



# Health in Nature: Advancing Clinical Competencies Through Environmental Health Advocacy

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## Background

Considerable evidence indicates that **spending time in nature benefits human health and well-being**.

Health practitioners worldwide are increasingly communicating these benefits, such as **prescribing nature to patients**, through Canada's Park Prescription (PaRx) program.

Professional standards and ethical codes also call on health practitioners to also serve as health advocates. **Advocating for nature access and environmental protections** so that patients can continue to experience these health benefits is an essential facet of this role.

The current study, a collaborative project between Dalhousie University, the Canadian Association of Physicians for the Environment (CAPE), and the Ecology Action Centre (EAC) is one such **example of this advocacy**: contributing to a **local environmental action campaign** to protect Sandy Lake Regional Park from development. The park offers free, accessible natural spaces and is among a declining number of protected urban nature spaces, making health advocacy in this space of critical importance.



## Methodology

18 healthy participants were recruited via social media to take part in a one-hour (2 km) guided walk at Sandy Lake Regional Park in Halifax, Nova Scotia.

Before the walk, participants completed informed consent, a demographic questionnaire (including age, gender, residence, nature exposure, and health status), the Positive and Negative Affect Schedule – Short Form (PANAS-SF), and the Subjective Vitality Scale. They also provided a saliva sample for cortisol analysis.

After the walk, participants gave a second saliva sample and completed the PANAS-SF and Subjective Vitality Scale again.

Cortisol levels were analyzed using LC-MS/MS by In-Common Laboratories.

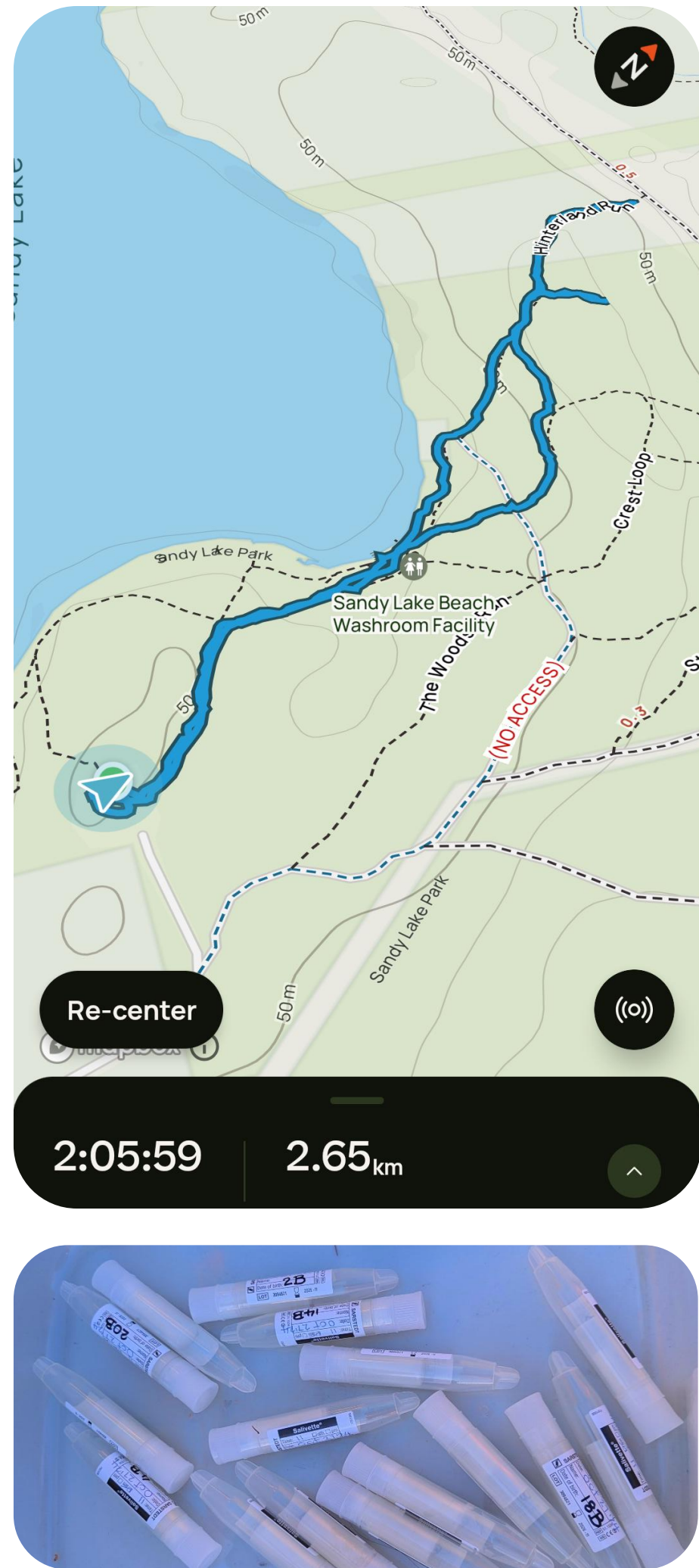
Pre- and post-walk cortisol levels and survey scores were compared using paired samples *t*-tests.

**Table 1**  
*Participant Age Statistics*

	Mean (SD)	Median	Minimum	Maximum
Age	43.1 (19)	37.5	23.0	83.0

**Table 2**  
*Participant Gender Statistics*

Gender	Count	% of Total
Man	3	16.7%
Woman	14	77.8%
Non-Binary	1	5.6%



## Scientific Results

Paired-samples *t*-tests were conducted for all measured variables before and after the nature walk. Due to the small sample size, effect size was calculated using Hedge's *g*.

The results revealed a statistically significant reduction in both salivary cortisol levels and reported negative affect from before the walk to after the walk.

There was a statistically significant increase in reported subjective vitality and positive affect from before the walk to after the walk.

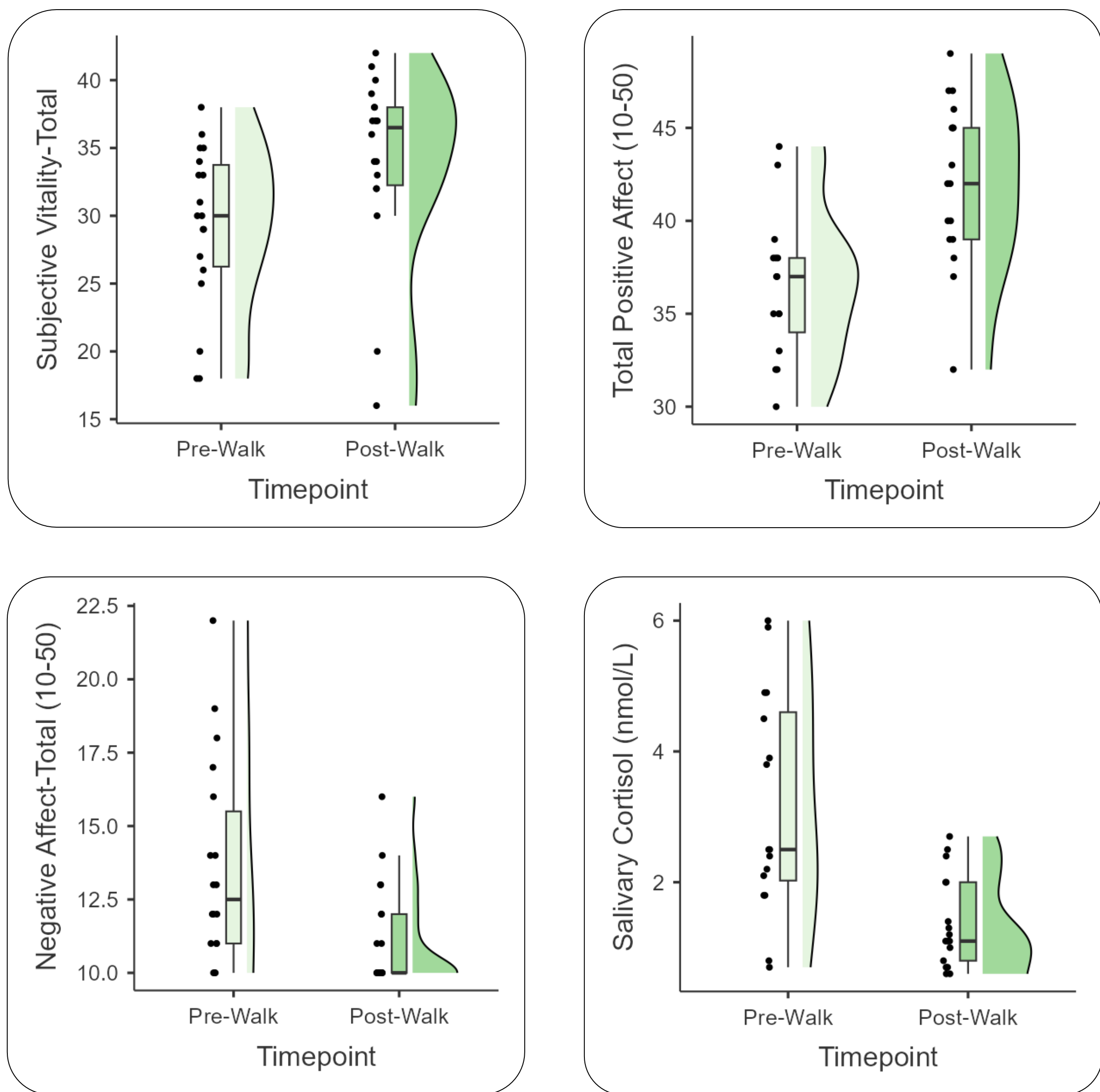
Effect sizes were large across all measures.

**Table 3**

*T-test Results*

	<i>t</i>	<i>df</i>	<i>p</i>	<i>g</i>
Cortisol	-5.40	15	<.001	-1.282
Negative Affect	-4.99	17	<.001	-1.122
Positive Affect	7.16	16	<.001	1.654
Vitality	3.74	17	.002	0.842

**Figure 1: T-test Raincloud Plots**



## Conclusions

The **positive health outcomes** following the nature walk align with previous research regarding nature's health benefits.

More specifically, these results show that **spending time in the Sandy Lake area improved mood and vitality and decreased cortisol levels**.

Thus, the findings provide concrete evidence of the health benefits of accessible urban nature space and **serve as an important advocacy contribution** to the protect Sandy Lake campaign.

By combining clinical and research acumen with health advocacy, this study offers a model for how **health practitioners can leverage research and collaboration to actualize their roles as health advocates** –promoting both environmental and human health.



## Key References

Antonelli, M., Barbieri, G., & Donelli, D. (2019). Effects of forest bathing (shinrin-yoku) on levels of cortisol as a stress biomarker: A systematic review and meta-analysis. *International Journal of Biometeorology*, 63(8), 1117–1134. <https://doi.org/10.1007/s00484-019-01717-x>

Diener, E., Wirtz, D., Toy, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, 97(2), 143–156. <https://doi.org/10.1007/s11205-009-9493-y>

Hansen, M. M., Jones, R., & Tocchini, K. (2017). Shinrin-Yoku (forest bathing) and nature therapy: A state-of-the-art review. *International Journal of Environmental Research and Public Health*, 14(8), 851. <https://doi.org/10.3390/ijerph14080851>

Kotera, Y., Richardson, M., & Sheffield, D. (2022). Effects of shinrin-yoku (forest bathing) and nature therapy on mental health: A systematic review and meta-analysis. *International Journal of Mental Health and Addiction*, 20(1), 337–361. <https://doi.org/10.1007/s11469-020-00363-4>

Ryan, R. M., & Frederick, C. (1997). *Subjective vitality scale*[Dataset]. <https://doi.org/10.1037/106466-000>