intervention.

Method

Participant

We recruited 439 young adults living in Turkey. Following Thorndike (1995), for a nine-item scale the recommended sample size is 5–10 times the item count (45–90 participants); our sample exceeded this guideline to improve robustness (Thorndike, 1995). Participants were recruited via snowball sampling in public and institutional settings. Data were collected in person using printed questionnaires. Inclusion criteria: age ≥18, living in Turkey, Turkish fluency, voluntary participation. Participants who reported a psychiatric diagnosis other than mood disorder were excluded via a self-report item. Prior to participant recruitment, ethical approval was obtained from the Institutional Review Board, and all participants provided written informed consent before enrollment in the study.

Study design

Permission to evaluate the psychometric properties of the Solastalgia Scale in the Context of Environmental Distress in Turkish was obtained via e-mail from the scale's original developer. Data collection was conducted between April and May 2025. The questionnaire form included demographic questions (e.g. age, gender, education level), the Turkish version of The Solastalgia Scale in the Context of Environmental Distress, and the Climate Change Worry Scale (CCWS).

Ethical considerations

Ethical approval for this study was obtained from the Non-Interventional Research Ethics Committee of Istanbul Beykent University prior to data collection. Ethical approval was not obtained from Istanbul Beykent University. Istanbul Beykent University was the institution where the study was conducted. The ethical approval was obtained from the Istanbul Medipol University Non-Interventional Research Ethics Committee (Istanbul, Turkey) (Approval date: 14 March 2025; Approval No: E-10840098-202.3.02-2024).

Language validity and cultural adaptation process

The original Environmental Distress Scale (EDS) was developed in English. Cross-cultural adaptation of the Solastalgia subscale followed the six-step guideline proposed by Beaton et al. (2000). Three independent bilingual translators, whose native language was Turkish, produced separate forward translations from English into Turkish. These versions were synthesized into a single preliminary Turkish version through consensus among the research team. Subsequently, one independent bilingual translator, who had not participated in the forward translation process and was blinded to the original version of the scale, performed the back-translation into English. Using an independent back-translator is recommended to minimize translation bias and to ensure conceptual rather than literal equivalence between the translated and original versions. The back-translated version was compared with the original English scale, and no substantial conceptual discrepancies were identified. In addition to forward- and back-translation, particular attention was paid to semantic clarity, conceptual equivalence, and cultural appropriateness during expert review and pilot testing. During pilot testing, participants were specifically asked whether any item was unclear, difficult to understand, or culturally inappropriate. No major comprehension problems were reported, and only minor wording refinements were made before finalizing the Turkish version.

Content validity

Nine psychiatric nursing academicians with strong English proficiency evaluated each item. We calculated Content Validity Ratio (CVR) *via* the Lawshe method; with nine experts, the minimum acceptable CVR is 0.78 (Ayre & Scally, 2014). All items met or exceeded this threshold. The overall Content Validity Index (CVI) was 0.93.

Pilot study

In scale adaptation studies, it is recommended to test the instrument on a group of 20 to 30 individuals similar to the main sample but excluded from final analyses (Karagöz, 2016). In the present study, the Turkish version was pilot-tested with 37 participants. Following completion of the pilot administration, participants were asked whether any items were unclear, difficult to understand, or culturally inappropriate. Overall, no major comprehension problems were identified. Based on participant feedback, minor wording revisions were made to improve linguistic clarity and cultural appropriateness while preserving the conceptual meaning of the original items. The revised version was subsequently used in the main validation study. For example, during pilot testing, the literal translation of the term "landscape" was found to sound overly narrow in Turkish because it primarily evokes a visual scene. Therefore, the wording was revised to refer more broadly to the participant's surrounding environment, thereby improving conceptual clarity and cultural appropriateness while preserving the intended meaning of the original item.

Test–retest

After the language validity process was completed and the final Turkish version of the Solastalgia Scale was established, the scale's reliability was assessed using test–retest and internal consistency methods. To evaluate temporal stability, the finalized version was administered to 37 adult volunteers on two occasions separated by a 30-day interval. The correlation between the first and second administrations was strong ($r = 0.88$, $p < 0.001$), indicating excellent test–retest reliability and stability of the instrument over time.

Data collection tools

Investigator-developed demographic survey

An investigator-developed demographic survey was designed to collect participants' demographic and environmental characteristics. The survey included questions regarding age, gender, education level, marital status, income, psychiatric and chronic disease history, emotional attachment to nature, time spent in natural environments, and responses to environmental issues.

The Solastalgia scale

The Environmental Distress Scale (EDS), developed by Higginbotham et al. (2007), was designed to assess how individuals emotionally and socially respond to environmental change (Higginbotham et al., 2007). Based on qualitative research conducted in Australia's Upper Hunter Valley, it captures emotional, cognitive, and behavioural responses to ecological disruption across six subdimensions: hazard perception, threat appraisal, felt impact, solastalgia, environmental action, and resource loss. The Solastalgia subscale consists of nine items rated on a five-point Likert scale and measures emotional distress associated with local environmental degradation, including grief, helplessness, and loss of place identity. In the original validation study, the English version of the Solastalgia subscale was administered to adults living in the Upper Hunter Valley region of Australia and demonstrated excellent internal consistency (Cronbach's $\alpha = 0.93$) together with a stable unidimensional factor structure (Higginbotham et al., 2007)

Climate change worry scale (CCWS)

The Climate Change Worry Scale (CCWS), developed by Stewart (2021), measures individuals' climate-related worries (Stewart, 2021). Adapted into Turkish by Özbay and Alci (2021), the scale retained its unidimensional structure and showed excellent internal consistency (Cronbach's alpha = 0.980) (Özbay & Alci, 2021). In this study, reliability was also high ($\alpha = 0.934$). The Climate Change Worry Scale (CCWS) is a 10-item self-report instrument developed by Stewart (2021) to assess personal worry about climate change. Items are rated on a 5-point frequency scale ranging from 1 (Never) to 5 (Always), with higher scores indicating greater climate change worry. The CCWS has demonstrated a unidimensional structure, excellent internal consistency, and satisfactory evidence of convergent and discriminant validity in the original validation studies.

The Climate Change Worry Scale (CCWS) was selected to evaluate convergent validity because it measures a construct that is theoretically related, but not identical, to solastalgia. According to the nomological network of environmental distress, solastalgia, climate change worry, eco-anxiety, and ecological grief represent distinct yet conceptually interconnected emotional responses to environmental change. While solastalgia primarily reflects distress arising from changes in one's immediate environment and loss of place, climate change worry captures concern regarding the broader consequences of climate change. Therefore, a positive correlation between these constructs was theoretically expected, while recognizing that they assess related rather than equivalent psychological phenomena (Clayton, 2020; Galway et al., 2019; Stanley, 2023).

Data analysis

The data were analysed using IBM SPSS 25 and AMOS 24.0. Frequencies, percentages, means, and standard deviations were used to describe variables. Normality was assessed *via* skewness and kurtosis (±1). Parametric tests (independent samples t-test, one-way ANOVA) and Pearson correlation was applied to normally distributed data. Validity and reliability analyses followed Beaton et al. (2000) and COSMIN guidelines (Beaton et al., 2000; Mokkink et al., 2016). Sample adequacy was tested using KMO and Bartlett's test. To address potential overfitting and to cross-validate the factor structure, the total sample ($N = 439$) was randomly split into two independent subsamples. Exploratory factor analysis (EFA) was conducted in Subsample 1 ($n = 219$), and confirmatory factor analysis (CFA) was performed in Subsample 2 ($n = 220$). Reliability analyses and convergent validity analyses were conducted on the full sample unless otherwise specified. Convergent validity was evaluated using Pearson's correlation coefficient between the Turkish Solastalgia Scale and the Climate Change Worry Scale (CCWS), based on the theoretical expectation that the two instruments assess conceptually related, yet distinct, constructs within the nomological network of environmental distress.

Results

Sociodemographic characteristics of the participants

When the sociodemographic characteristics of the participants were examined, it was found that 82.9% were female, 95.4% had a university degree or higher, and 96.1% were single. Additionally, 67.2% reported that their income was equal to their expenses. Furthermore, 95.2% had no

Table 1. Participants' environmental experiences and perceptions.

Variables		*n*	%
I am strongly attached to nature.	No	244	55.6
	Yes	195	44.4
I regularly spend time in natural areas.	No	274	62.4
	Yes	165	37.6
Climate change worries me.	Never/Rarely	110	25.1
	Sometimes	169	38.5
	Often/Always	160	36.4
My concern about environmental issues affects my daily life.	No	68	15.5
	Sometimes	253	57.6
	Yes	118	26.9
I feel hopeless or helpless because of environmental crises.	No	145	33.0
	Sometimes	196	44.6
	Yes	98	22.3
I feel anger in response to environmental damage.	No	125	28.5
	Sometimes	159	36.2
	Yes	155	35.3
How do I express myself and my behaviours in response to environmental damage?	I'm not interested at all.	61	13.9
	I only raise awareness through social media.	274	62.4
	I actively participate in environmental activities or organizations, or I make donations.	51	11.6I
Have you ever felt anger in response to environmental damage?	I only raise awareness through social media.	49	11.2
	I actively participate in environmental activities or organizations, or I make donations.	285	64.9
I see myself as someone who protects and cares about the environment.	No	105	23.9
	Partially	247	56.3
	Yes	178	40.5
Which habit do I practice most in my daily life to protect the environment?	I reduce waste (e.g. recycle, minimize packaging use)	247	56.3
	I choose a sustainable lifestyle (e.g. eat a plant-based diet, use public transportation)	178	40.5
	I don't practice any of these.	14	3.2

Note: The items presented in this table were investigator-developed questions designed to describe participants' environmental experiences, perceptions, and behaviours. These questions were not derived from the Climate Change Worry Scale (CCWS) and were included solely for descriptive purposes.

psychiatric diagnosis, and 91.8% reported having no chronic illness. The mean age of the participants was 21.71 ± 2.19.

Environmental experiences and perceptions of the participants

The environmental experiences and perceptions of the participants are presented in Table 1. Approximately 44.4% of the participants reported a strong emotional attachment to nature, and 37.6% indicated that they regularly spent time in natural environments. More than half of the participants reported that concerns about climate change and environmental issues affected their daily lives. Feelings of hopelessness or anger in response to environmental crises were reported by approximately 30%–45% of the sample. Participants also reported engaging in various pro-environmental behaviours, including raising environmental awareness, adopting environmentally friendly habits, and taking direct environmental action.

Findings related to the reliability and validity of the scale

Item analysis

To determine the suitability of the sample for factor analysis, the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity were performed. In Subsample 1 ($n = 219$), the Kaiser–Meyer–Olkin (KMO) value was 0.905, indicating excellent sampling adequacy, and Bartlett's test of sphericity was significant ($\chi^2 = 1765.129$, $p < 0.001$), confirming that the data were suitable for factor analysis. Exploratory factor analysis (EFA) supported a one-factor solution. All items loaded on a single factor with loadings above 0.35, and no items were removed. Item-total correlations ranged from 0.48 to 0.75, and the scale explained 53.5% of the variance (Figure 1).

Construct validity

Confirmatory factor analysis (CFA) was conducted in Subsample 2 ($n = 220$) to test the unidimensional structure of the Solastalgia Scale. The model demonstrated good fit: $\chi^2/df = 3.839$, CFI = 0.968, IFI = 0.969, TLI = 0.953, GFI = 0.958, RMSEA = 0.081. These indices are within acceptable to excellent thresholds ($\chi^2/df < 5$, CFI/IFI/TLI > 0.90, RMSEA < 0.10), supporting the one-factor structure. Standardized factor loadings ranged from 0.49 to 0.80 (Figure 1).

Internal consistency and convergent validity

To determine the internal consistency of the Solastalgia Scale, the Cronbach's alpha coefficient was examined. The Cronbach's alpha value was found to be 0.91, indicating excellent internal reliability (Table 2).

Convergent validity was supported by a strong positive correlation between the Solastalgia Scale and the Climate Change Worry Scale (CCWS) ($r = 0.82$, $p < 0.001$). The Pearson correlation coefficient between the total scores of the two scales measuring conceptually related constructs was $r = 0.82$ ($p < 0.001$). This finding supports the convergent validity of the scale.

Participants' scores on the Solastalgia scale

In the Turkish adaptation of the Solastalgia Scale, scores range from a minimum of 1 to a maximum of 5. The participants' mean scores and their distribution based on sociodemographic characteristics are presented in Table 3. The mean score of the participants was 3.59 ± 0.84, indicating a relatively high level of solastalgia in this sample.

No statistically significant differences were found in the scale scores based on participants' age, gender, marital status, or the presence of psychiatric or chronic illness diagnoses ($p > 0.05$). However, participants with a university degree or higher, and those whose income was less than or equal to their expenses, had significantly higher mean scores on the scale ($p < 0.05$).

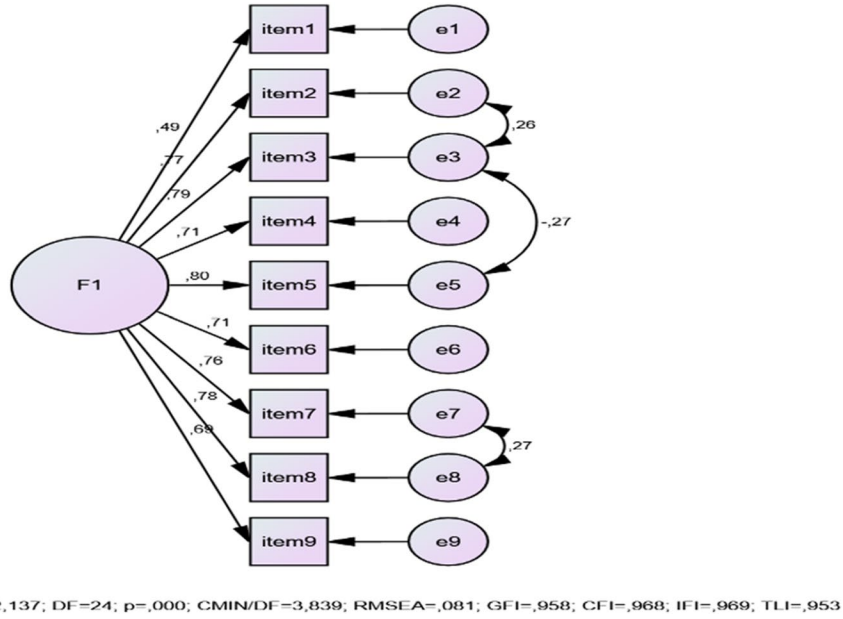

Figure 1. Confirmatory factor analysis model of the Solastalgia Scale (subsample 2, $n = 220$).

Table 2. Descriptive and psychometric properties of the Solastalgia Scale (subsample 1: EFA, $n = 219$).

Items	Factor loading	M	SD	α†	*r*
Item1	0.494	3.02	1.14	0.91	0.48
Item2	0.788	3.78	1.07	0.89	0.75
Item3	0.789	3.73	1.01	0.89	0.74
Item4	0.695	3.67	1.05	0.90	0.68
Item5	0.776	3.73	1.08	0.89	0.73
Item6	0.708	3.38	1.06	0.90	0.68
Item7	0.787	3.64	1.04	0.89	0.74
Item8	0.797	3.90	1.03	0.89	0.74
Item9	0.697	3.45	1.10	0.90	0.66
Explained Variance Ratio			%53.5		
Cronbach's alpha			0.91		

α†: Cronbach's alpha if item deleted; r: Corrected item-total correlation; M: Mean.

Comparison of solastalgia scores by participants' environmental experiences and perceptions

The comparison of solastalgia scores according to participants' environmental experiences and perceptions is presented in Table 4. Participants with a strong emotional bond with nature ($M = 3.92$, SD = 0.67) and those frequently in natural settings ($M = 4.01$, SD = 0.58) reported significantly higher scores ($p < 0.001$ for both). ANOVA revealed significant differences by climate change concern ($F = 14.122$, $p < 0.001$); Bonferroni tests indicated that those sometimes or often concerned scored higher than those rarely concerned ($p < 0.01$). Elevated scores were also found in participants whose environmental concerns affected daily life ($F = 17.138$), and in those feeling helpless ($F = 11.690$) or angry ($F = 11.735$) due to ecological crises (all $p < 0.001$). Regarding behaviour, those uninterested in environmental issues had lower scores ($M = 3.15$, SD = 0.93), while participants engaged in awareness activities ($M = 3.67$, SD = 0.69) or direct action ($M = 3.64$, SD = 0.91) scored higher ($F = 11.214$, $p < 0.001$). Those identifying as environmentally protective also reported higher scores ($M = 3.67$, SD = 0.73) compared to those who did not ($M = 3.17$, SD = 0.98; $F = 8.574$, $p < 0.001$). These results demonstrate that solastalgia is strongly associated with emotional attachment to nature, climate concern, and environmentally oriented behaviours.

Table 3. Comparison of the Solastalgia Scale scores with participants' sociodemographic characteristics.

Variables	*n*	%	Mean ± SD	Test Statistic
Gender				
Female	364	82.9	3.62 ± 0.82	*t* = 1.500
				P < 0.134
Male	75	17.1	3.46 ± 0.88	
Educational status				
High school or below	20	4.6	3.22 ± 0.73	***t* = 2.076**
				***P* < 0.038**
University or above	419	95.4	3.61 ± 0.83	
Marital status				
Married	17	3.9	3.36 ± 0.74	*t* = 1.177
				P < 0.240
Single	422	96.1	3.60 ± 0.83	
Income status				
Income less than expenses	55	12.5	3.64 ± 0.90[a]	***F* = 4.959**
				***P* < 0.007**
Income equal to expenses	295	67.2	3.66 ± 0.78[a]	
Income more than expenses	89	20.3	3.35 ± 0.90[b]	
Presence of psychiatric diagnosis				
Yes	21	4.8	3.75 ± 0.72	*t* = 0.852
				P < 0.395
No	418	95.2	3.59 ± 0.84	
Presence of chronic diagnosis				
Yes	36	8.2	3.55 ± 0.73	*t* = 0.349
				P < 0.727
No	403	91.8	3.60 ± 0.84	
Age	439	100	21.71 ± 2.19	*r* = 0.016
				P < 0.731
Total scale score			3.59 ± 0.84	

Mean ± SD. SD = standard deviation; t = independent-samples t test; F = one-way analysis of variance; r = Pearson correlation coefficient. n = number of participants.

Table 4. Comparison of Solastalgia Scale scores according to participants' environmental experiences and perceptions.

Variables	*n*	%	Mean ± SD	Test Statistic
My bond with nature is very strong.				
No	244	55.6	3.33 ± 0.80	***t* = 8.322**
				***P* < 0.001**
Yes	195	44.4	3.92 ± 0.67	
I regularly spend time in natural areas.				
No	274	62.4	3.33 ± 0.83	***t* = 9.866**
Yes	165	37.6	4.01 ± 0.58	***P* < 0.001**
Climate change worries me.				
Never/Rarely[1]	110	25.1	3.27 ± 0.84	***F* = 14.122**
Sometimes[2]	169	38.5	3.62 ± 0.74	***P* < 0.001**
Often/Always[3]	160	36.4	3.78 ± 0.77	**(1–2;1–3)**
My concern about environmental issues affects my daily life.				
No[1]	68	15.5	3.10 ± 0.85	***F* = 17.138**
Sometimes[2]	253	57.6	3.64 ± 0.75	***P* < 0.001**
Yes[3]	118	26.9	3.76 ± 0.77	**(1–2;1–3)**
I feel hopeless or helpless because of environmental crises.				
No[1]	145	33	3.42 ± 0.81	***F* = 11.690**
Sometimes[2]	196	44.6	3.55 ± 0.74	***P* < 0.000**
Yes[3]	98	22.3	3.91 ± 0.82	**(1–2;1–3)**
I feel anger in response to environmental damage.				
No[1]	125	28.5	3.37 ± 0.82	***F* = 11.735**
Sonetimes[2]	159	36.2	3.54 ± 0.76	***P* < 0.001**
Yes[3]	155	35.3	3.82 ± 0.77	**(1–3;2-3)**
How do I express myself and my behaviors in response to environmental damage?				
I'm not interested at all.[1]	61	13.9	3.15 ± 0.93	***F* = 11.214**
I only raise awareness through social media.[2]	274	62.4	3.67 ± 0.69	***P* < 0.001**
I actively participate in environmental activities or organizations, or I make donations.[3]	104	23.7	3.64 ± 0.91	**(1–2;1–3)**
I see myself as someone who protects and cares about the environment.				
No[1]	49	11.2	3.17 ± 0.98	***F* = 8.574**
Partially[2]	285	64.9	3.56 ± 0.84	***P* < 0.001**
Yes[3]	105	23.9	3.67 ± 0.73	**(1–3)**
Which habit do I practice most in my daily life to protect the environment?				
I reduce waste (e.g. recycle, minimize packaging use)[1]	247	56.3	3.64 ± 0.77	*F* = 1.843
I choose a sustainable lifestyle (e.g. eat a plant-based diet, use public transportation)[2]	178	40.5	3.53 ± 0.81	*P* < 0.160
I don't practice any of these.[3]	14	3.2	3.31 ± 1.09	

Mean ± SD. SD = standard deviation; t = independent-samples t test; F = one-way analysis of variance; r = Pearson correlation coefficient. n = number of participants.

Discussion

The Environmental Distress Scale (EDS) was developed to assess individuals' multi-phase responses to environmental change. One key subdimension, solastalgia, captures emotional distress and loss of belonging due to ecological degradation (Higginbotham et al., 2007). This study adapted and validated the solastalgia subscale for the Turkish context to provide a culturally appropriate tool for assessing environmentally induced psychological distress.

In the Turkish sample, CFA results confirmed the unidimensional structure of the solastalgia subscale; item factor loadings ranged from 0.494 to 0.797, and the explained variance was found to be 53.5%. In terms of convergent validity, a significant and strong correlation was observed with the CCWS ($r = 0.82$, $p < 0.001$). Importantly, the factor structure was cross-validated by conducting EFA and CFA in two independent subsamples, strengthening evidence for the unidimensional model.

In Australia, the Brief Solastalgia Scale (BSS) developed by Christensen et al. (2024), reduced the nine-item EDS-S to five items. This version was validated with very high model fit indices such as CFI = 0.999 and RMSEA = 0.020. Factor loadings ranged from 0.68 to 0.89, and internal consistency was high (α = 0.88–0.91). Although it exhibited similar structural characteristics when compared to the Turkish sample, the BSS had higher variance explanation and item loadings; this difference may be explained by the direct experience of environmental threats (e.g. post-wildfire).

In the original EDS development (Higginbotham et al., 2007), the solastalgia subscale showed strong psychometric properties (Cronbach's α = 0.93; ICC = 0.73). Solastalgia scores were significantly higher in Singleton, a highly degraded area ($M = 28.3$, SD = 7.2), than in Dungog, a less affected region ($M = 20.8$, SD = 6.3; $t = 7.71$, $p < 0.001$). While the Turkish results align conceptually with those of Christensen et al. (2024), and Higginbotham et al. (2007), the level of direct environmental exposure differs (Christensen et al., 2024; Higginbotham et al., 2007). Higginbotham et al. (2007) found higher solastalgia in communities facing severe ecological harm, such as open-pit mining zones, whereas participants in Turkey mostly reported more indirect or urban-based environmental experiences (Higginbotham et al., 2007).

In the study conducted in Kenya (Wahid et al., 2025), solastalgia items were rewritten to align with local cultural narratives, and the scale was adapted to resonate with the community's worldview. Here, environmental destruction is experienced not only as a loss of nature but also as the loss of sacred sites and cultural memory. These findings suggest that solastalgia may extend beyond an individual emotional response and may also involve cultural and place-related

dimensions. However, further research is needed to better understand how cultural identity, place attachment, and environmental change interact in shaping the experience of solastalgia, which may represent not merely an individual psychological condition, but also a cultural and identity-related trauma.

In the Turkish sample, solastalgia scores did not differ significantly according to age, gender, or marital status; however, significant differences were observed according to education level ($t = 2.076$, $p = 0.038$) and income status ($F = 4.959$, $p = 0.007$). Participants with higher educational attainment and those whose income was less than or equal to their expenses reported significantly higher solastalgia scores. Previous studies have not consistently demonstrated strong associations between solastalgia and socioeconomic characteristics. For example, Christensen et al. (2024) reported only weak negative correlations between solastalgia and educational attainment ($r = -0.07$, $p < 0.01$) and household income ($r = -0.07$, $p < 0.01$), whereas subjective social status showed a somewhat stronger negative association ($r = -0.17$, $p < 0.01$). In contrast, the original Environmental Distress Scale study by Higginbotham et al. (2007) primarily emphasized differences associated with environmental exposure rather than educational or socioeconomic characteristics. Therefore, the education- and income-related differences observed in the present study may represent context-specific findings rather than a consistently established pattern across previous research. A possible explanation is that individuals with higher educational attainment may have greater awareness of environmental degradation and its psychological consequences, whereas those with lower income may experience greater socioeconomic vulnerability and fewer resources to cope with environmental change. Nevertheless, these interpretations should be considered exploratory, and future studies involving more socioeconomically diverse populations are needed to clarify these relationships.

Beyond demographics, individual psychological orientation towards nature and climate concerns significantly predicted solastalgia scores. Participants with a strong emotional bond to nature or who frequently spent time in natural settings reported higher solastalgia ($M = 3.92$ vs. 3.33; $p < 0.001$). Those who felt worried or helpless about environmental crises also scored higher ($p < 0.001$), consistent with Albrecht et al. (2007), who identified place attachment as central to solastalgia (Albrecht et al., 2007). Similarly, participants involved in environmental advocacy or awareness efforts showed elevated scores compared to those who were passive or indifferent. These patterns suggest solastalgia may reflect not only emotional distress but also ecological sensitivity and potential for pro-environmental behaviour (Christensen et al., 2024; Galway et al., 2019). Although a minority take action, those who do tend to report stronger solastalgia, indicating that such emotions may motivate ecological engagement among highly affected individuals.

The level of solastalgia varies not only with the degree of environmental change but also with the pace of change, individuals' emotional attachment to place, and their sense of control. In Turkey, the change process may be relatively slower and more diffuse, whereas events such as wildfires in Australia or the destruction of sacred sites in Kenya can create sudden and direct traumas (Wahid et al., 2025). Additionally, cultural factors such as social trust, trust in government/institutions, and the function of collective memory may also influence the intensity of this feeling (Christensen et al., 2024; Higginbotham et al., 2007). Although participants' direct exposure to environmental disasters or environmental degradation was not assessed in the present study, these contextual factors may have influenced how environmental change was perceived and, consequently, participants' responses to the Solastalgia Scale. Future studies should further examine how specific environmental events and sociocultural contexts shape the experience and expression of solastalgia across different regions of Turkey.

While this study offers robust initial evidence supporting the validity and reliability of the Solastalgia Scale in the Turkish context, several limitations should be acknowledged. Firstly, the sample was relatively homogeneous, consisting predominantly of young, highly educated, urban, and single individuals. This limited demographic diversity may restrict the generalizability of the findings to other population groups in Turkey, particularly older adults, rural populations, or individuals with different socioeconomic and educational backgrounds. In addition, racial and ethnic background data were not collected. Although the study was conducted in Turkey, where the population is generally more homogeneous than in many multicultural settings, the absence of racial and ethnic information limits the evaluation of potential cultural differences and should be considered when interpreting and generalizing the findings. Secondly, data collection relied on self-report measures, which, despite careful translation and pretesting, may still be influenced by social desirability or individual interpretation. Finally, the cross-sectional design limits causal conclusions; longitudinal studies are needed to assess the scale's long-term stability and predictive utility.

Conclusion

This study adapted and validated the Solastalgia subscale of the Environmental Distress Scale for the Turkish context, offering a culturally appropriate and reliable tool to assess psychological distress related to environmental degradation. The scale demonstrated strong psychometric properties, including a unidimensional structure, high internal consistency, and significant convergent validity with the Climate Change Worry Scale. It effectively captured emotional responses such as grief, loss, and helplessness caused by local environmental change. Beyond statistical strength, the findings reveal the psychological toll of environmental degradation in Turkey, particularly among individuals with strong emotional ties to nature or active ecological concern. These results support the idea that solastalgia is rooted in place attachment and ecological sensitivity and may also drive environmental engagement. Even indirect or urban experiences of degradation were sufficient to elicit solastalgia, emphasizing the construct's broad relevance. However, the study has limitations. The sample was mostly highly

educated young adults, limiting generalizability. The cross-sectional design also prevents causal interpretations. Future research should involve more diverse and ecologically vulnerable groups and use longitudinal designs to explore solastalgia's long-term mental health impacts. Overall, the validated Turkish scale is a valuable resource for research and practice, supporting mental health assessment, guiding policy, and informing interdisciplinary approaches to the psychological dimensions of climate change. As ecological crises escalate, such tools will be essential for understanding and addressing their emotional effects.

Implications for mental health nursing

The Turkish version of the Solastalgia Scale provides mental health nurses with a brief and culturally appropriate tool to assess psychological distress related to environmental change. Incorporating this scale into routine psychosocial assessments may support early identification of place-based distress, particularly among individuals with strong attachment to nature or heightened environmental concern. In community mental health settings, the scale can be used to inform preventive and psychoeducational interventions addressing climate-related emotional responses. By integrating environmental context into assessment and care planning, mental health nurses can enhance holistic and person-centred care. The scale also offers a useful instrument for nursing research on climate-related mental health outcomes in Turkey.

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Author contributions

CRediT: **Özge Yaman**: Conceptualization, Data curation, Investigation, Methodology, Resources, Visualization, Writing – original draft, Writing – review & editing; **Ali Ilez**: Conceptualization, Data curation, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing; **Fahriye Oflaz**: Conceptualization, Supervision, Writing – review & editing.

Ethical approval

Ethical approval for this study was obtained from the Istanbul Medipol University Non-Interventional Research Ethics Committee (Istanbul, Turkey) (Approval date: 14 March 2025; Approval No: E-10840098-202.3.02-2024). The study was conducted according to the Declaration of Helsinki and research and publication ethics principles. Written informed consent was obtained from all participants prior to participation. Clinical trial number: not applicable.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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