

# "Pick a Nature Sound Now to Feel Better": The Effects of Listening to a Chosen Natural Sound on Informal Caregivers' Well-being

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## Abstract

Caring for a loved one can be challenging and stressful, making it crucial for caregivers to prioritize their own well-being. Listening to nature sounds may provide caregivers with a much-needed respite from their responsibilities. Research indicates that personal preferences significantly influence well-being, as granting autonomy in task selection can positively impact health. In this preliminary study, we explored the effects of selecting nature sounds on mobile phones for the well-being of informal caregivers. Specifically, we compared the effects of chosen sounds versus random sounds. We recruited twenty-eight informal caregivers, primarily women, and used the SAM and PANAS scales to assess well-being at baseline, during random sound exposure, and while listening to chosen sounds. Our findings suggest that nature sounds accessed via mobile phones can enhance the well-being of informal caregivers in at least three key areas: Valence, Positive Affect, and Negative Affect. Notably, the improvements in valence and positive affect were more pronounced when caregivers selected their own nature sounds compared to when they listened to random sounds.

## CCS Concepts

• Human-centered computing → Mobile phones.

## Keywords

Informal Caregivers, Self-care, Well-being, Nature Sounds

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## 1 Introduction

Family members are responsible for giving individuals who require emotional and physical support, and these caregivers are called

informal caregivers (ICs) [5, 12]. Many demands come with being an IC, which can lead to higher stress [7, 8]. This stress can have a severe negative impact on the IC, as evidence shows that stress can have adverse effects on psychological well-being and that ICs may be at an elevated risk of deteriorated psychological well-being [8, 13]. The well-being of ICs relies heavily on finding a balance between the demands they face and their ability to cope with those demands. This balance is essential to prevent the development of health problems [15]. Self-care is the practice of engaging in activities that promote overall well-being and health [10, 15]. By caring for themselves, ICs can be better prepared to handle caregiving demands and maintain their health and well-being. Participating in nature-based activities can be considered a form of self-care, as nature has been widely recognized as a repairing escape from the demands of daily life. [9].

Similar to real nature, research suggests that digital nature engagement can help with restoration and related psychological advantages [4]. These psychological effects of nature on well-being can be elicited by digital nature, such as images, videos, sound, olfactory or virtual reality, which has also been intensively investigated [3]. Various forms of interaction with nature are beneficial to one's well-being.

Natural noises result in a faster physiological stress recovery than road noises. Alvarsson et al. [1] reported that listening to natural sounds after being under stress significantly improved the sympathetic nervous system compared to listening to loud noises. According to their findings, natural noises may bring additional restorative experience to the visual senses. Natural soundscapes (e.g., birdsong, water, insects, and wind) were favored over urban soundscapes (e.g., traffic, coffee ambiance, machinery) in previous research but did not significantly improve mood [4]. Personal preferences appear to significantly influence well-being, as noted by Ng et al. [11] in their meta-analysis on the application of self-determination theory in health contexts. They highlighted the importance of autonomy and how this can positively impact health. Giving ICs the autonomy to choose their preferred nature sounds and listen to them, we believe that could enhance their emotional states. Thus, in this preliminary study, we sought to examine whether listening to a chosen nature sound improves the well-being of ICs compared to a randomly selected nature sound.

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## 2 Materials and Methods

### 2.1 Sample

All participants in this preliminary study were ICs (N=28, 93% female). The mean age among participants was 49 years old (SD=12). The disease that the person they are caring for was the cause for more than half of the participants (67%) to become ICs. 29% of them were daughters or sons of the person they cared for, and 11% were parents. The average of years spent as an IC was 6 years (SD=5).

### 2.2 Procedure

This was a within-subject design study where participants to participate in this study, signed the informed consent form. Then, completed the sociodemographic questions (age, gender, reasons for becoming ICs, the type of relationship with the person they care for, and the duration they have provided informal care) and SAM and PANAS scales [2, 16] to measure their emotional states. Participants were invited to take part in the study from home in a calm setting, using a mobile phone to listen to two YouTube nature sounds: one in a random condition and the other in a choice condition. The sounds were selected based on feedback from a previous questionnaire regarding ICs' nature preferences [14].

The study comprised three phases: T0 to T2. In phase T0, ICs completed the SAM and PANAS scales to establish a baseline. In phase T1, participants were randomly assigned to listen to either a random sound or a choice sound for the first condition, followed by the alternate condition in phase T2. In the random sound condition, participants heard one of two preselected nature sounds either sea waves or birds singing. In the choice sound condition, they could freely select their preferred sound from sea waves or bird singing<sup>1</sup>. To counteract order effects, conditions were alternated.

Participants listened to each nature sound for six minutes, as research indicates that exposure of less than seven minutes can induce positive psychological changes [6]. After listening, ICs completed the SAM and PANAS scales again and responded to an ad hoc satisfaction question: What nature sound did you choose and why?

### 2.3 Data analysis

The data were analyzed using the Friedman test using SPSS Statistics '26'. After the Friedman test was significant, we ran a separate post hoc test to examine where the differences occurred, using the Wilcoxon pairwise test, on the different combinations, where we adjusted the p-value on the Wilcoxon test results, resulting in a new significant level of 0.02 (0.05/3). The responses from participants to the open-ended question were analyzed by two researchers through thematic analysis. They started by developing initial codes, which were then organized into broader themes. After reviewing and refining these themes, they compiled all relevant excerpts for each theme and constructed a narrative.

## 3 Results

For the quantitative data, there was a statistically significant difference in all areas: Arousal, Valence, Positive and Negative Affect,

$X^2(2)=8.753$ ,  $p=0.013$  (degrees of freedom = chi-square)  $X^2(2)=26.425$ ,  $p\leq 0.001$ ,  $X^2(2)=15.864$ ,  $p\leq .0001$ ,  $X^2(2)=20.347$ ,  $p\leq 0.001$ , respectively. Wilcoxon's post hoc analysis adjusted the significance level to  $p=0.02$ . Despite the Friedman test being statistically significant in Arousal, the Wilcoxon pairwise comparison was not statistically significant. Valence showed a statistically significant increase between the baseline and sound choice ( $p\leq 0.001$ ,  $r=0.78$ ). Positive affect showed a statistically significant increase between baseline and sound choice ( $p\leq 0.001$ ,  $r=0.69$ ). Negative affect showed a statistically significant decrease between baseline and random sound ( $p\leq 0.001$ ,  $r=0.65$ ) and between baseline and choice sound ( $p\leq 0.001$ ,  $r=0.60$ ).

In analyzing the qualitative data, we identified three themes related to participants' reasons for selecting specific nature sounds: (a) feelings evoked by the sound, (b) personal choices, and (c) childhood memories.

(A) Feelings Evoked by the Sound: The majority of participants (82%) preferred the sound of waves over birdsong (18%). Among those who chose wave sounds, 75% mentioned positive feelings as their primary reason, expressing sentiments such as, "the sound of waves calms me down" (P2) and "it brings me tranquility and serenity" (P4).

(B) Personal choices: A smaller group of participants (20%) indicated that their choices were based on personal preferences, with comments like, "I like the sound of the waves" (P8) and "I enjoy the sound of the forest, especially the birds" (P9).

(C) Childhood memories: A few participants (5%) reported selecting nature sounds due to nostalgic associations, stating that certain sounds such as "The chirping of birds takes me back to my grandmother's garden" (P15).

## 4 Discussion

This paper aimed to investigate the impact of choosing nature sounds on the well-being of ICs. According to our results, listening to a chosen nature sound showed some benefits to the well-being of ICs. Both Valence and Positive Affect showed a statistically significant increase. However, this effect only appeared when the IC listened to a chosen nature sound. We would argue that a simple choice can positively impact the participants' emotional state. Also, this finding may depend on participants' preferences according to their feelings at the moment and previous memories of that nature sound that may have influenced their choices in this study. This is supported by the participants' answers with their reasoning for choosing, including feelings of calmness, preferences, or childhood memories. It is important to recognize the limitations of this study, including its short duration and reliance on self-reported measures. Future research could investigate physiological metrics and long-term effects to gain a deeper understanding of how listening to self-selected nature sounds affects the well-being of ICs. In conclusion, this study highlights the significance of listening to natural sounds and their positive effects on the well-being of individuals in care, especially when they have the autonomy to choose these sounds.

<sup>1</sup>Sea waves: [https://www.youtube.com/watch?v=NRF4N181O\\_U](https://www.youtube.com/watch?v=NRF4N181O_U), Birds singing: [https://www.youtube.com/watch?v=67drXiN\\_XvM](https://www.youtube.com/watch?v=67drXiN_XvM)

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