

Understanding the effects of watching a nature video on informal caregivers' emotional well-being compared to non-caregivers' emotional well-being

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Abstract

Informal caregivers may find caring for their health and well-being challenging, as informal caregiving is physically and emotionally exhausting. It is also challenging to leave their loved ones alone as they require constant care and support. Watching nature videos may allow caregivers to immerse themselves in nature without having to physically leave their home. This preliminary study investigates whether nature videos increase valence and positive affect and decrease arousal and negative affect of informal caregivers compared to non-caregivers using SAM and PANAS scales. We conclude that watching nature videos positively affects informal caregivers' well-being, especially by increasing valence and positive affect, and decreases arousal compared to the non-caregivers group. With this, nature videos could be a helpful and accessible tool for caregivers to incorporate into their daily routine to relieve their caregiving stress without physically leaving home.

Keywords

Nature Videos, Informal Caregivers, Non-Caregivers, Well-being

1. Introduction


In managing the health of their loved ones and providing care for those in need, informal caregivers (ICs) are essential. Nevertheless, the ICs may find it challenging to obtain the time to take care of their health, leisure, and relaxation due to the heavy responsibilities, such as personal care or domestic activities, and securing income [10]. This is a vital problem because informal caregiving is time-consuming and physically and emotionally exhausting [9]. As a result, the well-being of ICs may become compromised, leading to increased stress and burden levels [5]. Furthermore, studies have shown that ICs experience higher stress, anxiety, and depression compared to non-caregivers [5,11]. These adverse effects on their well-being can further impact their ability to provide adequate care and support. Additionally, neglecting their health and self-care can have long-term consequences for their overall quality of life [13]. With this, it is crucial to prioritize the health and well-being of ICs by implementing accessible

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resources that can help alleviate their burden and promote self-care [13]. Nature interaction is a type of self-care intervention that could have numerous benefits for ICs. Research has found that spending time in nature can reduce stress, improve mood, and increase overall well-being [2].

Nature's psychological effects on well-being can also be noticed without direct physical contact with nature. Examples include virtual reality nature experiences [1] and nature videos [15]. Digital nature interaction, such as nature videos, was a helpful means of accessing different natural settings for individuals with pre-existing health difficulties. This allowed for a sense of escape and fostered nostalgia by creating connections to places the user had previously visited or preferred [7]. The benefits of nature exposure are widely recognized, but it's important to consider the challenges that ICs encounter in accessing and enjoying these benefits. First of all, it can be quite challenging for many ICs to leave their loved ones alone to get a break or take care of themselves [12]. The never-ending responsibilities of providing constant care and support frequently leave them with little time for self-care, and especially for outdoor activities. Because of this, alternative forms of nature interaction, such as nature videos, offer a convenient and accessible alternative, allowing ICs to immerse themselves in nature without having to physically leave their home and the people they are caring for [12].

Comparing the experiences of ICs and non-caregivers may be important for a number of reasons, including identifying any benefits or challenges related to the digital nature in the context of caregiving. Firstly, since ICs probably have less opportunities than non-caregivers for relaxation and respite, they may benefit more from nature videos in terms of reductions in stress and emotional strain. On the other hand, ICs' increased emotional demands and responsibilities may affect the degree of receptivity they have to digital nature which may impact their emotional state in comparison to non-caregivers.

Overall, comparing the impact of nature videos on ICs and non-caregivers can reveal the potential value of these interventions in helping ICs' emotional states and self-care routines and can provide a nuanced understanding of how digital nature interaction may support caregiver well-being. With this, this preliminary study aims to determine whether nature videos increase valence and positive affect and decrease arousal and negative affect in ICs compared to non-caregivers. This has led us to the following research question: Would watching nature videos improve the valence, arousal, positive and negative affect of ICs compared to non-caregivers?

We hypothesized that a nature video would increase valence and positive affect and decrease arousal and negative affect of ICs compared to non-caregivers.

2. Methods

2.1. Nature videos

The nature videos used in this study were YouTube videos selected based on a previous questionnaire [12]. The questions were about the characteristics that ICs like and what they would change in the forest, beach, and mountain environment videos. The ICs were recruited using the method of snowball sampling.

After analysis of the data, we found the videos should have the following characteristics: (i) the videos could not have people, (ii) the forest and mountain videos should be during the day, and (iii) the beach environment should have a sunset. We pre-selected the three videos using these characteristics. Considering the the responses to the questionnaire, and how emotionally driven they were, we decided what metrics should be used in this study. The forest, beach and mountain videos used in this study ¹, figure 1 illustrates each nature video used in this study.



Figure 1: Screenshots of the videos

2.2. Data collection

We used several questionnaires to gather data from the participants. First, the questions differed for the two groups, ICs and non-caregivers. The ICs' group questions were about participants' age, gender, why they became ICs, their relationship to the family member they cared for, and how long they had been doing informal caregiving. The non-caregivers group's questions were about participants' gender and age.

We used the Self-Assessment Manikin (SAM) [3] a self-reported scale with manikin figures and the standard nine levels that measure valence, arousal, and dominance. However, this study was limited to valence and arousal. We used the Positive and Negative Affect Schedule (PANAS) [14] a self-report scale measuring mood or emotion. For this study, we used the time duration of "at the moment" as we were interested in knowing the emotions and feelings of the participants before and after the experiment.

2.3. Sample

The subjects in this study were ICs and non-caregivers distributed in two groups: the ICs group and the non-caregivers group. For both groups, the participants had to be more than 18 years old. For inclusion in the caregiver group, participants had to be currently providing informal care to someone who required assistance. For the non-caregiver group, participants were excluded if they had previous experience providing care, or if they were currently providing informal or formal care to others.

The participants were recruited using the method of snowball sampling. A total of sixty participants completed the study (thirty ICs and thirty non-caregivers) with an average age of 49.2 ± 9.8 years in the ICs group and 41.9 ± 13.7 years in the non-caregivers group. Regarding

the gender in the ICs group, a significant percentage of the participants were female (93.3%), but not in the non-caregivers group, where the participants were evenly distributed (50/50).

More than half of the participants in the ICs group (56.6%) became caregivers because of a family member's disease - 56.7% of them were daughters or sons of the diseased person, and 10% were parents. The average time being a caregiver was 5.3 ± 4.8 years.

2.4. Procedure

For both groups, participants 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. To establish a baseline, they filled out the SAM and PANAS scales. Then, the participants watched a 5-minute natural video, randomly selected from: Forest, Beach, or Mountain. The participants watched the video for five minutes, as research shows that a 5-minute video can induce positive physiological change [4,6,8].

Therefore, we selected this duration to keep the experiment short but with relevant results. After watching the video, participants filled out again the SAM and PANAS scales administered for baseline.

2.5. Valence

The valence (Table 1) between the ICs group (Mdn = 6, IQR = 3) and the non-caregivers group (Mdn = 7, IQR = 2) before exposure to the nature videos differed significantly, with $U = 284$, $p = 0.012$ (two-tailed test) with a medium effect size of $r = 0.46$. Comparing valence before and after exposure for each group, reported levels of valence from the group of ICs were statistically significant ($p \leq 0.001$ (two-tailed test), $r = 0.80$) as opposed to the ones reported from the group of non-caregivers that were not statistically significant ($p = 0.198$ (two-tailed test), $r = 0.24$). Finally, when compared between groups after being exposed to nature videos, the level of valence of ICs (Mdn = 8, IQR = 2) and of non-caregivers (Mdn = 7, IQR = 2) did differ significantly, with $U = 311.5$, $p = 0.033$ (two-tailed test) and a medium effect size $r = 0.39$ (Figure 2).

2.6. Arousal

The arousal (Table 1) between the ICs group (Mdn = 4.5, IQR = 3.25) and non-caregivers group (Mdn = 3, IQR = 3) before exposure to the nature videos was statistically significant, with $U = 292$, $p = 0.017$ (two-tailed test) with a medium effect size $r = 0.44$. Comparing arousal before and after exposure for each group, reported arousal levels from the group of ICs were statistically significant ($p \leq 0.001$ (two-tailed test), $r = 0.77$). The reported levels of arousal from the group of non-caregivers were not significant ($p = 0.825$ (two-tailed test), $r = 0.15$). Finally, when compared between groups after being exposed to nature videos the levels of arousal of ICs (Mdn = 1.5, IQR = 1.25) were significantly lower than the group of the non-caregivers (Mdn = 2.5, IQR = 3), $U = 319$, $p = 0.041$ (two-tailed test), with a medium effect size of $r = 0.37$ (Figure 2).

2.7. Positive affect

The positive affect (Table 1) between the ICs group (Mdn = 23.5, IQR = 16.75) and the non-caregivers group (Mdn = 24, IQR = 12.5) before exposure to the nature videos did not differ

significantly $U = 384.5$, $p = 0.332$ (two-tailed test) with a small effect size of $r = 0.18$. Comparing positive affect before and after exposure for each group, reported levels of positive affect from the group of ICs were statistically significant ($p = 0.001$ (two-tailed test), $r = 0.77$). The reported levels of positive affect from the group of non-caregivers were not statistically significant ($p = 0.156$ (two-tailed test), $r = 0.26$). Finally, when compared between groups after being exposed to nature videos the levels of positive affect by ICs (Mdn = 30, IQR = 18) were significantly lower than the non-caregivers (Mdn = 27, IQR = 18), $U = 314$, $p = 0.044$ (two-tailed test), with a medium effect size of $r = 0.37$ (Figure 2).

2.8. Negative affect

The negative affects (Table 1) in the ICs group (Mdn = 12, IQR = 9) and the non-caregivers group (Mdn = 10, IQR = 1.25) before exposure to the nature videos were statistically significant $U = 293.5$, $p = 0.014$ (two-tailed test) and had a medium effect size of $r = 0.45$. After exposure, reported levels of negative affect from the group of ICs were statistically significant ($p \leq 0.001$ (two-tailed test), $r = 0.66$), and reported levels of negative affect from the group of non-caregivers were not statistically significant ($p = 0.227$ (two-tailed test), $r = 0.22$). Finally, when compared between groups after being exposed to nature videos, the Negative Affect between ICs (Mdn = 10, IQR = 1) and the non-caregivers (Mdn = 10, IQR = 2) did not differ significantly, with $U = 364$, $p = 0.135$ (two-tailed test) and a small effect size $r = 0.27$.

Table 1

Results of Valence, Arousal and Positive and Negative Affect for the ICs and Non-caregivers Group

Variable	Informal Caregivers group before and after exposure (p-value)	Non-Caregivers group before and after exposure (p-value)	Between-group comparison before exposure (p-value)	Between-group comparison after exposure (p-value)
Valence	0.001	0.198	0.017	0.033
Arousal	0.001	0.825	0.017	.041
Positive Affect	0.001	0.156	0.332	0.044
Negative Affect	0.001	0.227	0.014	0.135

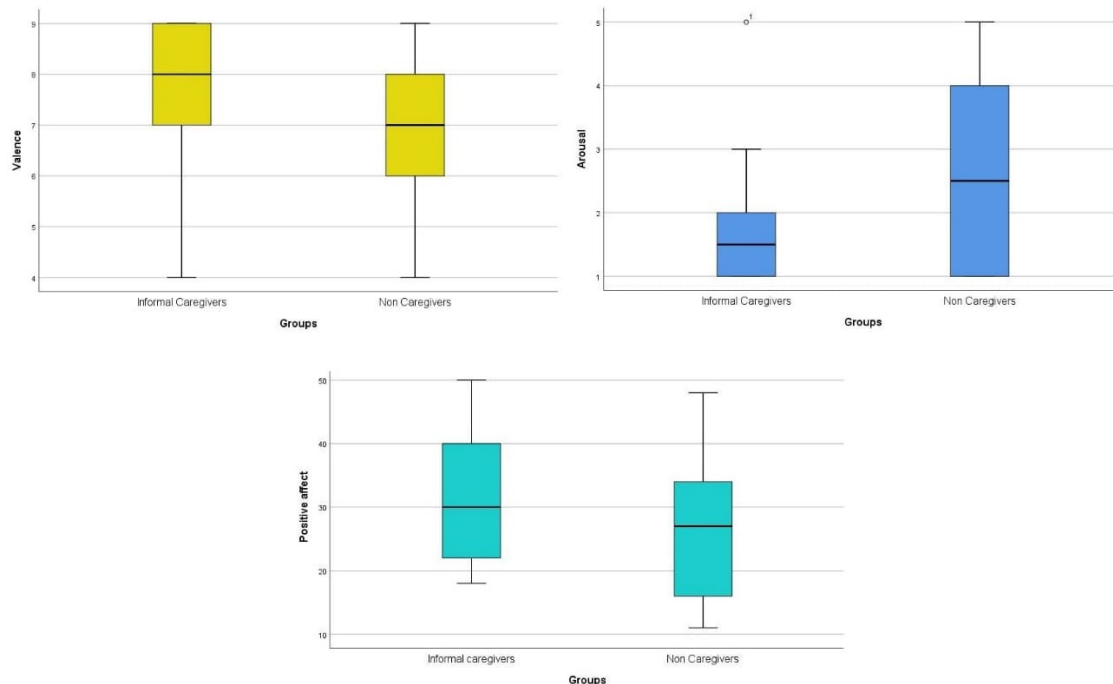


Figure 2: Box-plot between groups regarding valence (yellow), arousal (blue), and positive affect (green) after exposure. Each graphic shows the informal caregivers group to the left and the non-caregivers group to the right

3. Discussion

In this study, we hypothesized that watching a nature video would increase valence and positive affect and decrease arousal and negative affects compared to the non-caregivers. Our main hypothesis is supported by the finding that ICs reported a significantly increase of positive affect and valence compared to the non-caregivers group, who did not show a significant difference. The results highlight the potential of nature videos to increase positive emotions and enhance general well-being, particularly for ICs.

Additionally, ICs showed a significant difference in arousal, compared to non-caregivers who showed no significant difference. This suggests that ICs' arousal levels were successfully lowered by nature videos, which may have helped them feel more relaxed. Negative affect did not show a significant reduction in ICs compared with the non-caregivers. This outcome is contrary to our hypothesis and is the only aspect in which there was no significant difference between the two groups. Several factors, such as caring responsibilities, individual differences in coping mechanisms and resilience, and the duration and frequency of exposure to the videos, could contribute to this result.

Overall, the study's findings correspond with the hypothesis that, as compared to the non-caregivers' group, watching nature videos can have a positive impact on ICs' emotional well-being. The outcomes may be explained by a number of related aspects, including stress reduction, and the restorative power of nature.

Nature videos provide a practical and easily available way for ICs, who might not have many opportunities for self-care and respite, to experience the restorative benefits of nature. The

videos' soothing images and depictions of the sounds of nature can effectively relax the body and mind, lowering caregivers' arousal levels more than their non-caregiver group. With this, the results suggest that caregivers may derive greater benefits from nature video interventions, particularly in terms of enhancing positive emotions and reducing arousal levels. These findings highlight the potential of nature-based interventions, such as watching nature videos, as accessible and effective tools for promoting emotional well-being and relaxation among caregivers.

4. Study limitations and future work

4.1. Nature video selection

This study only considered three types of nature videos to which ICs were assigned. However, it is crucial to further explore more types of nature videos for this population, as it could offer a cost-effective and accessible means of improving their overall mental health.

4.2. Duration of the study

Our short-term study provided exciting results for ICs. However, further research is needed to explore this intervention's long-term effects and potential applications in caregiving settings.

4.3. Confounding variables

In this study, only age and gender were measured as demographic information in both groups. This could influence the results, as the participant's workload or other daily stressors within each group may affect the response to the videos. The frequency of exposure to nature or existing coping mechanisms can also be a factor that was not considered. This limits the interpretation of the findings observed. Future studies should take into account a more complete view of the target group's background. Measuring these variables would allow researchers to explore potential associations with the outcomes of the study.

5. Conclusion

We conclude that watching nature videos can positively affect ICs' valence, arousal, and positive affect, compared to the non-caregivers group. This finding suggests that nature videos could transport caregivers to serene landscapes, allowing them to momentarily escape their caregiving responsibilities and immerse themselves in the calming effects of nature. Nature Videos could be an accessible tool for ICs to incorporate into their daily routine to relieve their caregiving stress. It can provide a much-needed break from caregiving responsibilities, allowing them to recharge physically and mentally, ultimately increasing their quality of life. The calming properties of nature videos could also help ICs to relax, improving their ability to cope with the challenges they face as caregivers.

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