



“I Miss Going to that Place”: The Impact of Watching Nature Videos on the Well-Being of Informal Caregivers

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Abstract. Informal caregivers play an essential role in caring for persons who require assistance and in managing the health of their loved ones. Unfortunately, they need more health, leisure, and relaxation time. Nature interaction is one of many kinds of self-care intervention. It has long been regarded as a refreshing break from stressful routines, and research suggests exposure to nature interventions to improve the quality of life of caregivers. Despite not being the real thing, technology allows us alternatives that can still have some beneficial effects. In this preliminary study, we explore the benefits of natural environment videos on informal caregivers as an alternative to exposure to nature. Specifically, we are interested in the effects of their own choices versus a random video. We found that natural environment videos improve the well-being of informal caregivers in at least three key areas: valence, arousal, and negative affect. Furthermore, the effect increases when they choose the video they want to watch instead of a random video. This effect benefits the studied subjects because they need more time and energy to visit real natural environments.

Keywords: Informal caregivers · Self-care · Well-being · Nature videos

1 Introduction

Informal caregivers play an essential role in caring for persons who require assistance and in managing the health of their loved ones. However, coping with heavy responsibilities, like personal care or domestic activities, and securing income may absorb most informal caregivers' time budget, leaving little to no time for them to attend to their health, leisure, and relaxation [19]. This issue is vital as informal caregiving, besides being time-consuming, is also physically and emotionally demanding [13].

Self-care is defined by Cook [7] as the process of being aware of and attending to one's basic physical and emotional needs daily through engaging in beneficial behaviors, which may include modifying one's daily routine, relationships, and environment as needed to promote it [7].

Self-care practices are essential to informal caregivers since they positively impact mental health [17]. This matter emphasizes the importance of a build-up of interventions addressing the needs of informal caregivers to reduce stress and improve well-being. Some interventions help reduce the adverse effects of care and enhance caregivers' quality of life. Psychoeducational, psychotherapeutic, self-help, multi-component interventions that give disease or self-care knowledge, problem-solving approaches, communication skills, social support, or mindfulness are examples of these measures [10].

However, these interventions are typically costly and unavailable to everyone, and informal caregivers may need more time for them [5]. Furthermore, interventions that incorporate various activities to promote multiple outcomes, such as social support, psychological abilities, and a healthy lifestyle, have been linked to a reduction in burden and an increase in healthy living behaviors [7]. These interventions demonstrate the need to promote and practice self-care, particularly among informal caregivers, since it relates to improved physical, emotional, and mental health [7].

Nature interaction is a self-care intervention. It has long been regarded as a refreshing break from stressful routines. For instance, Lehto et al. [13] found that further research is required to support informal cancer caregivers. Nevertheless, they still suggest exposure to nature interventions, considering the benefits of the natural environment. Human health and well-being have been shown to benefit from interaction with nature and green environments [16]. *Shinrin-Yoku* (Forest Bathing) [14], is the practice of spending time in the forest, which promotes better health, a more robust immune system, happiness, and calmness. According to Qing Li's research [14], being around trees, filling the home with house plants, and vaporizing essential tree oils can reduce stress and improve health and well-being by interacting with nature.

These interactions have several physiological effects, including decreased salivary cortisol, heart rate, diastolic blood pressure, HDL cholesterol, decreased low-frequency heart rate variability (HRV), and increased high-frequency HRV [20]. It also has psychological effects such as positive effects on energy scores, tranquility, heightened levels of happiness, self-transcendent emotions (like awe, gratitude, and wonder), and an increased sense of well-being [2] improved attention levels [2], decreased depression [18], anxiety [2], stress levels [21] and reduced negative emotions such as anger, fatigue, and sadness [2]. Natural environments, such as forests, have been studied extensively, with findings indicating that they benefit human physical and mental health [11, 15].

Nature's psychological effects on well-being can also be noticed without direct physical contact with nature. Examples include nature videos [23] and virtual reality nature experiences [1]. In addition there are digital representations of nature in the form of nature videos on digital platforms [23], for example, in

online nature activities¹, and webcam travel (i.e., seeing location-based webcams online) [12]. For people with pre-existing health concerns, digital nature engagement provided a valuable opportunity to access other natural locations, allowing for a sense of escape and fostering nostalgia by establishing linkages to familiar or preferred locales [8].

When in-vivo nature is absent, Darcy et al. [8] findings agree to some extent that digital nature can supplement or serve as a suitable replacement. However, this may not be a sufficient substitute for ‘real’ nature encounters. For example, a lack of access to specific natural places has resulted in confused sensations or when digital nature fails to deliver a comprehensive sensory experience [8].

Alternatives to real-life nature may improve well-being. However, the impacts of actual [23] are worth noting. Digital nature surrogates (i.e., nature videos, photos, Virtual Reality) can help as they may improve well-being, particularly for informal caregivers who do not have the possibility to experience direct contact with nature.

Informal caregivers may not be able to go to a natural environment. Time constraints due to long working days or immobility may hamper opportunities for physical nature experiences. In addition, only some can access nature easily, as many people may not have the physical constitution or mobility to access nature areas. With this, informal caregivers could use technology to connect with nature without leaving home, such as watching videos that bring natural environments into their homes. However, no study was found using relaxing nature videos with informal caregivers that could allow them to take a break from their caregiving duties and focus on their health and well-being.

1.1 Research Question and Contributions

This preliminary study tries to pull informal caregivers closer to nature through nature environment videos. We aim to analyze whether watching chosen relaxing nature videos can impact the well-being of informal caregivers, as it appears that personal preference can improve well-being. For this reason, we try to answer the following research question:

- Will watching relaxing nature videos of their choice improve informal caregivers’ well-being versus watching a random nature video?

The contribution of this paper lies in analysing and interpreting the findings regarding the effects of watching a chosen nature video versus a random video on informal caregivers’ well-being.

2 Methods

2.1 Elicitation of Preferences

We used a questionnaire to ascertain the characteristics that informal caregivers like in forest, beach, and mountain environment videos. We then asked the par-

¹ Discover Small Moments of Joy in Nature, 2020; The Wildlife Trusts over 1000 Care Homes Sign-Up to Go Wild This June 2020.

ticipants to choose the type of environment videos they wanted to watch. After watching three different videos of the chosen type, we asked what they liked about the videos and what they would change. The answers provided insights into their emotions and feelings during the video visualization. The selected characteristics were: the videos can not have people, the forest and mountain video should be during the day, and the beach environment should have a sunset. This allowed us to preselect three videos for this study, what metrics should be considered, and their possible effects on the informal caregivers' well-being.

2.2 Sample

The subjects of this study are all informal caregivers. A total of thirty participants completed the study, with 49.7 ± 9 years old. A significant percentage of the participants were female (86.7%). More than half of the participants (60%) became caregivers because of a family member's disease - 26,7% of them were daughters or sons of the diseased person, and 16.7% were parents. The average time being a caregiver was 9.3 ± 6.2 years.

2.3 Data Collection

We used several questionnaires to gather data from the subjects. We started by asking the subjects about their age, gender, why they became informal caregivers, their relationship to the family member they cared for, and how long they had been doing informal caregiving.

We then used the Self-Assessment Manikin (SAM) [3] to measure the emotional states (valence, arousal, and dominance). For this study, we did not measure dominance as it is irrelevant. We also used the Positive and Negative Affect Schedule (PANAS) [22] to measure mood and emotion.

Finally, we administered three *ad hoc* satisfaction questions to assess the user's experience watching the nature environment videos. The questions were: a) What natural environment did you choose and why? b) What feature do you like in the natural environment video? c) What changes would you like to make in the natural environment video?

2.4 Tasks

The participants watched two nature environment YouTube videos in two different conditions from a preselected list based on the feedback of the initial questionnaire. The list had three nature videos (forest, beach, and mountain)².

After watching each video, participants had to fill out two self-reported scales.

² Forest video: <https://youtu.be/cm8qZWDjsr4> (starting at min 15); Beach video: <https://youtu.be/bCnfORRjaDU> (starting at min 15); Mountain video: <https://youtu.be/FW5IpeH202s> (starting at min 1).

2.5 Procedure

Individuals were invited to participate in the study in their home environment, in a calm environment, and using a mobile phone to watch nature videos. First, they signed the informed consent to participate in the research. Then, they filled out a socio-demographic survey. Then, the study was composed of phases from T0 to T2. In phase T0, and to establish a baseline, they filled out the SAM and PANAS scales.

In phrase T1, the participants were randomly assigned either a choice condition or a random one for the first video, followed by the opposite condition for the second video in phrase T2. In the choice condition, the participant can freely choose the video they want to watch, while on the random condition, the participant gets to watch a randomly selected video. We alternate the conditions (choice and random) to avoid the order effect. After watching the video, participants filled out the SAM and PANAS scales in each condition, administered during phase T0.

In both phrases T1 and T2, participants watched each video for five minutes, as research shows that a 5-minute video can induce positive physiological change [4,6,9]. Therefore, we selected this duration to keep the experiment short but with relevant results.

In the end, the participants answered *post hoc* questions about why they chose that video and what features they liked and disliked in the natural environment video. Figure 1 illustrates each nature video used in this study.



Fig. 1. Screenshots of each nature environment video

2.6 Data Analysis

The data were analyzed using the Friedman test using SPSS Statistics ‘26’. The Friedman test is a non-parametric test used when measuring an ordinal dependent variable. It is also applied to check for changes within people (repeated measures) and within a group measured in three or more conditions. We applied the Friedman test because we had three conditions, repeated measurements, and ordinal data. Since the Friedman test was significant, we had to examine where the differences occurred. We conducted a separate *post hoc* analysis on each combination using the Wilcoxon pairwise test.

Given that, we needed to adjust the p-value on the Wilcoxon test results since we were performing multiple comparisons. To calculate the p-value adjustment, we divided the previous significant level (0.05) by the number of tests we conducted, yielding a new significant level of 0.017 (0.05/3). If the p-value was higher than 0.017 was not a significant result. The participant's responses to the open-ended question were analyzed by two authors using thematic analysis. Starting by creating initial codes, then grouping codes into themes, reviewing and revising themes, grouping all excerpts associated with a particular theme, and writing the narrative.

3 Results

There was a statistically significant difference in valence, arousal, and negative affect, $X^2(2) = 11.146$ (degrees of freedom = chi-square), $p \leq 0.001$, $X^2(2) = 21.843$, $p \leq 0.001$, $X^2(2) = 34.758$, $p \leq 0.001$, respectively. However, no statistically significant difference was found in positive affect $X^2(2) = 5.845$, $p \geq 0.05$. Wilcoxon's post hoc analysis adjusted the significance level to $p = 0.017$.

Valence showed a statistically significant increase between the baseline and the choice condition ($p \leq 0.001$, $r = 0.54$). However, there was no significant difference between the baseline and the random condition ($p \geq 0.05$ $r = 0.33$). Arousal showed a statistically significant decrease between the baseline and random condition ($p \leq 0.001$, $r = 0.68$) and between the baseline and choice condition ($p \leq 0.001$, $r = 0.58$). Negative Affect showed a statistically significant decrease between the baseline and the random condition ($p \leq 0.001$, $r = 0.76$), between baseline and choice condition ($p \leq 0.001$, $r = 0.79$). Figure 2 illustrates the distribution of values for a better understanding of the results.

Most participants ($n = 20$) chose the beach as the environment they preferred to watch, nine chose the forest, and only one chose the mountain. Participants made their choices based on the following reasons: "it brings peace", "it helps to calm down", "it renews energy", "it gives a feeling of freedom", "it relaxes", "it feels light", "it takes away the sadness", "it brings tranquility", and "it makes them feel good". Some participants mentioned that "it is my environment", "I live in the countryside", and "I like contact with nature". Some participants mentioned "a feeling of missing going to that place", "the smell of the sea", "listening to the waves", and "I miss that". Some participants justified that they do not go to this natural environment with: "there is no possibility of great absence", "it is a bit distance from home and I can not leave my family member alone", "lack of time", "lack of money for fuel".

Some participants would like to change the type of environment, the light, the birds' sound, and the green colors of the forest video. They liked the sunset and the sound of the waves in the beach video, but some mentioned they would change the sound to a more relaxing one. In the mountain video, they liked the type of environment and the light but would also change the sound.

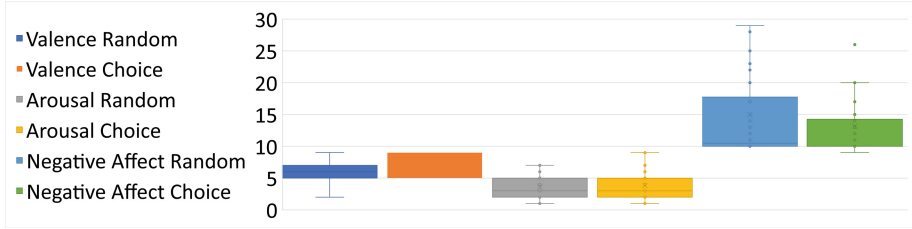


Fig. 2. Box and Whiskers plot of Valence, Arousal and Negative Affect with corresponding Random and Choice

4 Discussion

The main goal of this paper was to explore the impact of natural environment videos on informal caregivers with a focus on the act of choosing. We did find a statistically significant difference in valence, arousal, and negative affect between the baseline and the choice condition. In addition, the negative affect and arousal also have a statistically significant difference between the random and choice conditions.

Having a statistically significant increasing effect on valence seems to indicate a benefit of nature videos. However, in this study, the effect only appears when the subjects choose the video. This may indicate that the choice does matter for valence. Arousal and Negative Affect have a statistically significant decrease. There is a more prominent effect for the random condition for the arousal, while the negative affect has a similar size in both conditions. This finding may indicate that the choice has a small or negligent effect on both arousal and negative affect relative to the base condition.

We surmised that the effects found in valence, arousal, and negative affect might depend on previous feelings and experiences gathered on visitations to similar places. This idea of “gathered experience” highlights how certain places can become emotionally significant. This is supported by how the participants justified the choices with feelings of calmness and peacefulness. In this case, the positive emotional state is associated with an entire scene or specific sensory stimulation, visual or auditory, that evoked familiarity and nostalgia.

5 Study Limitations and Future Work

In this section, we discuss the main shortcomings of our approach and hint at future research opportunities.

Nature Video Selection: We studied only the effect of two nature videos, and anticipated that some videos would appeal more to one than others. Due to this, we requested that participants select the natural video. However, more types

of nature videos and giving more options to participants could yield different results.

Researchers could learn more about why participants selected a particular nature video, such as which videos they preferred most and how the specific nature video they selected affected their well-being by letting them select from a broader range of nature videos. Future research should consider this idea, and take the hints given by the subjects to create a better and more extensive selection of videos.

Other Media Types: Although we focused on the effect of watching natural environments, especially on choosing, looking into looking into other media forms, such as visual-only and Virtual Reality, is also essential. Other forms of media should be researched to determine which media the act of choosing has the best effect on the informal caregiver's well-being. These findings could be used to develop other approaches to promote the well-being of informal caregivers.

Regarding the act of choosing, the importance of choice must be further studied to understand its true impact, possibly with additional metrics.

Duration of the Study: Our short-term study provided exciting results. However, a study with more repetitions and a longer duration could provide a stronger case, so we could benefit from doing it in a future study.

6 Conclusion

We conclude that watching a chosen nature video improves the well-being of informal caregivers in at least three key areas: valence, arousal, and negative affect. The choice made by the participants improves the effect on valence. These results are important because many informal caregivers need help entering real natural environments. By viewing chosen nature videos, they can experience the calming effects of nature while in their own homes. By viewing nature videos, informal caregivers can escape caregiving's physical, emotional, and mental fatigue, feel more relaxed and less stressed, and improve their well-being without leaving home. Therefore, providing informal caregivers access to nature videos is an effective and empowering way to provide them with moments of self-care that can positively impact their physical, mental, and emotional health. Caregivers can also find comfort in the choice of nature videos allowing them to take ownership of their caregiving situation and feel empowered to make decisions that promote their physical and emotional health.

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