

Completed Theses and Projects 2020

Theses:



Forming New Habits: An Intervention to Decrease Sedentary Behavior in Medically Stable Older Adults

Researcher: Melissa Dale under the direction of Dr. Young Kim

Purpose: The purpose of this thesis is to explore the feasibility of a potential intervention option, the Everyday Meaningful Activities (EMA) intervention, for increasing physical activity level by forming new habits anchored in existing daily habits. The aims of this study were (1) to investigate the feasibility of implementing the EMA intervention with medically stable older adults, (2) to investigate the effectiveness of the EMA intervention in forming new active lifestyle behavior habits, and (3) to investigate the effectiveness of the EMA intervention in decreasing sedentary time.

Method: Twelve medically stable older adults in the Greenville, NC community participated in this pretest/posttest, experimental design study. During six intervention sessions over six weeks, participants selected two new active lifestyle behaviors to make habitual and created action plans for implementation.

Results: The recruitment rate for this study was 18%. The Rapid Assessment Disuse Index was found to not be an appropriate measure for sedentary behavior for this population. The Short Blessed Test was found to be an appropriate measure for screening cognitive impairment over the phone. Video conferencing was found to be an appropriate delivery method for selected intervention sessions if the participant was comfortable. Participants' subjective report of activity performance times is not a reliable subjective data collection method. The EMA intervention was effective in forming new active lifestyle behavior habits according to the Self-Report Habit Index and in decreasing perceived sedentary time spent according to the Sedentary Behavior Questionnaire.

Conclusion: The EMA intervention is a viable intervention for decreasing sedentary behavior in medically stable older adults. With minor changes to the assessments used for screening, a well-rounded sample of participants can be created for pilot testing. In future applications of the EMA intervention, more reliable subjective data on activity performance should be collected in order to compare subjective and objective reports of activity performance.



Using Eye Tracking Technology to Compare Hazard Detection On-Road versus Driving Simulator at Night across Two Age Groups

Researcher: Juliette Leonardo under the direction of Dr. Anne Dickerson

Purpose: To examine the night driving performance between younger and older drivers on both on-road and driving simulation using eye-tracking technology.

Methods: This quasi-experimental, 2x2 repeated-measures factorial design study examined comparisons between two age groups (older adults v. younger adults) and across two driving situations (on-road v. simulated). Driving conditions were counterbalanced. Convenience

sampling was used to recruit healthy, community-living drivers age 65+ years (N=16) and drivers age 20-40 years (N=17). Instruments included wearable Tobii Pro eye tracking glasses which tracked and recorded pupil glances, a STISIM Drive® driving simulator, and each participant's personal vehicle. In both driving conditions, there was a pedestrian "hazard" at three locations. Pedestrians stared at their cell phone and appeared to cross the street. Outcomes examined from the eye tracking recordings included total fixation duration, fixation count, and time to first fixation.

Results: Night hazard detection was similar across driving conditions except for time to first fixation, which was faster on-road for both age groups. At some locations, there were significant differences between the two age groups, with older adults taking longer to initially see hazards.

Conclusion: Findings indicated that, despite age-related visual decline, older adults detected hazards similarly to younger adults, especially when during the on-road performance. However, they may take slightly longer to see hazards at night. Results also support the use of driving simulators as a proxy for observing night driving performance. The implications of this research suggest that older adults may over self restrict night driving. Future research focus on the outcome of *time to first fixation*, as it may offer the most driving-safety related information. Occupational therapists have a vital role in researching fitness to drive, reducing risk of crashes, and addressing the IADL of occupational driving and community mobility.

Projects:



Learning the Rules of the Road and Community Mobility: The strategies and activities used to Improve the IADL of Driving and Community Mobility for Individuals with Autism Spectrum Disorder.

Researcher: Megan Cox and Madison Lesniak under the direction of Dr. Anne Dickerson

Purpose: To examine if a Driving and Community Mobility Bootcamp improved the IADL skills of individuals with autism spectrum disorder (ASD).

Methods: Eight individuals with ASD participated in five days of an intensive driving and community program with a variety of interventions including driving simulators, Vision Coach™, interactive sessions on rules of the road, role playing with law enforcement, using alternative transportation, actually using a bus, and Drive Focus™. Each participant completed multiple pre and post assessments and surveys prior to and on the last day of the Bootcamp.

Results: Using paired t-test, there were significant differences on the Beck's Anxiety Inventory with the following symptoms: feeling hot ($p < .02$), fear of the worst happening ($p < .002$), unsteady ($p < .021$), terrified or afraid ($p < .007$), fear of losing control ($p < .03$), fear of dying ($p < .041$), and scared ($p < .048$). In a pre-post survey, changes were seen by participants in *I have difficulty with focusing* ($p < .045$), *I have difficulty with attention* ($p < .03$), and *I have difficulty with tolerating when others make mistakes* ($p < .015$). Several comments approached significance including *I fear crashing* ($p < .064$), and *I can't pass a driver's license* ($p < .05$).

Conclusion: Both participants and parents indicated via survey answers and feedback the Driving Bootcamp was a positive learning experience. Overall, measures indicated participants learned information and gained in confidence and competence for driving and community mobility.



An Age Comparison of Vision and Glare Recovery on Driving Performance

Researcher: Megan Miller under the direction of Dr. Anne Dickerson

Purpose: The purpose of this study was to examine the visual and perceptual differences between younger adult and older adult drivers in the areas of visual acuity, color sensitivity, contrast sensitivity, phoria, peripheral field, and depth perception.

Method: Participant recruitment was done for eye tracking studies through the College of Allied Health Sciences email listserv or from previous research studies. Data collection was performed as a vision screening for two hazard detection studies. Data collection was completed using the Optec plus which is an electronic digital vision screener.

Results: Older adults demonstrated less refined acuities than younger adults. The same percentage of older and younger adults were able to detect visual differences in depth perception equivalent to 50°; however, a higher percentage of older adults had decreased/impaired depth perception. Most adults

demonstrated phoria with two older adults showing impairment. All participants demonstrated adequate peripheral fields according to North Carolina regulations, but older adults had a narrower field of view. More older adults required a higher contrast (60%) to detect visual stimuli compared to younger adults. Younger adults only demonstrated faster glare recovery by 1 second (11.24 seconds versus 12.38 seconds).

Conclusion: This study demonstrated visual differences between age groups that were consistent with the normal aging process. Vision is just one component that should be used in a comprehensive driving evaluation to determine an individual's fitness to drive; other essential components include a cognitive assessment and an on-road assessment.



Occupational Therapy Intervention for Persons with ASD Participating in a Driving & Community Mobility Bootcamp: Process and Outcomes

Researcher: Amelia Anglin and Eleanor Hodge under the direction of Dr. Anne Dickerson

Purpose: The ECU Driving and Community Mobility Bootcamp provided structured, individually tailored intervention in learning rules of the road as well as the risks of driving. In addition to increasing competency

and safety in the participant's driving skills, the purpose of this research was to assess the effectiveness of two interventions, the interactive driving simulators and the Vision Coach™.

Method: Eight teens or young adults with autism spectrum disorder participated in a weeklong driving bootcamp. Both interventions, driving simulators, Vision Coach™, were used as pre-test and post-test assessments as well as interventions throughout the Bootcamp. The *Performance Analysis of Driving Ability* (P-drive) (Patomella, 2013) standardized observational assessment was used for the pre and post data for the simulator. Individually tailored interventions were provided that focused on providing realistic driving scenarios that required driving specific knowledge, visual perception, executive function, mental flexibility and divided attention. The STISIM Drive® driving simulator was used as the assessment tool and the DriveSafety™ DS200 simulator was used for the intervention. Vision Coach™ was used as a preparatory method to improve general skills required for driving, such as visual perception, divided attention, reaction time, and scanning abilities.

Results: The P-drive provided an over total as well as four sections totals including maneuver, orient, following regulations, and heeding. Using a parametric paired t-test and Wilcoxon signed rank test, the results showed that each category's values increased at the post-test. Additionally, statistically significant categories included the maneuver, heeding, and overall total categories ($p < .05$). The Vision Coach™ data from the past two bootcamps ($N=19$) was analyzed using Wilcoxon signed rank test. The results showed statistically significant increases in speed of completion ($p = .001$) and decreases in errors ($p = .015$ & $p = .001$).

Conclusion: These results suggest that use of interactive driving simulators and visual processing such as the Vision Coach™ are effective methods to improve individualized skills for adolescents and young adults with Autism Spectrum Disorder. Although the quantitative data is limited to less than 20 participants, the statistically significant differences found through analysis of the P-drive assessment

and Vision Coach™ indicate the success of the Bootcamp's interventions, although independence use of any of the strategies may be different outside the Bootcamp experience.



The Relationship Between DSM-5 Diagnoses and Sensory Processing Preferences

Researcher: Megan Chandler and Rebecca Mathison under the direction of Dr. Denise Donica

Purpose: This research study examined the relationship between sensory processing preferences measured by the Adult Sensory Processing Scale and DSM-5 mental health diagnosis of adults in the Behavioral Health Unit at Vidant Medical Center in Greenville, NC.

Method: Participants admitted to the Behavioral Health Unit completed the Adult Sensory Processing Scale. Descriptive statistics, analyzed using the Statistical Package for Social Sciences version 26, were used to describe this population and the relationship between sensory processing preferences and DSM-5 mental health diagnosis.

Results: Fourteen adults ranging in age from 18-55 years old, with the average age of 32 years old participated in the study. We observed that 13 out of 14 participants had a diagnosis of depression. This led to the creation of five groups based on comorbid mental health diagnosis: Depression Only (n = 6), Depression and Bipolar (n = 2), Depression and Generalized Anxiety Disorder (n = 4), Depression and Post Traumatic Stress Disorder (n = 1), and Generalized Anxiety Disorder Only (n = 1). We found that for low registration, 10 participants scored in the *similar to most* category, and 3 scored in the *more than most* category; for sensation seeking, 1 participant scored *more than most*, 3 scored *similar to most*, and 10 scored *less than most*; for sensory sensitivity, 8 scored *more than most*, 4 scored *similar to most*, and 1 scored *less than most*; for sensation avoidance, 9 scored *more than most*, and 5 scored *similar to most* according to the Adult Sensory Processing Scale.

Conclusion: The findings provide medical professionals with information about sensory processing patterns of individuals who have DSM-5 diagnoses. This information may be helpful in assisting occupational therapists and other medical professionals in determining appropriate interventions to minimize anxiety, increase function, and make each treatment unique and client-centered. Due to our small sample size, our findings may be generalizable to specific diagnostic groups. However, we found that there was a trend where most of our participants' answers clustered together in their sensory processing preferences, without there being one diagnosis markedly different from the rest.



Is Subjective Report of Sedentary Behaviors Accurate? A Multiple Cross-Sectional Study for Sedentary Older Adults in the Community

Researcher: Aubrey Burgess and Alyssa Paul under the direction of Dr. Young Kim

Purpose: The purpose of this study was to investigate relationships among subjective reports of sedentary behaviors with minimal recall bias, typical subjective

measures, and an objective measure of physical activity levels in sedentary older adults.

Method: Through a cross-sectional and longitudinal design, physical activity levels were measured, using both subjective (Rapid Assessment Disuse Index, Sedentary Behavior Questionnaire, and Subjective report of daily sedentary behaviors) and objective measures (ActiGraph GT9X Link). Eligible older adults were recruited and assessed three times over the period of eight weeks using these measures. A Pearson's Correlation Coefficient or Spearman's rho was calculated to determine the correlations between (1) subjective report of sedentary behaviors (SB) with minimal recall bias and objective measure and (2) typical subjective measures of physical activity levels and objective measure.

Results: After the initial screening, eleven participants were eligible to participate in the study with a mean age of 72.73 years. Subjective and objective measures were compared at multiple times during the eight weeks. Results demonstrate that participants had difficulty with reporting their actual time spent in SBs when compared to the results of the objective measure reports. Some of the correlations were as anticipated while others were the opposite of our original thought. This could be due to our small sample size, our participants' lack of self-awareness, difficulty accurately self-reporting of sedentary behaviors, and the selections of subjective measures.

Conclusion: Occupational therapy practitioners should use both subjective reports and objective measures for determining client's levels of SBs. Additional research is needed on the correlation between self-reports and objective measure of SBs.



Determinants of Sedentary Time: Relationships among Interested, Important, and Current Activities in Older Adults in the Community

Researcher: Carly Emerson and Sydney Peavy under the direction of Dr. Young Kim

Purpose: The purpose of this study was to investigate (1) the relationships among metabolic equivalent of tasks (MET) in important, interested, and current activity participation, and (2) the

relationship between MET in current activity engagements and sedentary time in medically stable older adults.

Methods: This study was a cross-sectional design. The participants were 30 medically stable older adults (65+) in the community of Eastern North Carolina. Fifteen participants were considered active and 15 were considered sedentary based on screening measures. Participants were assessed in a single one-on-one session, and their sedentary time was then monitored for 1 week using Actigraph GT9X Link. Activity Measure for Post-Acute Care, Montreal Cognitive Assessment, and sociodemographic forms were used as descriptive measures, and study-modified Activity Card Sort and Actigraph GT9X Link as outcome measures.

Results: There was a statistically significant positive relationship between total MET levels of interested and important activities. Additionally, there was a statistically significant relationship between total MET levels of interested and current activity participation. No statistically significant relationship was found between current activity participation and interested total MET

levels; however, a positive trend was observed. Lastly, the study-modified ACS was not a good indicator of sedentary behavior.

Conclusion: This topic will advance occupational therapy practitioners' knowledge in the role of meaningful occupations to decrease sedentary behaviors and increase physical activities for older adults in the community. Results from this research suggest that creating interventions that are meaningful to the client may influence client buy-in, treatment compliance, and better outcomes related to reducing sedentary behaviors.



Impact of Cancer Survivorship Program on Participants' Well-Being

Researcher: Kendall Ellis, Rachel Lennon, and Gloria Norton under the direction of Dr. Lynne Murphy

Purpose: The purpose of this study was to explore the lived

experiences of participants in the Vidant Cancer Support and Survivorship Program.

Method: In partnership, members of the Vidant Medical Center Cancer Support and Survivorship Program and the ECU Occupational Therapy Department sought to fully understand the existing support and survivorship program, expand the group offerings, and contribute to the body of research regarding survivorship care. This qualitative study followed a phenomenological approach, with the primary objective of understanding the experiences of the individuals who participated in the cancer survivorship program. Participants were interviewed at the beginning and end of the study. Data was analyzed through three rounds of coding by the research team to identify and explore themes describing the impact of the program on participants' well-being.

Results: The nine participants in this qualitative study reported overwhelmingly positive experiences in the cancer survivorship program. Three themes emerged that were personal in nature, regarding their individual journey of healing related to the cancer diagnosis: 1) Journey of spiritual and emotional healing, 2) Growing into a new sense of self, and 3) Moving from survival to life. The personal themes explored individual growth, adjustment to diagnosis, and gaining the strength to fully experience life rather than just surviving cancer.

Conclusion: Benefits of cancer survivorship programs were more fully described through exploration of personal growth and embracing opportunities in life. The benefits of inclusion of occupation-based services warrants further exploration and research.



Impact of Cancer Survivorship Program on Participants' Community Involvement

Researcher: Nicole Jennette (Fox) and Sarah Lee under the direction of Dr. Lynne Murphy

Purpose: This research explored the influence of Vidant Medical Center's Cancer Support and Survivorship Program on participants' quality of life and well-being. This program was run through a partnership with the members of the Department of Occupational Therapy.

Methods: This qualitative, phenomenological research study used convenience sampling to identify adult cancer survivors who had participated in the cancer survivorship program for at least four months (n=9). Interviews with these participants were recorded and transcribed, then analyzed through three rounds of coding (descriptive, pattern, and thematic). Trustworthiness of the analysis was addressed through measures of credibility (member checking and peer debriefing) and confirmability (audit trails).

Results: All participants reported positive experiences through their participation in the cancer survivorship program. Two themes emerged that were relational in nature, which described the importance of the interactions with other people involved in the program, namely: 1) Building a community of caring and connection, and 2) Embracing the value of altruism. Participants described how other members of the group formed a vital social and support network. In addition, they became much more involved in their communities and gained pride in helping others.

Conclusion: The benefits of the Cancer Support and Survivorship Program were articulated from the perspective of increased involvement in a community of survivors and through altruistic pursuits in the larger community. Additional research to explore the benefits of occupation-based services is vital for improved community-based cancer survivorship programs.



Effects of a Collaborative Occupational Therapy Interactive Vaulting Program on Executive Function in Children with Disabilities: A Pilot Study

Researchers: Amy Godfrey, Autumn Pilgreen, and Mary Vieregge under the direction of Dr. Heather Panczykowski

Purpose: The aim of this 12-week, pilot, collaborative Interactive Vaulting occupational therapy program was to determine the influence on executive function and social skills in children with behavioral disorders.

Method: This concurrent, embedded mixed methods study utilized a pretest-posttest design and the Cognitive Orientation to daily Occupational Performance in occupational therapy approach to structure interventions. The Behavior Rating Inventory of Executive Function-2 (BRIEF-2) was used in a pre

and posttest format with ratings from both the parent/guardian and the interactive vaulting instructor completed and analyzed. A qualitative measure of semi-structured interviews with the parents were conducted, and a thematic analysis was completed.

Results: A total of nine participants completed the study. Results indicated significant improvements in 5/10 measured variables of the BRIEF-2 by the interactive vaulting instructor, but this trend was not mirrored by parent ratings. However, qualitative analysis of parent interviews revealed the benefits of the program which were working with animals, relationship building, emotional maturity, and self-control.

Conclusion: This study provides preliminary evidence that a collaborative interactive vaulting and occupational therapy program positively affects executive functioning within the context of the center. The equine team member served as a mutual experience with which students rehearsed emerging skills that later acted as a bridge between peers. The parent BRIEF-2 results warrant further investigation on the generalizability of these skills into daily routines outside of the center. Encouragingly, the qualitative results of this study coincide with the benefits of equine assisted activities reflected in current literature, and further supports the need for sensitive standardized assessment options within this context to more accurately track and reflect behavioral outcomes.



The Role of Success and Failure in the “Just Right Challenge” a Review of the Methodology

Researchers: Suzanne Dotson, Sarah Mary Evanko, Katie Joyner, and Carmen Stringfield under the direction of Dr. Kelly McGlooin

Purpose: The purpose of this study is to evaluate the feasibility of utilizing the modified Constraint Induced Movement Therapy (CIMT) protocol to systematically monitor and adjust the challenge of tasks.

Methods: Eight participants diagnosed with cerebral palsy, between the ages 5-10 years, completed pre-testing on upper extremity function using the Melbourne Assessment of Unilateral Upper Limb Function (MUUL) and Shriner’s Hospital Upper Extremity Evaluation (SHUEE). Participants were paired based on severity and age and then randomly assigned to two challenge groups, high and low. At a five-day camp, 9am - 3pm, groups completed activities graded in real time while wearing splints on their unaffected limb. Undergraduate students and occupational therapy graduate students facilitated and recorded success rates. The high challenge group averaged a 40-60% success rate, and the low challenge group at 80-100%. Post-testing was completed after the fifth day of camp using the MUUL and SHUEE.



Results: Preliminary data suggest that it is possible to grade tasks to keep a child within a certain success rate. Based on daily averages, participants stayed within designated conditions for 97% of study.

Conclusion: This methodology study confirms that using success rate as a measure of challenge appears a feasible method to maintain challenge level during task-oriented therapeutic activities. Additionally, grading was completed by occupational therapy graduate students, which has positive implications for new practitioners in pursuing the just right challenge.