

2023

## The effects of outdoor therapy on depression and anxiety: a quantitative review

Lindsey N. Wheeler

Western Kentucky University, [lindsey.wheeler796@topper.wku.edu](mailto:lindsey.wheeler796@topper.wku.edu)

Steven R. Winger

Western Kentucky University, [steven.winger@wku.edu](mailto:steven.winger@wku.edu)

Follow this and additional works at: <https://scholar.utc.edu/mps>



Part of the [Psychology Commons](#)

---

### Recommended Citation

Wheeler, Lindsey N. and Winger, Steven R. (2023) "The effects of outdoor therapy on depression and anxiety: a quantitative review," *Modern Psychological Studies*: Vol. 28: No. 2, Article 4.

Available at: <https://scholar.utc.edu/mps/vol28/iss2/4>

This article is brought to you for free and open access by the Journals, Magazines, and Newsletters at UTC Scholar. It has been accepted for inclusion in *Modern Psychological Studies* by an authorized editor of UTC Scholar. For more information, please contact [scholar@utc.edu](mailto:scholar@utc.edu).

### **Abstract**

The goal of this research was to assess the effectiveness of outdoor therapy on depression and anxiety across different moderators via a quantitative review. While there are studies that look at the effectiveness of outdoor therapy on psychological outcomes, there is a lack of synthesis of the research investigating moderators. A literature review was conducted, and six studies were included in the analysis. Cohen's  $d$  was calculated for each study. We examined the following moderators: intervention type, intervention duration, age, and outcome measurement. The effects of outdoor therapy were greater for anxiety ( $d=0.65$ ,  $n=1215$ ) than depression ( $d=0.43$ ,  $n=115$ ). Within the anxiety results, the average effect size for adolescents ( $d=0.75$ ,  $n=979$ ) was greater than the adult effect size ( $d=0.27$ ,  $n=236$ ).

*Keywords:* depression, anxiety, outdoor therapy

### **The effects of outdoor therapy on depression and anxiety: a quantitative review**

The term “outdoor therapy” describes the use of outdoor activities for therapeutic benefits and encompasses both wilderness therapy and adventure therapy (Revell et al., 2014). Outdoor therapy programs are used to treat a variety of psychological conditions and vary significantly in duration, type of activity, therapy modalities, and intervention type. The existing literature indicates several benefits of prescribing outdoor therapy programs for depression and anxiety specifically, reductions in: emotional and somatic stress, relational problems, and behavioral dysfunction as well as increases in self-efficacy (Bird, 2015; Johnson et al., 2020). Unfortunately, many studies fail to provide detailed explanations of how their outdoor therapy program is operated and which theories were utilized in program design (Norton et al., 2014). This creates challenges in replication, comparison, and generalization (Ferneer et al., 2017). In 2014, Hoag et al. stated “Even with this growth of research, the evidence and literature within this field still lacks depth and methodological sophistication, and has been limited in the scope of what it has examined” (p. 383).

Outdoor therapy has become an increasingly popular choice for those looking for alternatives to traditional therapy modalities, especially following the global changes and mental health challenges caused by the COVID-19 pandemic (James et al., 2021). Many individuals are struggling with COVID-19 related health anxiety, and as new variants of the virus emerge, it becomes increasingly evident that we cannot fully predict the timeline of the COVID-19 crisis (Tyrer, 2020). Health anxiety is just one of several mental health challenges worsened by the COVID-19 pandemic. Outdoor therapy practices have the potential to serve as both affordable and accessible mental healthcare solutions for a variety of populations and mental health conditions (Harper et al., 2021).

There are many studies that look at the effectiveness of outdoor therapy on psychological outcomes. However, we identified a lack of research that investigates moderators such as age, intervention type, and intervention duration. Understanding which elements make some outdoor therapy programs more effective than others is key to standardizing programs and increasing overall treatment efficacy. A synthesis of the impact of these moderators on intervention efficacy will aid therapists in deciding who to target for outdoor therapy, preferred duration of therapy, best program modality, and which outcomes outdoor therapy is most efficacious for treating. The aim of the present study was to investigate the effectiveness of outdoor therapy treatment on depression and anxiety while also examining the following moderators: intervention type, intervention duration, participant age, and measurement type.

### **Methods**

As described in Appendix A, an online literature review was conducted by using the following databases: APA PsycInfo, APA PsycArticles, Psychology and Behavioral Sciences Collection, and SPORTDiscus. Results were refined to include scholarly (peer reviewed) academic journals that were available in English. All articles were screened by the same reviewer to maintain consistency. A total of 118 studies were excluded for not pertaining to outdoor therapy, not pertaining to depression and/or anxiety, participants being children (rather than adolescents or adults), or not containing data from relevant sub scales. Some studies appeared to meet the criteria but were excluded upon further inspection for not separating adolescent results from preadolescent child results (Norton et al., 2017; Tucker et al., 2012) or not providing information about outdoor therapy treatment frequency and duration (Wolf & Mehl, 2010). This left 6 studies with a total of 1294 participants (adults and adolescents who completed an outdoor therapy program) to be used in the analysis.

We proceeded to calculate Cohen's  $d$  for each study using their mean outcomes for anxiety and/or depression. This was done by calculating the mean difference for each group and then dividing that result by the pooled standard deviation (Ellis, 2010). We then investigated the following moderators through our quantitative synthesis: intervention type (immersion vs part-time treatment), intervention duration (0-2 months vs 2-4 months), age (adult vs adolescent), and measurement type (direct vs indirect).

### **Results**

The effects of outdoor therapy were greater for anxiety ( $d=0.65$ ,  $n=1215$ ) than depression ( $d=0.43$ ,  $n=115$ ). For anxiety, the average effect size for adolescents ( $d=0.75$ ,  $n=979$ ) was greater than for adults ( $d=0.27$ ,  $n=236$ ). Treatments 2-4 months in duration ( $d=0.73$ ,  $n=895$ ) had greater reductions in anxiety than 0-2 months in duration ( $d=0.45$ ,  $n=320$ ). Anxiety effect sizes were not as great for part-time treatment ( $d=0.30$ ,  $n=79$ ) compared to immersion treatment programs ( $d=0.68$ ,  $n=1136$ ).

### **Discussion**

The results of this quantitative review suggest that outdoor therapy is a more effective treatment for anxiety than depression. Therapists should consider this when tailoring individual treatment plans. The results also offer important insights with regard to potential moderators such as age and length of treatment. Outdoor therapy appears to be far more effective at reducing anxiety in adolescents than adults. Consequently, therapists should target adolescents more for outdoor therapy. Outdoor therapy was found to be more effective if the treatment duration is 2-4 months rather than less than two months, and more effective for immersion treatment vs. part-time treatment programs. These last two findings are important when considering patient schedules. It may be more challenging for some to commit to a full immersion program and

especially for durations of longer than two months. This may partially explain the differences in adolescents vs. adults. Adults would most likely be more challenged to commit to full immersion programs and for longer durations. Commitment to full immersion and longer durations for adults may even increase anxiety due to worries about leaving responsibilities or significant others full time and for longer durations. Based on our findings, outdoor therapy programs might be better suited to treat adolescents than adults, and for anxiety rather than depression. Therapists should carefully consult with clients about the viability of full immersion programs and durations to make sure that these will reduce anxieties rather than add to them.

There are numerous theories that attempt to explain the benefits of nature on mental health. According to attention restoration theory (ART), directed attention fatigue can be restored by spending time in natural environments through several key components: fascination, being away, compatibility, and extent (Kaplan, 1995; Kaplan & Berman, 2010). Directed attention fatigue is associated with decreased problem solving and increased irritability, both of which can be linked to depression (Kaplan, 1995; Priester & Clum, 1993; Vidal-Ribas & Stringaris, 2021). Ulrich's psycho-evolutionary theory describes that spending time in unthreatening natural settings can trigger unconscious positive emotional responses and have a restorative effect. (Ulrich, 1983; Ulrich et al., 1991). Ulrich (1983) states "For individuals experiencing stress or anxiety, most unthreatening natural views may be more arousal reducing and tend to elicit more positively toned emotional reactions than the vast majority of urban scenes, and hence are more restorative in a psychophysiological sense" (p.116). According to the biophilia hypothesis, human's innate emotional connection with nature facilitates personal identity and life satisfaction, and lack of connection with nature can have detrimental affective and cognitive repercussions (James et al., 2021; Kellert & Wilson, 1993). This hypothesis is supported by

increased rates of depression in urbanized areas (Sundquist et al., 2004). Surprisingly, none of the articles analyzed in this study appeared to utilize these theories and focused instead on theories not related to nature such as the stages of change model (Prochaska & DiClemente, 1983) and attachment theory (Bowlby, 1973). Future studies should incorporate existing theories into their research methodology so that we can begin to assess which theories are most viable.

While the six studies included in this quantitative review contained a total of 1294 participants, the 816 of those participants came from a study by Johnson et al. (2020) and half of the studies contained fewer than 100 participants (Bettmann et al., 2012; Bowen et al., 2016; Kelley et al., 1997). Of the studies that reported participant demographics, the majority of participants were Caucasian, and many minority groups were not represented. Additionally, the majority of studies did not utilize a control group. Most of the studies did not go into sufficient detail when describing their outdoor therapy program. All six of the studies give a brief description of the context of their outdoor therapy program, however Kelley et al. (1997) was the only study that described the frequency of each outdoor activity in their program. Additionally, half of the studies included in the review had interventions that took place in the Rocky Mountain region of the United States (Bettmann et al., 2012; Bettmann et al., 2016; Tucker et al., 2015).

### **Limitations**

There are several limitations to this study. Though there were 1294 participants, these participants were only drawn from six studies and, therefore, 6 outdoor therapy programs. This small sample of outdoor therapy programs cannot be used to generalize efficacy for all outdoor therapy programs. Additionally, there was not enough data to use type of outdoor activity as a

moderator. As more studies are conducted, further syntheses should also be carried out to examine the impact of activity types on treatment efficacy.

### **Future Research Directions**

Investigating potential differences in the effectiveness of different outdoor activities, especially across various populations would be a pertinent direction for future research. Perhaps certain outdoor activities would be more effective at treating some psychological conditions than others. It would also be ideal to identify other possible moderators, such as: socioeconomic status, physical health, individual differences in connection to nature, or phobias that might be triggered via outdoor activities.



### References

- Bettmann, J. E., Russell, K. C., & Parry, K. J. (2012). How substance abuse recovery skills, readiness to change and symptom reduction impact change processes in wilderness therapy participants. *Journal of Child and Family Studies, 22*(8), 1039-1050. doi:10.1007/s10826-012-9665-2
- Bettmann, J. E., Tucker, A., Behrens, E., & Vanderloo, M. (2016). Changes in late adolescents and young adults' attachment, separation, and mental health during wilderness therapy. *Journal of Child and Family Studies, 26*(2), 511-522. doi:10.1007/s10826-016-0577-4
- Bird, K. (2015). Research evaluation of an Australian peer outdoor support therapy program for contemporary veterans' wellbeing. *International Journal of Mental Health, 44*(1-2), 46–79. <https://doi.org/10.1080/00207411.2015.1009752>
- Bowen, D. J., Neill, J. T., & Crisp, S. J. (2016). Wilderness adventure therapy effects on the mental health of youth participants. *Evaluation and Program Planning, 58*, 49-59. doi:10.1016/j.evalprogplan.2016.05.005
- Bowlby, J. (1973). *Attachment and loss, vol. II separation*. Basic Books.
- Ellis, P. D. (2016). *The Essential Guide to effect sizes: Statistical Power, meta-analysis, and the interpretation of research results*. Cambridge University Press.
- Ferneer, C. R., Gabrielsen, L. E., Andersen, A. J. W., & Mesel, T. (2017). Unpacking the black box of wilderness therapy: A realist synthesis. *Qualitative Health Research, 27*(1), 114–129. <https://doi.org/10.1177/1049732316655776>
- Harper, N. J., Fernee, C. R., & Gabrielsen, L. E. (2021). Nature's role in outdoor therapies: An umbrella review. *International Journal of Environmental Research and Public Health, 18*(10), 5117. <https://doi.org/10.3390/ijerph18105117>

- Hoag, M. J., Massey, K. E., & Roberts, S. D. (2014). Dissecting the wilderness therapy client: Examining clinical trends, findings, and patterns. *The Journal of Experiential Education*, 37(4), 382–396. <https://doi.org/10.1177/1053825914540837>
- James, G., Kidd, K., Cooley, S. J., & Fenton, K. (2021). The feasibility of outdoor psychology sessions in an adult mental health inpatient rehabilitation unit: Service user and psychologist perspectives. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.769590>
- Johnson, E. G., Davis, E. B., Johnson, J., Pressley, J. D., Sawyer, S., & Spinazzola, J. (2020). The effectiveness of trauma-informed wilderness therapy with adolescents: A pilot study. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(8), 878-887. [doi:10.1037/tra0000595](https://doi.org/10.1037/tra0000595)
- Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169–182. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2)
- Kaplan, S., & Berman, M. G. (2010). Directed attention as a common resource for executive functioning and self-regulation. *Perspectives on Psychological Science*, 5(1), 43–57. <https://doi.org/10.1177/1745691609356784>
- Kellert, S. R., & Wilson, E. O. (1993). *The Biophilia Hypothesis*. Island Press.
- Kelley, M. P., Coursey, R. D., & Selby, P. M. (1997). Therapeutic adventures outdoors: A demonstration of benefits for people with mental illness. *Psychiatric Rehabilitation Journal*, 20(4), 61–73.
- Nguyen, N., & Singh, S. (2018). A primer on systematic reviews and meta-analyses. *Seminars in Liver Disease*, 38(02), 103–111. <https://doi.org/10.1055/s-0038-1655776>

- Norton, C. L., Tucker, A., Farnham-Stratton, M., Borroel, F., & Pelletier, A. (2017). Family enrichment adventure therapy: A mixed methods study examining the impact of trauma-informed adventure therapy on children and families affected by abuse. *Journal of Child & Adolescent Trauma, 12*(1), 85–95. <https://doi.org/10.1007/s40653-017-0133-4>
- Norton, C. L., Tucker, A., Russell, K. C., Bettmann, J. E., Gass, M. A., Gillis, H. L., & Behrens, E. (2014). Adventure therapy with youth. *Journal of Experiential Education, 37*, 46–59. doi:10.1177/1053825913518895
- Page, M. J McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C., Shamseer, L., Tetzlaff, J., Akl, E., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J., Hróbjartsson, A., Lalu, M., Li, T., Loder, E., Mayo-Wilson, E., McDonald, S., McGuinness, L., Stewart, L., Thomas, J., Tricco, A., Welch, V., Whiting, P. & Moher, D. (2020). The Prisma 2020 statement: An updated guideline for reporting systematic reviews. <https://doi.org/10.31222/osf.io/v7gm2>
- Priester, M. J., & Clum, G. A. (1993). Perceived problem-solving ability as a predictor of depression, hopelessness, and suicide ideation in a college population. *Journal of Counseling Psychology, 40*(1), 79–85. <https://doi.org/10.1037/0022-0167.40.1.79>
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390–395. <https://doi.org/10.1037/0022-006x.51.3.390>
- Revell, S., Duncan, E., & Cooper, M. (2014). Helpful aspects of outdoor therapy experiences: An online preliminary investigation. *Counselling and Psychotherapy Research, 14*(4), 281–287. <https://doi.org/10.1080/14733145.2013.818159>.

Sundquist, K., Frank, G., & Sundquist, J. (2004). Urbanisation and incidence of psychosis and depression. *British Journal of Psychiatry*, *184*(4), 293–298.

<https://doi.org/10.1192/bjp.184.4.293>

Tucker, A., & Bettmann, J. (2015). Role of transport use in adolescent treatment: Its relationship to readiness to change and outcome. *PsycEXTRA Dataset*. doi:10.1037/e549152014-001

Tucker, A. R., Javorski, S., Tracy, J., & Beale, B. (2012). The use of adventure therapy in community-based mental health: Decreases in problem severity among youth clients. *Child & Youth Care Forum*, *42*(2), 155–179. <https://doi.org/10.1007/s10566-012-9190-x>

Tyrer, P. (2020). COVID-19 health anxiety. *World Psychiatry*, *19*(3), 307–308.

<https://doi.org/10.1002/wps.20798>

Ulrich, R. S. (1983). Aesthetic and affective response to natural environment. *Behavior and the Natural Environment*, 85–125. [https://doi.org/10.1007/978-1-4613-3539-9\\_4](https://doi.org/10.1007/978-1-4613-3539-9_4)

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, *11*(3), 201–230. [https://doi.org/10.1016/s0272-4944\(05\)80184-7](https://doi.org/10.1016/s0272-4944(05)80184-7)

Vidal-Ribas, P., & Stringaris, A. (2021). How and why are irritability and depression linked? *Child and Adolescent Psychiatric Clinics of North America*, *30*(2), 401–414.

<https://doi.org/10.1016/j.chc.2020.10.009>

Wolf, M., & Mehl, K. (2011). Experiential learning in psychotherapy: Ropes course exposures as an adjunct to inpatient treatment. *Clinical Psychology & Psychotherapy*, *18*(1), 60–74.

<https://doi.org/10.1002/cpp.692>

Appendix

Literature Review Flow Chart

