# ENHANCING KNOWLEDGE AND PERCEPTIONS OF ENVIRONMENTAL SUSTAINABILITY IN OCCUPATIONAL THERAPY

A Thesis to the faculty at Stanbridge University in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy

by

Christopher Chen, Sarah Park, Chantylle Pradera, and Michael Tabora

Thesis Advisor: Kelcie Kadowaki, OTD, OTR/L

October 2023

**Certification of Approval**

I certify that I have read *Enhancing Knowledge and Perceptions of Environmental Sustainability in Occupational Therapy* by Christopher Chen, Sarah Park, Chantylle Pradera, Michael Tabora, and in my opinion this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.

Kelcie Kadowaki, OTD, OTR/L

Instructor of Occupational Therapy

ACCEPTED 


Myka Persson, OTD, OTR/L

Program Director, Master of Science in Occupational Therapy

**Acknowledgements**

We want to extend our deepest gratitude to Kelcie Kadowaki, our thesis advisor, for her unwavering dedication, invaluable guidance, and steadfast support throughout the entire journey of this thesis. Additionally, we want to spotlight Frederick Poling, Michael Mahoney, Shaina Phillips, and the dedicated personnel of the Stanbridge Library for their invaluable support in sourcing relevant articles and enhancing the robustness of our thesis. Furthermore, we sincerely appreciate Timothy Allison-Aipa, our esteemed statistician, for his pivotal role in meticulously analyzing our data. With his expertise, we noticed critical insights within our dataset. Finally, this study was only achievable with our fellow students' active participation and contributions. We sincerely value all those who played a role in this effort.

## Preface

We have endeavored to explore the relatively novel link between climate change and the field of occupational therapy, an area of research that has come to express our academic journey. Our collective fascination with the intersection of global climate change and occupational therapy is driven by a profound realization that environmental changes significantly impact the health and well-being of individuals worldwide. We humbly offer this study to the academic community, occupational therapy practitioners and educators, and all those passionate about understanding and addressing the impact of climate change on human health and well-being. May it serve as a starting point for further research and inspire a communal effort to integrate climate-conscious occupational therapy practices into our ever-evolving world.

## Abstract

Occupational therapy (OT) may contribute positively to climate change mitigation by promoting eco-friendly strategies and adaptive practices for individuals with disabilities, fostering greater independence and reducing the overall environmental footprint. This study measured the effectiveness of a five week-long educational workshop and examined the perspectives of OT students concerning the subjects of global climate change and its potential impact on current occupations and activities for both OT practitioners and individuals in their daily lives. Students who were enrolled in a Master of Occupational Therapy (MSOT) or Occupational Therapy Assistant (OTA) program volunteered to participate in the workshop, which consisted of informative educational modules and pamphlets aimed at enhancing their understanding of global climate change. We created and administered the Global Environmental Knowledge and Attitudes pre- and post- questionnaire to measure participants' perceived knowledge and perspectives towards global environmental issues. In support of our hypothesis, the results of the Global Environmental Knowledge and Attitudes questionnaire yielded significant improvement in knowledge and perspectives among global climate issues. With p-values ranging from 0.005 to 0.245, significant statistical differences were found between the pre- and post- questionnaire in 9 of 14 surveyed areas for participants. Apart from gaining insight into their views on knowledge and perspectives about global environmental issues, we also collected written feedback regarding participants' overall experiences in regard to the educational workshop. The common themes found in these responses encompassed the influence of global climate issues on the current field of OT, students' ability to envision applying the workshop's lessons to shape their future

practices, and suggestions for enhancing the workshop itself. Our findings align with existing literature that supports the advantages of enhancing the knowledge and perspectives of OT students regarding global environmental issues, which can impact their future practice. The study's limitations had an impact on the formation of recommendations for future research including improvements for recruitment and retention, duration of the study length, and including a more vast and diverse population of participants.

## Table of Contents

# Enhancing Knowledge and Perceptions of Environmental Sustainability in Occupational Therapy

According to the World Health Organization (2021), climate change presents the paramount threat to humanity and healthcare. The global community has agreed that climate change must be contained within a 1.5°C rise in overall temperature to avoid further catastrophe. The World Health Organization has stated that "every additional tenth of a degree of global warming will take a serious toll on people's lives and health." The growing urgency of climate change is affecting all sectors of society, environmental disasters are becoming more commonplace, and people are suffering, especially those already vulnerable with illness or injury (Lindsay et al., 2022). The healthcare industry helps influence and direct the public to change their mindset and behaviors in the overall fight against climate degradation. If every individual were to do their part, the effects of climate change could be decelerated. Watts et al. (2015) proposes that healthcare providers are uniquely positioned to equip their patients with the proper knowledge and confidence to guide their clients. The research suggests focusing on occupational therapy, given its inherent focus on humans and human occupation. Existing occupations and activities can potentially be exchanged for more sustainable alternatives, with no or even improved effect on therapy efficacy. One of the recurring themes appearing in recent scholarship is the need for healthcare practitioners to rise to the challenge of contributing to environmental sustainability efforts (Huss et al., 2020). If occupational therapists can instill the volition within themselves to support environmentally friendly practices, it can ripple into meaningful change across the patients and professionals they interact with.

## Statement of Problem

Although climate change is a growing modern threat, there exists a critical gap in the understanding of the relationship between global environmental education and its impact on the healthcare industry, particularly in the context of occupational therapy. Though there is tangible evidence of volition and awareness of the climate crisis among healthcare practitioners (Hess & Rihtman, 2023; Lister et al., 2022), education regarding sustainability oftentimes lacks meaningful professional training around environmental sustainability. Despite the potential for the healthcare sector to play a significant role in combating climate change, there is currently insufficient research examining the integration of environmental education into occupational therapy practices. According to the American Occupational Therapy Association (2022) *Policy E.16*, occupational therapy has a commitment to sustainability and climate change, addressing occupational needs in a manner that considers future generations and marginalized communities, and focusing on the ability to minimize and adapt from harmful health impacts of climate change through education, practice, research, policy, and advocacy. Our study contributes to this policy by examining the effectiveness of multiple-session workshops on occupational therapy students, with an anticipated outcome of assessing and increasing their knowledge and perceptions regarding environmental sustainability within the occupational therapy field at Stanbridge University.

## Literature Review

### Social Significance of Topic

The World Health Organization has stated that “climate change is a significant and emerging threat to public health” (World Health Organization, 2021). Climate

change forces people to come to terms with "humans having become a destructive geophysical agent causing changes in vast natural historical timescales" (Toivonen, 2022, p. 2). Human activity is believed to be the main driving force behind contemporary climate change. According to the EPA, it is "extremely likely (>95%) that human activities have been the dominant cause of warming" (U.S. Environmental Protection Agency, 2023). Consequently, virtually all areas of human life are at risk of being affected by global warming. Individuals' occupations and behaviors must undergo a transformation to guide climate change toward a more favorable future. In a study by Smith and Joffe (2013), participants felt the need to better understand climate change in order to then plan their activities to make a difference. Occupational therapy, a unique part of healthcare, can help to ameliorate climate change by fostering eco-conscious thoughts, behaviors, and activities at the individual level.

**Common Themes**

A common theme that emerged in our literature review centered around combatting climate change at the individual level through the utilization of occupational therapy and instilling the sustainability mindset into each client by switching to more eco-minded interventions for patients. A resulting motif from this theme is that individuals often feel disheartened by the prospect of effective change on the scale necessary to combat climate change. However, these same individuals also believe collective action may yield a decisive impact. According to Toivonen (2022), "many people hold very contradictory feelings and thoughts about climate change," (p. 8) citing that people are willing to understand the significance of their behaviors in the broader social and environmental framework, yet also question the impact of these actions on a

larger scale. Several sources note that approximately two-thirds of global emissions are attributed to human consumption in both direct and indirect forms (Ikiugu et al., 2015; Williamson et al., 2018). There is a general scientific consensus that even modest estimates of behavior change have the potential to reduce natural resource consumption that would substantially reduce emissions.

Nonetheless, the studies acknowledge that realizing this potential represents a formidable challenge. Consequently, this challenge necessitates the identification and implementation of behavioral modifications to engage individuals, households, and communities. That process fundamentally alters the deep-seated patterns of production and consumption entrenched in activities of daily life. Jenkin et al. (2016) explore the challenges occupational therapists face between personal values and professional standards and competencies when considering the implementation of sustainable development. In doing so, the researchers observed the necessity to redefine practice with respect to environmental parameters. However, this redefinition of practice may require altering deeply rooted cultural values about consumption and their interdependence.

Implementation of sustainable practice has already begun to take place in certain countries. Australia, for example, has recognized that the relationship between human health and sustainability is crucial (Patrick & Kingsley, 2015). Health practitioners are encouraged to advocate for an eco-friendly mindset in their patients. Patients in turn are empowered to make sustainable choices within their daily activities as well as within their treatment. To turn these steps into a commonality throughout global healthcare, more awareness is needed. Greater awareness around the benefits of merging healthcare and environmental sustainability would usher in the proper education, training, and

support that would enable practitioners to better guide their clients to make sustainable choices with their health in mind (Kircher et al., 2022). With climate crisis awareness on the rise, efforts are being made to apply sustainability into health promotion, but these efforts need to be made more urgent.

Several studies address the issue of how climate change can have an impact on human health from a global standpoint. Lindsay et al. (2022) address how people who live with disabilities experience a negative impact on their health because of extreme weather. In particular, extreme weather resulting from climate change may increase the risk of acquiring new injuries or health issues, a worsening of pre-existing medical conditions, and an increased risk of mortality. Lindsay et al. supports this statement by demonstrating that people with pre-existing disabilities or chronic diseases experienced a worsening of their condition after extreme weather events in Greece, Taiwan, China, and Germany, the U.S., and Canada. Dust storms, heat waves, wildfires, droughts, and ice storms were defined as extreme weather, causing deaths related to injuries and illnesses of the cardiovascular and respiratory systems (Kircher et al., 2022). Climate change can also impact people's sense of safety due to the loss of property, land, and pets from severe weather conditions.

Climate-specific temperatures also have lasting effects on health. Older adults with chronic physical illnesses who lived through an ice storm in Canada reported significant storm-related stress compared to those living outside the storm areas of Canada (Lindsay et al., 2022). Toan et al. (2014) emphasize that climate change is not just a threat to biological systems and the environment, but it also poses risks to human health, especially to those who live in lower-income populations and tropical or

subtropical countries. The rising incidence of illness compared suggests that a warming climate alters the traditional seasonal structure, consequently disrupting people's biological rhythms leading to increased susceptibility to diseases. Toan et al. presented a study that suggested a warmer climate could be negatively impacting human health which would lead to negative health consequences for groups who may be more vulnerable than others such as older people and those suffering from chronic illnesses or diseases. The effects of colder climates could lead to increases in coughs, colds, headaches, asthma, or pneumonia (Toan et al., 2014). The articles from Lindsay et al. (2022), Toan et al. and Kircher et al. (2022), contribute knowledge about how climate change can have an impact on human health. Evidence from these researchers suggest that reframing climate change as a threat to human life and that viewing climate change as a policy issue affecting public health and overall well-being may be the push for people to start changing their behaviors.

**Remaining Gaps in Evidence**

Each study in our literature review contributes to the question of how to best influence people to modify their occupations and behaviors that are more sustainable for the environment. In one study, researchers found that people can view global warming in three types of dichotomies: self/other, natural/unnatural and certainty/uncertainty (Smith & Joffe, 2013). The self/other dichotomy refers to an “us” vs. “them” perspective resulting in thinking in a variety of different ways. People may feel good about “doing their part” in living suitably, but without everyone “chipping in,” people often feel frustrated and powerless in what they can do to help (Smith & Joffe, 2013). The natural/unnatural dichotomy refers to reminiscing of what past weather experience was

like when it was “normal.” For example, people who experienced a warmer winter and a wetter summer compared it to how it was the previous year. With this, there is a nostalgic recollection of how the weather was “normal” beforehand. This function of nostalgia speaks to a way of how people deal with upcoming threats and how it is used to familiarize themselves and cope with the uncertainty (Smith & Joffe, 2013). Lastly, the certainty/uncertainty dichotomy pertains to individuals relying on familiarity and everyday experience to make sense of unfamiliar and uncertain information and events. For example, individuals would use the ozone layer of the Earth as a visual of the global warming process and how it can play a role in it. Individuals will use something abstract to give form to global warming.

Jenkin et al. (2016) also argue the need to examine how other professions incorporate sustainability practices into their respective fields; this insight may lead occupational therapists to determine effective strategies and adapt them to their practice. Kircher et al.’s (2022) claim that climate change is the most visible health crisis for healthcare professionals and addressing this problem can help improve human health and benefit the health of all life on the planet. Further research can narrow down how to tie health and the health of the planet in more efficient ways. On an individual level, many of the perspectives offered in qualitative studies showed that arguments and constructions regarding climate change came across as “vague, external, or intellectualizing...perhaps reflecting emotional detachment from client change” and that further work is needed to investigate perspectives from different educational levels and contexts to increase generalizability (Toivonen, 2022, p. 9). Overall, in each of the studies, researchers have

claimed that there has been a lack of studies about how daily occupations can directly cause harm to the environment.

**Clinical Significance of Evidence**

Based on the eight qualitative and quantitative studies included in our review, it is evident that climate change is significantly associated with human health and well-being. Climate change affects everyone, but it is also evident that vulnerable persons are impacted the most (Lindsay et al., 2022). Toivonen's 2022 study emphasized that "participatory efficacy beliefs, the beliefs that one's own individual actions are a crucial contribution to collective climate action (p. 2)" are vital in unlocking progression toward better outcomes for those that are and will be affected by global climate change.

Whether the scope is individualistic or global, occupational therapists have the means to enable better ties between human health and sustainability. The literature supports the use of eco-minded interventions and treatments that have more sustainable alternatives. Due to the more recent nature of merging health and sustainability, unfortunately there is only limited evidence to support its efficacy thus far. Jenkin et al. (2016) further discuss the requirements of individuals who are willing to act on their ethical convictions, even if it means going against traditional cultural values or practices. However, the article does not provide clear guidance on cultivating these ethical subjects. It is unclear whether the study aims to encourage occupational therapists to embrace new ethical principles and redefine their professional identities accordingly, or if it assumes that there are already individuals within the profession who possess the necessary ethical values and need support and encouragement to act on them.

The results of Pokrovsky's (2019) study concluded that "the linear trend of increasing CO2 concentration in the atmosphere covers almost all the interannual variability and reflects the linear trend of the global temperature" (p. 1187). Even after utilizing statistical models that are sensitive to the factors of interaction between the atmosphere and ocean, the climate models show that human intervention is largely responsible for the processes that drive global climate change. Pokrovsky's (2019) findings support the assertion that the modification of human behavior through mechanisms such as therapeutic education can be an individual avenue of global climate solutions.

Relevant literature strongly supports the impact of global climate change on human behavior, and vice versa. It also supports the use of behavioral modification through mechanisms such as occupational therapy as a means to affect environmental impact on an individual level. However, areas that require more support are methods providing awareness that can specifically lead to a desire to impart change, how occupational therapy can advocate or incorporate these methods effectively at both an individual level and larger community level, and the effects of global climate change on specific types (physical, sensory, developmental, etc.) rather than viewing people with disabilities as a homogenous group.

Smith and Joffe, (2013) found that images of global warming such as melting ice caps, stranded polar bears, flooded landscapes and graphical representation of pollution had a huge impact on those who viewed it. This type of imagery depicts the reality of the threat of global warming and how it can strongly impact those who are living in it. On the other hand, some participants in the Smith and Joffe study felt indifferent to climate

change as the study was carried out in Britain. They felt that places such as Africa or China bear the brunt of the cause and consequences, and British citizens do not have as much of a burden, even though there is evidence that people are directly affected by climate change in all parts of the globe. Healthcare practitioners can be effective in influencing the mindset and activities of those willing to change, as well as those who need more guidance in seeing climate change as a global and collective threat. It is evident that climate change is no longer a looming threat; it is at our doorstep.

In the Kircher et al. (2022) study, researchers suggest that further research must be done in order to bring more evidence to light, in terms of the direct effects climate change has on current patients and how effective practitioners can be in influencing patient behavior and activities towards sustainability. More evidence would support further reforms in how sustainability can be applied in our daily lives.

**Literature Review Conclusions**

It is clear to us that occupational therapy can have positive effects at an individual level towards combating or slowing down the accelerating phenomenon of climate change. According to our research, there is no shortage of literature linking human behavior and occupations, collectively and individually, to environmental impact that is of direct consequence toward global climate change. The literature strongly supports that awareness of the issue is highly dependent on level of education, which has underlying factors such as availability and access.

We acknowledge that various socioeconomic factors can influence an individual's ability to access educational awareness about the issue. However, we propose that occupational therapy can serve as a tool to empower individuals, enabling them to adopt

and integrate these changes into their lifestyles and behaviors. Occupational therapists are in a unique position to directly affect change through their roles as healthcare providers, as well as advocates, producers, and consumers contributing to research. As providers, occupational therapists are responsible for educating and influencing people to make changes in their behaviors that are sustainable for the environment. This responsibility also presents as an opportunity to advocate for policy change, with the aim of generating effects that reverberate across diverse branches of medicine in a transdisciplinary fashion. We observed a gap in knowledge concerning how climate change affects distinct kinds of disabilities, rather than considering individuals with disabilities as a uniform group. This would be an excellent entry for producing scientific information highlighting the individual needs of patient populations that can contribute to awareness of interventions necessary to protecting against climate change.

## Statement of Purpose

The purpose of this study is to evaluate the effectiveness of multiple-session workshops designed for Stanbridge University students enrolled in the Master of Science in Occupational Therapy (MSOT) and Occupational Therapy Assistant (OTA) programs. The primary objective of these workshops is to assess and enhance the student's knowledge and perceptions regarding environmental sustainability within the context of the occupational therapy field. Through a structured and comprehensive evaluation of the workshops, this research aims to identify the extent to which the participants' understanding of environmental sustainability principles and practices is improved. The study employed pre- and post-workshop assessments, as well as qualitative feedback, to gauge the students' acquisition and perception changes. Through the analysis of the

workshops' impact, there is an aspiration to provide valuable insights into the potential advantages of incorporating environmental sustainability education into the curricula of occupational therapy. The findings from this research can inform educational institutions, occupational therapy programs, and the broader healthcare community on the significance of incorporating environmentally conscious practices within the discipline. Ultimately, this study seeks to promote sustainable, and environmental responsible practices among future occupational therapists and occupational therapy assistants, fostering a generation of healthcare professionals who are conscious of environmental implications of their work and contribute to positively to the well-being of their patients and the planet.

## Theoretical Framework

Our study was theoretically informed by the occupational justice framework which focuses on the experiences of an individual, group, and population because it recognizes that occupation is vital and central to human existence (Adamo & Lysack, 2018). This theory acknowledges that humans have a right to participate in societal occupations regardless of their background, abilities, or social circumstances. It ensures that individuals have equal opportunities to engage in meaningful occupations and recognizes the diversity of individuals while addressing the importance of identifying barriers that limit participation. Engagement in meaningful occupations is essential for overall well-being and quality of life. It provides individuals with a sense of purpose, identity, and fulfillment. When individuals are unable to participate in occupations that are meaningful to them, they can be negatively affected because occupations have a significant influence on mental health. Occupations provide opportunities for self-

expression, creativity, mastery, and social interaction which are all important for mental well-being. The occupational justice framework acknowledges the role of occupations in promoting mental health and advocates for equitable access to activities that support mental well-being. By addressing occupational injustices and promoting equal access to occupations, the framework aims to improve mental health outcomes and emphasizes the interplay between occupations and health, highlighting the need to consider occupational justice as a fundamental piece of holistic well-being (Adamo & Lysack, 2018). This theory shows that occupations have both economic and social value. For justice to prevail within society, there must be an equal distribution of resources, rights, and responsibilities around individuals' wants and needs to facilitate better engagement in meaningful occupations.

This framework relates to our study because it emphasizes the importance of occupational justice and rights in the environment and society. It also concerns ethical, moral, and civic issues like equity and fairness for individuals in order for them to engage in meaningful occupations that are inclusive of “doing, being, belonging, and becoming” in society (Adamo & Lysack, 2018, p. 645). This concept is essential to our thesis because climate change has the ability to disrupt the everyday lives and activities that individuals engage in. It affects their ability to participate in occupations that bring them purpose, fulfillment, and well-being. Extreme weather events such as hurricanes, droughts, floods, heatwaves, and storms can disrupt an individual’s daily life and activities by causing environmental degradation, limiting access to outdoor leisure activities that contribute to their overall health and well-being. Extreme weather can cause occupational deprivation, the inability to engage in meaningful and desired

activities (Adamo & Lysack, 2018), and imbalance in an individual's life leaving them with no access to basic necessities like water, food, and safe housing. Climate change can force individuals and communities to relocate due to rising sea levels, coastal erosion, flooding, or the loss of habitable land. This disruption in their lives can lead to social, economic, and psychological imbalance for these individuals when adapting to new living situations and environments.

Our study was designed to create a space for individuals to learn about the topic and issues of climate change and how it can affect their daily lives. They will be able to have opportunities to engage in conversations with peers in a safe and welcoming environment. Exchanging thoughts and opinions with others may inspire individuals to adapt their lifestyle to live more sustainably in order to reduce the effects of climate change that is currently impacting their lives.

## Methodology

The intervention used for this research project was a global environmental knowledge and sustainability workshop designed for occupational therapy students enrolled at Stanbridge University. Participants were recruited from the MSOT and OTA programs at Stanbridge University campuses and needed to be over the age of 18 years old. We evaluated participants' understanding of global climate issues and solutions over a 4-week period using an anonymous pre– and post–questionnaire. The research team implemented an intervention consisting of two educational modules and one brochure.

Recruitment was conducted through Stanbridge University's media email using a designated email script and a recruitment flier. The study aimed to utilize a paired t-test for evaluating paired measurements, specifically before-and-after measurements, within a

group of prospective occupational therapy practitioners. The advantages of utilizing a study methodology involving paired measurements is that it eliminates variation between the samples that could be caused by anything other than what is tested. The minimum sample size required for a paired t-test depends on several factors, including the desired level of statistical power, the significance level (alpha), the effect size, and the variability in the data. Assuming a standard alpha level of 0.05 and an effect size of 0.8, it was determined that a minimum of 15 participants would be required to attain a statistical power of 82%.

Once potential participants were identified, a waiting period of one week was observed to facilitate the recruitment process. Participants who expressed interest in the study during week one were screened for eligibility and given consent forms and their bill of rights. Upon participants granting their informed consent, correspondence was dispatched outlining significant dates for survey and intervention activities. Participants were directed to create a unique 6-digit PIN that allowed pre- and post-test comparisons and de-identified sensitive information from the researchers. Participants were made aware during recruitment and consent that the faculty advisor would not have knowledge of which students enrolled in the study, and their participation was strictly voluntary.

In week two, participants were emailed a Google Forms link to our “Global Environmental Knowledge and Attitudes Questionnaire”. The pre-test survey was distributed to participants and consisted of 14 items (plus a de-identifying PIN), including quantitative Likert scale questions, which evaluated their perceived knowledge and perspectives towards global environmental issues. The intent of this assessment was to establish a baseline for comparison, current thoughts or actions regarding the climate

crisis, and volition or intent to include sustainable practices during their respective careers within occupational therapy. The participants' answers from this survey were submitted and recorded through a password-protected Google Forms document that only student researchers could access. Participants were given one week to finish this survey, which was to be completed at their discretion. It was estimated that this survey would take less than 20 minutes.

The first study intervention was given during week three, following the release of the pre-study survey. Participants were emailed a link to a video-hosting platform, Prezi, that contained our first educational intervention. This video was made private, and viewers could not comment, like, or otherwise be known to other participants, ensuring anonymity and confidentiality of identifying information. Similar to the pre-study survey, participants were given the option to watch the video at their discretion as not to interfere with academic work and may view the video as many times as necessary. The videos were created by the research group to provide education regarding global climate problems, solutions, and occupational therapy relevance. Trigger warnings were issued to inform participants to proceed with caution, as there could be potentially offensive or sensitive topics presented. The trigger warning was as follows: "Warning: this workshop will discuss the global environment and the current climate crisis via discussions and questionnaires. Subject matter includes human health, chronic illness, natural disasters, and death. Certain images and topics can be triggering for some. Participants are not obligated to answer or participate in any question or discussion that might cause personal harm." Participants were introduced to the topic and issues of climate change, biodiversity conservation, environmental policies, and the importance of sustainably

living through a provided educational module. After watching the module, participants were able to submit any questions, comments, or concerns that they had regarding the information they received by contacting the student researchers.

Week four of the study consisted of addressing the questions and comments that participants sent through Google Forms. Once questions and comments were discussed, another education module was provided for participants to watch, with the same parameters as the first educational intervention. The second module focused on climate change happening in the state of California and provided strategies and ways to live more sustainably. This included potential ways to enhance the occupational therapy field by incorporating sustainable alternatives to current practices. The module emphasized that even small changes in occupational behaviors can prevent the issue of climate change from exacerbating. Once participants finished watching the second module, they had the opportunity to raise questions and comments once again through email correspondence.

During the fifth and final week of the study, participants were provided with a brochure that had a summary of information from the modules that were previously distributed to them. The brochure also consisted of a section where participants could complete self-reflection questions regarding their own views, experiences, and strategies regarding climate change issues. Self-reflection would solidify the content learned and will help keep the topic relevant for these future occupational therapists. Along with this brochure, participants were given the Global Environmental Knowledge and Attitudes Questionnaire survey once again. The post-survey contained the same questions that were given during the pre-test survey, but also an additional 8 questions to evaluate the workshop interventions and give qualitative data regarding post-intervention perspectives

on environmental education and occupational health. This qualitative information was coded to produce additional data.

The pre-and post-test survey used in this study was assessed for common themes using ethnography and paired T-tests to interpret quantitative data. The Likert scales used in the surveys were used to receive quantitative data that reflected the participants' changed perspectives from the pre-and post-test surveys. Results were examined to compare global climate awareness from the first week of the workshop and again in the last week to see if the participant's skills, knowledge, and analysis of global climate awareness changed throughout the weeks. Much of the data and interpretations for the qualitative and quantitative tests were analyzed through Jamovi (www.jamovi.org), an open statistical software, to see if there was an overall increase in understanding, knowledge, and analysis of the subject matter from the first week of the study to the last. The Stanbridge University statistician was also consulted for additional assistance regarding data processing. Because all our materials and data collection instruments are original, it was difficult to evaluate the reliability and validity of our instruments due to the lack of precedent.

## Data Analysis

A series of Wilcoxon Signed Rank Tests were conducted to assess changes in Likert scale ratings of knowledge in five areas: climate change, biodiversity conservation, sustainable development, environmental policies and regulations, and ecological footprint, from pre-test to post-test. The results, presented in Tables 1.1 through 1.5, showed significant differences in Likert scale ratings of knowledge in these areas. Regarding climate change, knowledge ratings increased significantly from the pre-test

(Mdn = 5.00) to the post-test (Mdn = 8.00, z = -2.7, p = .008, Table 1.1). Similarly, biodiversity conservation saw a significant increase in knowledge ratings from pre (Mdn = 2.50) to post (Mdn = 8.00, z = -2.8, p = .005, Table 1.2). Sustainable development exhibited a notable increase in knowledge ratings from pre (Mdn = 5.50) to post (Mdn = 7.50, z = -2.7, p = .007, Table 1.3). Moreover, environmental policies and regulations showed a significant increase in knowledge ratings from pre (Mdn = 4.50) to post (Mdn = 8.50, z = -2.7, p = .008, Table 1.4). Finally, regarding ecological footprint, knowledge ratings increased significantly from pre (Mdn = 5.50) to post (Mdn = 9.00, z = -2.7, p = .007, Table 1.5).

| | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Table 1.1 | | | | | | | 50th | | | |
| Climate change | N | M | SD | Min | Max | 25th | (Mdn) | 75th | z | p |
| Pre | 10 | 5.20 | 1.989 | 3 | 10 | 3.75 | 5.00 | 6.00 | -2.7 | .008 |
| Post | 10 | 8.20 | 1.135 | 7 | 10 | 7.00 | 8.00 | 9.25 | | |

| | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Table 1.2 | | | | | | | 50th | | | |
| Biodiversity conservation | N | M | SD | Min | Max | 25th | (Mdn) | 75th | z | p |
| Pre | 10 | 3.10 | 2.470 | 1 | 8 | 1.00 | 2.50 | 5.25 | -2.8 | .005 |
| Post | 10 | 7.60 | 2.366 | 3 | 10 | 6.25 | 8.00 | 9.25 | | |

| | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Table 1.3 | | | | | | | 50th | | | |
| Sustainable development | N | M | SD | Min | Max | 25th | (Mdn) | 75th | z | p |
| Pre | 10 | 4.60 | 2.413 | 1 | 8 | 2.00 | 5.50 | 6.25 | -2.7 | .007 |
| Post | 10 | 7.70 | 1.567 | 5 | 10 | 6.75 | 7.50 | 9.00 | | |

| | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Table 1.4 | | | | | | | 50th | | | |
| Environmental policies & regulations | N | M | SD | Min | Max | 25th | (Mdn) | 75th | z | p |
| Pre | 10 | 4.60 | 1.955 | 1 | 8 | 3.75 | 4.50 | 5.50 | -2.7 | .008 |
| Post | 10 | 7.80 | 1.814 | 4 | 10 | 6.75 | 8.50 | 9.00 | | |

| Table 1.5 | N | M | SD | Min | Max | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| Ecological footprint | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 25th | 50th (Mdn) | 75th | z | p |
| Pre | 10 | 5.00 | 2.494 | 1 | 9 | 3.25 | 5.50 | 6.25 | -2.7 | .007 |
| Post | 10 | 8.10 | 1.595 | 4 | 9 | 7.75 | 9.00 | 9.00 | | |

Note. N, number. M, mean. SD, standard deviation. Min, lowest rating in distribution. Max, highest rating in distribution. Mdn, median. z, z-score. p, p-value.

Another series of Wilcoxon Signed Rank Tests were conducted to determine if there were differences from pre to post test in Likert scale ratings in nine different areas related to the environment. The results, presented in Tables 2.1-2.4, showed significant differences in Likert scale ratings of knowledge in these areas.

| Table 2.1 | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I am aware of the impact of human activities on the environment. | N | M | SD | Min | Max | 25th | 50th (Mdn) | 75th | z | p |
| Pre | 10 | 8.60 | 1.075 | 7 | 10 | 7.75 | 9.00 | 9.25 | -2.5 | .014 |
| Post | 10 | 9.50 | 0.707 | 8 | 10 | 9.00 | 10.00 | 10.00 | | |

| Table 2.2 | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I feel confident in speaking about climate change to others in the hopes of spreading its awareness. | N | M | SD | Min | Max | 25th | 50th (Mdn) | 75th | z | p |
| Pre | 10 | 5.20 | 2.098 | 3 | 9 | 3.00 | 5.00 | 6.50 | -2.7 | .007 |
| Post | 10 | 7.90 | 1.287 | 6 | 10 | 7.00 | 8.00 | 8.50 | | |

| Table 2.3 | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I feel confident in my ability to incorporate global environmental considerations into my future occupational therapy work. | N | M | SD | Min | Max | 25th | 50th (Mdn) | 75th | z | p |
| Pre | 10 | 5.50 | 2.915 | 1 | 10 | 3.00 | 5.00 | 7.75 | -2.4 | .017 |
| Post | 10 | 8.10 | 2.183 | 3 | 10 | 7.00 | 8.00 | 10.00 | | |

| Table 2.4 | | | | | | Percentiles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| I believe that occupational therapy programs should | N | M | SD | Min | Max | 25th | 50th (Mdn) | 75th | z | p |

| include global environmental education and training. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 7.00 | 1.633 | 5 | 10 | 5.75 | 7.00 | 8.25 | -2.3 | .024 |
| Post | 10 | 8.50 | 2.121 | 4 | 10 | 7.00 | 10.00 | 10.00 | | |

Note. N, number. M, mean. SD, standard deviation. Min, lowest rating in distribution. Max, highest rating in distribution. Mdn, median. z, z-score. p, p-value.

However, according to Tables 2.5-2.9, there were no significant differences from pre to post test in Likert scale ratings.

| Table 2.3 Environmental degradation is linked to human health. | N | M | SD | Min | Max | Percentiles 25th | 50th (Mdn) | 75th | z | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 7.90 | 2.331 | 5 | 10 | 5.00 | 9.00 | 10.00 | -1.6 | .105 |
| Post | 10 | 9.10 | 1.524 | 6 | 10 | 7.75 | 10.00 | 10.00 | | |

| Table 2.4 OT can play a role in advocating for environmental sustainability. | N | M | SD | Min | Max | Percentiles 25th | 50th (Mdn) | 75th | z | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 8.10 | 1.912 | 4 | 10 | 7.00 | 8.50 | 10.00 | -1.2 | .245 |
| Post | 10 | 8.70 | 1.947 | 4 | 10 | 7.75 | 9.50 | 10.00 | | |

| Table 2.5 Addressing global environmental issues is essential for OT. | N | M | SD | Min | Max | Percentiles 25th | 50th (Mdn) | 75th | z | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 7.70 | 2.163 | 3 | 10 | 7.00 | 7.00 | 10.00 | -1.4 | .149 |
| Post | 10 | 8.70 | 1.703 | 6 | 10 | 7.00 | 10.00 | 10.00 | | |

| Table 2.8 OT can contribute to sustainable practices in healthcare settings. | N | M | SD | Min | Max | Percentiles 25th | 50th (Mdn) | 75th | z | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 8.10 | 1.729 | 4 | 10 | 7.75 | 8.00 | 9.25 | -1.9 | .052 |
| Post | 10 | 8.90 | 1.853 | 4 | 10 | 8.75 | 9.50 | 10.00 | | |

| Table 2.9 | N | M | SD | Min | Max | Percentiles |
|---|---|---|---|---|---|---|

| OT has a responsibility to encourage clients in sustainable behaviors while treating. | | | | | | 25th | 50th (Mdn) | 75th | z | p |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | 10 | 7.20 | 1.932 | 4 | 10 | 5.75 | 7.00 | 8.50 | -1.6 | .120 |
| Post | 10 | 8.20 | 1.932 | 4 | 10 | 7.50 | 8.50 | 10.00 | | |

Note. N, number. M, mean. SD, standard deviation. Min, lowest rating in distribution. Max, highest rating in distribution. Mdn, median. z, z-score. p, p-value.

## Results

### Quantitative Results

Participants were asked to self-report their current level of knowledge, attitudes, and beliefs on the following topics using a Likert scale from 1-10, with 1 being the least and 10 being the most level of knowledge or agreement with the statement. These results were taken by comparing pre-study scores to post-study scores.

#### *Climate Change*

Participants reported a mean score of 5.20 with a standard deviation of 1.99 on their pre-study score. Following the classes and interventions, they reported an average score of 8.2 with a standard deviation of 1.14.

#### *Biodiversity Conservation*

Participants reported a mean score of 3.10 with a standard deviation of 2.47 on their pre-study score. Following the classes and interventions, they reported an average score of 7.60 with a standard deviation of 2.37.

#### *Sustainable Development*

Participants reported a mean score of 4.60 with a standard deviation of 2.41 on their pre-study score. Following the classes and interventions, they reported an average score of 7.70 with a standard deviation of 1.57.

### *Environmental Policy and Regulation*

Participants reported a mean score of 4.60 with a standard deviation of 1.96 on their pre-study score. Following the classes and interventions, they reported an average score of 7.80 with a standard deviation of 1.81.

### *Ecological Footprint*

Participants reported a mean score of 5.00 with a standard deviation of 2.49 on their pre-study score. Following the classes and interventions, they reported an average score of 8.10 with a standard deviation of 1.60.

### *Impact of Human Activity on the Environment*

Participants reported a mean score of 8.60 with a standard deviation of 1.07 on their pre-study score. Following the classes and interventions, they reported an average score of 9.05 with a standard deviation of 0.71.

### *Speaking About Climate Change to Spread Awareness*

Participants reported a mean score of 5.20 with a standard deviation of 2.10 on their pre-study score. Following the classes and interventions, they reported an average score of 7.90 with a standard deviation of 1.29.

### *Belief Environmental Degradation is Increasingly Linked to Human Health*

Participants reported a mean score of 7.90 with a standard deviation of 2.33 on their pre-study score. Following the classes and interventions, they reported an average score of 9.10 with a standard deviation of 1.52.

### *Belief Occupational Therapy Plays a Role in Environmental Stability Advocacy*

Participants reported a mean score of 8.10 with a standard deviation of 1.91 on their pre-study score. Following the classes and interventions, they reported an average score of 8.70 with a standard deviation of 1.95.

### *Belief Addressing Global Environmental Issues is Essential for Occupational Therapy Practice*

Participants reported a mean score of 7.70 with a standard deviation of 2.16 on their pre-study score. Following the classes and interventions, they reported an average score of 8.70 with a standard deviation of 1.70.

### *Confidence Incorporating Environmental Considerations to Future Occupational Therapy Work*

Participants reported a mean score of 5.50 with a standard deviation of 2.92 on their pre-study score. Following the classes and interventions, they reported an average score of 8.10 with a standard deviation of 2.18.

### *Belief Occupational Therapy Programs Should Include Environmental Education and Training*

Participants reported a mean score of 7.00 with a standard deviation of 1.63 on their pre-study score. Following the classes and interventions, they reported an average score of 8.50 with a standard deviation of 2.12.

### *Belief Occupational Therapy can Contribute to Sustainable Practice in Healthcare Settings*

Participants reported a mean score of 8.10 with a standard deviation of 1.73 on their pre-study score. Following the classes and interventions, they reported an average score of 8.90 with a standard deviation of 1.85.

### *Belief Occupational Therapy has a Responsibility to Encourage Clients in Sustainable Behavior*

Participants reported a mean score of 7.20 with a standard deviation of 1.93 on their pre-study score. Following the classes and interventions, they reported an average score of 8.20 with a standard deviation of 1.93.

## Qualitative Results

Participants were able to discuss their opinions in a free-response section featured in the post-test questionnaire, which consisted of four questions: how the workshop changed their feelings regarding the environment, how sustainability can play a part in their own future practices, whether or not they believe occupational therapy curriculum should include environmental education, and suggestions as to what more can be done regarding occupational therapy and sustainability. Many of the responses to the four qualitative questions on our survey brought to light what was impactful and memorable from the two workshop modules.

### *Change in how the Participant Felt*

The first open-ended question asked each participant if their experience in this workshop changed their feelings about the environment and the direct impact healthcare/occupational therapy can have on the public. Two main themes were noted

within the answer pool: an increase in confidence and an increase in knowledge regarding occupational therapy and sustainability. One participant clearly stated that they "feel more confident in [their] abilities to aid clients on how to choose more sustainable options in their daily occupations." Some noted increased knowledge as a future practitioner, while others acknowledged how climate change can negatively affect physical and mental health, given a "better understanding of the connection," according to one answer.

### *Sustainability in Future Practices*

Participants were then asked for examples of how they would incorporate sustainability measures in their own future practices. The leading theme after data analysis was to decrease carbon footprints by implementing activities or occupational therapy interventions that would align with sustainability. Some activities/interventions listed by participants were "ride share programs" and "community gardening." Other common themes were the utilization of reusable products/equipment and renewable energy. One answer specified the reuse of rehab-specific equipment, while others mentioned everyday items for reuse within interventions. Future practices would also include community-level involvement in environmental issues as well as policy change.

### *Supplementation of Environmental Education to Occupational Therapy Curriculum*

Responses to the idea of adding environmental education to occupational therapy curriculum were unanimously positive. The importance of increasing awareness and knowledge of climate change and its adverse effects on human health was described by the participants, though it was felt in varying degrees. One participant stated that they "think that it's important to address environmental education programs to OT programs

so OT practitioners and OT assistants can educate their future patients about how the environment is affecting their physical and mental health." At the more conservative end of the spectrum, a participant expressed that although environmental education should be made known to students at some point, universities could offer an environmental education class as an elective for those interested in the subject.

### *What Occupational Therapy can Further do to Aid the Client and Climate Change*

Lastly, the participants were asked what more can be done from an occupational therapy standpoint to aid both clients and climate change. The most commonly proposed solution was to spread awareness of this topic, followed by specifically designed interventions that would help aid against climate change. Occupational therapists are in an opportune position to advocate for climate change solutions while serving their clients with the best care. One response mentioned that this advocacy is not meant simply for their clients, but also for their peers to follow suit: "continue to advocate for the matter, and increase awareness among occupational therapy practitioners, and encourage participation by teaching them how they can contribute in small or large ways. Either in their personal life, or while educating clients." Another response suggested that spreading awareness can lead to a better foundation in our community to create positive change in the environment.

## Discussion

Guided by our academic advisor, our research team developed a hypothesis anticipating that our educational intervention would notably enhance both the knowledge and attitudes of students towards environmental issues. We expected to see a clear positive difference when comparing the results from before and after the intervention.

Our study results affirmed this hypothesis: a significant portion of our assessment questions, 9 out of 14, showed statistically significant improvements.

The research literature we engaged with prior to our study emphasizes the critical need for integrating sustainability into healthcare education, especially in light of the increasingly evident climate crisis. The importance of this integration is underscored by the notion that healthcare professionals play a crucial role in advocating for and implementing sustainable practices. Our findings align with these scholarly arguments, suggesting that there is both a need and a fertile ground for such educational endeavors.

Our intervention strategy included two educational modules and an informative brochure. It’s worth considering that a more intensive or longer-duration intervention might produce even stronger evidence of knowledge and attitude shifts. Delving into the specifics of our study, we found that the impact on knowledge was clear-cut: nine areas dedicated to assessing the increase in environmental knowledge after the intervention showed significant positive results. This indicates that well-structured educational content has the potential to effectively increase knowledge among healthcare students. The areas concerning attitudes and perspectives, however, were less conclusive. Of the remaining five areas we assessed, some showed positive changes while others did not reach statistical significance. This mix of results suggests a more complex interplay between education and attitude formation. Changing attitudes is evidently a more nuanced challenge, possibly requiring interventions that go beyond imparting knowledge to also engage students emotionally and socially.

The implications of our study's findings are multifaceted and suggestive of several avenues for enhancing educational strategies within healthcare training programs. Firstly,

our results indicate that simply disseminating information, while effective in increasing knowledge, may not be as influential in altering attitudes and perspectives toward environmental sustainability. Therefore, the enhancement of curricula to include innovative and interactive learning experiences seems imperative.

Experiential learning is one such approach that could have a profound impact on students. This type of learning involves activities that enable students to apply their knowledge in real-world scenarios, thereby deepening their understanding and commitment to sustainable practices. For instance, healthcare students might participate in community-based environmental health projects, such as assessing the impact of pollution on community health, assisting in local clean-up efforts, or working with community leaders to develop sustainable, health-promoting environments. These experiences can help students connect the dots between environmental health and patient outcomes, fostering a sense of responsibility and advocacy for environmental issues.

Critical reflection is another key element that could be incorporated into the curriculum. Reflective practices encourage students to think deeply about their values, the impact of their actions, and the broader implications of healthcare on environmental sustainability. Through guided reflections, perhaps as part of a course or in conjunction with experiential learning projects, students could explore their role in the healthcare system and consider how they can contribute to more sustainable practices both personally and professionally.

In conjunction with these approaches, a reimagined curriculum might also include interdisciplinary collaboration, wherein students from various healthcare disciplines come together to learn from and with each other about the interconnections between their

fields and environmental sustainability. This can help in breaking down silos within healthcare education and promote a more holistic and collaborative approach to patient care and environmental stewardship.

Ultimately, the goal of these curricular modifications would be to produce occupational therapy practitioners who are not only knowledgeable but also intrinsically motivated to advocate for and implement sustainable practices within their fields. As the healthcare sector is a significant contributor to environmental degradation, the onus is on educational institutions to produce professionals who are equipped with the tools and the mindset to champion environmental stewardship as part of their clinical practice.

## Limitations

There were some limitations in this study that need to be considered. One limitation of this study would be sample size. The outreach efforts were exclusively targeted towards MSOT and OTA students who were enrolled at Stanbridge University. Although the recruitment scope was extended to include multiple Stanbridge campuses, no contact was established with students from external educational institutions enrolled in MSOT or OTA programs. This decision contributed to a smaller sample size for the study. A larger sample size would enhance the likelihood of encompassing a diverse array of participants or data points, thereby providing a more accurate representation of the population's characteristics and variability. This would have enhanced the generalizability of the findings to a broader context. This study also used a convenience sample, recruiting participants through established communication and vicinity rather than through a random or systematic approach. Through the utilization of a convenience sample, there exists the possibility that the perspectives or attributes of individuals

originating from diverse backgrounds or contexts were not fully captured. As such, confidence in generalizing or applying our study results to the broader population would be limited. Another limitation was the length of the study. Our study was conducted over a 5-week period, limiting the ability to capture long-term trends of perceptions and views of climate change and may not allow enough time to observe the sustained impact of the workshop provided. Having a longer length of time for our study would allow for us to analyze long-term trends and assess the stability or consistency of participants' survey answers. It would be important to see the long-term impact of the study and see the study outcomes evolve gradually over time. Lastly, due to the exclusive focus on students enrolled in the Stanbridge MSOT and OTA programs, access to varied populations and perspectives within the healthcare domains remains constrained. Many healthcare issues and research questions are connected and by narrowing the focus to just one field, important insights and potential interactions with other fields about the topic and issues of global climate change may be overlooked, limiting the comprehensive understanding of the topic.

## Ethical & Legal Considerations

Regarding ethical considerations, the student researchers and principal investigator were students and faculty, respectively, of the same university as the participant pool. However, efforts were made to mitigate this potential conflict of interest. After informed consent was received, participants were required to create a unique 6-digit PIN to de-identify themselves in data for pre- and post-survey comparisons. From this, participants were informed on how their responses to questionnaires would be analyzed and used for research, and that student researchers

would make reasonable efforts to safeguard the participants' privacy and confidentiality. Any identifiable information obtained during this study remained confidential. Data gathered from participants was kept in a protected Google Forms account which only members of the research team could access. Participant survey responses were not shared with participants' instructors, faculty, program, or university. To ensure confidentiality, the primary investigator did not have access to participant responses from the survey. Furthermore, clarity was established within the consent forms and recruitment materials, affirming that engagement in the study would have no impact on participants' academic standings. Participants could discontinue participation at any point of the study for any reason. In that event, or if researchers decided to withdraw a participant, a modification form would be submitted to the IRB and the participant(s) would be notified via email. Any data already collected from the participant would be de-identified (if necessary) and deleted/destroyed.

## Conclusion

Climate change is no longer an issue that can be overlooked. It is an alarming threat that the world must collectively confront without another moment to lose. The healthcare sector, in addition to the usual recycle, reduce, reuse, has an even greater potential to make strides toward sustainability. To do so, the first step in initiating this process would be to equip current and future healthcare practitioners with the right knowledge. Knowledge is crucial in influencing not only their own attitudes and subsequent behaviors, but also their clients. Due to the novel nature of the climate crisis, there is limited research surrounding the integration of healthcare and sustainability. Studies have shown that healthcare practitioners in current practice do not feel adequate

in guiding their clients regarding climate change and their health, though it is acknowledged as a growing concern (Lister et al., 2022; Patrick & Kingsley, 2015). With practitioners feeling this way, this research study aimed to address the research gap within the context of occupational therapy students to measure perspectives on global environmental education and analyze its effects on knowledge and volition. We hypothesize that there will be significant positive difference in the following outcome measurements: education level and volition to participate in sustainable behaviors following participation in the 4-week workshop. Future research should continue to address the topic of environmental education integration within healthcare and its positive impacts in order to provoke change in healthcare curriculum and further climate change efforts. Quantifying the benefits of climate change efforts implemented by occupational therapists or other practitioners would also be valuable in terms of future research as well. This study aims to draw attention to the pivotal role that occupational therapists and other healthcare professionals can assume in the battle against climate change. To do so, healthcare practitioners must be well supported with education and training to build the confidence and knowledge to provide the best client-centered care with sustainability in mind.

## References

Adamo, D. E., & Lysack, C. L. (2018). Social, economic, and political factors that influence occupational performance. In G. Gillen & B. Schell (Eds.), *Willard and Spackman's occupational therapy* (13th ed., pp. 240–255). Wolters Kluwer Health. https://online.vitalsource.com/books/9781975200008

American Occupational Therapy Association. (2022). *Policy E. 16: Occupational therapy's commitment to sustainability and climate change*. https://www.aota.org/-/media/corporate/files/aboutaota/officialdocs/policies/policy-e16-20220908.pdf

Hess, K. Y., & Rihtman, T. (2023). Moving from theory to practice in occupational therapy education for planetary health: A theoretical view. *Australian Occupational Therapy Journal, 70*(4), 460-470, https://doi.org/10.1111/1440-1630.12868

Huss, N., Ikiugu, M. N., Hackett, F., Sheffield, P. E., Palipane, N., & Groome, J. (2020). Education for sustainable health care: From learning to professional practice. *Medical Teacher*, *42*(10), 1097–1101. https://doi.org/10.1080/0142159x.2020.1797998

Ikiugu, M. N., Westerfield, M. A., Lien, J. M., Theisen, E. R., Cerny, S. L., & Nissen, R. M. (2015). Empowering people to change occupational behaviours to address critical global issues. *Canadian Journal of Occupational Therapy*, *82*(3), 194–204. https://doi.org/10.1177/0008417414567529.

Jenkin, K., Sellar, B., Stanley, M., & Thomas, K. (2016). How sustainable development is understood in World Federation of Occupational Therapy policy. *British Journal of Occupational Therapy*, *79*(8), 505-513. https://doi.org/10.1177/0308022615623555

Kircher, M., Doheny, B. M., Raab, K., Onello, E., Gingerich, S., & Potter, T. (2022). Understanding the knowledge, attitudes, and practices of healthcare professionals toward climate change and health in Minnesota. *Challenges*, *13*(2), Article 57. https://doi.org/10.3390/challe13020057

Lindsay, S., Hsu, S., Ragunathan, S., & Lindsay, J. (2022). The impact of climate change related extreme weather events on people with pre-existing disabilities and chronic conditions: A scoping review. *Disability and Rehabilitation.* Advance online publication. https://doi.org/10.1080/09638288.2022.2150328

Lister, H. E., Mostert, K., Botha, T., van der Linde, S., van Wyk, E., Rocher, S.A., Laing, R., Wu, L., Müller, S., des Tombe, A., Kganyago, T., Zwane, N., Mphogo, B., & Maric, F. (2022). South African healthcare professionals' knowledge, attitudes, and practices regarding environmental sustainability in healthcare: A mixed-methods study. *International Journal of Environmental Research and Public Health*, *19*(16), Article 10121. https://doi.org/10.3390/ijerph191610121

Patrick, R., & Kingsley, J. (2015). Exploring Australian health promotion and environmental sustainability initiatives. *Health Promotion Journal of Australia, 27*(1), 36-42. https://doi.org/10.1071/HE15008

Pokrovsky, O. M. (2019). Quantitative estimates of the impact of the most important factors on global climate change over the past 150 years. *Izvestiya, Atmospheric*

*and Oceanic Physics, 55*(9), 1182–1188. https://doi.org/10.1134/s0001433819090354.

Smith, N., & Joffe, H. (2013). How the public engages with global warming: A social representations approach. *Public Understanding of Science, 22*(1), 16–32. https://doi.org/10.1177/0963662512440913

Toan, D. T. T., Kien, V. D., Bao Giang, K., Van Minh, H., & Wright, P. (2014). Perceptions of climate change and its impact on human health: An integrated quantitative and qualitative approach. *Global Health Action*, *7*, Article 23025. https://doi.org/10.3402/gha.v7.23025

Toivonen, H. (2022). Themes of climate change agency: A qualitative study on how people construct agency in relation to climate change. *Humanities and Social Sciences Communications, 9*(1), Article 102. https://doi.org/10.1057/s41599-022-01111-w

U.S. Environmental Protection Agency. (2023). *Causes of climate change*. https://www.epa.gov/climatechange-science/causes-climate-change

Watts, N., Adger, W. N., Agnolucci, P., Blackstock, J., Byass, P., Cai, W., Chaytor, S., Colbourn, T., Collins, M., Cooper, A., Cox, P. M., Depledge, J., Drummond, P., Ekins, P., Galaz, V., Grace, D., Graham, H., Grubb, M., Haines, A., ...Costello, A. (2015). Health and climate change: Policy responses to protect public health. *The Lancet, 386*(10006), 1861–1914. https://doi.org/10.1016/s0140-6736(15)60854-6

Williamson, K., Satre-Meloy, A., Velasco, K., & Green, K. (2018). *Climate change needs behavior change: Making the case for behavioral solutions to reduce global*

*warming.* Rare Center for Behavior & the Environment. https://rare.org/wp-content/uploads/2019/02/2018-CCNBC-Report.pdf

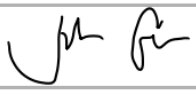
World Health Organization. (2021). *Climate change and health.* https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health

# Appendix A

## IRB Approval Form

Dear Dr. Kelcie Kadowaki and Students,

The Stanbridge University Institutional Review Board has completed the review of your application entitled "Enhancing Knowledge and Perceptions of Environmental Sustainability in Occupational Therapy: Evaluating the Impact of Multiple-Session Workshops on Occupational Therapy Students." Your application (#04MSOT012) is approved and categorized as Expedited.

| | |
|---|---|
| IRB Application Number | #04MSOT012 |
| Date | 08/21/2023 |
| Level of Review | Expedited |
| Application Approved | X |
| Conditional Approval | |
| Disapproved | |
| Comments | The requested Minor changes have been reviewed and confirmed as completed by the IRB. (08/21/2023) |
| Signature of IRB Chair |  |

**Please note that any anticipated changes to this approved protocol requires submission of an IRB Modification application with IRB approval confirmed prior to their implementation.**

Sincerely,
Julie Grace, M.S., M.A.
IRB Chair

# Appendix B

## Site Approval Forms

### Research Site Agreement Form
**Stanbridge University**

**AGREEMENT**

Research Site: Stanbridge University

Research Site Address: 2041 Business Center Drive, Irvine, CA 92612

Title of Proposed Research: Global environmental knowledge and sustainability training in occupational therapy

**RESEARCH STUDY INFORMATION**

**Student Investigator(s) Name(s):**

1. Christopher Chen
2. Sarah Park
3. Chantylle Pradera
4. Michael Tabora

**Principle Student Investigator Name:** Christopher Chen

Email address: christopher.chen@my.stanbridge.edu Phone Number: (909) 896-8857

**Duration of the study**: Five weeks

Authorization Effective Date: August 7th, 2023 Authorization Expiration Date: September 8th, 2023

Allowed Number of Contact Hours: 5 hours per participant The study will be completed by (date): November 21st, 202

**Description of Research:**

The primary objective of this study is to increase the educational scope and sustainability-oriented volition of students in the Master of Occupational Therapy and Occupational Therapy Assistant programs at Stanbridge University. The study's endpoints include the enhancement of participants' knowledge, attitudes, and perceptions regarding environmental sustainability in the context of occupational therapy, assessed post-workshop.

The study intervention for this research project is a global environmental knowledge and sustainability workshop designed for occupational therapy students enrolled at Stanbridge University. The workshop will include interactive sessions, educational presentations, and group discussions to enhance students' understanding of global environmental issues and their relevance to occupational therapy practice. In addition, the workshop will cover topics such as climate change, biodiversity conservation, sustainable development, environmental policies, and ecological footprint.

STANBRIDGE UNIVERSITY

Research Site Agreement 1 of 3

Research Site Agreement v1.1.docx

## Research Site Agreement Form
**Stanbridge University**

**Intellectual Property Statement:**

Stanbridge University reserves the right to use, publish, and disseminate the results of the research findings. The University shall provide the research site with a copy of the final research product at the earliest practicable time.

**Thesis Advisor Contact Information:**

Name: Kelcie Kadowaki OTD, OTR/L

Email address: kkadowaki@stanbridge.edu Phone Number: (310) 918-2347

**RECRUITMENT PLAN**

Means by which the researcher(s) will contact and/or recruit participants:

Participants will be recruited from occupational therapy programs at various Stanbridge University campuses. We intend to send emails containing an information about our study as well as a RSVP Google Form link to Stanbridge University students who were enrolled in the Master of Occupational Therapy (MSOT) program and Occupational Therapy Assistant (OTA) program.

**SITE REPRESENTATIVE AGREEMENT**

I agree to the recruitment and data collection methods to be used in this study, and I authorize the investigator to conduct research at:

Facility Name/Research Site Name: Stanbridge University

Representative authorizing agreement: Kelly Hamilton

Title: Vice President of Instruction

Kelly Hamilton Digitally signed by Kelly Hamilton
DN: cn=Kelly Hamilton, o=Stanbridge University, ou=Vice President of Instruction, email=khamilton@stanbridge.edu, c=US
Date: 2023.06.22 15:40:42 -07'00'

Signature Date

STANBRIDGE UNIVERSITY

**Research Site Agreement Form**
**Stanbridge University**

**STANBRIDGE UNIVERSITY AGREEMENT SIGNATURES**

I/We accept the terms of this agreement.

**Student Investigator 1**: Christopher Chen Title: Principle Student Investigator

Christopher Chen Digitally signed by Christopher Chen Date: 2023.06.13 16:19:14 -07'00' 6/13/23

Signature Date

**Student Investigator 2**: Sarah Park Title: Student Investigator

Sarah Park Digitally signed by Sarah Park Date: 2023.06.15 12:33:15 -07'00' 6/15/23

Signature Date

**Student Investigator 3**: Chantylle Pradera Title: Student Investigator

Chantylle Pradera Digitally signed by Chantylle Pradera Date: 2023.06.15 12:21:37 -07'00' 6/15/23

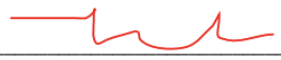
Signature Date

**Student Investigator 3**: Michael Tabora Title: Student Investigator

6/15/23

Signature Date

**Faculty Thesis Advisor**: Kelcie Kadowaki Title: Faculty Instructor and Fieldwork Coor



6/15/23

Signature Date

**Program Director**: Myka Persson Title: Program Director

Myka Persson Digitally signed by Myka Persson Date: 2023.06.16 17:15:00 -07'00' 6/16/23

Signature Date

**Dr. Kelly Hamilton**
Vice President of Instruction, Stanbridge University

Kelly Hamilton Digitally signed by Kelly Hamilton DN: cn=Kelly Hamilton, o=Stanbridge University, ou=Vice President of Instruction, email=khamilton@stanbridge.edu, c=US Date: 2023.06.22 15:40:55 -07'00'

Signature Date

STANBRIDGE UNIVERSITY