

Promoting Personalized Park-Based Exercise for Adults with Developmental Disabilities

Summary

My long-term mission is to support equitable physical activity opportunities, particularly within communities that have been historically underserved. The **proposed research** will build on a growing body of evidence demonstrating the critical role of community parks and structured programming in promoting physical activity and chronic disease prevention. This work will extend our prior park audits published in the *Delaware Journal of Public Health*¹ and the *International Journal of Environmental Research and Public Health*,² as well as ongoing large-scale accessibility, usability, and safety evaluations being conducted by my undergraduate research mentee across 50 parks in Cecil, Chester, and Delaware counties (Figure 1). Preliminary findings provide critical insights into the local infrastructure to support the next phase of this research, which will involve the development of mapped route atlases and evaluation of a novel personalized, park-based exercise program conducted by students in accessible community parks.

Specific Aims

Aligned with the United Nations' commitment to “*no one left behind*” and the World Health Organization's Global Action Plan on Physical Activity 2018-2030,³ our **long-term goal** is to develop and test a community-driven framework that targets chronic disease risk by expanding access to equitable physical activity opportunities. Outdoor activities promote holistic health for people of *all communities*, and the 2025 Position Statement on Active Outdoor Play emphasize the critical need to form programs that strengthen community connections.⁴ Although we found that many parks generally provide safe, navigable spaces,^{1,2} major gaps remain in programming and supports that enable sustained engagement, particularly for adults with developmental disabilities. Creating environments that foster belonging and meaningful participation requires not only physical access, but supportive features that allow individuals of all abilities to engage independently and enjoyably over time. Accessible parks represent a promising setting for tailored programs delivered by trained undergraduate health science students under faculty supervision. My **proposal's objective** is to evaluate the feasibility, acceptability, and preliminary effects of a personalized, route-based exercise program conducted in accessible community parks to promote physical activity among adults with developmental disabilities. Research questions include:

- Is the program feasible to implement (attendance, session completion, fidelity, wearable data capture) and acceptable to participants (enjoyment, clarity, comfort)?
- Do participants reach the intended moderate-intensity physical activity target when using personalized route cards within inclusive park environments?

Approach

This project will be ongoing, beginning before the end of the Spring of 2026 and continuing into Summer and Fall of 2026. Route atlases will be finalized for approximately five routes per park, each with a color-coded rating scale indicating expected effort scores based on distance, time, surface, and grade/incline profile, using a mapping application and in-person GPS tracking and measurements. Route notes will also include amenities (e.g., bench spacing, restroom distance) and safety considerations (e.g., road crossings, available turnaround points). The atlas will be organized into accessible digital and printed formats that integrate these quantitative and qualitative features to support individualized session planning and easy navigation.

A target sample of 20 adults with developmental disabilities, aged 18-44 years, who live within 0.25 miles of at least one selected park will be recruited. Participants will complete baseline assessments (e.g., height, weight, resting heart rate, resting blood pressure, and a 6-minute walk test for routing personalization). Approximately 25-30 sessions (2-4 per week for 12 weeks) will follow a personalized, progressive route regimen generated by our novel dose-response routing tool, which provides segment-level intensity guidance, pacing cues, and estimated metabolic cost. Primary outcomes will include adherence (attendance and completion), acceptability, intervention fidelity (adherence to procedures and instructional competence), social validity (enjoyment and perceived benefits), and preliminary effect sizes for predicted versus observed physical activity intensity (heart-rate monitoring) and sustained physical activity adherence (weekly participation). Secondary observations, such as rated perceived exertion and field notes, will provide additional insight into barriers, facilitators, participant and student experiences.

Expected Results and Dissemination of Research Findings

Park-based programs can significantly decrease the odds of cardiovascular diseases (CI 0.84-0.97), diabetes mellitus (CI 0.95-0.97), and obesity (CI 0.93-0.95) diagnoses for every \$30 per capita spent on programming.⁵ This research project will generate preliminary feasibility, implementation, and physiological data to support a scalable exercise program delivered by trained undergraduate students in adapted physical activity, wearable technology, community engagement, and clinical data collection. Findings will support competitive external grant submissions and future larger-scale trials. Results will be disseminated through peer-reviewed abstracts and manuscripts, and local and national conference presentations (e.g., Undergraduate and Faculty Research Symposium, National Consortium for Physical Education for Individuals with Disabilities). Notably, students will gain hands-on experience supporting community members with disabilities, strengthening their graduate school applications and workforce preparation, particularly for those interested in physical, therapy, occupational therapy and rehabilitation sciences. Field experiences will also inform student interest in trail-based physical activity both in the community and on campus, as well as adapted physical education. Adapted physical education was previously offered as a 300-level selective course in the Health Science Department according to the 2024–2025 Catalog, and these experiences may inform future curricular development and community partnerships at Lincoln University. Prior to joining Lincoln, I taught and assisted with this course for five years, partnering with local schools and transition programs to provide experiential learning opportunities for undergraduate students while increasing access to physical activity for students with disabilities. Collectively, these activities will align with Lincoln University's mission to empower students to become leaders who apply their learning in service to their communities, while advancing engaged scholarship and institutional visibility.

Travel and Faculty Development Activities

My faculty development request includes travel expenses, registration, and professional membership fees for a highly regarded discipline-specific international and national conference. The international conference is the North American Federation of Adapted Physical Activity (NAFAPA) Bi-annual Symposium taking place from July 28–31, 2026 in Honolulu, Hawaii, USA. The national conference is the National Consortium for Physical Education for Individuals with Disabilities (NCPEID) Annual Conference taking place July 9–12, 2026, virtually. Only registration and membership are requested for NCPEID. Details are provided in the budget and the justifications, as well as the Appendix.