

# Clinical Effectiveness of an Aquatic Exercise Program on Those With Visual Impairments: A Protocol Study

Allison Amos, SPT; Melanie Fry, SPT; Sarah Stevens, SPT  
Emma Weber, SPT; Maureen Rinehimer, PT, PhD, MS, MHS

## INTRODUCTION

Sensory systems are crucial for locomotion and can impact balance, coordination, and posture. Visual impairment may cause a more sedentary lifestyle and can lead to health complications such as cardiovascular disease, Diabetes Mellitus Type II, and hypertension, among others. This research is looking to use aquatic exercise as a way to increase activity levels in people who have visual impairments in a safe manner.<sup>1,2</sup>

## BACKGROUND

- Minimal research has been conducted on people with visual impairments performing aquatic exercise
- Various studies that had similar patient populations or involved aquatic therapy include:
  - Through an hour-long aquatic exercise program 5 days per week for 8 weeks, sedentary participants with chronic low back pain had decreased pain, disability, quality of life, and body composition.<sup>3</sup>
  - A land-based exercise program where visually impaired or deaf/blind adults performed a 5 to 6-week aquatic exercise program for 60 minutes, 3 days per week. They improved their balance of muscle groups, increased flexibility, and improved ability to ascend stairs.<sup>4</sup>

## PURPOSE

- 1) To determine if participants with visual impairments are able to complete an 8-week aquatic exercise program
- 2) Determine if participants have significant changes in the following:
  - Strength
  - Endurance
  - Cardiovascular fitness
  - Quality of life
  - Emotional wellbeing

## MISERICORDIA UNIVERSITY ANDERSON CENTER POOL LIFT



## METHODS

- 8-week quasi-experimental study
- Aquatic exercise program, 2x per week
- Repeated measures design with a pre-test and post-test
- Outcome measures performed at week 1 and week 8 of the program
- Outcome measures
  - 30 Second Chair Stand Test
  - Borg Rating of Perceived Exertion (RPE)
  - Modified Borg Dyspnea Scale
  - 6-Minute Walk Test
  - SF-36
- All of the outcome measures have been determined to be valid and reliable<sup>4,5,6,7</sup>

## EXERCISE PROGRAM

- 10 Minute Warm-up
- 20-25 Minute LE Strengthening Exercises
- 15-20 Minute Aerobic Exercises
- 10 Minute Cool Down

## PARTICIPANTS

To conduct this study, future researchers will use convenience sampling to recruit up to 25 participants to ensure the participants' safety in the pool. Potential participants will be recruited with the help of Northeast Sight Services in Exeter, PA.

Inclusion Criteria	Exclusion Criteria
Ages 30-80	Currently involved in an exercise program
Diagnosis of visual impairment	Severe CVD or pulmonary disease
A&O x4	Presence of psychiatric disorders
English speaking	Pregnancy or recent childbirth
	Major neurological impairment
	Open wounds that are not covered
	Incontinence
	Uncontrolled seizure disorders
	Serious fear of water
	High fever
	Uncontrolled HTN
	Hearing impairments

## DATA ANALYSIS

A paired t-test will be utilized to analyze all parametric data. This includes the SF-36, 6-Minute Walk Test, and 30-Second Chair Stand Test. The non-parametric equivalent of the paired t-test, the Wilcoxon, will be utilized to analyze all non-parametric data. This includes the Borg Ratings of Perceived Exertion Scale and the Modified Borg Dyspnea Scale. We will utilize this method to determine if a statistically significant difference occurred between participants from the beginning of the 8-week exercise program to the end.

## IMPLICATIONS FOR PHYSICAL THERAPY PRACTICE

If aquatic therapy shows to be effective in improving LE strength and endurance, cardiopulmonary fitness and endurance, and quality of life for those with visual impairments, it will show that this is a viable treatment method for physical therapists to use with this population. It also gives physical therapists the opportunity to promote health and wellness in community members that have visual impairments.

## CONTACT INFORMATION

For any questions or for more information, you can contact the researchers at [mrinehimer@misericordia.edu](mailto:mrinehimer@misericordia.edu)

## MISERICORDIA UNIVERSITY ANDERSON CENTER POOL LIFT

