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Abstract

Time spent in nature is linked to numerous physical and mental health benefits, yet opportunities for nature contact vary widely among individuals. Understanding factors influencing how often and how long people engage with natural environments is essential for promoting health and well-being. Here we conducted a nationally representative survey of 3,125 American adults in 2025 to examine demographic, health, and nature relatedness factors associated with frequency and duration of nature contact. Over half of participants reported spending time in nature more than twice weekly and for two or more hours weekly. Significant differences in nature contact were observed by age, race/ethnicity, income, marital status, employment, health status, political ideology, and urbanicity. Higher nature relatedness correlated positively with nature engagement. These findings provide a foundation for future research and inform practitioners and policymakers aiming to enhance public health through increased nature exposure.

Keywords: nature contact, nature relatedness, health benefits, green space, nature exposure

Introduction

Urbanization and rapid technological encroachment into all aspects of daily life continue to significantly reduce the amount of time people spend outdoors. Against this backdrop of reduced contact with nature, the need to understand factors associated with nature contact and relatedness becomes increasingly important for the promotion of health and well-being. Nature contact can be described as the extent to which people interact with natural environments through activities such as spending time in parks, greenspaces, or other settings, [1] while nature relatedness reflects a person's emotional, cognitive, and experiential relationship with the natural world [2]. Both constructs have been strongly linked to a wide range of positive physical, mental, and social health outcomes [3,4].

Greater nature contact has been associated with reductions in heart rate, blood pressure, cardiovascular disease, depressive symptoms, anxiety, stress, and negative emotions; improvements in immune function, sleep, and general health; and greater happiness and life satisfaction, with children and adolescents experiencing better attention, working memory, and overall cognitive development [1,5-11]. Evidence further suggests a dose-response relationship, whereby higher frequency or longer durations of time spent outdoors in nature is associated with greater health benefits [12]. Additionally, nature contact has been shown to facilitate increases in social connectedness and physical activity [6,12]. Parks, trails, and outdoor spaces provide opportunities to spend time with family and friends, move freely, and participate in various community activities (e.g., engaging in outdoor physical activity with others is a way to enhance social connections in nature) [8,13-15]. Additionally, cultural norms, social expectations, tradition, and community practices can influence how and when people spend time outdoors and engaging with others [16]. Time spent outside in nature has also been linked to increased physical activity and has been implemented as a method to promote healthy physical movement in various populations [6].

However, even though short, regular visits to green or blue spaces deliver meaningful physical and mental health benefits, gaps in knowledge exist related to the optimal dose of nature and the exact mechanisms through which these benefits operate [5,12]. Further, and unfortunately, the opportunity to experience safe and accessible nature is not evenly distributed across the U.S. population. Studies show systematic disadvantages for people of color and residents of low-income geographic areas [17,18], whereas populations with higher income and education tend to report greater nature contact and access to parks and blue spaces [17-19].

In a study of U.S. metropolitan areas, white residents consistently had higher-than-average green space contact, while residents identifying as Asian, Black, Hispanic, Native American, and Pacific Islander had lower-than-average contact [20]. National

and multi-city studies show that minority and low-income communities have fewer park acres, fewer park facilities, and lower park quality and safety than white and affluent communities [17,18,21].

To gain a better understanding of the American public's evolving relationship with the natural world, Dr. Stephen R. Kellert and DJ Case & Associates conducted a landmark national study of nearly 12,000 adults and children in 2015-2017 titled "The Nature of Americans" survey [9]. This survey found a significant interest-action gap in which, although Americans across all demographic groups highly valued nature and recognized its physical, psychological, and social benefits, they found themselves spending increasingly less time outdoors. The study identified various factors potentially underlying this disconnect, including modern societal barriers such as heavy reliance on electronic media, built urban environments, and competing daily priorities for time and money, resulting in over half of the adult respondents spending five hours or less outside each week. The authors collected their findings into a comprehensive report and closed with recommendations for how to overcome the hurdles of modern life by making nature engagement a routine, highly sociable, and accessible part of everyday American life.

The current study builds upon the Nature of Americans study, describing findings from the first nationally representative survey of Americans' relationships with nature since the 2015-2017 survey [9]. The present study aims to provide insight into the lived experiences, correlates, and mechanisms of nature contact in the U.S. [9]. In addition to learning more about the characteristics and motivations of how and why people experience nature, these findings contribute ongoing surveillance of Americans' time spent outdoors in nature and form a foundation to inform future research.

Methods

Participants and Recruitment

Data were collected between October 6 – November 5, 2025, using the online crowdsourcing research platform Prolific (https://www.prolific.com/). Prolific utilizes a rigorous screening process, including government identification validation, to ensure responses are from U.S.-based adults [22]. Prolific has been identified in several studies as providing some of the highest quality data across online platforms [10,11]. We employed stratified random sampling with quotas to match the sample to the U.S. adult population in terms of gender, race/ethnicity, and age categories [23]. Inclusion criteria required that participants be 18 years of age or older, currently reside in the U.S., and be able to read and respond in English.

Before beginning the study, participants reviewed an online consent form. Those who agreed to participate completed the survey and received a small monetary

incentive through Prolific. Data quality checks included three attention-check questions throughout the survey (e.g., “Answer Strongly Disagree for this question” [24]) and a manual review of respondents with exceptionally fast completion times (less than half the median time) or failed validation checks. Non-relevant responses were removed from the dataset [25]. Investigators were blind to participant identities, and Prolific did not have access to individual responses. All methods were carried out in accordance with relevant institutional guidelines and regulations, as well as the ethical standards set forth in the Declaration of Helsinki. Experimental protocols were reviewed and approved as exempt by the Texas A&M Institutional Review Board (Protocol ID: STUDY2025-0710). Informed consent was obtained electronically from all individual participants (and/or their legal guardians) prior to study enrollment and publication.

Survey Development

The survey was designed by a multidisciplinary group of investigators from the Nature and Health Alliance (https://natureandhealthalliance.org/), a not-for-profit research and practice group created to advance and communicate understanding of the health benefits of engaging with nature. Survey questions assessed individuals' perceptions of nature places, time spent outdoors in nature, general health, and nature relatedness. The survey also collected standard demographic information, including age, sex, race/ethnicity, urbanicity, zip code, and housing type.

After completing the core questionnaire described above, all participants who indicated that they had a child under the age of 18 living in their home completed an additional module on their child’s time in nature. These family-specific data were beyond the scope of the current paper and are expected to be reported in a subsequent manuscript and white paper.

Survey Items

To ensure that all participants shared a common understanding of 'nature,' the survey began with a definition adapted from the 'Natural England' framework, with modifications to suit an American audience and based on previous U.S.-based studies [26,27]. Unlike the Natural England Adult studies, which focused on public spaces, this definition explicitly included participants' private back and front yards (referred to as 'gardens' in Europe). The specific prompt shared with participants was: *The following questions are about the time you have spent outdoors in green or natural spaces. Most people define these as visits to…*

- *Green spaces in towns and cities (e.g., parks, yards and gardens, rivers, trails)*
- *The countryside (e.g., farmland, forests, mountains, hills, lakes, rivers, springs, trails, deserts)*

- *The coast (e.g., beaches, lakes, dunes, shorelines) and activities in the ocean, intercoastal, marsh, ponds and wetlands*

Do not count time spent outside but not in green or natural spaces, including parking lots and roads.

Time Spent in Nature

After the above-described nature definition prompt, participants self-reported how often in the last month they spent time outdoors in nature. Response options included: every day; more than twice a week, but not every day; twice a week; once a week; a few times a month; less than once a month; and never. Participants were then asked how much total time they spent in nature during the past 7 days. Response options included: less than 30 minutes; 30-59 minutes; 1 to 2 hours; 2 to 3 hours; 4 to 6 hours; 7 to 10 hours; and more than 10 hours. Next, participants were asked to identify the top three months that they spent the most time outdoors. Finally, respondents completed the six-item Nature Relatedness Scale – Short Form (α = 0.85) with a range from 1-5 with higher scores indicating higher nature relatedness [28,29].

Demographics

Participants self-reported sociodemographic information. Age was categorized into groups: 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75-84, and ≥85 years. Participant's sex was self-reported as female, male, or prefer to self-describe. Education level was categorized as no high school diploma/GED, high school graduate or GED, some college or associate's degree, and bachelor's degree, or graduate education. Race/ethnicity was categorized as Hispanic, non-Hispanic Asian, non-Hispanic Black, non-Hispanic White, and non-Hispanic another race or multiracial (including non-Hispanic Hawaiian/Pacific Islander, non-Hispanic American Indian or Alaskan Native, and non-Hispanic multiracial adults). Total household income from all sources before taxes was categorized as < $25,000, $25,000-$49,999, $50,000-74,999, $75,000-$99,999, $100,000-$149,999, and $150,000+. Marital status was categorized as single, married or living with a partner, and divorced, separated, or widowed. Employment status was categorized as employed full time, employed part time, self-employed, not employed, retired, full-time student, or caregiver.

Health Status

Participants were asked several questions regarding their health status. These included: the SF-1, physical and mental health over the past 30 days and the ability to walk for at least 10 minutes at a time [30-32].

Statistical analysis

Data were summarized using mean and standard deviation (SD) for quantitative variables.

The two primary outcome variables being examined were **frequency**: "In the past month, how often, on average, have you spent time outdoors in nature?" and **duration**: "In the past week, how much total time did you spend outdoors in nature?" For analysis purposes, these variables were organized into smaller groups of three or four categories. Additionally, the same variables were recoded into binary indicators for subsequent analysis to approximate the recommended time spent in nature. The duration binary indicator was set as 2 hours per week following White and colleagues recommendation [1]. Based on the experience of the author group, more than twice a week was set as the binary indicator for frequency.

Comparisons across 3-4 groups were performed using analysis of variance (ANOVA) and a Chi-square test. Comparisons between two groups were conducted using an unpaired t-test and a Chi-square test. A univariate relative risk regression analysis was conducted using the binary versions of the two nature exposure questions.

A multivariable relative risk regression was conducted for frequency and duration of time spent outdoors in nature. The final models were determined using a backward stepwise selection process. Initially, all variables with a p-value of 0.05 or less were included in the model. Variables were subsequently removed if they had a p-value of 0.25 or higher. Each model was described using relative risk (RR), 95% confidence intervals (CI), and p-values. Results were considered statistically significant with a p-value less than or equal to 0.05.

All data analysis was conducted using Stata V.18.5.

Results

The survey consisted of 3,684 total respondents. Participants were removed for a variety of reasons, including not agreeing to consent (n = 511), too rapid a response (n = 3), and not completing at least half of the questions or failing the attention checks (n = 45). This yielded a final usable sample of n = 3,125 participants.

The study was fairly evenly divided between females (51.7%) and males (47.0%) with 1.4% preferring to self-describe. The majority of respondents were in middle adulthood (60.4%; 35-64), followed by young adults (27.9%; 18-34), and older adults (11.7%; 65+). Most of the sample were employed either full time (57.4%) or part-time (17.5%) and had an income between $50,000-$99,999 (36.4%). Participants were included across all four US regions, urban and rural communities, the political spectrum, and health status. The participants reported a high level of nature relatedness (M = 3.63, sd = 0.91). Table 2 presents in-depth demographic details.

There was a significant but not perfect relationship between frequency and duration ($p < .001$). Almost 30% (29.2%) of the sample did not meet either the frequency or duration thresholds. Forty percent (40.8%) met both while 15.7% met duration but not frequency and 14.3% met frequency but not duration.

Frequency of Nature Contact

Bivariate Results

Just more than half of the participants (56.5%) reported being in nature more than twice a week. Other responses included: twice a week (13.9%), once a week (10.6%), 2-3 times a month (9.3%) and 9.7% reporting once a month or less often. In the bivariate analysis, people with more than two times a week in nature had higher nature relatedness scores. Additionally, differences in the frequency of nature contact were seen by age, race, income, marital status, employment, self-reported health, political ideology and urbanicity. No significant differences were seen by gender, education or region of the country. A univariate relative risk regression analysis was conducted to assess the magnitude of differences by category. Both 35-64 and 65+ age groups reported higher frequency of nature contact than 18-34 year old participants. Black and Other, non-Hispanic racial and ethnic groups reported less frequent contact than white respondents. People with incomes greater than $100,000 had a higher frequency of nature contact than those with less than $50,000. Never married respondents had less frequent nature contact than other groups. Retired people had more frequent nature contact than people employed full-time, while students and part-time employed respondents had even less frequent nature contact. People with good or very good and excellent health had more nature contact than those with poor/fair health. People who were liberal on both fiscal and social issues had less frequent nature contact than those with conservative identities. Rural respondents and people in small towns had more frequent nature contact than urban respondents. Detailed results are displayed in Tables 1 and 2.

Multivariable Results

The multivariate relative risk regression analysis was conducted for frequency of nature contact to assess the relative contributions of variables in the complete model. Age, race/ethnicity, urbanicity and self-rated health remained significant as seen in the bivariate analyses. Income and self-identity for fiscal issues were not significant, and only “married” and “living with a partner” were statistically different from “never married”. Table 3 displays these results.

Duration of Nature Contact

Bivariate Results

Duration of time was spread across the sample with 33.5% of participants reporting 4 or more hours, 21.5% reporting 2-3 hours, 21.9% reporting 1 to 2 hours, and 22.9% reporting less than an hour in the past week. The bivariate analysis comparing 2 or more hours per week to less than 2 hours a week revealed a similar pattern to frequency of nature contact, except the difference between urban and rural adults was not significant. Specific differences by groups were seen in the univariate relative risk analyses. These included respondents in both age groups above 35, identifying as Black and Other, identifying as non-Hispanic, and with the two highest levels of income reporting more time in nature. Only respondents who were “married” and “living with a partner” spent more time in nature than those “never married”. Respondents reporting both categories of better health status had a greater duration of nature contact than those with fair/poor health. Respondents who identified as liberal for both social and fiscal issues reported spending less time in nature than those who identified as conservative or moderate. These results are displayed in Table 4 and 5.

Multivariable Results

The multivariate relative risk regression analysis was conducted for duration of nature contact to assess the relative contributions of variables in the complete model. Race/ethnicity and self-rated health remained significant across the same categories as seen in the bivariate analyses. Age, income and self-identity for fiscal issues were not significant, and only “married” and “living with a partner” were statistically different from “never married”. Table 6 displays these results.

Discussion

The current paper represents the first comprehensive examination of Americans’ nature contact since the Nature of Americans survey over a decade ago. Previous research has suggested a minimum of 120 minutes in nature per week to achieve optimal well-being outcomes (duration) [1], although some evidence suggests that health benefits can be seen in as little as 10 minutes per outing with repeated (frequency) nature exposure [33]. This paper examines both the duration and frequency of Americans’ nature contact to being exploring to see if Americans are meeting these proposed recommendations.

We found that approximately 40% of Americans are getting this “dose” of both frequency (more than two days a week in nature) and duration (more than 2 hours (120 minutes) per week), while approximately 30% didn’t get either. Short frequent bouts of nature (microdoses) have been related to improvements in mood, attention restoration, and changes in blood pressure, salivary cortisol, and heart rate [5,34]. While longer duration bouts (longer macro-doses) have shown improvements in immune function, self-reported mental and physical health, cardiovascular health, and creativity [1,35,36]. To date, there are no official nature contact recommendations [37]. However, it is quite

possible that we should consider both duration and frequency analogous to the original US physical activity guidelines (i.e. 30 minutes a day most days of the week). The Nature of Americans study fielded in 2015 and 2016 found that only 25% of respondents spent less than 2 hours a week in nature [9], while we found 44.8% of respondents reported spending less than 2 hours per week. While the 2015- 2016 study used slightly different questions and sampling frames, it is unlikely this change in duration of nature contact is due to methodological issues.

In addition to overall prevalence rates, we found significant variations in time spent in nature according to several demographic variables, including age, race, income, marital and employment status, self-reported health, political ideology, and whether respondents lived in a rural area. Specifically, older and married Americans reported spending significantly more time in nature. These results speak to a growing body of research exploring how human behavior changes across the lifetime. Studies in Northern Europe have indicated that shifting priorities associated with age and major life events (e.g. marriage, job loss, loss of spouse) influence travel behaviors and engagement in outdoor recreation [38,39], as these life changes can alter the balance between the challenges or constraints associated with travel and outdoor recreation activities and the perceived benefits received. We also found that Americans with higher incomes or those who are retired were more likely to report nature contact of more than 3 times per week. While neither income nor employment status remained significant in the multivariate analysis, the trend holds when looking at duration. Higher-income Americans and Americans with full-time jobs (followed closely by retired Americans) were more likely to report spending more than 2 hours a week in nature.

When considering time spent in nature it is important to consider intentionality and engagement (i.e., why someone chose to spend time in nature, and how deeply immersed they are in their experience) [40]. For example, the benefits received by someone who works outdoors in nature all day (e.g. landscaper, park ranger) will likely not be the same as someone who spends two hours hiking or meditating in a park as a leisure activity or break from work. As priorities change throughout a lifetime, so might the intentionality behind nature contact experiences. This can be seen in facets such as heat exposure where one can chose to be out in nature on more pleasant days [41]. Therefore, it is pertinent for researchers to consider *why* their participants are spending time in nature and *how engaged* they are in the experience.

There were also significant differences in self-reported time in nature according to racial and ethnic identity. Specifically, non-Hispanic white Americans reported significantly more time in nature compared to other racial and ethnic groups. This result is perhaps best understood within the historical context of nature access in the US. For example, many National Parks and greenspaces were built during an era of racial segregation, where Black visitors were not allowed in the same areas as white visitors

[42], quite literally preventing access to nature spaces for minority groups. In residential areas, historical practices of redlining, segregation, and postwar suburbanization (sometimes termed “white flight”) led to disparities in greenspace and park distribution [43].

These historical issues have direct connections to the present day, as recent research has demonstrated continued disparities in tree canopy coverage and distance to parks and greenspaces according to race and socio-economic status in the US [44]. At the same time, there are also disparities in the quality of nearby parks, as lower-income and majority non-white cities tend to have lower quality parks [45]. This is particularly relevant, as recent research of predominantly Black participants has shown that outdoor activity can counterproductively worsen mental health if environmental conditions in those outdoor spaces are perceived as unsafe (e.g. vacant lots) [46].

It is not just awareness of an outdoor space that prompts Americans to spend time outdoors in nature. People must feel *safe* while using outdoor spaces. Perceived safety, or how safe one feels in a particular space, can influence when and where they choose to engage with nature [47,48]. The carry-over effects of historical disparities in access to recreation may also influence how safe Americans of minority groups and communities feel outdoors. Interviews with African American women who participated in outdoor recreation (e.g. hiking and camping) indicated that internal constraints, namely safety, were amplified by a lack of representation in outdoor industries [49]. We saw a deviation in these patterns during the COVID-19 pandemic, when large-scale public health concerns led Americans to change their recreation behaviors in order to feel safer, and engage in activities that promoted their health [50].

Given the historical violence against, and exclusion of, people of color that has occurred in parks and nature spaces [51], there is an immense need for programs that provide positive, safe, and inclusive experiences in these spaces. Such experiences could provide powerful transformations in perspectives about who “belongs” in nature, and subsequently positively influence future behavior. For example, a recent case study found that Black men participating in a nature-based mental health retreat reported positive perspective shifts in their own relatedness to nature [52].

Our results further showed that individuals who feel more related to nature tend to spend more time outdoors, consistent with previous research (for review see [53]). However, these data are cross-sectional and correlational in nature, limiting causal inference in this study, and it is possible that time in nature causally *increases* nature relatedness, rather than the other way around. Indeed, previous research has shown nature interventions that increase nature exposure also increase nature relatedness (for review see [54]). Nature relatedness can not only affect well-being by increasing time spent in nature, but it can also improve well-being in the absence of nature contact (for

review see [53]). Taken together, these findings highlight the importance of fostering nature connection in the American public as one mechanism through which to promote nature contact.

A growing body of literature is exploring the conditions necessary to promote nature contact. A recent mixed-methods study highlighted several potential pathways to increase nature contact, and through experimental methods demonstrated that interventions focused not only on knowledge or contact with nature, but also emotional relationships with nature were most effective [55].

Limitations & Future Directions

This study represents the first comprehensive effort to assess Americans' time spent in nature and its relationship to health since the Nature of Americans study over a decade ago. It establishes an important baseline and offers valuable insights into who is accessing nature. Nonetheless, there are important limitations to this work and opportunities for further research.

Perhaps the most notable limitation of the present study is that, while we attempted to understand if Americans were getting the proposed 120 minutes of nature contact per week, these best-available recommendations are based on correlational research [1]. Therefore, to confirm that 120 minutes per week is actually the “optimal” amount of time in nature, randomized dose response trials are needed. To date, there are no recommendations on frequency. More than two days a week was based on expert opinion but still needs to be validated.

Another potential limitation of the current work is that, despite the best efforts of the researchers in providing a definition of nature at the beginning of the survey, when asked how much time they spend in nature, participants may not have answered based on a true mutual understanding of what is meant by “nature”. This could have led to potentially different interpretations of what “nature” means across participants (e.g., one participant might consider their backyard to be “nature” while another may only consider the local park). Maddock and colleagues noted significant differences across populations on what “counts” as nature [56]. To this point, future research could consider supplementing participant survey responses with GPS data or NatureQuant [57] scores.

On the other hand, there is some emerging research that suggests *perceptions* of being in nature matter meaningfully for well-being benefits. For example, in one study, perceived biodiversity of a space predicted well-being benefits [58]. This is to say that the exact location and properties of the natural environment may matter less than the *perception* of the individual in contact with that nature. Therefore, providing a one-

size-fits-all definition may actually limit our understanding of nature contact. Further, this flexibility in the definition of “nature” may enhance equity and pluralism in the field [59].

Implications for Practitioners and Policymakers

Americans today suffer from ongoing stress and mental health crises, with approximately 23.4% of US adults experiencing mental illness in 2024 [60], further compounded by a progressively worsening loneliness “epidemic” [61], both of which have significantly harmful impacts on cardiovascular health (e.g., [62,63]). Contact with nature is known to improve each of these outcomes [33,64] (for review see [65]). Yet, our results show that only 40% of Americans get 120 minutes of nature contact or spend more than two days a week in nature [1]. Therefore, increasing time spent in nature may be associated with improved collective health and well-being among Americans.

One potential area for improving mental and physical health could include combining physical activity with time in nature. Studies show that engaging in physical activity outdoors can enhance the mental health benefits of regular physical activity (e.g. [66]). Physicians and health care providers should consider encouraging patients to exercise outdoors at a local park or greenspace when possible. There are also popular NatureRx programs available to “prescribe” nature to patients, and initial studies show improvements in mental and physical benefits [67,68], though, given the wide variety of prescription types and settings, there is still much to learn about what makes these prescriptions successful or unsuccessful for specific patients and contexts.

Policymakers should invest in preserving and maintaining existing nature spaces and put effort into expanding greenspace access. To address the disparities of access that our results identified, care should be taken to consider systems of power and privilege. For example, creating more accessible trails could help disabled individuals connect with nature and engage in outdoor recreation. It is also important to consider potential downsides to greenspace investment, such as green gentrification [69], which can unintentionally price vulnerable communities out of neighborhoods or regions. To this end, communities should be directly engaged in the process of designing and maintaining parks and greenspaces. Ideally, communities should be consulted and engaged using participatory methods *before* ground is broken on a new space in or immediately surrounding the community (for review see [70]).

Beyond the mere existence or creation of greenspace and parks, care should also be taken to deliberately design spaces and interventions that prompt engagement and emotional connection to nature [55,57], as connection to nature has been shown to deepen the mental health benefits of nature contact and to promote further pro-environmental behaviors and environmental stewardship.

Nature contact is a powerful tool that can be incorporated into a variety of domains and sectors, ranging from education [71] to nursing homes [72] to the workplace [73]. For further review of potential local, regional, and national policies to support nature contact, see [70].

Conclusion

The study presents a baseline look at how much time Americans spend in nature by demographic categories. This type of study should be repeated on a regular basis to document trends in nature contact and potential progress in increasing nature contact for all Americans. While differences exist between different demographic categories less than half of respondents get adequate nature contact.

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Author Contributions

JM conceived the study. JM and LA performed the analyses. All authors contributed to the methodology of survey design; contributed to writing, reviewing, and editing the manuscript; and approved the final manuscript.

Data availability statement (mandatory)

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Statement

The study procedures were ruled to be exempt by the Texas A&M Institutional Review Board (STUDY2025-0710). All participants completed a consent to participate and publish electronically before completing the study.

Competing Interest Statement

The authors declare no competing interests.

Clinical Trial Number

Not applicable

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Use of AI

The Nature Research Assistant was used for the final review of the paper.

Table 1: Comparison of demographic variables and nature relatedness by frequency of nature contact in the past month.

		In the last month, how often have you spent in nature?		
Factor	**Overall**	**More than twice a week/Everyday**	**Twice a week or less**	**p-value**
N	**3,125**	**1,765**	**1,357**	
Nature Relatedness, mean (SD)	3.63 (0.91)	3.83 (0.83)	3.36 (0.94)	<0.001
What is your age (recode)				<0.001
18-34	827 (27.9%)	411 (49.8%)	414 (50.2%)	
35-64	1790 (60.4%)	1032 (57.7%)	757 (42.3%)	
≥ 65	348 (11.7%)	225 (64.7%)	123 (35.3%)	
Race (ethnicity)				<0.001
White (Non-Hispanic)	2104 (67.3%)	1271 (60.4%)	832 (39.6%)	
Black (Non-Hispanic)	335 (10.7%)	162 (48.4%)	173 (51.6%)	
Hispanic	154 (4.9%)	87 (56.9%)	66 (43.1%)	
Other (Non-Hispanic)	532 (17.0%)	245 (46.1%)	286 (53.9%)	
Gender				0.260
Male	1382 (47.6%)	760 (55.1%)	619 (44.9%)	
Female	1521 (52.3%)	870 (57.2%)	651 (42.8%)	
Education level (recode)				0.810
≤ High School	412 (13.9%)	236 (57.3%)	176 (42.7%)	
Some college	942 (31.8%)	523 (55.5%)	419 (44.5%)	
≥ Bachelors	1608 (54.3%)	907 (56.5%)	698 (43.5%)	
Income (recode)				0.021
≤ $49,999	1053 (35.5%)	561 (53.3%)	492 (46.7%)	
$50,000-$99,999	1079 (36.4%)	611 (56.8%)	465 (43.2%)	
≥ $100,000	832 (28.1%)	496 (59.6%)	336 (40.4%)	
Marital status (recode)				<0.001
Never married	1055 (35.7%)	522 (49.5%)	532 (50.5%)	
Married/living with partner	1489 (50.3%)	902 (60.7%)	585 (39.3%)	
Div/Wid/Sep	415 (14.0%)	244 (58.8%)	171 (41.2%)	
Employment status (unique-re)				0.009
Employed Full Time	1658 (57.4%)	949 (57.3%)	706 (42.7%)	
Employed Part Time	506 (17.5%)	277 (54.7%)	229 (45.3%)	
Not employed/student/care	450 (15.6%)	231 (51.3%)	219 (48.7%)	
Retired	274 (9.5%)	174 (63.5%)	100 (36.5%)	
Self health assessment				<0.001
Poor/Fair	607 (20.5%)	292 (48.1%)	315 (51.9%)	
Good	1018 (34.4%)	553 (54.3%)	465 (45.7%)	
Very Good/Excellent	1331 (45.0%)	818 (61.6%)	510 (38.4%)	
Self-Identify - Social Issues				0.006
Conservative	736 (24.9%)	442 (60.2%)	292 (39.8%)	
Moderate	664 (22.5%)	387 (58.4%)	276 (41.6%)	

Liberal	1558 (52.7%)	835 (53.6%)	723 (46.41%)	
Self-Identify - Fiscal Issues				<0.001
Conservative	869 (29.5%)	531 (61.3%)	336 (38.8%)	
Moderate	765 (25.9%)	437 (57.2%)	327 (42.8%)	
Liberal	1316 (44.6%)	691 (52.5%)	625 (47.5%)	
RUCA				0.001
Urban	2528 (86.3%)	1396 (55.3%)	1130 (44.7%)	
Rural/Small	402 (13.7%)	256 (63.8%)	145 (36.2%)	
U.S. Region				0.700
Northeast	522 (17.8%)	291 (55.7%)	231 (44.3%)	
Midwest	610 (20.8%)	333 (54.7%)	276 (45.3%)	
South	1165 (39.7%)	669 (57.5%)	495 (42.5%)	
West	636 (21.7%)	361 (56.9%)	274 (43.2%)	

Table 2: Univariate relative risk regression analysis of nature duration (> 2 times per week vs ≤ 2 times per week or none).

Factor	RR	95% C.I.		p-value
Nature relatedness	1.31	1.26	1.36	<0.001
What is your age (recode)				
18-34	1.00	---	---	Ref
35-64	1.16	1.07	1.25	**<0.001**
≥ 65	1.29	1.17	1.44	**<0.001**
Race/Ethnicity				
White (Non-Hispanic)	1.00	---	---	Ref
Black or African American (Non-Hispanic)	0.80	0.71	0.89	**<0.001**
Hispanic	0.94	0.82	1.08	0.01
Other (Non-Hispanic)	0.76	0.69	0.84	**<0.001**
Gender				
Male	1.00	---	---	Ref
Female	1.04	0.97	1.11	0.259
Education level (recode)				
≤ High School	1.00	---	---	Ref
Some college	0.97	0.87	1.07	0.545
≥ Bachelors	0.98	0.89	1.08	0.777
Income (recode)				
≤ $49,999	1.00	---	---	Ref
$50,000-$99,999	1.07	0.98	1.15	0.104
≥ $100,000	1.12	1.03	1.21	**0.006**
Marital status (recode)				
Never married	1.00	---	---	Ref
Married/living with partner	1.22	1.14	1.32	**<0.001**
Div/Widow/Sep	1.18	1.07	1.31	**0.001**
Employment status (unique-re)				
Employed Full-Time	1.00	---	---	Ref
Employed Part-Time	0.95	0.87	1.04	0.310
Not employed/student/care	0.89	0.81	0.98	**0.029**
Retired	1.11	1.00	1.22	**0.043**
Self-health assessment				
Poor/Fair	1.00	---	---	Ref
Good	1.13	1.02	1.25	**0.017**
Very Good/Excellent	1.28	1.17	1.41	**<0.001**
Self-identify - Social issues				
Conservative	1.00	---	---	Ref
Moderate	0.97	0.89	1.06	0.483
Liberal	0.89	0.83	0.96	**0.002**
Self-identify - Fiscal issues				
Conservative	1.00	---	---	Ref
Moderate	0.93	0.86	1.01	0.098
Liberal	0.86	0.79	0.92	**<0.001**
US region				
Northeast	1.00	---	---	Ref
Midwest	0.98	0.88	1.09	0.719

South	1.03	0.94	1.13	0.511
West	1.02	0.92	1.13	0.707
Rural/Urban				
Urban	1.00	---	---	Ref
Rural/Small	1.15	1.06	1.25	**0.001**

Table 3: Multivariable relative risk regression analysis of nature duration (> 2 times per week vs ≤ 2 times per week or none).

Factor	RR	95% C.I.		p-value
What is your age (recode)				
18-34	1.00	---	---	Ref
35-64	1.09	1.01	1.19	**0.030**
≥ 65	1.21	1.08	1.35	**0.001**
Race/Ethnicity				
White (Non-Hispanic)	1.00	---	---	Ref
Black or African American (Non-Hispanic)	0.86	0.77	0.97	**0.012**
Hispanic	1.01	0.87	1.17	0.910
Other (Non-Hispanic)	0.71	0.62	0.81	**<0.001**
Income (recode)				
≤ $49,999	1.00	---	---	Ref
$50,000-$99,999	1.03	0.95	1.11	0.526
≥ $100,000	1.04	0.95	1.14	0.402
Marital status (recode)				
Never married	1.00	---	---	Ref
Married/living with partner	1.08	1.00	1.17	**0.049**
Div/Widow/Sep	1.06	0.95	1.18	0.313
Self-health assessment				
Poor/Fair	1.00	---	---	Ref
Good	1.13	1.02	1.25	**0.017**
Very Good/Excellent	1.27	1.16	1.40	**<0.001**
Self-identify - Fiscal issues				
Conservative	1.00	---	---	Ref
Moderate	0.99	0.92	1.08	0.939
Liberal	0.93	0.86	1.00	0.060
Rural/Urban				
Urban	1.00	---	---	Ref
Rural/Small	1.12	1.03	1.22	**0.008**

** Variables that were found to be statistically significant in the univariate analysis (Table 3) were included in the multivariable analysis. Education was not included because missingness in the variable affected the final model.*

Table 4: Comparison of demographic variables and nature relatedness across nature duration. (**Binary**).

	In the last week, how much time have you spent in nature? (row percent)		
Factor	**≥ 2 hours**	**< 2 hours/None**	**p-value**
N	**1719**	**1401**	
Nature relatedness, mean (SD)	3.84 (0.82)	3.37 (0.95)	<0.001
What is your age (recode)			0.028
18-34	420 (51.0%)	404 (49.0%)	
35-64	995 (55.7%)	793 (44.4%)	
≥ 65	203 (58.3%)	145 (41.7%)	
Race/Ethnicity			<0.001
White (Non-Hispanic)	1206 (57.4%)	895 (42.6%)	
Black or African American (Non-Hispanic)	160 (47.8%)	175 (52.2%)	
Hispanic	87 (56.9%)	66 (43.1%)	
Other (Non-Hispanic)	266 (50.1%)	265 (49.9%)	
Gender			0.790
Male	757 (54.9%)	621 (45.1%)	
Female	827 (54.4%)	693 (45.6%)	
Education level (recode)			0.950
≤ High School	228 (55.3%)	184 (44.7%)	
Some college	512 (54.5%)	428 (45.5%)	
≥ Bachelors	875 (54.5%)	730 (45.5%)	
Income (recode)			<0.001
≤ $49,999	524 (49.8%)	529 (50.2%)	
$50,000-$99,999	594 (55.3%)	481 (44.7%)	
≥ $100,000	501 (60.3%)	330 (39.7%)	
Marital status (recode)			<0.001
Never married	510 (48.4%)	544 (51.6%)	
Married/living with partner	886 (59.7%)	599 (40.3%)	
Div/Widowed/Sep	219 (52.8%)	196 (47.2%)	
Employment status			0.770
Employed Full Time	916 (55.4%)	737 (44.6%)	
Employed Part-Time	268 (53.0%)	238 (47.0%)	
Not employed/student/care	242 (53.8%)	208 (46.2%)	
Retired	150 (54.7%)	124 (45.3%)	
Self-health assessment			<0.001
Poor/Fair	256 (42.2%)	351 (57.8%)	
Good	560 (55.1%)	457 (44.9%)	
Very Good/Excellent	797 (60.1%)	530 (39.9%)	
Self-identify - Social issues			0.007
Conservative	422 (57.7%)	310 (42.4%)	
Moderate	383 (57.8%)	280 (42.2%)	
Liberal	809 (51.9%)	749 (48.1%)	
Self-identify - Fiscal issues			<0.001
Conservative	495 (57.2%)	370 (42.8%)	
Moderate	456 (59.7%)	308 (40.3%)	
Liberal	656 (49.9%)	660 (50.2%)	

Rural/Urban			0.093
Urban	1368 (54.2%)	1155 (45.8%)	
Rural/Small	236 (58.7%)	166 (41.3%)	
US region			0.120
Northeast	290 (55.6%)	232 (44.4%)	
Midwest	309 (50.7%)	300 (49.3%)	
South	643 (55.3%)	520 (44.7%)	
West	363 (57.3%)	271 (42.7%)	

Table 5: Univariate relative risk regression analysis of nature duration (≥ 2 hours per week) binary outcomes.

Factor	RR	95% C.I.		p-value
Nature relatedness	1.32	1.26	1.37	<0.001
What is your age (recode)				
18-34	1.00	---	---	Ref
35-64	1.09	1.01	1.18	**0.029**
≥ 65	1.14	1.02	1.28	**0.017**
Race/Ethnicity				
White (Non-Hispanic)	1.00	---	---	Ref
Black or African American (Non-Hispanic)	0.83	0.74	0.94	**0.002**
Hispanic	0.99	0.86	1.14	0.897
Other (Non-Hispanic)	0.87	0.79	0.96	**0.004**
Gender				
Male	1.00	---	---	Ref
Female	0.99	0.93	1.06	0.776
Education level (recode)				
≤ High School	1.00	---	---	Ref
Some college	0.98	0.88	1.09	0.766
≥ Bachelors	0.98	0.89	1.08	0.764
Income (recode)				
≤ $49,999	1.00	---	---	Ref
$50,000-$99,999	1.11	1.02	1.2	**0.011**
≥ $100,000	1.21	1.12	1.32	**<0.001**
Marital status (recode)				
Never married	1.00	---	---	Ref
Married/living with partner	1.23	1.14	1.33	**<0.001**
Div/Widow/Sep	1.09	0.98	1.22	0.123
Employment status (unique-re)				
Employed Full-Time	1.00	---	---	Ref
Employed Part-Time	0.86	0.87	1.05	0.340
Not employed/student/care	0.97	0.88	1.07	0.540
Retired	0.98	0.88	1.11	0.837
Self-health assessment				
Poor/Fair	1.00	---	---	Ref
Good	1.31	1.18	1.46	**<0.001**
Very Good/Excellent	1.42	1.28	1.58	**<0.001**
Self-identify - Social issues				
Conservative	1.00	---	---	Ref
Moderate	1.00	0.92	1.09	0.965
Liberal	0.90	0.83	0.97	**0.009**
Self-identify - Fiscal issues				
Conservative	1.00	---	---	Ref
Moderate	1.04	0.96	1.13	0.314
Liberal	0.87	0.80	0.94	**0.001**
US region				
Northeast	1.00	---	---	Ref
Midwest	0.91	0.82	1.02	0.105
South	0.99	0.91	1.09	0.919
West	1.03	0.93	1.14	0.563

Rural/Urban				
Urban	1.00	---	---	Ref
Rural/Small	1.08	0.99	1.18	0.082

Table 6: Multivariable relative risk regression analysis of nature duration (≥ 2 hours per week vs < 2 hours per week or none).

Factor	RR	95% C.I.		p-value
What is your age (recode)				
18-34	1.00	---	---	Ref
35-64	1.04	0.95	1.13	0.383
≥ 65	1.08	0.96	1.22	0.194
Race/Ethnicity				
White (Non-Hispanic)	1.00	---	---	Ref
Black or African American (Non-Hispanic)	0.87	0.77	0.98	**0.022**
Hispanic	1.02	0.89	1.18	0.740
Other (Non-Hispanic)	0.79	0.71	0.90	**<0.001**
Income (recode)				
≤ $49,999	1.00	---	---	Ref
$50,000-$99,999	1.03	0.95	1.12	0.008
≥ $100,000	1.06	0.97	1.16	0.526
Marital status (recode)				
Never married	1.00	---	---	Ref
Married/living with partner	1.12	1.03	1.22	**0.008**
Div/Widow/Sep	1.04	0.92	1.17	0.526
Self-health assessment				
Poor/Fair	1.00	---	---	Ref
Good	1.27	1.14	1.41	**<0.001**
Very Good/Excellent	1.35	1.22	1.50	**<0.001**
Self-identify - Fiscal issues				
Conservative	1.00	---	---	Ref
Moderate	1.10	0.98	1.23	0.097
Liberal	0.92	0.81	1.04	0.177

** Variables that were found to be statistically significant in the univariate analysis (Table 4) were included in the multivariable analysis.*