THE EFFECTS OF A LOW-INTENSITY AEROBIC EXERCISE PROGRAM ON ENHANCING OCCUPATIONAL PERFORMANCE AND QUALITY OF LIFE IN DIABETIC PATIENTS

By

Asia Suriyachottakul

Bachelor of Science – Kinesiology
University of Nevada, Las Vegas
2019

A doctoral project submitted in partial fulfillment
of the requirements for the

Occupational Therapy Doctorate

Department of Brain Health
School of Integrated Health Sciences
The Graduate College

University of Nevada, Las Vegas
May 2024

UNLV | GRADUATE COLLEGE

Doctoral Project Approval

The Graduate College
The University of Nevada, Las Vegas

March 3, 2024

This doctoral project prepared by

Asia Suriyachottakul

entitled

The Effects of a Low-Intensity Aerobic Exercise Program to Enhance Occupational Performance and Quality of Life in Diabetic Patients

is approved in partial fulfillment of the requirements for the degree of

Occupational Therapy Doctorate
Department of Brain Health

Donnamarie Krause, Ph.D.
Graduate Coordinator

Jefferson Kinney, Ph.D.
Graduate Program Chair

Alyssa Crittenden, Ph.D.
Vice Provost for Graduate Education & Dean of the Graduate College

Abstract

Globally, diabetes mellitus (DM) is a prevalent chronic condition many people encounter. DM is one of the primary causes of mortality due to individuals struggling to manage or prevent the condition. The healthcare field is also failing to provide sufficient education on DM. Individuals with this condition may begin to experience co-morbidities and depressive symptoms, which make it difficult for them to engage in meaningful occupations, in addition to decreased quality of life (QOL). This project examines the effectiveness of a low-intensity aerobic exercise (LIAE) program to enhance occupational performance (OP) and QOL in those diagnosed with the condition or at-risk, which was guided by the occupational performance process model and the problem-based learning theory. The objectives were to enhance engagement in desired occupations, provide guidance and resources to better manage or prevent DM, and increase awareness in the occupational therapy program. This project utilized a quasi-experimental, pretest-posttest design. Assessments utilized the Canadian Occupational Performance Measure (COPM) and the Perceived Quality of Life (PQOL) scale. These assessments incorporated a 10-point Likert scale to determine performance and satisfaction rates. Three participants from Encompass Health Rehabilitation Hospital in Henderson, Nevada took part in a one-week LIAE program lasting approximately 15-30 minutes per session. Each participant began their program during different weeks. The exercise program consisted of yoga, tai chi, boxing, and upper extremity strengthening. The results indicated a correlation between LIAE, OP, and QOL. It was concluded that LIAE can have beneficial impacts on OP and QOL in DM patients or those at-risk. However, the outcomes did not demonstrate statistical significance.

Acknowledgments

I would like to express my gratitude and appreciation to the following individuals for assisting me throughout my capstone project: Dr. Jonathan Legarte, my faculty mentor, provided guidance, resources, support, and patience throughout the whole capstone process. Dr. Legarte was committed to being there for me when I needed him, devoting his own spare time away from other responsibilities. Dena Berezin, my site mentor, supervised me while I was at Encompass Health Rehabilitation Hospital of Henderson. She was available to assist with finding participants and providing guidance with equipment necessary for the implementation process. Lastly, to participants of this capstone project, for their contribution to the data collection process.

Table of Contents

List of Tables

List of Figures

Introduction

According to the World Health Organization (2022), DM is a chronic condition that develops when the pancreas fails to generate insulin, or the body refuses to utilize it effectively. Insulin is a hormone that converts glucose from food into energy. It also regulates blood glucose levels. There are many forms of DM-type I, II, and gestational diabetes. Type I is when the body is unable to generate enough insulin, and typically occurs during childhood years. Type II is when the body refuses to utilize insulin, which mainly occurs in adulthood due to lifestyle factors. Pregnant women commonly develop gestational diabetes, but the condition can be reversed. However, these women have a greater risk of developing type II diabetes in the future. If this condition is left untreated, there is a higher chance of developing comorbidities such as cardiovascular disease, nephropathy, retinopathy, peripheral neuropathy, diabetic foot wounds or amputations, diabetic ketoacidosis, and/or stroke (American Diabetes Association, n.d.). In addition to these comorbidities, some individuals can also develop depression. DM is relatively easy to develop, given that some individuals cannot regulate their lifestyle habits, and it generally occurs in many hereditary lines (Wu et al., 2014). The Centers for Disease Control and Prevention (2023) noted that in 2021, approximately 38.4 million young adolescents and older adults had DM, which is 11.6% of the nation's population. The proposed solution was to develop an LIAE program that would help promote healthy, sustainable habits and routines.

Significance to Occupational Therapy

The Occupational Therapy Research Agenda (2011) discusses goals and priorities for six categories: assessment/measurement, intervention/prevention, basic, translational, health services, and training. This program closely aligns with the goals and priorities of the intervention/prevention category. The goal of intervention/prevention is to provide the most

effective intervention that will target difficulties with performance. However, prior studies must be reviewed to determine what is effective. Furthermore, this category should broaden occupational therapy's (OT) role and function by promoting interventions focused on improving occupational engagement and minimizing additional conditions or illnesses among those currently dealing with debilitating conditions. This program examined how LIAE can encourage positive change in those dealing with DM or at-risk, with the goal of enhancing engagement in meaningful occupations.

According to the American Occupational Therapy Association (2020), physical activity is an occupation that falls under health management, which are activities or tasks that maintain health and wellness to support engagement in other occupations. Physical activity is one of the essential occupations for humans to participate in to increase their cardiovascular system for endurance/activity tolerance and skeletomuscular system for strength necessary to engage in other meaningful occupations. This program can demonstrate the importance of physical activity as a preventative measure by targeting those at risk.

The Statement of the Problem/Research Question

DM is a prevalent chronic illness in the United States, and each year the number increases. By 2060, the number of individuals diagnosed with DM is expected to triple (Lin et al., 2018). Thus, it emphasizes the urgency of improving the quality of care and health outcomes for those managing DM or at-risk. Chobot et al. (2018) noted that one of the primary causes of DM was due to being obese. According to the Pan American Health Organization (n.d.), DM is the primary cause of 1.5 million deaths worldwide. Okafor et al. (2023) note that DM individuals struggle to manage their condition due to a lack of knowledge and resources. Individuals may also have concerns regarding the difficulties performing their activities of daily living (ADLs), instrumental activities of daily living (IADLs), rest and sleep, and many more occupations (Bahadir Ağce & Ekici, 2020). Preechasuk et al. (2019) conducted a cross-sectional survey focusing on DM educators' perspectives on treating patients with DM. They determined that most educators felt that there were unclear roles and responsibilities, in addition to a lack of structure.

The focus of this project was to utilize an LIAE program as a possible intervention to enhance OP and QOL in individuals with DM or at-risk. Occupational therapists (OTs) can assist with making individuals feel more comfortable when dealing with the condition by providing education, support, and utilizing interventions to tackle barriers and limitations affecting occupational engagement (Shen & Shen, 2019). OTs can also assist with providing guidance when developing an exercise regimen. The anticipated outcome was to develop a program that would assist individuals with becoming confident in managing or preventing this chronic condition, provide sufficient education along with resources, and increase awareness of DM management in the OT profession. This project aimed to emphasize the value of maintaining a

healthy lifestyle and increasing engagement and QOL in meaningful occupations. The target demographic of this project was patients admitted at Encompass Health Rehabilitation Hospital of Henderson at-risk or diagnosed with DM.

Problem Intervention Outcome Question

The project's problem intervention outcome question was: Will participating in an LIAE program enhance OP and QOL in individuals with DM or at-risk?

Operational Definitions

- Low-intensity Aerobic Exercise: Physical activity completed at a slow and comfortable pace. Measured by chair yoga, seated boxing, tai chi, and UE strengthening.
- Occupational Performance: The ability to identify, remember, organize, and perform roles, routines, and responsibilities in response to internal and external stimuli in order to maintain oneself and be productive (Chapparo & Ranka, 1997). Individuals must score a ten on the COPM.
- Quality of life: One's standard for health, comfort, and happiness (Teoli & Bhardwaj, 2023). Individuals must score a ten on the PQOL.
- Individuals with DM: Patients or participants who have diabetes. Measured by their medical chart.
- Individuals at-risk: Patients or participants who are considered prediabetic, live an unhealthy lifestyle, or have a family history of DM. Measured by their medical chart.

Literature Review

A literature review was completed to better understand the current needs and gaps in relation to DM care/management and prevention. It also offers current insights from studies that have already examined the effectiveness of aerobic exercise as a DM intervention. The occupational performance process model and the problem-based learning theory were considered upon exploring studies. This literature review encompassed DM health literacy, impacts from QOL and depression, a lack of physical activity, and aerobic exercise as an intervention.

DM Health Literacy

DM health literacy is the rate at which diabetic individuals have the essential skills and capabilities to acquire, comprehend, evaluate, and communicate diabetes-related information within healthcare settings and in their daily lives in order to treat and manage their condition (Mogessie et al., 2022). If an individual has low DM health literacy, it was gleaned that they will have poor DM management.

Gopalan et al. (2018) found that there are multiple misconceptions about how to manage DM. This qualitative study utilized a semi-structured interview to examine how individuals utilize information to judge their current degree of DM management. The entire interview was transcribed verbatim, along with field notes from 25 participants, who were mainly females. The common themes that arose were perceived self-efficacy/adherence to self-management, perceived medication adherence, presence of symptoms, and blood glucose levels. The results revealed that “self-management” implied confidence in their ability to perform self-care, prioritize their health, fulfill a healthy diet, exercise, or remain in contact with a provider. Ten participants noted that medication adherence was how they controlled their DM. Half of the participants thought that having residual DM symptoms demonstrated “bad” control. Sixteen

participants agreed that hemoglobin A1c levels were a significant indicator to assess DM management. According to the study's conclusion, most participants correctly stressed the importance of medication adherence and a healthy lifestyle in controlling DM and properly associated lower HbA1c and blood glucose levels with successful DM management. However, some were misled by the idea that the absence of diabetes-related symptoms was another indicator of DM control. A weakness of the study was that it had a small sample size, which reduced the statistical power of the study. A strength of this study was that it identified current influences on patients' perceptions of their DM management, which may enable providers and healthcare professionals to educate patients more efficiently about their DM management status and goals for improved outcomes.

QOL and Depression with DM

DM has psychological and emotional connections with self-esteem, self-care, daily living, and overall QOL. Three studies found that individuals with DM are more likely to become depressive, deny treatment, develop obesity, and limit their engagement in ADLs (Ahmed et al., 2022; Lee et al., 2021; Mishra et al., 2015).

A variety of factors, including depressive symptoms, can hinder occupational engagement. Ahmed et al. (2022) explored potential factors that limit ADL engagement and QOL among DM type I and II individuals through a cross-sectional study. Four hundred and eighty participants were recruited from a hospital in Bangladesh. The researchers implemented the Katz Index of Independence in ADLs to assess the participants' ability to carry out bathing, dressing, toileting, transferring, and feeding tasks. Additionally, the EQ-5D-5L score was utilized to measure QOL. Results illustrated that 430 participants scored 6 (full function) during ADL tasks, and 361 participants had anxiety/depression. The study concluded that the majority

of participants had a comorbidity that was a repercussion of the condition, however, they were able to complete ADL tasks independently but had anxiety and/or depression. Disadvantages of the study included limited generalizability, the correlation between ADL impairments and factors that may have been diluted, and data lacking variables such as physical activity. The strength of this study was that they were able to demonstrate how individuals with this condition can complete ADLs independently but still experience some emotional distress that impacts their QOL.

When looking at depression in terms of DM care, Lee et al. (2021) utilized a cross-sectional study to determine the correlation between the severity of depressive symptoms and the prevalence, awareness, treatment, and control of DM. The study analyzed data from the National Health and Nutrition Examination Survey (NHANES) to determine specific populations that require greater focus in addition to standard care. Researchers were able to obtain data from 14,328 participants who completed the NHANES. Based on the Patient Health Questionnaire-9 (PHQ-9) in the NHANES, participants were categorized as none, mild, moderate, moderately severe, or severe. The results illustrated that 84 percent of moderately severe and 86 percent of severe participants acknowledged their DM condition, which increased their depressive symptoms even more. Participants in this group were also more likely to deny DM treatment, are more obese, and smoke often. The study concluded that more awareness among individuals with moderately severe to severe depressive symptoms did not result in better treatment or control, demonstrating an even lower percentage of DM treatment and control in addition to an increase in harmful behaviors. A drawback of the study is using a single measure to gauge the intensity of depression in NHANES. The study noted that the PHQ-9 exaggerates the severity of depression.

Focusing on depression and QOL roles in desired occupations, Mishra et al. (2015) carried out a cross-sectional study on 157 participants from a diabetes clinic in a hospital in Nepal. The study utilized the World Health Organization Quality of Life-Brief (WHOQOL-BREF) scale and the PHQ-9. The WHOQOL-BREF assesses physical health, psychological health, social relationships, and the environment. The PHQ-9 is a screening tool for depression severity. The WHOQOL-BREF was found to have good internal consistency. Results demonstrated that the highest mean for WHOQOL-BREF is social relationships (57.32) followed by the environment. Participants had the lowest scores in physical health. The mean score for the PHQ-9 was 6 on a 1 to 10 scale. According to the results, participants are confident in their ability to establish positive relationships but struggle with energy and work capacity for ADLs, in addition to relying more on medications and medical aids to manage their condition. Disadvantages include having one setting and high rates of individuals not complying, which leads to biases and decreased statistical significance.

Overall, individuals dealing with DM are noted to have increased depressive symptoms. Ahmed et al. (2022) noted that individuals had a diabetic-related comorbidity but were still able to engage in their ADLs. However, they were still depressed. Lee et al. (2021) implied that more emphasis should be focused on individuals who have moderately severe to severe depressive symptoms. Mishra et al. (2015) examined how depression and poor QOL can affect ADLs and social relationships.

Physical Activity in Individuals with DM

Physical activity is known to be one of the most effective ways to manage one's health. However, not many individuals engage in this activity. Two studies found that negative

consequences were common in those who were physically inactive (Li et al., 2022; Silva et al., 2019).

Practicing unhealthy sedentary lifestyles can negatively impact the body composition of type II DM participants. Li et al. (2022) conducted a cross-sectional study that involved 402 participants from the Endocrinology Department of Nantong University's Second Affiliated Hospital. Three groups were created based on their sedentary time: low (LST, less than 4 hours), middle (MST, 4-8 hours), and high (HST, more than 8 hours). Blood samples and dual-energy X-ray absorptiometry (DXA) were the tools utilized in the study. Biochemical indicators such as glucose, triglycerides, total cholesterol, and low- and high-density lipoproteins were assessed in the blood sample, in addition to body composition measured by DXA. Researchers were also able to obtain dietary habits and smoking and drinking history. The benefit of employing these instruments is that they require adequately trained individuals. The results indicate that participants with sedentary time for more than 4 hours had higher fat body composition and glucose levels than participants with less than 4 hours. Those with more sedentary time had increased their consumption of soft drinks, tea, and/or coffee. Total cholesterol, as well as low- and high-density lipoprotein, had no significance. Researchers concluded that individuals with type II DM who practice sedentary lifestyles are more likely to develop detrimental effects on their body composition. A disadvantage is that the researchers must rely on what each participant says about their medical and dietary history, not knowing if their words are reliable. The study did not perform a follow-up survey, thus making it difficult to compare results along with confirming the validity and reliability of the study.

Although physical inactivity can cause harm to body composition, Silva et al. (2019) conducted a retrospective chart analysis from 1990, 2006, and 2016 to explore the mortality rate

in response to physical inactivity in 222,988 DM cases. The measurements that were utilized included the Global Physical Activity Questionnaire, the International Physical Activity Questionnaire, population-attributed fraction, and the Healthcare Access and Quality Index. Results demonstrated that in 1990, there were around 736 deaths and 1,337 deaths in 2006. Lastly, in 2016, there were 1,897 deaths. Results from the PAF illustrated that 3% of deaths could have been prevented with exercise. The study concluded that being physically inactive provided a higher risk for mortality. A drawback is that the study included subjective measures from questionnaires to determine physical activity, should have taken into account the different types of DM, and utilized only three periods of time. However, demonstrated how being physically inactive can cause mortality and how the mortality rates increased throughout the years.

There is a current trend of individuals with DM that are lacking physical activity. Li et al. (2022) demonstrated that sedentary lifestyles lead to increased body composition, causing harmful repercussions. Silva et al. (2019) found that physical inactivity may cause an increase in risk for mortality.

Aerobic Exercise as an Intervention

Aerobic exercise is a form of physical activity that depends on oxygen consumption to produce energy. This type of exercise is commonly used to enhance cardiorespiratory endurance. Two studies explored current aerobic exercise programs and found beneficial outcomes (Myers et al., 2013; Nojima et al., 2017).

An article by Myers et al. (2013) executed a randomized controlled trial aimed to determine if exercising enhanced QOL among individuals with DM. The assessment utilized to measure QOL was the 36-item Short Form Survey. This assessment focused on physical

functioning, general health, role barriers, pain, social relationships, and mental/emotional health. One hundred and seventy-three participants were randomized into four different groups: aerobic training only (AT)(treadmill), resistance training only (RT)(bench press, seated row, shoulder press, lateral pull-down, and leg press), combination (C), and non-exercise control group (NEC)(stretching and relaxation conditioning). When reviewing the results, all three exercise training groups improved in the physical component and overall health. In terms of pain, the RT group had the most beneficial changes, but the AT and C groups had the most improved physical functioning. There was no difference in changes in the mental component score between the NEC and either of the exercise groups. However, when examining the exercise groups, the C group outperformed the AT group for mental health. The study concluded that aerobic exercise enhances physical health QOL regardless of the training method. Furthermore, while the positive effects of exercise training on mental health QOL were modest, changes in mental QOL tend to favor combined AT and RT. This study illustrates how exercising may potentially enhance the QOL. Nonetheless, researchers were only concerned with the QOL baseline of the participants as they were higher than the national average. Which leads to favorable outcomes as the result of the study.

When examining long-term aerobic exercise in correlation to glycemic management, Nojima et al. (2017) conducted a follow-up study from 2003 on 62 male participants from an outpatient clinic. Participants were separated into four groups: low-fitness/inactive, low-fitness/active, high-fitness/inactive, and high-fitness/active. Vital signs, blood sampling, and cardiopulmonary exercise testing were conducted at baseline and after three, six, and 12 months of training. The study also measured serum GA to evaluate glucose levels. A spirometry instrument was utilized to calculate the forced expiratory volume and forced vital capacity at

baseline and after 12 months. When looking at aerobic exercise training (walking and jogging), participants were required to exercise for 30 minutes or more for three days or more. To assess the participant's physical activity through steps, the researchers used pedometers that have multiple-memory uniaxial accelerometers. Results illustrated lower serum GA levels after three, six, and 12 months in the active group but no change for those in the inactive group. Systolic blood pressure in the low-fitness/active group increased, but the other groups remained the same. The study was able to conclude that glucose levels are significantly enhanced when individuals practice aerobic exercise training after 12 months. A strength of the study is the instrument's reliability and validity. The disadvantages are poor supervision when performing exercises and not using a naturalistic environment. Participants with hemoglobin A1C >10%, diabetic micro- or macrovascular complications, insulin therapy, difficulty ambulating, and respiratory complications were excluded from the study, making it less generalizable.

Aerobic exercise has been noted to have positive effects on the human body. Myers et al. (2013) found that aerobic exercise improves QOL. Nojima et al. (2017) were able to conclude that aerobic exercise decreases and maintains blood glucose levels.

Synthesis

In general, it is essential to fully understand the factors that render complications with managing or preventing DM and actively engage in meaningful occupations. By doing so, the development of interventions can be tailored to provide the best quality of care. Gopalan et al. (2018) highlighted that individuals may perceive adherence to medication in addition to no diabetic-related symptoms were considered managing DM. Individuals with DM are more likely to demonstrate increased depressive symptoms, deny/avoid treatment, develop obesity, and limit their engagement in meaningful occupations (Ahmed et al., 2022; Lee et al., 2021; Mishra et al.,

2015). There is also a noticeable trend of lack of physical activity in DM patients causing other detrimental repercussions (Li et al., 2022; Silva et al., 2019). Myers et al. (2013) and Nojima et al. (2017) noted positive outcomes on QOL and glycemic levels. However, there is insufficient evidence that supports the idea that aerobic exercise may potentially enhance QOL and engagement in meaningful occupations. Additionally, there is a lack of evidence for OTs' roles and responsibilities in DM treatment and prevention.

Statement of Purpose and Hypothesis

This project aimed to determine the effectiveness of an LIAE program in enhancing OP and QOL of individuals with DM or at-risk, in addition to improving physical health outcomes that include sustainable blood glucose levels. This project hypothesized that participating in an LIAE would enhance OP and QOL in patients who are diagnosed with DM or at-risk. The objectives were to utilize evidence-based articles to generate an exercise program and educational brochure and provide additional resources. Individuals can now manage this chronic condition with a sense of self-efficacy and assistance from proficient OT practitioners through education and guidance for developing healthy habits and routines.

Theoretical Framework

The theory utilized in OT and mends well with the concept of this project would be the Occupational Performance Process Model (OPP). Through collaboration and a client-centered approach, this model is used to identify OP barriers and limitations that an individual may not be satisfied with and then determine appropriate solutions or interventions to enhance it (Fearing et al., 1997). The OPP model mends with this project by discerning what aspects of the participants' daily occupations they are dissatisfied with and then applying their interest in physical activity as a solution or intervention to evaluate any improvement or changes that may occur. Given the literature examined, most DM patients experience a decline in OP due to the condition's effects. This model facilitates a better understanding of what demands or necessities are not being fulfilled, in addition to facilitating positive lifestyle modifications to manage the condition.

The learning theory that best fits this project is the problem-based learning theory. According to Zakaria et al. (2019), learning takes place when an individual engages in activities or tasks that actively strive to solve a real-world challenge. DM is one of the prevalent challenges that the world struggles with. Individuals find it difficult to manage due to financial or accessibility issues and lack of education about the condition. It often necessitates lifestyle modifications, which might be challenging for some individuals. The problem-based learning theory demonstrated that those who participated in this project learned about an exercise program that can assist with managing a prevalent chronic condition of DM. This provides individuals guidance or a solution for implementing healthy routines and habits into their daily lives.

Methodology

Agency Description

This capstone project was completed at Encompass Health Rehabilitation Hospital of Henderson, located in Henderson, Nevada. Communications were completed through email and Google Meets between the site coordinator for clinical education, the site mentor, the student, and the University of Nevada, Las Vegas (UNLV) Occupational Therapy Doctorate (OTD) capstone coordinator. Visits to the facility were also made to become familiarized with the environment before implementing the program. This site was preferred due to hearing fieldwork experiences from other students in the UNLV OTD program. Additionally, Encompass offered a diabetic education group where patients can learn new abilities while socializing with others in similar situations.

Target Population/Sampling Method

The target population for this capstone project consists of young/old adolescents who were admitted to Encompass Health in Henderson. Participants were gathered through a purposive sampling by receiving approval to review patient medical charts. This method ensured that the participants exhibited the traits, backgrounds, or knowledge essential to fulfill the objectives of the program. The disadvantage of using purposive sampling is the need for more randomization, making it difficult to determine whether the results are generalizable.

The inclusion criteria for this project consisted of having a medical history of DM or being at-risk for the condition and must be at least 12 years of age or older. There is no specific gender, race/ethnicity, or socioeconomic status. They must deem physical activity as a meaningful occupation or of interest, be able to tolerate at least 15-30 minutes of exercise, and be able to comprehend/speak some English. Exclusion criteria included full/complete loss of gross

or fine motor skills of bilateral upper extremities, lack of interest in physical activity, inability to comprehend English, and inability to understand or follow commands. However, some accommodations include using a wheelchair, having other conditions and/or comorbidities that do not severely hinder them from exercising, and having a slight hearing or vision deficit.

Methods and Procedures

The design for this project was a quasi-experimental design using pre- and post-assessments as a form of evaluation. The project was reviewed by UNLV's Institutional Review Board (IRB) and was approved. Consent or approval from the site mentor and therapy director was obtained to access patient records. The assessments utilized include the COPM (Appendix A) and the PQOL (Appendix B), which have both been shown to have good reliability and validity (Berardi et al., 2019; Patrick et al., 1988).

Developmental Phase

The initial process of the program was the developmental phase. At this phase, the DM educational brochure (Appendix C) and exercise programs (Appendix D) were assembled while considering evidence-based articles to gather content. The advantage of evidence-based articles is that they ensure the reliability of the content that was provided. Databases like PubMed, JSTOR, and ScienceDirect were used. The articles that were selected demonstrated high statistical significance in their results. By doing so, this made sure that the content obtained was credible. Articles translated from another language were excluded, considering discrepancies and inconsistencies that may have occurred during the translation process. The content in the DM brochure covered the description of the condition, signs and symptoms, diabetes-related comorbidities, preventative/management methods, and additional resources through QR codes

and websites. The exercise program consisted of four different LIAEs, including chair yoga, seated boxing, tai chi, and UE strengthening.

Implementation Phase

The second phase was the implementation phase, consisting of the pilot study, the process of gathering participants, and the actual implementation of the exercise program. The pilot study was conducted to determine any necessary modifications, focused on the study design, how the participants were obtained, the type of exercises, and the assessments utilized. After participants were identified and obtained, a consent form (Appendix E) was provided. The exercise program lasted for approximately four weeks. Each participant completed their program during separate weeks; this made certain that the program was client-centered and concentrated on one individual at a time. The first session involved administering pre-assessments of the COPM and PQOL, along with providing DM brochures. Participants then underwent a 15-30 minute exercise program that lasted for four days. Depending on the participant's preference, sessions were conducted in their room, the facility's therapy gym, or the courtyard. The exercise schedule started with chair yoga and proceeded to tai chi, boxing, and UE strengthening. One exercise was completed per session, and each day consisted of only one session. During the last session, post-assessments were administered. The data collection was accomplished through assessments and observations during exercises, written down on physical assessment forms and electronic spreadsheets.

Outcome Phase

The final step was the outcome phase. All data was analyzed, stored, and organized in Statistical Package for the Social Science (SPSS) and Microsoft Excel. A password was established on Microsoft Excel to limit access by individuals who were not involved in the

capstone project. Moreover, extra copies were kept on Google Sheets as a safeguard against data loss from technical malfunctions and issues. Site and faculty mentors collaborated with the student to cross-check if data in SPSS, Microsoft Excel, and Google Sheets matched the physical copies. To protect the participants' confidentiality and adhere to IRB regulations, pseudonyms were incorporated.

A consensus was reached to determine the pre- and post-program changes, the impact, and any unintentional errors. This project carried out an investigator triangulation method between the student, site mentor, and faculty mentor to enhance the credibility and validity of the results. The project's findings were disseminated after the results were finalized and reviewed thoroughly. Upon project completion, all records and data were stored in a locked facility at UNLV for approximately one year. After the storage time expires, the information gathered will be discarded via shredding.

Assessments/Instruments, Materials, and Equipment

As mentioned previously, the COPM and PQOL are the assessments utilized in the evaluation plan. The COPM assessment was designed to measure the participant's satisfaction with their performance in meaningful occupations over an extended period of time (Law et al., 2023). To utilize the COPM assessment, training was an option available through their website. Upon completion of the training, access to the COPM materials was granted. Regarding the PQOL, this assessment measured the participants' quality of life and functional status (Patrick et al., 2000). The PQOL materials were provided through the University of Washington website and did not require any training.

In order to educate the participants on their condition, a DM brochure was provided utilizing content gathered from the American Diabetes Association, Centers for Disease Control

and Prevention, American Heart Association, scholarly articles, and peer-reviewed articles. The facility provided any other necessary exercise equipment.

Ethical & Legal Considerations

Participants were provided with informed consent to address unethical issues involving anonymity and safety. Additionally, this project was reviewed and revised by the site mentor, faculty mentor, and UNLV's IRB (IRB# UNLV-2023-573) prior to the development of the program. The form outlines the purpose of the program and emphasizes confidentiality. The project will also adhere to OT's Code of Ethics and Encompass's rules and regulations. All participants involved in the project were advised of the minimal risks of exercising. Risks included slight soreness, fatigue, SOB, and increased blood pressure.

As aforementioned, the data management plan was to store data in multiple sources, such as SPSS, Microsoft Excel, and Google Sheets. Pseudonyms were utilized to protect the participants' true identities. In cases like technical difficulties, data was also obtained through physical copies and were kept in a storage file.

Results

Characteristics of the Participants

Five participants who were admitted to Encompass Health Rehabilitation Hospital met all the inclusion criteria and voluntarily accepted to participate in this capstone project. Two participants withdrew before the program began, leaving this project with three participants who fully completed the program. All consent forms were signed and returned. Reasons for attrition were due to leaving against medical advice and other comorbidities that developed, resulting in the participants being excluded from the program.

The demographic details of each participant are shown in Table 1. The majority of participants were females (67%). The ages of each individual ranged from 63 to 75 years old. Ethnicity was divided between Asians (33%) and Caucasians (67%). Of the participants, 33% were widowed and 67% were married. They had either a bachelor's degree, associate's, degree, or a high school diploma. Finally, 67% of these individuals were retired and 33% were disabled.

Table 1: Demographic Characteristics of the Participants.

Participants	Age	Gender	Ethnicity	Marital Status	Education	Employment
R2	63	F	Caucasian	Widowed	Associates	Disabled
C1	71	F	Caucasian	Married	HS diploma	Retired
T1	75	M	Asian	Married	Bachelor's	Retired

Note. This table displays the demographics of each participant. F=Female, M=Male, and HS = high school.

Occupational Performance

COPM assessments were conducted before and after the exercise program. Table 2 displays the top three important occupations that the participants identified through the COPM assessment. The common occupations include instrumental activities of daily living (IADLs), functional mobility, and active recreation. IADLs included cooking and caring for a pet dog. Functional mobility included being able to walk/ambulate and also carry out transfers. Active recreation consisted of using the treadmill or elliptical, taking dance classes at the gym, jogging with friends, and bike riding.

Table 2*: Important Occupations*

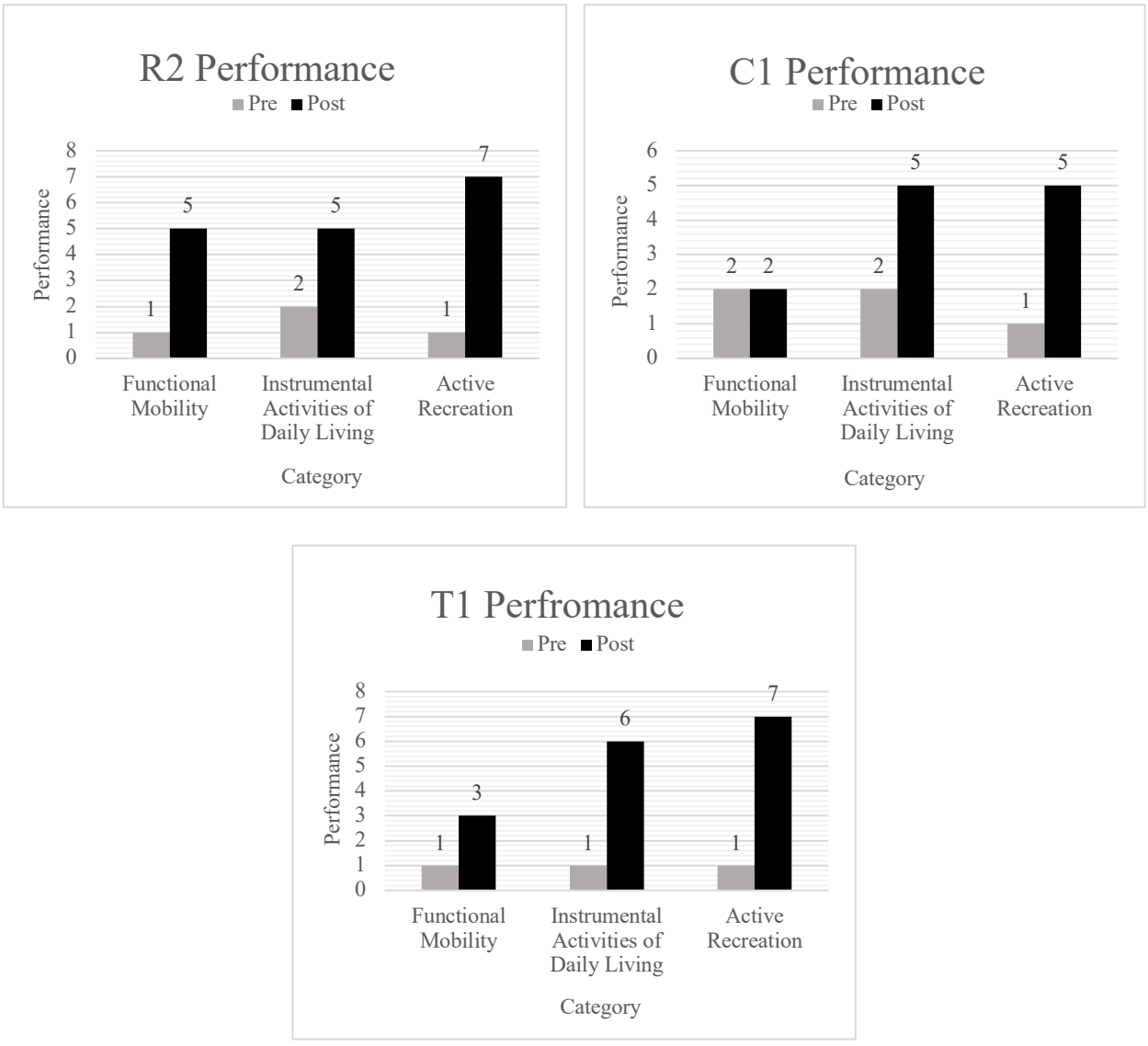
Participants	**#1**	**#2**	**#3**
R2	Active Recreation	IADLs	Functional Mobility
C1	IADLs	Functional Mobility	Active Recreation
T1	Functional Mobility	Active Recreation	IADLs

Note. This table displays the top three important occupations identified through the COPM assessment. Occupations are ranked (#1=most important, #3=least important). IADLs = Instrumental activities of daily living.

Participants were asked to rate how effectively they performed those occupations and how satisfied they were on a scale of 1 to 10. Figure 1 illustrates the ratings from the participants before and after the program. Each participant either remained the same or increased in their

performance ratings after the program. Most scores increased by approximately four to six points.

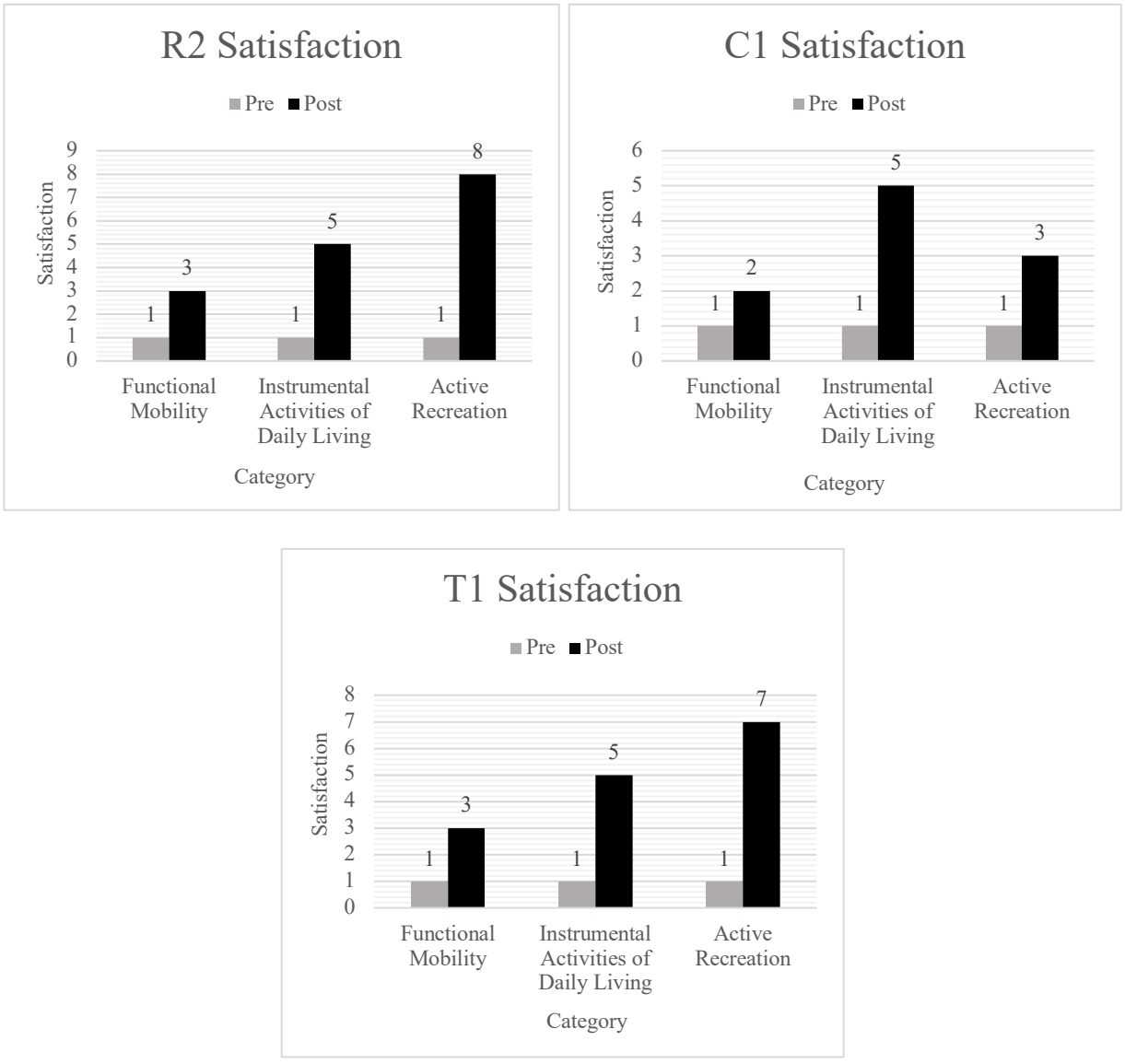
Figure 1: Bar Graph of Pre-/Post-Ratings on Performance in Each Occupation.



Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied). Categories are based on the occupations identified.

Figure 2 displays a bar graph of each individual's pre- and post-satisfaction rating on how well they perform the occupations. All participants' initial satisfaction score was at one. However, after the program, their scores increased by one to seven.

Figure 2: Bar Graph Pre-/Post-Ratings on Satisfaction with Performance.



Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied). Categories are based on the occupations identified.

A Wilcoxon Signed Rank Test was utilized to determine if there was a significant change between pre- and post-assessment scores regarding their performance and satisfaction. Results demonstrated a P-value of 0.18 between pre- and post-scores for performance in functional mobility. The P-value for satisfaction on how well the participants felt they performed for functional mobility was 0.10. In terms of IADLs, the P-value for performance was 0.10 and 0.08 for satisfaction. Lastly, for active recreation, the P-value in performance was 0.10 and 0.11 for satisfaction. Table 3-5 summarizes the statistics for the performance and satisfaction scores of all three participants.

Table 3: Descriptive Statistics and Wilcoxon Signed Rank Test for Functional Mobility.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Performance	3	1.33 (.58)	1.00/2.00	3.33 (1.53)	2.00/5.00	1.34	.18
Satisfaction	3	1.00 (.00)	1.00/1.00	2.67 (.58)	2.00/2.00	1.63	.10

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Table 4: Descriptive Statistics and Wilcoxon Signed Rank Test for IADLs.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Performance	3	1.67 (.58)	1.00/2.00	5.33 (.58)	5.00/6.00	1.84	.10
Satisfaction	3	1.00 (.00)	1.00/1.00	5.67 (.00)	5.00/5.00	1.73	.08

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Table 5: Descriptive Statistics and Wilcoxon Signed Rank Test for Active Recreation.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Performance	3	1.00 (.00)	1.00/1.00	6.33 (1.16)	5.00/7.00	1.63	.10
Satisfaction	3	1.00 (.00)	1.00/1.00	6.00 (2.65)	3.00/8.00	1.60	.11

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Quality of Life

The PQOL assessment was also conducted before and after the exercise program. The questions in the assessment were categorized into four domains: physical, cognitive, social, and diet. The Wilcoxon Signed Rank Test was utilized to determine if there was a significant change between pre- and post-assessment scores regarding their perceived QOL. Table 6 provides the average rating score for each domain from each participant.

Table 6: Average Pre- and Post-Rating Scores from Each Participant

Domain	R2		C1		T1	
	Pre	Post	Pre	Post	Pre	Post
Physical	2.6	5.4	3.6	5.4	2.8	5.6
Cognitive	8	8	5	6.5	4	7.5
Social	5.2	7.3	5.9	7.9	6.7	9.5
Diet	10	10	9	10	4	9

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Physical Domain

The questions in this domain focused on the participants' satisfaction with their health, their ability to care for themselves, the amount of walking they do, how frequently they go outside, and the type/amount of sleep they obtain. The lowest score before the program was 2.6, and the highest score after the program concluded was 5.6. Overall, the P-value for this domain was 0.10. Table 7 displays the descriptive statistics and Wilcoxon Signed-Rank Test of scores for this domain.

Table 7: Descriptive Statistics and Wilcoxon Sign for PQOL Physical Domain.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Physical	3	3.00 (.53)	2.60/3.60	5.47 (.12)	5.40/5.60	1.63	.10

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Cognitive Domain

This domain assessed their ability to think/remember and hold conversations, such as speaking effectively, hearing others, and being understood. The lowest pre-score was 4 followed by a high of 8. The lowest post-score was 6.5, with the highest score of 8. The P-value for this domain was 0.18. Table 8 displays the descriptive statistics and the Wilcoxon Signed-Rank Test of scores for the cognitive domain.

Table 8: Descriptive Statistics and Wilcoxon Signed-Rank Test for PQOL Cognitive Domain.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Cognitive	3	5.67 (2.08)	4.00/8.00	7.33 (.76)	6.50/8.00	1.34	.18

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Social Domain

The social domain involves the support and respect given to and from friends and family, as well as their contributions to the community. The lowest pre-score for this domain was 5.2,

with the highest score of 6.7. The lowest post-score was 7.3, with the highest score being 9.5. The p-value for the social domain was 0.11. Table 9 provides descriptive statistics and the Wilcoxon Signed-Rank Test of scores for this domain.

Table 9: Descriptive Statistics and Wilcoxon Signed-Rank Test for PQOL Social Domain.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Social	3	5.93 (.75)	5.20/6.70	8.23 (1.13)	7.30/9.50	1.60	.11

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Diet Domain

The last domain is diet. This section contained only one question that focused on the kind and amount of food each participant eats. The lowest pre-score was 4, with the highest score of 10. For post-scores, the lowest was a 9, and the highest was 10. The p-value score for this domain was 0.18. Table 10 displays the descriptive statistics and the Wilcoxon Signed-Rank Test of pre- and post-scores of this domain.

Table 10: Descriptive Statistics and Wilcoxon Signed-Rank Test for PQOL Diet Domain.

		Pretest		Posttest			
	N	Mean (SD)	$25^{th}/75^{th}$	Mean (SD)	$25^{th}/75^{th}$	T-score	P-value
Diet	3	7.67 (3.21)	4.00/10.00	9.67 (.58)	9.00/10.00	1.34	.18

Note. Scores are based on a 10-point Likert scale (1=extremely dissatisfied to 10=extremely satisfied).

Discussion

LIAE has been known to be beneficial for the human body (Myers et al., 2013; Nojima et al., 2017). However, limited studies explore the effects of LIAE on enhancing the ability to complete meaningful occupations. The objective of this capstone project was to determine if individuals who are diabetic or at-risk would benefit from engaging in an LIAE program to enhance their OP and QOL, in addition to improving glucose blood levels and sustaining healthy habits and routines.

Application to OT

After comparing the program's results to the objectives and goals of the Occupational Therapy Research Agenda, LIAE has the potential to be implemented as both an intervention and/or a preventative measure. Even though the post-test scores were not significantly different from the pre-test scores, the results still demonstrated an improvement in scores. The scores may have been more significant if the program had been administered over an extended duration and bigger sample size. This would have made it effortless to declare that the program attained the Occupational Therapy Research Agenda's objectives and goals.

Occupational Performance and COPM

When comparing the COPM pre- and post-scores for perceived occupational performance and satisfaction in functional mobility, IADLs, and active recreation, all three individuals had an increase in their perceived performance scores after completing the program. However, the increased scores needed to be more sufficient to make a substantial difference between scores. Like performance scores, the satisfaction scores increased after each participant completed the program. However, these increases in scores were inadequate to propose a significant difference.

Upon comparing before and after scores with each participant, most stated that they felt a difference in their performance as a result of this training.

Functional Mobility

The majority of participants defined *functional mobility* as the ability to ambulate in addition to being able to complete proper and safe transfers. Initial ratings on performance varied from a score of one or two, indicating that they perceived themselves as being unable to perform this occupation proficiently. After completing the program, some post-ratings increased by scores of three and five. This suggests that these individuals felt that there was a change in their ability to complete functional mobility. One participant retained the same score, signifying that they believed their performance had not changed. All pre-ratings for satisfaction in their performance were at a score of one. This implies that all participants were not pleased with how well they believed they performed. Post-ratings increased to only a score of two or three, suggesting that all participants were minimally pleased with how well they felt they could perform. Therefore, the null hypothesis was retained.

IADLs

Throughout the assessment, participants identified IADLs as their capability to prepare meals, cook, and care for their pets at home. Pre-scores rated by participants varied from a score of one to two, which implies that they believe they do not perform well with these tasks. Pretest ratings for satisfaction with performance were all a score of one, meaning each participant was unhappy with their performance. Posttest ratings for performance increased to a score of five or six, with satisfaction post-ratings ranging from a score of five to six. This demonstrates how participants felt improvement in their performance with being able to cook and care for pets and

were more satisfied than before the program. Despite the results, the null hypothesis was still retained due to scores being minimally increased.

Active Recreation

One participant referred to active recreation as the idea of utilizing a treadmill or elliptical. Another participant stated that taking dance classes at the gym is their form of active recreation. The last participant identified active recreation as jogging with friends or riding bikes. The initial performance scores were all one, in addition to the satisfaction scores being one. This illustrates how all three participants were highly dissatisfied with how they performed in this occupation. Post-scores for performance increased to a score of five or seven, with satisfaction also increasing between a score of five and eight. This area of occupation demonstrated the most improvement; however, it was not significant enough. This resulted in the null hypothesis being retained.

Quality of Life and PQOL

While exploring the literature, Lee et al. (2021) found that diabetic individuals were more likely to experience depressive symptoms. The PQOL assessment utilized rating scales to determine each participant's satisfaction with their QOL in four domains: physical, cognitive, social, and diet. When examining scores, each participant's score increased after the program. Similar to the COPM scores, there was an insufficient increase to make a significant change in PQOL.

Physical Domain

In the physical domain, initial scores prior to the program had an average score of approximately three. This meant that most individuals felt dissatisfied with their physical abilities. After the program, scores increased to an average of 5.47. Even though there was an

increase, a five on the Likert scale still implied that participants felt neutral in this domain. Therefore, the null hypothesis was retained.

Cognitive Domain

The cognitive domain had an average pre-score of 5.67, which suggests that the majority of participants felt neutral with this domain. Post-score averaged around 7.33 implying that individuals felt slightly more satisfied upon finishing the program. Since the score only increased by two, it was not enough to justify a significant difference that the change was due to the program. This resulted in the null hypothesis for this domain to also be retained.

Social Domain

Recent studies have noted that an individual's QOL can be greatly affected if their social relationships and support are limited (Mishra et al., 2015). In this assessment, the social domain had the most questions. The average pre-score was 5.93, which suggests that participants felt neutral with the support or respect they received from friends or family. The average for post-scores was 8.23, implying that they were highly satisfied with this area.

Diet Domain

The last domain was diet, which focused on the quality and quantity of food. The average for pre-scores in this area was 7.67, with a pre-score of 9.67. This implies that participants were already satisfied with their diet. The results were able to demonstrate an increase in post-scores, which led to the program having some effect on the scores. Regardless of the scores that slightly increased from the initial one, it was not sufficient to say there was a significant impact.

Limitations

The project had some limitations. The absence of a control group was the initial drawback. A control group would have provided a benchmark to compare the results of the program. Without it, it was difficult to identify with confidence the changes and outcomes that the program was truly responsible for. The second limitation is response bias. Since the student who developed the program was present, participants may have responded or provided false information during the assessments. In future implementations, assessments like the PQOL should be given to the participants to complete alone. The last limitation is time constraints. Most participants only received one to one and a half weeks of the exercise program due to the length of stay at the hospital or other therapy sessions they were required to attend. This made it challenging to determine if the program made an impact in a short amount of time.

Conclusion

Given the findings, LIAE has been shown to benefit an individual's life. In this case, individuals who deal with diabetes or are at-risk for the condition demonstrated increases in OP and PQOL rating scores. Participants in this program identified their meaningful occupations through the COPM as functional mobility, IADLs, and active recreation. Participants believed that there were noticeable changes in the way they performed functional mobility and active recreation as a result of the program, although they were minor. All domains in the PQOL displayed a slight increase in scores, suggesting that participants had a slightly higher satisfaction rating in their physical, cognitive, social, and diet areas in life.

Recommendations

When treating individuals with DM, therapists should provide an exercise regimen. These exercise regimens can be used to refer back to once they are discharged home. Once comfortable and plateaued, exercise regimens can be modified and graded to a higher level. It is also recommended that individuals remain consistent with their exercise regimen to experience positive changes.

Implications for Research

Exercise, a form of physical activity, seems to be a beneficial occupation that anyone can practice. Since research is limited, additional research is essential to gain a deeper understanding and awareness of the impact of LIAE on OP and QOL in individuals with diabetes or at-risk. Future studies should expand this program to younger populations who deal with this condition, in addition to exploring other similar conditions. Some similar conditions include thyroid disease, polycystic ovary syndrome, carpal tunnel syndrome, cardiac conditions, and many more.

The focus of future studies should also take the duration into account to see the prolonged effects of LIAE.

Implications for Practice

There are a range of LIAE programs. When developing a program, it should be client-centered and creative in order to benefit the patient. This ensures that the program intrigues the patient enough to follow through. Other occupations such as cooking, cleaning, and gardening can also be a form of exercise. Virtual reality is another way LIAE can be practiced. Individuals may exercise in realistic simulation and the setting can be adjusted to their preference, which can make it more exciting and entertaining.

Future Implications for OT

LIAE programs can be an option for OTs to complete their continuing education units. In-services may also be provided to work facilities to increase awareness. OTs can now able to support their patients in managing DM with a different approach. It is an opportunity for OTs to feel more confident when utilizing exercise as part of an intervention plan. Therapists can provide a home exercise plan that is specific to the patient's requirements and interests, allowing them to maintain consistency at home. Furthermore, OT students can be more acquainted with the notion that physical activity is also considered a type of occupation (American Occupational Therapy Association, 2020).

Appendices

Appendix A

The Canadian Occupational Performance Measure

COPM

Canadian Occupational Performance Measure

PLACE INSTITUTIONAL STAMP HERE

The **Canadian Occupational Performance Measure (COPM)** supports high-quality, client-centred, occupation-based practice. The COPM is an individualized measure designed to detect change in a client's self-perception of occupational performance over time. The COPM is intended for use as an outcome measure. As such, it should be administered at the beginning of service to support the establishment of intervention goals, and again at an appropriate interval thereafter to determine progress and outcome.

The COPM is used to:

- identify problem areas in occupational performance;
- provide a rating of the client's priorities in occupational performance;
- evaluate performance and satisfaction relative to those problem areas;
- provide the basis for goal-setting; and,
- measure changes in a client's perception of their performance and satisfaction over the course of intervention.

The COPM is completed in 5 steps

1. Identify occupational performance problems. The definition of a problem is:
   An occupation that a person WANTS TO DO, NEEDS TO DO or IS EXPECTED TO DO, but CAN'T DO, DOESN'T DO or ISN'T SATISFIED WITH THE WAY they DO IT.
2. Once specific occupational performance problems have been identified, ask the client to rate each one in terms of its IMPORTANCE in their life. Importance is rated on a ten-point scale, where:
   1 = not important at all, 10 = extremely important
3. Ask the client to choose up to five problems that seem most pressing or important, using the ratings just done.
4. Rate: PERFORMANCE (How would you rate the way you do this activity now?) and SATISFACTION (How satisfied are you with the way you do this activity now?)
5. Establish date for re-assessment.

Client Information

Client name: _____

Therapist name: _____

Client date of birth: ___/___/_____

Initial Assessment: ___/___/_____

Re-assessment: ___/___/_____

Scoring

PERFORMANCE (How would you rate the way you do this activity now?)

1 = not able to do it at all ⟷ 10 = able to do it extremely well

SATISFACTION (How satisfied are you with the way you do this activity now?)

1 = not satisfied at all ⟷ 10 = extremely satisfied

TIME 1: _____/_____/_____ TIME 2: _____/_____/_____

Occupational Performance Problem (OPP)	Imp.	Performance T_1	Satisfaction T_1	Performance T_2	Satisfaction T_2	Change in Performance (T_2-T_1)	Change in Satisfaction (T_2-T_1)
1.							
2.							
3.							
4.							
5.							
Total Score (Σ=1+2+3+4+5)							
Average Score (Σ/number of OPPs)							

Occupational Performance Areas

SELF-CARE

Self-care includes occupations aimed at getting ready for the day and getting around. In the COPM, we measure three aspects of self-care: personal care, functional mobility, and community management.

	IMPORTANCE
Personal care:	
Functional mobility:	
Community management:	

PRODUCTIVITY

Productivity includes occupations aimed at earning a living, maintaining home and family, providing service to others and/or developing one's capabilities. The COPM measures three types of productive activity: paid or unpaid work, household management, and school/play.

Paid or unpaid work:	
Household management:	
School and/or play:	

LEISURE

Leisure includes the occupations performed by an individual when freed from the obligation to be productive. The COPM includes quiet recreation, active recreation, and socialization.

Quiet recreation:	
Active recreation:	
Socialization:	

Notes and Observations

Initial assessment: _____

_____

_____

Re-assessment: _____

_____

_____

ISBN: 978-1-9995053-3-2

IMPORTANCE

1	2	3	4	5	6	7	8	9	10
This is not important to me									This is very important to me

PERFORMANCE

1	2	3	4	5	6	7	8	9	10
I do not do this well.									I do this very well.

SATISFACTION

1	2	3	4	5	6	7	8	9	10
I am not satisfied with how I do this									I am satisfied with how I do this

Appendix B

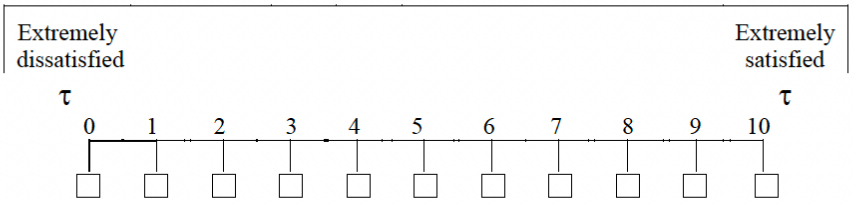
Perceived Quality of Life

Satisfaction with Health and Life

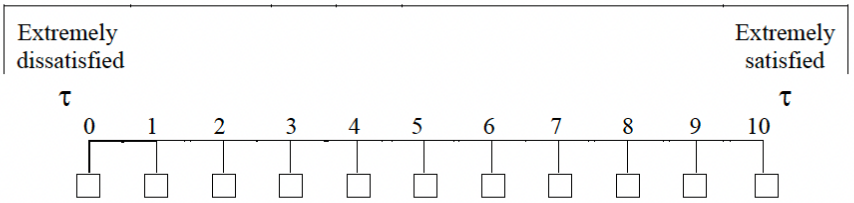
We would like to know how satisfied you are with different aspects of your life. Each item below has a scale where "0" is Extremely Dissatisfied and "10" is Extremely Satisfied. [For each item, mark an ☒ in the box of the number that shows your own level of satisfaction.]

How dissatisfied or satisfied are you with:

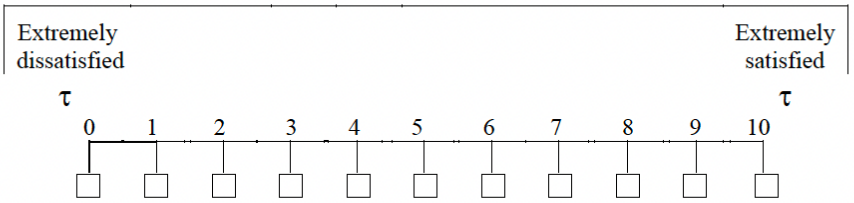
1. Your physical health (the health of your body)?



2. How well you care for yourself, for example, preparing meals, bathing, or shopping?



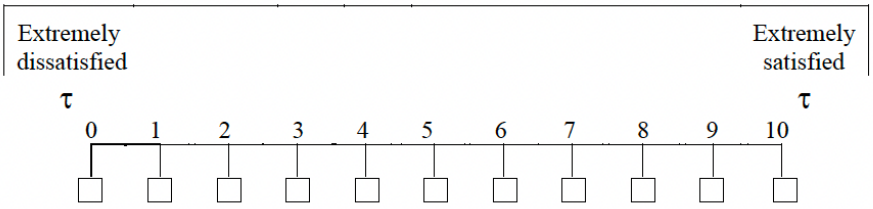
3. How well you think and remember?



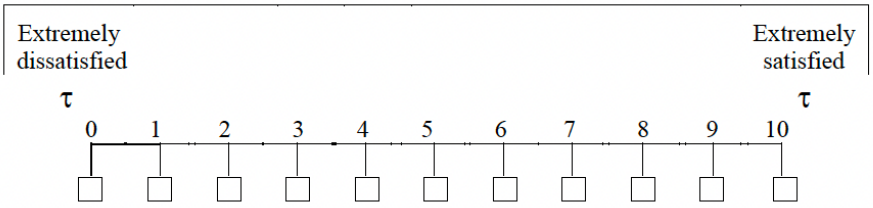
(Please turn the page)

How dissatisfied or satisfied are you with:

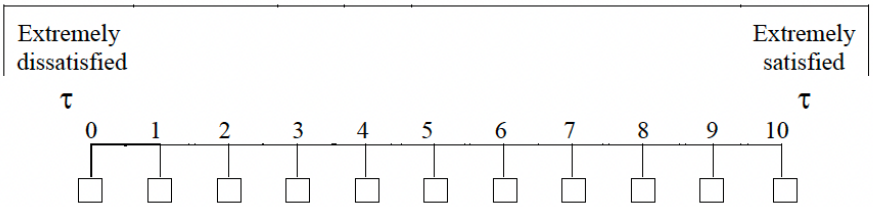
4. The amount of walking you do?



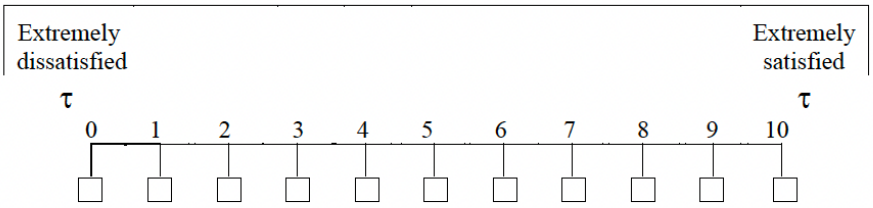
5. How often you get outside the house, for example, going into town, using public transportation or driving?



6. How well you carry on a conversation, for example, speaking clearly, hearing others, or being understood?



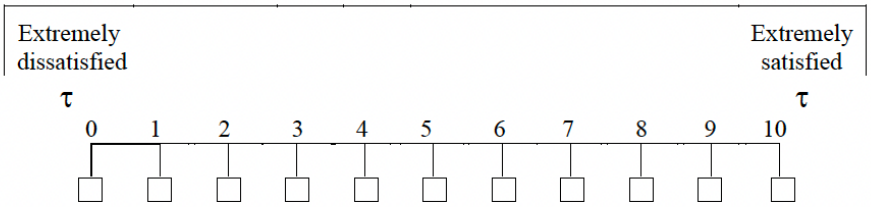
7. The kind and amount of food you eat?



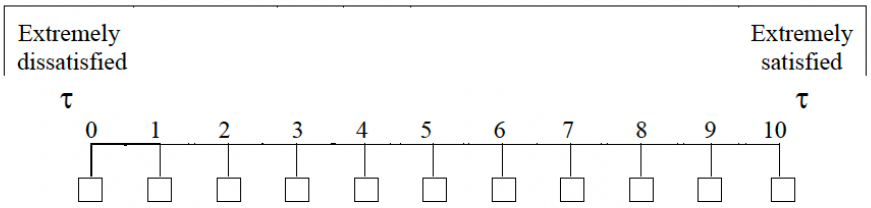
(Please turn the page)

How dissatisfied or satisfied are you with:

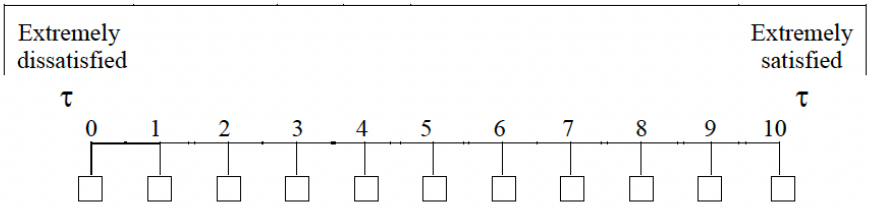
8. How often you see or talk to your family and friends?



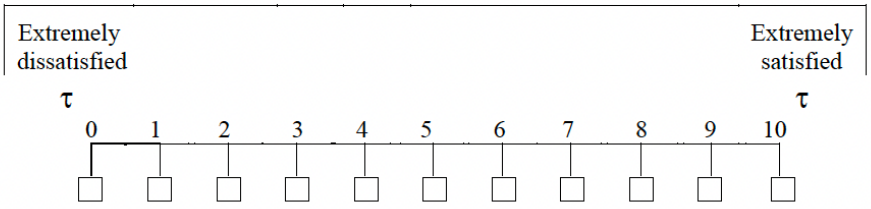
9. The help you get from your family and friends, for example, helping in an emergency, fixing your house, or doing errands?



10 . The help you give to your family and friends?



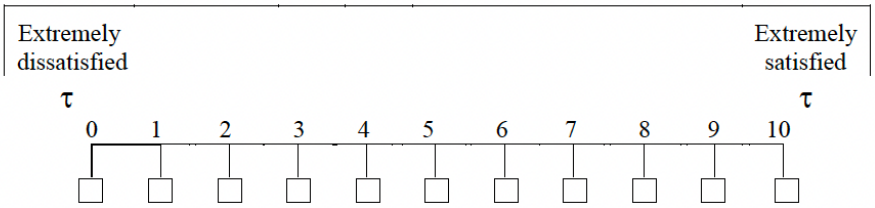
11 . Your contribution to your community, for example, a neighborhood, religious, political or other group?



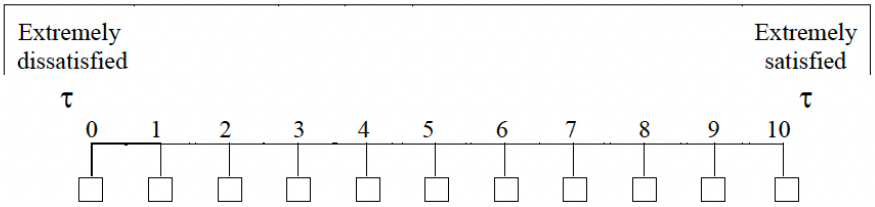
(Please turn the page)

How dissatisfied or satisfied are you with:

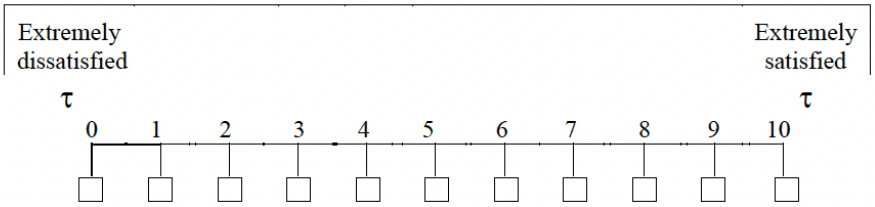
12 . Your retirement or current job?



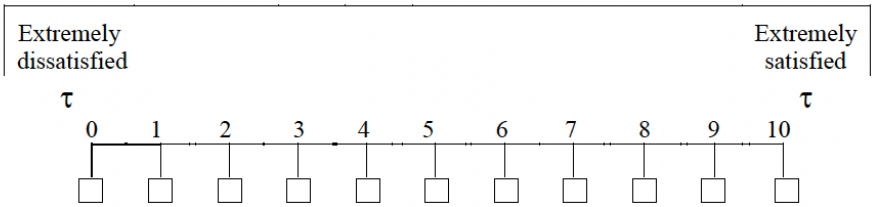
13. The kind and amount of recreation or leisure you have?



14. Your level of sexual activity or lack of sexual activity?



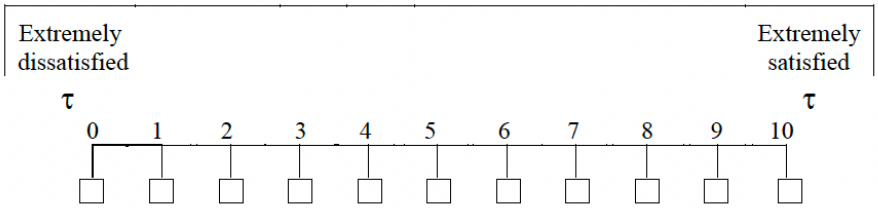
15. The way your income meets your needs?



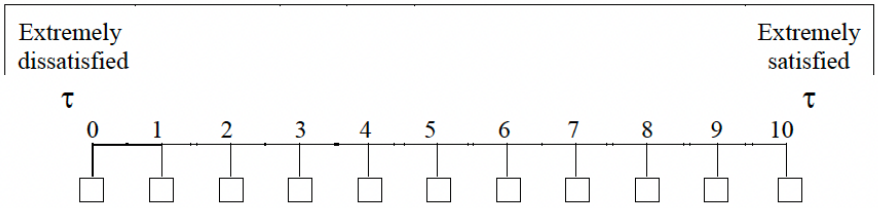
(Please turn the page)

How dissatisfied or satisfied are you with:

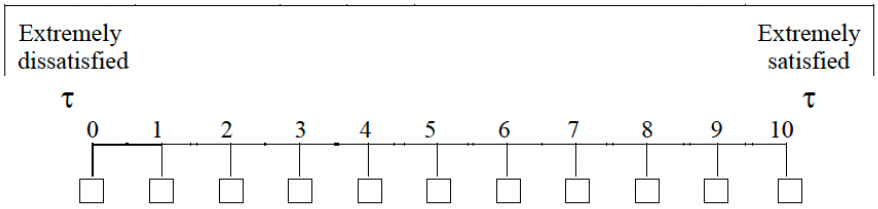
16 . How respected you are by others?



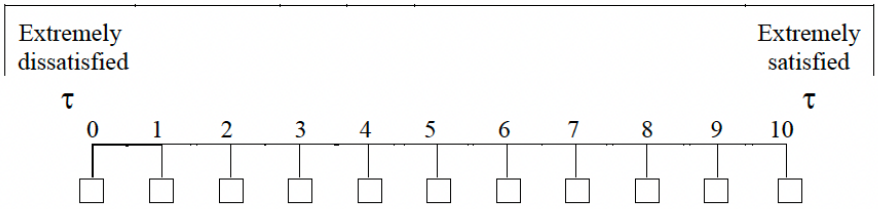
17. The meaning and purpose of your life?



18 . The amount of variety in your life?

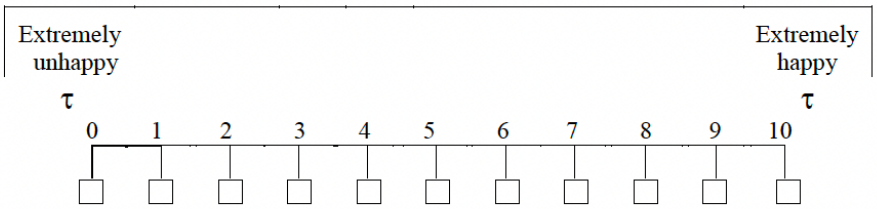


19 . The amount and kind of sleep you get?



(Please turn the page)

20. How happy are you?



Appendix C

DM Brochure

What is Diabetes Mellitus?

Diabetes is a chronic condition that can occur when the pancreas cannot produce enough hormone known as insulin. Sometimes, it does not produce any at all. There can be instances where the body rejects the hormone.

When this happens, a person will experience high blood sugar (glucose) levels.

- More than 37 million people are diagnosed & 1 in 5 don't know they have it.
- 8th leading cause of death.
- #1 cause of kidney failure, lower-limb amputations, & blindness.

Additional Resources

Centers for Disease Control and Prevention (CDC):

https://www.cdc.gov/diabetes/index.html

American Diabetes Association:

https://diabetes.org

Find a Diabetes Doctor Near You:

https://doctor.webmd.com/providers/specialty/endocrinology-diabetes-metabolism

DIABETES MELLITUS

Constructed by:
Asia Suriyachottakul OTD/S

Who is at Risk?

- Middle-aged adults (40+)
- Family history
- History of gestational diabetes.
- Overweight/Obese
- Physically inactive
- Untreated hypertension
- High cholesterol

Signs and Symptoms

- High blood sugar (glucose) levels (fasting: 126+ mg/dL)
  - A1C of 6.5%+
- Frequent urination
- Increased thirst
- Unexplained weight loss
- Feeling very hungry
- Blurry vision
- Numbness/Tingling in hands or feet.
- Feeling tired easily
- Dry skin
- Sores/cuts that heal slowly

Types

- **Prediabetes:** when blood sugar levels are higher than normal but not enough to be diagnosed.
- **Type I:** when the body attacks itself (autoimmune reaction) by preventing insulin production. Seen mainly in children, teens, & young adults.
- **Type 2:** most common; the body doesn't utilize insulin efficiently making it difficult to maintain blood sugar levels. Develops over the years and depends on daily lifestyle. Seen mainly in adults but is becoming more common in children and teens.
- **Gestational Diabetes:** commonly seen in pregnant women. May go away, but will be at higher risk for type II later.

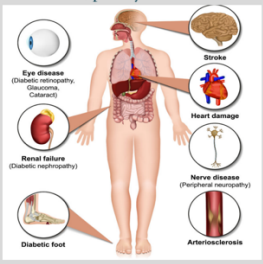
Prevention

- Get active/exercise
- Manage weight
- Skip sugary drinks
- Don't smoke
- Eat more fruits and vegetables

Management

- Develop a diabetic-friendly diet.
- Regularly monitor blood glucose levels.
- Take medication as prescribed.
- Physical activity as a daily routine.
- Maintain regular checkups with primary doctor (PCP).

If untreated/poorly maintained :



Appendix D

Exercise Program

Exercise 1:
Chair Yoga

Equipment:

- Chair
- Speaker for mindfulness music (optional)

Breathing Mountains (x5)

1. Sit upright in your chair while rolling the shoulders down and behind the ears. The head must be aligned with the spine.
2. Feet flat on the floor.
3. Place hands down and to the side with the palms facing forward.
4. Eyes may be closed (optional).
5. Inhale for 4 seconds and then exhale until all air is expelled.

The Cat and Cow (x5)

1. Sit upright in the chair and place both hands on the thighs.
2. While inhaling, lift the chest up and arch the back. Shoulders should be rolled back.
3. Then exhale and pull the belly button inward while rounding the upper back and shoulders. The chin should be tucked inward toward the chest.

Knee Hugs (x5)

1. Sit upright in the chair and slowly bring the right knee toward the chest.
2. Place the hand below the knee. (May also use hands to assist with bringing the knee towards the chest.)
3. Hold position and take 3 breaths.
4. Repeat for the left knee.

Side Bends (x5)

1. Sit upright in the chair and while inhaling, raise the right arm over the head with palms facing inward and fingers straight.
2. The left hand should be placed on the chair for stability.
3. Slowly exhale and lean towards the left. Both elbows should be slightly bended.
4. Slowly inhale and return to the center.
5. Slowly exhale and lower the right arm.
6. Repeat for the left arm.

Helicopter (x5)

1. Sit upright in the chair, while inhaling, raise both arms parallel to the floor with palms facing down.
2. Slowly exhale and gently twist at the waist to one side.
3. Slowly inhale and return to the center.
4. Slowly exhale and gently twist at the waist to the other side.
5. Slowly inhale and return to the center again.

Chopper (x5)

1. Sit upright in the chair. While slowly inhaling, raise both arms over the head with palms facing inward and fingers straight.
2. Slowly exhale and lean forward at the hips to form a 45-degree angle. The back should be straight, and the head should be aligned with the spine.
3. Hold the position for 3 seconds.
4. Slowly inhale and return to an upright position.
5. Slowly exhale and lower the arms.

Gluteal Stretch (x5)

1. Sit upright in the chair and place the right ankle on top of the left thigh.
2. Place the right hand on the right knee and the left hand on the right ankle.
3. Hold the position while slowly inhaling and exhaling 3 times.
4. Repeat for the other side.
5. Alternative: keep both feet on the floor with ankles crossed and slightly lean forward. Hands may be placed on the chair for stability. The back should be straight.

Hamstrings Stretch (x5)

1. Sit upright towards the front edge of the chair.
2. Keep the left knee bent and the foot flat on the floor.
3. Extend the right leg with only the heel touching the floor & the foot flexed.
4. Place both hands with a slight bending of the elbow on the left knee.
5. Slowly & gently lean forward at the hips. Look straight ahead.
6. Hold and slowly inhale and exhale 3x.
7. Repeat for the other side.

Bonus: <u>Eagle Pose</u> (x5)

1. Sit upright on the chair with both feet flat on the floor.
2. Position the right arm diagonally at chest level with palms facing to the right.
3. Then position the left arm on top of the right arm diagonally at chest level with palms facing the left.
4. Intertwine fingers and roll wrist inward.
5. Hold the position and inhale/exhale 3x.

Exercise 2:
Tai Chi

Equipment:
Speaker (YouTube: tai chi music)

Commencing Form (10x):

1. Stand/sit with feet shoulder-width apart. Both hands are relaxed to the side or on the knees.
2. Breath in
3. Slowly raise both arms straight ahead to the shoulder level (keep elbow and wrists relaxed.
4. Breath out
5. Lower your arms and wrists in a relaxed manner.

Broadening One's Chest (10x):

1. Stand/sit with feet shoulder-width apart. Arms should remain relaxed by your side.
2. Breathe in
3. Raise arms to shoulder level and keep elbows and wrists relaxed.
4. Breathe out
5. With hands facing each other, open the arms and chest out.
6. Breathe in
7. With hands facing each other again, bring the arms back to the middle.
8. Breathe out
9. Lower arms back to the starting position.

Dancing with Rainbows (10x):

1. Breathe in
2. Lift the right arm overhead with elbows bent and shift weight on the right side. At the same time, extend the left arm out straight (looks like an archer or teapot).
3. In a continuous movement, raise both hands overhead and shift your weight to the center.
4. Repeat steps for the left side.

Circling Arms (10x):

1. Stand/sit with feet shoulder-width apart. Arms remain loose and relaxed. Hands are crossed with palms facing the body.
2. Breathe in
3. Raise arms up the body until your head or as high as you feel is comfortable.
4. Breathe out
5. Lower arms in a circular motion to the outside of the body and return to the starting position.

Carrying the Moon (10x):

1. Breathe in
2. Turn the body towards the left from the waist. Shoulders should be relaxed and elbows slightly bent.
3. Now reach both arms towards the left with the head focusing on the hands.
4. Breathe out
5. Bring the hands down. Turn to the R and repeat.

Scooping from the Sea (10x):

1. Stand/sit with the left foot forward, knees bent, and weight shifted slightly toward the left side.
2. Breathing in
3. Bend down forward over the head (or as far as is comfortable), slowly separate the arms, and transfer weight onto the right foot.
4. Breathe out
5. Separate arms and bend forward again to scoop from the sea.

Punching (10x):

1. Stand/sit with feet shoulder-width apart and weight spread evenly across both legs. Arms remain relaxed by the side with soft fists.
2. Breathe out
3. Punch with the right arm forward at chest level if possible
4. Breathe in
5. Turn the wrist over so that the fists face upward and draw the arm back to rest by the sides.
6. Repeat with the left arm.

Pressing the Palms (10x):

1. Stand/sit with feet shoulder-width apart and weight spread evenly across both legs. Rest hands on top of each other palms facing up.
2. Breathe in
3. Raise hands to chest height with palms facing up.
4. Breathe out
5. Turn hands over to face down and slowly lower arms.

Twisting Waist and Swing Arms (10x):

1. Turn the body at the waist toward the right side and keep the knees slightly bent.
2. Breathe in
3. With the right arm down at the side of the body, palm facing up, draw your arm back in an arc, lifting the elbows towards shoulder height (or as far as comfortable).
4. Breathe out
5. Begin to rotate the wrist so that the palms are facing forward. At the same time, bring the right arm and body weight forward until the right arm is extended in front. (like front crawl swim)
6. Repeat with the left side.

Exercise 3:
Seated Boxing Cardio

Equipment:

- Speakers for music (optional).

Keycodes:

R - right side

L - left side

1. **Diagonal punches**

- Take one hand and punch to the opposite side.

2. **Slap**

- Keep one arm at 120 degrees and pretend to slap.

3. **Straight punch**

- Take one hand and punch straight forward.

4. **Uppercut**

- Take one hand and punch upwards towards the head.

5. **Headlock**

- Take one arm and punch towards the opposite ear.

6. **Hug**

- Take both arms and pretend to hug someone.

7. **Dodge**

- Slowly lean forward.
- Then, lean to the side.

8. **Kick**

Sitting:

- Start with knees flexed at 90 degrees.
- Then, extend the leg forward.

Patterns:

Grade patterns as needed.

- 1R, 1L, 2R, 2L (x5)
- 3R, 3R, 3L, 3L, 6 (x5)
- 5L, 5R, 7L, 7R (x5)
- 4R, 4L, 8R, 8L (x5)
- 1R, 1R, 8L, 8R (x5)
- 6, 7R, 6, 7L (x5)
- 8L, 8R, 7L, 7R (x5)
- 2L, 2L, 2R, 2R, 4L, 4R (x5)
- 7R, 7L, 1R, 1R, 1L, 1L (x5)
- 4R, 4R, 4L, 4L, 3R, 3L, 2R, 2L (x5)

Exercise 4:
UE Strengthening

Equipment:

- Dumbbells or weighted cuffs (2-5lbs).
- TheraBand (Yellow-blue)
- Speakers for music (optional).

Steps:

1. Can be done sitting or standing.

Exercises:

Dumbbells

1. Bicep curls (x25)

2. Lateral raises (x25)

3. Triceps extensions (x25)


4. Overhead press (x25)


5. Up rows (x25)


TheraBand

1. Chest pulls (x25)


- Feet shoulder width apart
- Loop band around each palm.
- Elbows should be slightly bent.
- Pull the band out for 3 seconds then slowly return.

2. Shoulder flexion (x25)


- Loop the band around both hands.
- Place both hands on the middle of your thigh.
- Then take one hand and slowly raise it up to the ceiling.
- Hold for 3 seconds then slowly bring it down.
- Repeat with the other shoulder.

3. Shoulder diagonals (x25)


- Start the band with one of the R hip.
- Pull the band from R hip up toward the ceiling on a diagonal.
- Hold for 3 sec then return to the starting position.
- Repeat with the other shoulder.

4. Elbow flexion (x25)


- Securely step on one end of the band.
- Bend your elbow toward your shoulder against the body.
- Hold for 3 seconds.
- Repeat with the other side.

5. Elbow extension (x25)

- Hold the band with both hands by the belly button. Elbows should be bent.
- Take one arm and straighten the elbow pulling the band back towards the waist.
- Hold for 3 seconds then return to the starting position.
- Repeat for the other arm.

Appendix E

Informed Consent

UNLV

INFORMED CONSENT

Department of Brain Health

TITLE OF PROJECT: THE EFFECTIVENESS OF A LOW-INTENSITY AEROBIC EXERCISE PROGRAM TO ENHANCE OCCUPATIONAL PERFORMANCE AND QUALITY OF LIFE IN DIABETIC PATIENTS

EXAMINER (S): ASIA SURIYACHOTTAKUL

For questions or concerns about this project, you may contact Asia Suriyachottakul at **suriyach@unlv.nevada.edu.**

For questions regarding the rights, complaints, or comments regarding the manner in which this project is being performed, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-0020 or via email at IRB@unlv.edu.**

It is unknown as to the level of risk of transmission of COVID-19 if you decide to participate in this project. The project activities will utilize accepted guidance standards for mitigating the risks of COVID-19 transmission: however, the chance of transmission cannot be eliminated.

PURPOSE OF THIS PROJECT

The purpose of this project is to enhance occupational performance and quality of life, in addition to improving physical health outcomes of individuals who are diagnosed with diabetes mellitus or at risk.

PARTICIPANTS

You are being asked to participate in this project because you fit the criteria of having diabetes or may be at risk.

PROCEDURES

If you volunteer to participate in this project, you will be asked to do the following: participate in a low-intensity exercise program and complete assessments regarding satisfaction with your quality of life and occupational performance.

BENEFITS OF PARTICIPATION

There may not be direct benefits to you as a participant. However, we hope to learn about proper treatment plans occupational therapists can utilize when treating patients with diabetes in order to improve assistance with managing diabetes or preventing it, in addition to providing good quality care.

RISKS OF PARTICIPATION

There are risks involved in all projects. However, this project may include only minimal risks. The exercise program in this project will have you moving at a slow, repetitive, and steady pace. You may also feel uncomfortable with answering some questions during the assessment portion.

COST /COMPENSATION

There is no financial cost for you to participate. This project will take approximately 1-1.5 hours of your time. There is also no compensation.

CONFIDENTIALITY

All information gathered in this project will be kept as confidential as possible. To ensure anonymity, any information collected from the participants will be referenced utilizing pseudonyms. No reference will be made in written or oral materials that could link you to this project. All records will be stored in a locked facility at UNLV for 1 year after completion of the project. After the storage time expires, the information gathered will be shredded.

VOLUNTARY PARTICIPATION

Your participation in this project is voluntary. You may refuse to participate in this project or withdraw at any time without prejudice to your relations with UNLV. You are encouraged to ask questions at any time during the duration of the project.

PARTICIPANT CONSENT:

I have read the above information and agree to participate in this project. I have been able to ask questions about the project. I am also at least 18 years of age or older. A copy of this form has been given to me.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

References

Ahmed, S., Faruque, M., Moniruzzaman, M., Roby, N. U., Ashraf, F., Yano, Y., Miura, K., & Ahmed, M. S. A. M. (2022). The pattern of physical disability and determinants of activities of daily living among people with diabetes in Bangladesh. *Endocrinology, Diabetes & Metabolism*, *5*(5), e365–n/a. https://doi.org/10.1002/edm2.365

American Diabetes Association. (n.d.). *Diabetes complications*. https://diabetes.org/about-diabetes/complications

American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process-fourth edition. *The American Journal of Occupational Therapy, 74*(Supplement_2), 7412410010p1–7412410010p87. https://doi.org/10.5014/ajot.2020.74S2001

American Occupational Therapy Association. (2021). Occupational therapy curriculum design framework. American Journal of Occupational Therapy, 75(Suppl. 3), 7513430010. https://doi.org/10.5014/ajot.2021.75S3008

Bahadır Ağce, Z., & Ekici, G. (2020). Person-centred, occupation-based intervention program supported with problem-solving therapy for type 2 diabetes: a randomized controlled trial. *Health and Quality of Life Outcomes*, *18*(1), 1–265. https://doi.org/10.1186/s12955-020-01521-x

Belsi, E., Tsironi, M., & Theofilou, P. (2022). The effect of quality of life and depression on the compliance of patients with type 2 diabetes. J Clin Images Med Case Rep. 3(7). https://jcimcr.org/pdfs/JCIMCR-v3-1962.pdf

Center for Disease Control and Prevention (2023). *National diabetes statistics report*. CDC. https://www.cdc.gov/diabetes/data/statistics-

report/index.html#:~:text=Among%20the%20US%20population%20overall,Table%201a%3B%20Table%201b

Chapparo, C., & Ranka, J. (1997). Occupational performance model (Australia): Monograph 1. OP Network: The University of Sydney. http://www.occupationalperformance.com/wp-content/uploads/2014/01/definitions.pdf

Chobot, A., Górowska-Kowolik, K., Sokołowska, M., & Jarosz-Chobot, P. (2018). Obesity and diabetes-not only a simple link between two epidemics. *Diabetes/metabolism research and reviews*, *34*(7), e3042. https://doi.org/10.1002/dmrr.3042

Fearing, V. G., Law, M., & Clark, J. (1997). An occupational performance process model: Fostering client and therapist alliances. *Canadian Journal of Occupational Therapy (1939)*, *64*(1), 7–15. https://doi.org/10.1177/000841749706400103

Gopalan, A., Kellom, K., McDonough, K., & Schapira, M. M. (2018). Exploring how patients understand and assess their diabetes control. *BMC Endocrine Disorders*, *18*(1). https://link-gale-com.ezproxy.library.unlv.edu/apps/doc/A567964234/AONE?u=unlv_main&sid=bookmark-AONE&xid=92717e54

Law, M., Baptiste, S., Carswell, A., McColl, M. A., Polatajko, H. J., & Pollock, N. (n.d.). *About copm*. COPM. https://www.thecopm.ca/about/

Lee, J., Kim, K. H., Ahn, J. C., Kim, J. A., Lee, G., Son, J. S., Choi, S. J., Oh, Y. H., & Park, S. M. (2021, June 1). *Prevalence, awareness, treatment, and control of diabetes mellitus by depressive symptom severity: A cross-sectional analysis of NHANES 2011–2016*. BMJ Open Diabetes Research & Care. Retrieved from https://drc.bmj.com/content/9/1/e002268

Li, D.-dan, Yang, Y., Gao, Z.-yi, Zhao, L.-hua, Yang, X., Xu, F., Yu, C., Zhang, X.-lin, Wang, X.-qin, Wang, L.-hua, & Su, J.-bin. (2022). Sedentary lifestyle and body composition in type 2 diabetes. *Diabetology & Metabolic Syndrome*, *14*(1). https://doi.org/10.1186/s13098-021-00778-6

Lin, J., Thompson, T. J., Cheng, Y. J., Zhuo, X., Zhang, P., Gregg, E., & Rolka, D. B. (2018). Projection of the future diabetes burden in the United States through 2060. *Population Health Metrics*, *16*(1), 9–9. https://doi.org/10.1186/s12963-018-0166-4

Mishra, S. R., Sharma, A., Bhandari, P. M., Bhochhibhoya, S., & Thapa, K. (2015). Depression and health-related quality of life among patients with type 2 diabetes mellitus: A cross-sectional study in Nepal. *PLOS ONE*, *10*(11). https://doi.org/10.1371/journal.pone.0141385

Mogessie, H. M., Gebeyehu, M. A., Kenbaw, M. G., & Tadesse, T. A. (2022). Diabetic health literacy and associated factors among diabetes mellitus patients on follow up at public hospitals, Bale Zone, South East Ethiopia, 2021. *PloS One*, *17*(7), e0270161–e0270161. https://doi.org/10.1371/journal.pone.0270161

Myers, V. H., McVay, M. A., Brashear, M. M., Johannsen, N. M., Swift, D. L., Kramer, K., Harris, M. N., Johnson, W. D., Earnest, C. P., & Church, T. S. (2013). Exercise training and quality of life in individuals with type 2 diabetes: a randomized controlled trial. *Diabetes care*, *36*(7), 1884–1890. https://doi.org/10.2337/dc12-1153

Nojima, H., Yoneda, M., Watanabe, H., Yamane, K., Kitahara, Y., Sekikawa, K., Yamamoto, H., Yokoyama, A., Hattori, N., & Kohno, N. (2017). Association between aerobic capacity and the improvement in glycemic control after the exercise training in type 2 diabetes. *Diabetology & Metabolic Syndrome*, *9*(1).https://doi.org/10.1186/s13098-017-

0262-9

Okafor, C. N., Akosile, C. O., Nkechi, C. E., Okonkwo, U. P., Nwankwo, C. M., Okoronkwo, I. L., Okpala, P. U., & Afonne, A. J. (2023). Effect of educational intervention programme on the health-related quality of life (HRQOL) of individuals with type 2 diabetes mellitus in South-East, Nigeria. *BMC Endocrine Disorders*, *23*(1), 75–75. https://doi.org/10.1186/s12902-023-01329-y

Pan American Health Organization (n.d.). *Diabetes*. PAHO. https://www.paho.org/en/topics/diabetes#:~:text=About%2062%20million%20people%20in,attributed%20to%20diabetes%20each%20year.

Patrick, D. L., Danis, M., Southerland, L. I., & Hong, G. (1988). Quality of life following intensive care. *Journal of general internal medicine*, *3*(3), 218–223. https://doi.org/10.1007/BF02596335

Patrick, D. L., Kinne, S., Engelberg, R. A., & Pearlman, R. A. (2000). Functional status and perceived quality of life in adults with and without chronic conditions. *Journal of Clinical Epidemiology, 53*(8), 779-785.

Preechasuk, L., Sriussadaporn, P., & Likitmaskul, S. (2019). The obstacles to diabetes self-management education and support from healthcare professionals' perspectives: a nationwide survey. *Diabetes, Metabolic Syndrome and Obesity*, *12*, 717–727. https://doi.org/10.2147/DMSO.S195916

Shen, X., & Shen, X. (2019). The role of occupational therapy in secondary prevention of diabetes. *International journal of endocrinology*, *2019*, 3424727. https://doi.org/10.1155/2019/3424727

Silva, D. A. S., Naghavi, M., Duncan, B. B., Schmidt, M. I., de Souza, M. de F. M., & Malta, D.

C. (2019). Physical inactivity as risk factor for mortality by diabetes mellitus in Brazil in 1990, 2006, and 2016. *Diabetology and Metabolic Syndrome*, *11*(1), 23–23. https://doi.org/10.1186/s13098-019-0419-9

Teoli, D., & Bhardwaj, A. (2023). *Quality of life*. In: StatPearls. https://www.ncbi.nlm.nih.gov/books/NBK536962/

World Health Organization. (2022). *Diabetes*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/diabetes

Wu, Y., Ding, Y., Tanaka, Y., & Zhang, W. (2014). Risk factors contributing to type 2 diabetes and recent advances in the treatment and prevention. *International journal of medical sciences*, *11*(11), 1185–1200. https://doi.org/10.7150/ijms.10001

Zakaria, M. I., Maat, S. M., & Khalid, F. (2019). A systematic review of problem based learning in education*. *Creative Education*, *10*(12), 2671–2688. https://doi.org/10.4236/ce.2019.1012194

Curriculum Vitae

Asia Suriyachottakul
University of Nevada, Las Vegas
Suriyachasia@gmail.com

Education

Doctorate in Occupational Therapy **May 2024**
University of Nevada Las Vegas
Capstone Title: The Effects of a Low-Intensity Aerobic Exercise Program to Enhance Occupational Performance and Quality of Life in Diabetic Patients.
Advisor: Dr. Jonathan Legarte, OTD, OTR/L, CSRS

Bachelor of Science in Kinesiology **December 2019**
University of Nevada Las Vegas

Clinical Experience

Level I Experiences

- **The Garden Foundation (Community-based)** **September 2023**
  Las Vegas, NV
- **Cornerstone Christian Academy & Tykes Preschool (School-based)** **March 2023**
  Las Vegas, NV
- **Thrive Therapies (Outpatient Pediatrics)** **February 2023**
  Las Vegas, NV
- **Spring Valley Hospital (Acute Care)** **March 2022**
  Las Vegas, NV
- **Nevada Senior Services (Adult Daycare)** **October 2021**
  Las Vegas, NV

Level II Experiences

- **Spring Valley Hospital (Acute Care)** **May 2023 – August 2023**
  Las Vegas, NV
- **Spooner Ahwatukee (Outpatient Hands)** **May 2022 – August 2022**
  Phoenix, AZ

Professional Associations

- **American Occupational Therapy Association (Student)** **May 2021 – Present**
- **UNLV Student Occupational Therapy Association** **February 2022 – Present**

Certifications

- CarFit
- Koru Mindfulness
- MoCA