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EXAMINING SEDENTARY BEHAVIOURS OF ADULTS WITH INTELLECTUAL DISABILITIES

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SANA SAFI

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EXAMINING SEDENTARY BEHAVIOURS OF ADULTS WITH INTELLECTUAL DISABILITIES

Submitted by

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In partial fulfillment of the requirements for the degree of

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Dedication

I dedicate my thesis to my younger son, Ibrahim, who was the main inspiration for the idea of this research. Ibrahim, your siblings and I are truly thankful for having you in our lives. You taught us and will continue to teach us many meaningful life lessons. Your mom and siblings are very proud of you and love you unconditionally.

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Abstract

Sedentary behaviours among adults with intellectual disabilities have not been well studied in nursing and other disciplines. A sedentary lifestyle puts adults with and without disabilities at high risk of developing health conditions and diseases. Current literature revealed few empirical studies on the benefits of reducing sedentary behaviours with respect to the health of adults with intellectual disabilities. This study explored the factors that helped or hindered sedentary behaviours of adults with intellectual disabilities in the Canadian population. Guided by the socio-ecological model, a Critical Incident Technique was conducted and five adults with intellectual disabilities from the Province of Ontario were interviewed. Adults with intellectual disabilities identified personal and environmental related factors that led to increased sedentary behaviours; and revealed helpful factors and wish-lists of actions that decreased sedentary lifestyle. Findings may be useful when developing programs aimed to decrease prolonged periods of sedentary behaviours specific to this vulnerable population.

Keywords: intellectual disabilities, sedentary behaviours, adults, the socio-ecological model, the Critical Incident Technique, qualitative study, in-depth interviews, nursing

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Chapter 1. Introduction

Approximately 6.2 million Canadians who are 15 years of age and older live with a disability (Statistics Canada, 2018). The types of disabilities represented in this population are 15% pain-related disability, 10% flexibility, 10% mobility, 7% mental health-related, 5% seeing, 5% hearing, 5% dexterity, 4% learning, 4% memory, 1% developmental, and 1% intellectual, while the remaining disabilities are unknown (Statistics Canada, 2018). Intellectual disabilities (ID) include Fragile X syndrome, Down syndrome, developmental delay, Prader-Willi Syndrome (PWS), and fetal alcohol spectrum disorder (FASD) (Mefford et al., 2012; Morris et al., 2018; Roll, 2018). Adults with ID face numerous health inequalities and social disadvantages which increase the prevalence of morbidity and mortality in this population (Harvey et al., 2013; Hsieh et al., 2017; Melville et al., 2018). Sedentary behaviours may contribute to an increase in the prevalence of diabetes, obesity, and mental health problems (Melville et al., 2018). Hence, to enhance health equalities for adults with ID, health services should emphasize on creating constructive changes in sedentary behaviours.

The study of sedentary behaviours among adults with ID is unique and new in qualitative research. As adults with disabilities tend to have poorer health behaviours which lead to diseases and health conditions, reducing sedentary behaviours and facilitating physical activity behaviours are considered a priority to improving health among those with ID (Melville et al., 2015; Roll, 2018; Willems et al., 2018). Adults with ID spend an estimated 85% of their waking time in sedentary pursuits (Melville et al., 2015) compared to 65-80% sedentary time reported in adults without ID (Chastin et al., 2015). It was found that adults with ID do not meet physical activity levels

recommended by public health which involve performing at least 150 minutes of moderate to vigorous physical activity per week (Melville et al., 2015; Pitchford et al., 2018). It is important to understand and analyze sedentary behaviours in this population in order to improve their health and enhance their quality of life.

Definitions

Disability

Disability is a condition of impairment, limitation, or restriction that hinders or prevents individuals from participating in various activities (World Health Organization [WHO], 2020). Intellectual disabilities can be defined as significant restrictions in an individual's intellectual function and adaptive behaviours that begin before the age of 18 years (Chow et al., 2018; Ghosh, 2020; Harris et al., 2018; Mefford et al., 2012; Roll, 2018). These restrictions or limitations affect the social and practical skills of individuals with ID on a daily basis and throughout their lifespan. Yet, in early childhood, individuals with ID are presented with developmental delays including cognitive, speech, and motor delays (Mefford et al., 2012). Intellectual disabilities diagnoses are made based on the results of IQ testing where the individual scores less than 70 on the test and can be classified into mild, moderate, severe, and profound grades of intellectual disabilities (Chow et al., 2018; Mefford et al., 2012; Melville et al., 2018). According to Kim and Yi (2018) the characteristics of intellectual disabilities can be described as delay in verbal development, lack of understanding of mathematical concepts, and decreased daily self-care. Individuals with ID typically show emotional instability, abnormal behaviour, and slow movement which may lead them to adopt a sedentary lifestyle (Kim & Yi, 2018). Generally, family members or paid personal support workers provide

assistance to adults with ID with activities of daily living and social interaction (Melville et al., 2017). Individuals with ID commonly rely on others to be active in the community and may need their guidance to break prolonged periods of sedentary behaviours.

Prevalence of Disabilities. It is estimated that the prevalence of intellectual disabilities is 1% of the population around the world (Chow et al., 2018) with a higher prevalence in low-middle income countries (Oppewel et al., 2018). Statistics Canada's report about disabilities for the year of 2017 showed that 24% of women and 20% of men live with at least one type of disability (Morris et al., 2018). Disability can be classified into four types based on the global severity score (Morris et al., 2018). In Canada, there are four severity classes of disabilities: mild, moderate, severe, and very severe (Morris et al., 2018). Of the 22% which counts as 6.2 millions of Canadians who live with disability 37% were classified under mild disability, 20% under moderate disability, 21% under severe disability, and 22% under very severe disability. Men with disability were more likely to have mild or moderate disability whereas women were more likely to have severe or very severe disability (Morris et al., 2018). The total number of Canadians with ID is estimated to be 61,000 (Special Olympics, 2021). Therefore, it is vital to focus on helping this population to make positive changes in their habits and decrease sedentary behaviours.

Sedentary Behaviours

The Sedentary Behaviour Research Network defines sedentary behaviours as any waking behaviour characterized by an energy expenditure of one and a half or less metabolic equivalents while in a sitting or reclining posture (Tremblay et al., 2017). Sedentary behaviour is a cluster of behaviours that appear in different contexts such as at

home, school, or work, during leisure time, and while using transportation (Agiovlasitis et al., 2020; Harvey et al., 2013). For example, the use of electronic devices such as a computer, tablet, or phone, watching television, playing video games, arts and crafts activities, sewing, reading and writing, cooking, or sitting in a vehicle are considered sedentary behaviours (Chastin et al., 2015; Ghosh, 2020; Hsieh et al., 2017; Melville et al., 2017). It is important to consider the daily time spent on these activities in order to understand their effect on increased sedentary behaviours of adults with ID.

It is important to note that sedentary behaviour is different from physical inactivity. The Sedentary Behaviour Research Network defines physical inactivity as performing insufficient amounts of moderate-intensity to vigorous-intensity physical activity (MVPA), such as not meeting specified physical activity guidelines (Tremblay et al., 2017). The recommended daily activity for adults (ages 18 – 65) is 30-60 minutes of moderate activity five days per week, or 20-60 minutes of vigorous activity three days per week (Walsh et al., 2018). These recommendations include all adults with or without ID from the same age group. According to Walsh et al. (2018), if adults with ID cannot meet the daily activity guidelines due to their conditions, they should aim to be active in accordance with their ability to reduce the risk of developing health conditions or diseases.

Rationale and Objectives

Further investigation into the factors that led to increased or decreased sedentary behaviours of adults with ID in the Canadian population is needed to better support and improve their health outcomes. The outcomes of sedentary behaviours in the literature draw attention to the significance of understanding the importance of promoting the

health and well-being of adults with ID. Using exploratory qualitative methods, this study examined and analyzed the views, perceptions and beliefs of adults with ID in the Canadian population with respect to what determines their sedentary behaviours on a daily basis. Therefore, the research question was: what are the factors that contribute to increased or decreased sedentary behaviours of adults with ID? Understanding sedentary behaviours in adults with ID is essential to improve and enhance the quality of life for this population. However, a literature search of online databases found no qualitative studies published on this topic. While there may be information in printed text, the lockdown imposed by COVID-19 restrictions at the time of writing has made such material inaccessible. In Canada, no studies on the experience of sedentary behaviours for adults with ID have been conducted to date. The purpose of this research was to examine and analyze sedentary behaviours of adults with ID in the Canadian Population.

Chapter 2. Literature Review

It is widely established that the majority of adults with ID are physically inactive and sedentary. Some literature reviews showed that 9% of adults with ID meet the physical activity guidelines compared with 77% of the general population (Chow et al., 2018; Westrop et al., 2019). One longitudinal study on the physical fitness of adults with ID that lasted over 13 years showed a greater decline in physical activity compared to adults without ID (Chow et al., 2018). Epidemiological research has demonstrated that adults with ID spend a high percentage of their day engaging in sedentary behaviours (Ghosh, 2020; Harris et al., 2018; Koyanagi et al., 2018). A present study focused on measuring sedentary behaviours among adults with ID in the United Kingdom found that 46.7% of the population spent most of their day sedentary (Tyrer et al., 2019). A systematic review on the prevalence of sedentary behaviours in older adults indicated that about 60% of this population is seated for more than 4 hours per day, where 54% of participants reported watching television for more than 3 hours and 65% spent over 3 hours in front of a screen (Harvey et al., 2013). A comparative study by Dixon-Ibarra et al. (2013) indicated that adults with ID spent 61% of their waking time engaging in sedentary activity compared with 55% for adults without ID. Minimizing prolonged periods of sedentary behaviours in adults with ID may lead to better health conditions and an enhanced quality of life.

Sedentary Time in Adults With ID

To date, several studies have documented the volume and extent of sedentary behaviours of those with ID. According to Ghosh (2020), adults with ID have higher levels of sedentary behaviours than the general population as they spend an average of 8-

10 hours a day in sedentary behaviours. Melville et al. (2018) disclosed that 50% of the 725 adults with ID who participated in their study reported spending at least four hours a day in front of a screen. A systematic review of 19 studies on sedentary behaviours of adults with ID revealed that sedentary time ranged from 522-643 min/day (Melville et al., 2017). Similarly, a recent systematic review of 17 studies that measured sedentary behaviours in individuals with Down syndrome indicated that sedentary time ranged between 392-680 min/day (Agiovlasitis et al., 2020). The results of these studies show that adults with ID spend more than one third of their waking time sedentary, which highlights the importance of minimizing sedentary time in this population.

Many studies used time spent in front of a screen to measure sedentary behaviours of adults with ID. Hsieh et al. (2017) investigated the prevalence of time spent watching television in adults with ID and showed that adults with mild and moderate ID spend significantly more time in front of the television compared to adults with severe ID. In the United States, a study examining adults with ID showed that television watching time was lower in group homes and in those living independently and was higher in those living with family (Hsieh et al., 2017). In said study, about 60% of adults with ID spent 3.4 hours per day watching television and about 40% of participants spent more than 4 hours on average watching television (Hsieh et al., 2017). Furthermore, Chow et al. (2019) illustrated that adults with ID spent 67% of their waking time engaging in sedentary behaviours including sitting during work, leisure time, and at mealtime. The limited data published around the world on the patterns of sedentary behaviours in adults with ID highlights the need for more studies to help this vulnerable population.

Sedentary Behaviours and Health

Independent of physical activity, the negative health outcomes linked to high levels of sedentary behaviours reflect on the health inequality experienced by adults with ID. Lack of exercise, low social interaction, and increased sedentary behaviours are some of the reasons that place individuals with ID at high risk for developing health conditions (Oviedo et al., 2019; Yilmaz et al., 2014). Sedentary behaviours lead to developing primary and secondary health conditions in adults with ID (Koyanagi et al., 2018; Melville et al., 2017). Primary health conditions may include epilepsy, sensory, and mobility problems (Roll, 2018; Westrop et al., 2019). Secondary health conditions may include obesity, poor oral hygiene, increase risk for bone fractures, gastroesophageal reflux, and constipation (Chow et al., 2018; Ghosh, 2020; Hsieh et al., 2017; Melville et al., 2015; Melville et al., 2017; Roll, 2018). Obesity in this population creates a higher risk for other serious health conditions such as diabetes, cardiovascular disease, hypertension, hyperlipidemia, depression, colon cancer, and arteriosclerosis (Agiovlasitis et al., 2020; Dixon-Ibarra et al., 2018; Ghosh, 2020; Kim & Yi, 2018; Melville et al., 2017; Walsh et al., 2018; Yilmaz et al., 2014). Sedentary behaviours cause a reduction in metabolic activity, resulting in increased risk for cardiovascular issues in adults with ID (Harris et al., 2018; Harvey et al., 2013). The above-mentioned health conditions are serious and need to be addressed to help this population be healthy.

Recent studies proposed that sedentary behaviours are linked to mental health comorbidities such as anxiety and depression (Koyanagi et al., 2018; Melville et al., 2018). In addition, a study which measured sedentary behaviours in adults with ID reported that prolonged viewing of television and computers led to psychological issues

due to an increase in isolation and a lack of social interaction with others (Harris et al., 2018). Furthermore, sedentary behaviours increase the likelihood of having multimorbidity conditions in adults with ID regardless of age, gender, walking ability, severity of intellectual disability, ethnicity, and socio-economic status (Tyrer et al., 2019). Sedentary behaviours have negative effects on the mental health and physical well-being of adults with ID, which highlights the need for reducing sedentary behaviours in this population.

Studies suggest that engaging in large amounts of sedentary behaviours increase the risk for morbidity and mortality regardless of the level of moderate-intensity to vigorous-intensity physical activity (Atkin et al., 2012; Ghosh, 2020; Harvey et al., 2013; Tremblay et al., 2017; Westrop et al., 2019). A population-based research study showed that adults who watched television three or more hours per day were at higher risk of mortality compared to those who watched less hours (Hsieh et al., 2017). A meta-analysis found that regardless of the level of physical activity, watching television for three or more hours per day increased mortality rate (Oviedo et al., 2019). Adults with ID when compared to the general population have higher prevalence for non-communicable diseases and premature mortality due to increased sedentary behaviours, decreased cardiovascular fitness, and low nutrition intake (Oviedo et al., 2019). It was found that individuals who engage in sedentary behaviours are twice as likely to develop and die from chronic heart disease compared to active individuals (Walsh et al., 2018). Similar to the general population, adults with ID are at high risk of developing health conditions and diseases due to engaging in prolonged periods of sedentary behaviours. Thus,

intervention programs targeting adults with ID should focus on reducing sedentary behaviours.

Life expectancy of adults with ID is known to be lower than that of the general population. According to Dixon-Ibarra et al. (2013), the early onset of aging in adults with ID could be linked to different biological and social conditions. These conditions could be related to disability or linked to poor health status due to unhealthy lifestyle behaviours and living conditions (Chastin et al., 2015; Dixon-Ibarra et al., 2013). Adults with ID show signs of aging in their 40s and 50s through the development of musculoskeletal disability, hearing and visual problems, and physical health problems that are similar to adults 65 years old and above in the general population (Oviedo et al., 2019). Adults with ID are known to have multiple health conditions such as low cardiovascular fitness that begins at a young age, which leads to shorter life expectancy (Chow et al., 2018). In their comparative study, Dixon-Ibarra et al. (2013) stated that adults with ID may experience age-related changes during their 50s. Hence, reducing sedentary behaviours for adults with ID may result in improvements in longevity, enhanced quality of life, and increased functional ability.

Determinants of Sedentary Behaviours

A review of the literature shows adults with ID experience various personal and environmental barriers that prevent them from reducing sedentary behaviours. According to Melville et al. (2018), adults with ID experience social isolation which leads them to spend extended periods in sedentary behaviours. To explore and understand the determinants and factors that influence adults with ID to assume sedentary behaviours, it is vital to examine sedentary behaviours in different settings such as transport,

occupation, and household (Melville et al., 2018). It was found that changing lifestyle behaviours can decrease sedentary behaviours in adults and improve their health, especially in adults with ID (Martin et al., 2015 as cited in Melville et al., 2018).

A population-based cross-sectional study examining the relationship between the level of intellectual disabilities and sedentary behaviours indicated that there is a negative relationship between the two elements. That is to say, as the level of intellectual disabilities increases, sedentary behaviour decreases (Melville et al., 2018). Moreover, a comparative study by Dixon-Ibarra et al. (2013) on sedentary behaviours in adults with ID indicated that individuals of this population face many challenges that led them to be more sedentary than active. Dependence on family members or personal support workers for help with activities of daily living led to increased sedentary behaviours in this population. Although factors that lead to sedentary behaviours such as age, lack of self-efficacy, and lack of interest are similar to the general population, these factors are elevated for adults with ID due to restrictive environment and reliance on social support (Dixon-Ibarra et al., 2013). It is essential to address these factors and provide adults with ID with tools that aid them in decreasing sedentary behaviours to improve their health and quality of life.

Barriers Leading to Sedentary Behaviours in Adults With ID

Adults with ID may not be able to participate in physical activities due to their cognitive condition; thus, they adopt sedentary behaviours. Quantitative studies from different countries identified many barriers that lead adults with ID to adopt sedentary behaviours and refrain from participating in physical activities. Social isolation, experienced by many adults with ID, is one barrier that results in extended periods of

sedentary behaviours (Melville et al., 2018). Lack of interest, low self-efficacy, availability of resources, restrictive environments, and destructive support from caregivers are some other barriers that lead to increased sedentary behaviours in this population (Dixon-Ibarra et al., 2018). Moreover, stigmatization and discrimination are key obstacles that may lead adults with ID to experience negative thoughts about themselves (Carbó-Carreté et al., 2016; Chastin et al., 2015; Melville et al., 2018; Walsh et al., 2018). When faced with these barriers, the self-esteem of adults with ID may be affected, resulting in increased anxiety levels and a lack of participation in the community.

Economics and transportation further restrain adults with ID from becoming active, making them more likely to adopt sedentary behaviours. Ghosh (2020) identified the lack of money and access to transportation as other barriers that prevent adults with ID from participating in physical activity. Due to their cognitive limitations, adults with ID are not able to access public transportation without help from caregivers (Dixon-Ibarra et al., 2018; Melville et al., 2015; Roll, 2018). The Council of Canadians with Disabilities (n.d.) reported that individuals with disability live in poverty as they receive unequal education and have less opportunities for employment which furthers sedentary behaviours. A comparative study regarding sedentary behaviours between adults with and without ID found that adults with ID spent most of their waking time being sedentary regardless of age and gender (Oviedo et al., 2019). With the presence of these barriers, a very small number of adults with ID are able to be active in the community, whereas the vast majority are leading sedentary lifestyles.

Reducing Sedentary Behaviours

Evidence from previous studies suggests that breaking up and reducing periods of sedentary behaviours decreases health risks in adults with ID (Oppewel et al., 2018; Oviedo et al., 2017). For instance, walking is the most affordable physical activity program that suits individuals with ID across their lifespan, which helps in the reduction of sedentary behaviours (Agiovlasitis et al., 2020; Chow et al., 2018; Mansoubi et al., 2015). A comparative study on the level of physical activity and sedentary behaviours indicated that a small increase in daily physical activity provided significant increase in health outcomes for adults with ID (Dixon-Ibarra et al., 2013). It was also found that breaks in sedentary behaviours reduced hypertension, diabetes, and other cardiometabolic conditions (Ghosh, 2020). For example, introducing a short period of light or moderate intensity walking during sedentary time decreases the levels of glucose and insulin when measured after dinner (Dunstan et al., 2012 as cited in Oviedo et al., 2017). It is imperative to focus on decreasing sedentary behaviours for adults with ID when developing health promotion programs.

Adults with ID need appropriate support to encourage them to reduce sedentary behaviours, especially with increased leisure time (Dixon-Ibarra et al., 2013; Oppewel et al., 2018). A longitudinal investigation about the prevalence of low physical activity and sedentary behaviours in 1618 adults with ID by Hsieh et al. (2017) suggested that interventions to reduce sedentary behaviours in adults with ID should focus on disrupting periods of sedentary behaviours. The researchers in the above-mentioned study suggested that introducing light-intensity activities such as walking may help adults with ID to be more active and less sedentary (Hsieh et al., 2017). Community activities such as

organized outings, bowling, and park activities are some of the interventions that helped reduce sedentary behaviours in adults with ID (Hsieh et al., 2017). Limited studies have been conducted examining this issue from the perspective of those living with ID. Thus, conducting a qualitative study using the Critical Incident Technique guided by the socio-ecological model will help investigate and analyze sedentary behaviours of adults with ID by determining what aids or hinders activity levels in the population.

Chapter 3. Theoretical Framework

Different theoretical frameworks have been discussed in the literature. These frameworks contribute to understanding sedentary behaviours in individuals with and without ID. The most frequently used framework is the socio-ecological model based on Urie Bronfenbrenner's work. This framework is further discussed in the upcoming section. The insufficient number of studies available on examining sedentary behaviours of adults with ID emphasize the need for more in-depth qualitative research to help this vulnerable population. As such, it is vital to look at the research problem as a whole to understand the roots of the problem. The socio-ecological model will aid in examining the research problem from different angles as it involves the person, society, environment, and regulation. Utilizing the socio-ecological model in this study will assist in identifying critical incidents that led to increased or decreased sedentary behaviours by listening to adults with ID's insights and views.

The Socio-Ecological Model

The socio-ecological model can be used as a framework to examine the determinants of sedentary behaviours in adults with ID. Through placing the individuals within an ecosystem, the socio-ecological model suggests that multiple relevant attributes influence sedentary behaviours in adults with ID (Chastin et al., 2014). These attributes consist of four factors: (1) intrapersonal including demographic, biological, behavioural, psychological, emotional, and cognitive factors; (2) interpersonal/cultural such as social support factors; (3) physical environment including distance to services and facilities, financial costs, unsafe environment, and weather condition factors; and (4) policy such as laws, rules, and regulations factors (Agiovlasitis el al., 2020; Chastin et al., 2014; Hsieh

et al., 2017; Koyanagi et al., 2018). A systematic investigation by Chastin et al. (2014) that focused on determinants of sedentary behaviours in older women indicated five main themes: (1) physical complaints such as pain; (2) lack of environmental services and stimuli; (3) pressure from peers and society; (4) relaxation and pleasure; and (5) mental health reasons. A cross-sectional study by Koyanagi et al. (2018) that explored the correlation of sedentary behaviours in the old adult population suggested that beside individual factors, social, environmental, and policy factors influenced sedentary behaviours.

The socio-ecological model defined four different settings in which sedentary behaviours may take place: household, occupation, transport, and leisure time (Melville et al., 2017). Therefore, sedentary behaviours can be examined within four specific domains: (1) watching television, (2) participating in other screen-focused behaviours in household environments such as use of a computer or cellphone, (3) sitting in the workplace, and (4) sitting in a vehicle (Melville et al., 2017; Oppewal et al., 2018). Through the socio-ecological model, a multilevel framework is used to search for determinants for each domain from the individual level to the society level in both the general and intellectual disabilities populations (Melville et al., 2017). Adults with ID experience various personal and environmental barriers which prevent them from reducing sedentary behaviours. According to Oviedo et al. (2017), adults with ID showed low participation in physical activity programs due to financial difficulties, lack of support from their caregivers, or the struggle of finding support workers who are able to train them.

Chapter 4. Methodology

Design Overview

As shown in Chapter 2, existing studies on sedentary behaviours in adults with ID are largely quantitative in nature, where many aspects and parts of the phenomenon remained unclear. According to Thorne (2020), as quantitative research does not include the perspectives and experiences of patients in regards to the question under investigation, the need for conducting qualitative studies increases. Qualitative research employs a deep and detailed analysis to further understand the research question. Qualitative studies provide an opportunity to include the viewpoints of participants and help identify the similarities and differences between the perspectives of participants regarding the issue (Saldana, 2015; Throne, 2020). As the present study's population has limited access to healthcare and health promotion programs, further studies and research are needed to address their needs. According to Moore et al. (2015), qualitative studies help with the understanding of complex phenomena and identifying unexpected factors that affect research findings.

The Critical Incident Technique

The Critical Incident Technique (CIT) is considered the newest methodology in qualitative research, and is based on Flanagan's work in 1954. CIT can be defined as the process of collecting critical factors and facts regarding a specific behaviour in a defined condition (Flanagan, 1954). CIT can be described as an inductive approach that focuses on the participants' perspectives and opinions regarding a specific experience or incident (Butterfield et al., 2009; Flanagan, 1954; Persolja, 2020; Viergever, 2019). Moreover, CIT can be used to examine under-studied issues or incidents that are affected by the

different factors (Butterfield et al., 2009; Viergever, 2019). According to Viergever (2019), the "critical incident" is used as a unit of analysis when analyzing and interpreting data in CIT. Therefore, the purpose of using CIT in this study is to expand the researcher's understanding of the key elements that lead adults with ID to assume sedentary behaviours. Furthermore, the critical incidents specific to this study can be defined as behaviours, factors, experiences, or events that lead adults with ID to be sedentary.

CIT is an introductory and exploratory tool used during the early phases of a qualitative research and plays a big role in building theories and models (Bott & Tourish, 2016; Butterfield et al., 2005; Butterfield et al., 2009; Cunningham et al., 2020; Flanagan, 1954). CIT is a strong and adaptive qualitative research methodology that focuses on answering "what" and "why" questions (Viergever, 2019). According to Butterfield et al. (2009), researchers using CIT may begin the study by stating their assumptions regarding the research question. Through participants' views and perceptions regarding the research question, the researcher will identify themes that represent what helped or hindered the specific incident. According to Viergever (2019), CIT can be used to explore both the participants and researcher's points of view regarding the research question. Using CIT methodology guided by the socio-ecological model in this study helped in understanding and pinpointing the obstacles that lead to sedentary behaviour in adults with ID.

Rationale for Choosing CIT

CIT is a qualitative research methodology that is used widely in many disciplines such as, nursing, health services research, hospital care, psychology, counselling,

education, social work and job analysis (Bott & Tourish, 2016; Butterfield et al., 2005; Butterfield et al., 2009; Clark et al., 2018; Cunningham et al., 2020; Flanagan, 1954; Persolja, 2020; Viergever, 2019). As CIT is a very flexible methodology, it can be modified to help the researcher explore what aids or obstructs a specific incident or experience (Butterfield et al., 2005; Butterfield et al., 2009; Flanagan, 1954; Persolja, 2020; Viergever, 2019). CIT allows participants to reflect on their feelings, thoughts, and behaviours about a well-defined situation (Butterfield et al., 2005; Cunningham et al., 2020). In a CIT study, the researcher is considered the key instrument as they collect data by interviewing participants and precisely reporting their views (Butterfield et al., 2009; Cunningham et al., 2020; Viergever, 2019). Data in CIT methodology is collected as words that describe participants' views and beliefs (Bott & Tourish, 2016; Butterfield et al., 2009).

CIT is characterized by its operational definitions and consists of five major steps: (1) establishing the general aim of the study and its objectives; (2) planning and setting specifications such as creating an interview guide, as well as defining the critical incident and its relevance to the participants; (3) collecting data through participants; (4) analyzing the data by identifying critical incidents and forming categories; and (5) interpreting the data and reporting findings (Butterfield et al., 2005; Butterfield et al., 2009; Cunningham et al., 2020; Flanagan, 1954; Kostamo et al., 2019; Viergever, 2019). CIT conveys the voices and views of participants because they are considered experts in their own lives. Therefore, it is important to trust that adults with ID are able to think about themselves and are able to share their opinions and perceptions. Rose et al. (2019) emphasized the importance of including adults with ID as members of qualitative

research teams and enabling them to express their thoughts and views. Exploring the insights of adults with ID using CIT will help examine sedentary behaviours and analyze their determinants, leading to a meaningful qualitative research study. Based on the consequences of a sedentary lifestyle on the health of adults with ID, there is a need to reduce sedentary behaviours to enable them to be more active in the community and increase their quality of life. A CIT was conducted to understand and analyze the roots and origins of the research topic.

Population and Study Sample

Adults aged 18 years to 65 years who are diagnosed with intellectual disabilities were invited to participate in the study. This age range is based on Statistics Canada's definition of adulthood (Statistics Canada, 2018). The study included participants of various genders, ethnicities, and levels of education.

Inclusion and Exclusion Criteria

The inclusion criteria included adults diagnosed with mild intellectual disabilities who identified themselves as living a sedentary lifestyle. Participants of any gender who met the age range of 18-65 and who were living in Ontario, Canada were invited to partake in the study. The rationale for limiting recruitment to the province of Ontario included the difficulty in coordinating interview times considering time zone differences, as well as environmental and political factors such as government funding provided for adults with ID. Inclusion criteria also included participants who were willing to participate in up to two hours distributed across two virtual interviews. Participants were expected to answer questions about their views and thoughts regarding sedentary behaviours. In addition to the main interview, a follow-up session was scheduled to

review the interview transcript for accuracy. During the follow-up, participants were invited to clarify their comments and answers. Participants were able to speak and comprehend the English language as this was the language of communication for this study. The exclusion criteria included adults unable to communicate verbally and adults using augmented and alternative communication devices (AAC), individuals younger than 18 years of age or older than 65, and non-English speakers.

Recruitment

Several organizations in Ontario have been identified as potential institutes where participants could be recruited for the study. Among the numerous organizations contacted, Community Living Ontario and the Ontario Disability Coalition responded favourably. Community Living Ontario is a non-profit and provincial organization that advocates and raises funds for adults with intellectual disabilities (Community Living Ontario, 2021). The Ontario Disability Coalition is an association that advocates for health care services necessary for a better and healthy life for individuals with disabilities (Ontario Disability Coalition, 2021). A recruitment poster was posted on the organizations' website to recruit participants for the study (Appendix A).

Sampling

There is no specific sample size required in CIT in comparison to other qualitative research methodologies (Butterfield et al., 2009; Viergever, 2019). The researcher should continue interviewing participants until they reach data saturation. Data saturation can be achieved by collecting between 50-100 critical incidents for simple activities or several thousand critical incidents for more complex activities (Bott & Tourish, 2016; Butterfield et al., 2009; Flanagan, 1954; Persolja, 2020). Data

saturation can also be reached when no new categories occur to describe the critical incidents (Viergever, 2019). In CIT, recruiting small sample size can be sufficient considering the methodology's rapid data saturation (Butterfield et al., 2009; Clark et al., 2018; Flanagan, 1954). A small sample size offers researchers an entry into understanding the elusive condition by developing a meaningful analysis for patterns of similarities and differences (Butterfield et al., 2009; Clark et al., 2018; Viergever, 2019).

In this study seven participants partaken the interviews; however, two participants were excluded (N=5) for not meeting the inclusive criteria. That is, one was excluded as they did not reside in Ontario, and the other was excluded because they were non-verbal. The interviews were conducted and compensation was provided for both participants to ensure minimized harm that could have been felt as a result of refusing their initiative to participate in this research study.

Purposive sampling was used to represent the population and to provide insight into a specific experience (Clark et al., 2018). A relatively small sample size (N=5) was recruited for this study considering rapid data saturation and the state of the COVID-19 pandemic. Recruiting five participants allowed for more in-depth and detailed interviews. Data saturation was reached as no new categories occurred and a total of 102 critical incidents were collected from interviewing the five participants.

A capacity to consent screening was obtained from the participants, followed by informed consent. A capacity assessment tool adapted from UC Davis Alzheimer's Disease Centre (2002) was used (Appendix B). The process of informed consent and capacity assessment were recorded using the Capacity Assessment Record (Appendix C). As a Registered Nurse, the author of this study was able to determine the capacity for

consent of the participants, obtained informed consent, and interviewed the participants to collect enriched data.

Ethical Considerations

Prior to the commencement of the study, an approval by the Athabasca University Ethics Review Board was obtained (Appendix D). To maintain confidentiality and reduce bias, the data was anonymized and assigned aliases (Dixon-Ibarra et al., 2018; Flanagan, 1954; Persolja, 2020). Throughout the study process, all the collected information stored and secured in a locked cabinet and password access files (Dixon-Ibarra et al., 2018; Persolja, 2020). All devices that were used for collecting data used with consent and approval from the participants (Dixon-Ibarra et al., 2018).

Other considerations included creating easy-to-read format documents that explained and described the study and the interview process for adults with ID (Butterfield et al., 2009; Dixon-Ibarra et al., 2018; Flanagan, 1954). The researcher verbally read the roles, responsibilities, risks, and benefits of the study to the participants and asked them some critical questions to ensure that they understand the documents (Dixon-Ibarra et al., 2018). Participants were informed that they have the right to withdraw from the study at any time. A written informed consent was obtained from the participants before conducting or voice recording the interviews (Dixon-Ibarra et al., 2018).

Concerns at Stake

According to Rose et al. (2019), for a long period of time, researchers were cautious of conducting qualitative research methods with individuals with ID due to several challenges. For one, some researchers view individuals with ID as unresponsive

and inarticulate. Secondly, some researchers have raised concerns regarding the ability of individuals with ID to give informed consent. Third, due to the wide range of intellectual disabilities, diagnoses sampling may include a heterogeneous range. Using a heterogeneous sample may result in challenges with providing explanations and theming. Rose et al. (2019) argued that adults with ID are capable of expressing themselves and speaking about their experiences. Although they may appear to be slow speakers, or may need extra time to comprehend the information provided and to communicate their opinions, they are able to communicate with researchers and other individuals to express their ideas and opinions.

Another concern arises in adults with ID's capacity to provide consent in research settings. A study by Wark et al. (2017) exploring the capacity to consent in adults with ID population showed that seven out of ten participants in the study were capable to consent. It was found that three critical factors influence the capacity to consent for adults with ID. The researcher needs to (1) ensure the consent is specific to the population, (2) outline the criteria for consent, and (3) provide an alternative communication mechanism when needed (Wark et al., 2017). To determine the capacity to consent, the information was presented in a manner that would best fit the participant's ability to comprehend. For example, simplifying interview questions and content, adjusting the interview environment by decreasing distractions and noises, and providing enough time to answers questions (Wark et al., 2017). Using various communication mechanisms such as verbal questioning, pictorial cards, photographs, and yes/no cards also helps adults with ID to understand and answer questions (Wark et al., 2017).

Moreover, as suggested by Flanagan (1954), a slight changing or rewording of the question were used during the interview to enhance comprehension.

Building Rigour Into the Study Design

According to Butterfield at al. (2009), there are nine credibility checks that enhance the rigor of the research. These nine credibility checks are useful when collecting data regarding opinions and beliefs via interviews. The credibility checks consist of: (1) audiotaping interviews, (2) enhancing fidelity by creating an interview guide, (3) independent extraction from another person, (4) exhaustion of the data and keeping a log for each interview, (5) reporting participation rates for each incident, (6) forming categories by an independent person, (7) cross-checking the categories by participants, (8) seeking the opinions of experts, and (9) using a theoretical framework that supports the researcher's assumptions (Butterfield et al., 2005; Butterfield et al., 2009; Flanagan, 1954). Implementing the nine credibility checks helps to either limit the researcher's biases or make them transparent to the reader (Butterfield et al., 2009; Flanagan, 1954; Viergever, 2019). After meeting the nine CIT credibility checks, the research results can be reported either through publishing a scholarly journal article or a book chapter (Butterfield et al., 2009; Flanagan, 1954). Documenting the research process in CIT is considered the key element in enhancing the reliability and credibility of the results.

Research Methodology

Data Collection

Data collection methods in CIT include in-person interviews, phone interviews, self-administered questionnaires, qualitative open-ended questions, workshops, and field

observations (Bott & Tourish, 2016; Butterfield et al., 2005; Butterfield et al., 2009; Clark et al., 2018; Cunningham et al., 2020; Kostamo et al., 2019; Viergever, 2019). In this study, data collection occurred through in-depth semi-structured interviews to allow the researcher to constantly explore the same critical incidents with all participants (Butterfield et al., 2009; Cunningham et al., 2020; Persolja, 2020). Virtual interviews were conducted in adherence to the current COVID-19 restrictions placed by the Ethics Board, as well as in consideration for the participants' financial and social difficulties. The Zoom Video Communication website was used to conduct and record the interviews with all participants. According to Gray et al. (2020), the advantages of using online interviews include saving travel costs, reducing time in data transcription, creating a safe and comfortable environment for participants, and enabling participants to discuss more sensitive issues.

Interview questions focused on identifying factors, supports, and beliefs which led to living a sedentary lifestyle for adults with ID. Participants were asked to describe their insights of being either active or inactive. Interview questions were adopted from van Schijndel-Speet et al. (2014). The original study by van Schijndel-Speet et al. (2014) investigated physical activity preferences in old adults with ID and existing barriers that may affect physical activity engagement in that population. While the aim and population of the current study differed from that of van Schijndel-Speet et al., the interview questions were reused with some modifications. Van Schijndel-Speet et al.'s interview question setup has been proven to be suitable for adults with ID as it uses accessible language to capture the participants' experiences. For this reason, the format of the interview questions used in the current study was modeled after van Schijndel-Speet et

al.'s. However, the questions differed to better suit the aim and population of the current study.

The interview questions were structured into a list of key questions and prompt questions. The interview began with a key question which is then followed by numerous related prompts. The prompt questions allowed participants to elaborate on earlier responses, enriching the quality of collected data. An example key question was "what does a typical day look like?", which was followed by prompt questions such as "what are your hobbies?" and "what activities do you do?". These questions were adapted from van Schijndel-Speet et al. (2014) which included key question like "in what physical activity do you participate?". Both key questions were important to understand and explore the phenomena of interest of their respective study. However, they were worded to serve a specific research purpose. That is to say, van Schijndel-Speet et al.'s questions were highly tailored for investigating physical activity, while the current study used vocabulary particular to understanding sedentary behaviours. Appendix E includes a full list of key interview questions and prompts used in the study.

During the interviews, open-ended and non-directional questions were used to enable an in-depth dialogue to help participants share their views and insights regarding sedentary lifestyle (Bott & Tourish, 2016; Cunningham et al., 2020; Flanagan, 1954; Kostamo et al., 2019). Using prompt and probe questions during the interviews provided opportunities for the participants to share their perceptions and ensure complete answers were received by the researcher, producing a rich and detailed dataset (Butterfield et al., 2009; Flanagan, 1954). Interviews were audio recorded and transcribed individually in a precise way to maintain the consistency of the information (Butterfield et al., 2009;

Cunningham et al., 2020; Flanagan, 1954; Persolja, 2020). This helped the researcher draw findings for the research (Butterfield et al., 2009; Flanagan, 1954; Viergever, 2019).

Data Analysis

The process of analysing the data started by creating and organizing the information obtained from the raw data in files. Typically, as masses of data were produced from the interviews, the critical incidents were extracted and organized into codes. According to Saldana (2015), codes may be described as patterns that are characterized by similarity, difference, frequency, sequence, correspondence, or causation. Codes were sorted and organized to identify repetitive patterns to create themes or categories. According to Butterfield et al. (2009), interpreting and analyzing data in CIT encompasses three main stages: (1) determining the frame of reference, (2) forming categories using inductive reasoning, and (3) identifying the generality level of the reported data. It is important to combine the manual and electronic methods when analysing and interpreting the research data. In this study, in addition to the manual method Microsoft Word was used to transcript the interviews. Codes were highlighted, with different colours and tracked on word documents for each participant. Codes were transferred into Excel spreadsheet to analyze and organize the data produced from the interviews into categories or themes.

In the manual method, different coloured highlighting markers and coloured sticky notes were used to colour scheme the data to extract categories. The researcher started by highlighting the text in the transcripts that seems to encourage participants to be sedentary. Sticky notes were used to classify any items that helped or hindered the

incident of being sedentary (Butterfield et al., 2009). The second step was forming categories that serve the purpose of the study. As this study focuses on examining sedentary behaviours in adults with ID, the categories specified what causes sedentary behaviours in adults with ID living in Ontario, Canada. Using inductive reasoning, the researcher distinguished patterns, themes, similarities, or differences in the incidents provided by the participants to form categories (Butterfield et al., 2009; Clark et al., 2018; Viergever, 2019). Themes are defined as the products of the process of coding, categorizing, and sorting data (Saldana, 2015). When needed, the researcher decided to merge small categories together or to break down large categories into smaller ones (Butterfield et al., 2009; Viergever, 2019).

For the category to be viable, at least 25% of the participants should identify that particular critical incident during the interview (Borgen & Amundson, 1984 as cited in Butterfield et al., 2009). In case the critical incident was identified by less than 25% of participants, the researcher can either choose to combine it into another existing category or create a new category to accommodate the small ones (Butterfield et al., 2009; Viergever, 2019). The next step was creating a list of categories that represent the critical incidents extracted from the interviews. Each category had a self-descriptive title and an operational definition (Butterfield et al., 2009). At this point, the researcher has conducted the credibility checks within the data interpretation. Viergever (2019) indicated that the number of critical incidents reported in CIT ranged between 22 to 2505, while data analysis resulted between one to five layers. A spreadsheet document was used to organize all the data collected from each participant.

The credibility check points according to Butterfield at al. (2009) were conducted in this study to ensure the validity of the results. All the interviews and follow-ups with participants were audiotaped with their consent. The researcher used the interview questions guide to run the interviews to collect enriched data. The researcher transcribed the interviews and listened to the audio recordings multiple times to ensure all participants' comments were included verbatim. Also, the researcher kept a log for each interview and follow-up with each participant and cross-checked with the audio recordings. The interview transcripts, themes, and subthemes created were reviewed and approved by the research supervisor. Follow-up interviews were conducted to cross-check the data were collected from the participants for accuracy and provision of more information by the participants when needed. The supervisory committee reviewed the data collected, the themes and subthemes emerged and provided their opinions and feedbacks to enhance the rigor of this study. The socio-ecological model was used as a framework to support the research question and to make the researcher's bias transparent to the readers.

Chapter 4. Results

Participants

Participants were one male and four females with the age range of 28 – 45 years (average age = 34.8 years, median = 34 years). All participants had a diagnosis of mild intellectual disability and completed post-secondary education. At the time of data collection, two participants were employed and 3 participants were not working. All participants live in the province of Ontario, where 3 participants live in an apartment and 2 live in a house. Two of the participants live alone and 3 live with family members. Table 1 in Appendix F summarizes the socio-demographic characteristics of the sample.

Emerging Themes

The following four themes emerged from data extraction of 102 critical incidents: (1) personal related incidents led to increase sedentary behaviours, (2) environmental related incidents aided to increase sedentary lifestyle (3) helpful incidents led to decrease sedentary behaviours, (4) wish-lists including participants' thoughts and opinions of ways that may help them in becoming less sedentary. Table 2 in Appendix F displays the themes and subthemes derived from the critical incidents.

Personal Related Incidents

Personal related incidents are considered internal events that led participants to become more sedentary. The subthemes under personal related incidents include leisure time, hobbies, activities of daily living, and health conditions and comorbidities. Participants reported spending most of their leisure time in front of a screen. Participants stated they spend hours watching television, gaming, texting, and working or searching online on a daily basis. Some participants indicated that they play video or mobile games

for hours on a daily basis. For instance, a participant stated “some days I get lost in the world of video games… I try to set timers… I do not check the time and it has been 6 hours... now I try to set timers like after an hour and a half…”. All participants reported spending between 310 – 615 min/day in front of a screen. Figure 1 in Appendix G shows the reported time spent daily in each leisure activities.

Another personal related incident that led participants to adopt a sedentary lifestyle is hobbies. On average, participants reported the following activities as hobbies: reading, arts and crafts, knitting, and listening to music while laying down. All these hobbies are considered sedentary activities because they require sitting or reclining for extended times per day. Reading was identified as the preferred hobby by all five participants. For example, one participant stated “I read 30-180 min/day; not just in one sitting. Like 6 hours a week…”. On average, participants spent between 30 – 270 min/day engaging in hobbies. Figure 2 in Appendix G summarizes the reported hobbies by each participant and the time spent daily on each hobby where applicable.

Moreover, participants reported engaging in activities of daily living such as housekeeping, cooking, napping, and doing laundry. Participants’ engagement in housekeeping activities was once or twice a week whereas doing laundry was once a week. Participants used to take breaks while cleaning and some reported watching television or working on a computer while waiting for their laundry. One participant reported difficulty engaging in housekeeping activities due to left-sided weakness and dependency on available personal support worker or caregivers. The participant stated, “usually my mom or dad fix me my coffee and oatmeal or cold cereal or something… I fix toast on Sunday morning… but sometimes I burn them...”. Most of the participants

nap during the day which is considered sedentary behaviour. On average, participants nap between 45 – 180 min/day. Figure 3 in Appendix G summarizes the time spent by each participant engaged in activities of daily living.

Participants also identified health conditions and comorbidities as personal related incidents that increased their sedentary levels. Different health conditions such as chronic pain, weakness, seizure, and obesity led some of the participants to develop a sedentary lifestyle. Participants stated that they cannot continue with their daily activities due to chronic pain or when they get a seizure episode. Other participants reported that standing for a long time increases their pain levels, which force them to sit for long periods of time per day. For example, a participant stated "if I have had a seizure… then obviously, it is game over. I would not be able to do much of anything…". Moreover, due to obesity, some participants chose to stay home and not engage in physical activity in the community as they feel tired constantly throughout the day.

Environmental Related Incidents

Environmental related incidents are considered external events that aided to increase sedentary behaviours of adults with ID in this study. The subthemes identified by participants include COVID-19 pandemic, financial hardship, discrimination, safety, weather, lack of social support, distance, and noise levels. The COVID-19 pandemic affected people of all ages with and without disability. All participants in the study reported decreased levels of activity related directly to the COVID-19 pandemic. Reports such as increased feelings of isolation due to a decrease in social interaction, increased agitation, fear, and panic attacks in regard to the COVID-19 pandemic were made by participants. One participant stated "I am just not fully… not fully satisfied because I do

not have any social contact… My friends are too afraid to come near me anymore…". In regard to adhering to Public Health's recommendation, four of the participants were double vaccinated at the time of data collection and one has a medical condition that prevented them from getting the COVID-19 vaccine. Participants were willing to get tested and swabbed for COVID-19 as needed.

Financial hardship was another environmental related incident identified by some participants that directed them to further become sedentary. Most adults with ID rely on the Ontario Disability Support Program (ODSP) for living and Passport Funding for recreation. The amount of money they receive per year does not cover all of their expenses. Participants considered themselves poor because they lived primarily on ODSP, and reported having no opportunities for full-time job positions. Participants emphasised that during winter season, they can neither go on walks outside nor pay for a gym membership due to financial hardship. One participant highlighted their financial hardship by saying "there is a gym near me which I can easily walk to but it is really expensive... you need money to build muscles…"

Discrimination, safety issues, and lack of social support were reported as environmental related incidents that refrained participants from becoming more active. Participants chose to stay home for different reasons, including saving money, adhering to cultural practice, and avoiding discriminations, ableism, or islamophobia. Some of the participants also raised concerns regarding safety and the need to have someone accompany them when going for walks in the community. Participants who lacked social support spent more time at home engaging in sedentary activities. They prefer to staying

at home than going outside because “people stare” as one of the participants indicated during the interview.

Participants also named weather, distance, and noise levels as environmental related incidents that fostered their sedentary lifestyle. Weather, especially in winter, restrained participants from participating in different activities particularly for those who use mobility devices such as a cane or a wheelchair. Cold temperatures, piles of snow, and icy sidewalks were all considered hindrance for participants to engage in community walks and becoming less sedentary. The distance from gyms or community centres was also a big hindrance for some participants. One participant was able to exercise on a daily basis because they have a gym in their family house basement. That participant said, “I work out every day at home. I head downstairs for another workout…”. Some participants who did not have a Personal Support Worker (PSW), or a family member available to take them to different places, were forced to stay home. Most participants live on Passport Funding and ODSP; therefore, they cannot easily afford to take a taxi to the gym once or twice a week. Lastly, one of the participants stopped going to the gym and replaced that activity with a sedentary behaviour rather than going outside for another physical activity due to increased sensitivity to noises.

Helpful Incidents

Helpful incidents are events that aided participants to become less sedentary. The following subthemes was identified as incidents that helped participants decrease sedentary behaviours: outdoor walking, indoor activities, and presence of a PSW. Walking was recognized as the chosen outdoor activity or the preferred hobby by all participants. All participants reported walking on a weekly basis either in the community

and parks or to a nearby mall or plaza. Another outdoor activity that was mentioned during interviews was camping. One participant stated that going to a camp was their desired outdoor activity. That participant emphasized “I am a camp person… we are outside all day on summer camp… I can live there… I totally would…”. Other outdoor activities such as hiking, running, kayaking, and biking were not reported by any of the participants when asked during interviews. Figure 4 in Appendix G shows the amount of time each participants spent engaging in outdoor activities per week.

Participants listed rugby and wheelchair basketball as indoor sports that they enjoyed before the COVID-19 pandemic. With COVID-19 restrictions, participants were not able to continue playing those sports and were forced to stay home. Some of the participants used to go to the gym on a weekly basis but due to financial hardship they could not continue. With an intention to decrease sedentary behaviour, some participants stated that they tried to engage in some indoor physical activities. For example, one participant joined a specialized program focusing on balancing and strengthening exercise that runs once a week. Another participant performs restorative yoga three times a week at home. Two participants reported using a fitness tracking device to help them become more active. Both purchased the fitness tracking device after the COVID-19 pandemic to encourage themselves to count their daily steps. The devices used by the two participants are Da Fit and Fitbit. The participant using the Fitbit device stated that “Fitbit will vibrate so I will get up and like take 2 steps and then that counts for something... I got one specially for COVID…”.

The presence of a PSW was recognized as an incident that helped participants become less sedentary. Some of the participants depend on a private PSW to go outside

in the community and to engage in different activities. Others rely on a Respite Worker to get them engaged in different activities. With either a PSW or a Respite Worker's help, participants were able to become more active by either going for a walk outside in nature, or attending some activities and sports. Some of the participants receive help from a PSW on a daily or weekly basis with self-grooming and personal care due to muscle weakness and fatigue. An example for the crucial role of social support shows in one of the participants' statements, "I like to go to respite... this was pre-COVID... I do have a respite worker... we go for drives to get ice cream or we go to the mall or we research a craft that they can help me with... Respite worker that does like... let's go to hockey games or something like that."

Wish-Lists / Participant Suggested Incidents

Wish-lists or participant suggested incidents are items and actions desired by the participants that may help them to become less sedentary. The subthemes included in this category are providing resources, education, accessibility, and increased financial support. Participants believe that the above-mentioned items and actions may decrease their levels of sedentary behaviours. Participants identified resources as social stories, sensory tools, posters, prizes, and specialized program. Social stories are used to provide people with ID an overview or expectations while visiting new places. Some participants highlighted the importance of using social stories in helping people with ID to anticipate the process of going to a gym and how to use the exercise equipment. Social stories can be in-print or online. Some participants reported using sensory tools to decrease stress or anxiety levels when going outside in the community. They prefer having access to sensory tools when attending any program or going to an exercise session. Posters and

visuals were also suggested by some of the participants as resources that were effective in decreasing levels of anxiety and encouraging them to participate in different activity programs. Some participants believe that offering small prizes when participating in physical activity programs may help them and other adults with ID to decrease sedentary lifestyles. Running specialized program for adults with ID that focus on physical activity such as walking in the community club or aerobic exercise program were also suggested by some participants.

Some participants proposed that raising awareness and education are two enablers of becoming less sedentary. Participants suggested providing online education for adults with ID on how sedentary behaviours affect health and well-being. They recommended to have access to free websites or apps to explain to them how and why it is important to become less sedentary. These websites or apps should be dedicated to adults with ID and programed using simple instructions and therapeutic music. Also, some participants recommended that education should include people without ID, especially those who work with adults with ID. For example, educating and teaching healthcare providers and staff working with adults with ID approaches on how to provide advice and ideas to become less sedentary. Beside education, some participants highlighted accessibility as a vital action to become less sedentary. Some participants suggested offering accessible gyms that allow adults with ID to exercise safely without judgement or ableism. Another suggestion was accessible transportation that takes adults with ID to the nearest gym or community centre without needing to walk for long distances alone.

Another crucial incident that may greatly help adults with ID in the reduction of sedentary behaviours is the increase in financial support according to participants. For

instance, one participant stated “I think ODSP need to go up... if ODSP does get increased and get the basic income, yes, I might try dancing again or I might become more active...”. Some participants stressed the importance of having enough money that covers not only basic necessities but being active. Some participants believe that money is the solution for many obstacles of becoming less sedentary. Having money will help with accessibility, food, gym membership, and enrolling in physical activity programs. A participant stated “I think if I have more money... some things become more accessible in the moment…”.

Chapter 6. Discussion

This study explored the factors, supports, and beliefs that led to increased or decreased sedentary behaviours of adults with ID using the Critical Incident Technique guided by the socio-ecological model. The findings shed the light on the sedentary lifestyle in adults living with ID in Ontario, Canada. The outcomes of this study showed how the four attributes of the socio-ecological model facilitated an increase or decrease in sedentary behaviours of adults with ID. The demographics of participants such as their health condition, the lack of social support, the environment, and the political and sociocultural regulations led to the adaptation of sedentary lifestyle in adults with ID. Most of the incidents extracted from the data centered around incidents that led adults with ID to become more sedentary. This study demonstrated that factors led adults with ID to become more sedentary could be related to participants themselves or internal incidents, or to the environment or external incidents. Also, the study identified support incidents that help decrease sedentary lifestyle of adults with ID. The study provided adults with ID the opportunity to provide wish-lists of actions to support them in becoming less sedentary.

Consistent with other findings in the literature, personal related incidents that were initiated by the participants and external incidents that were caused by the environment appear to have encouraged adults with ID to adopt a sedentary lifestyle (Chastin et al., 2014). Leisure activities, hobbies, activities of daily living, and comorbidities are some of those personal related incidents that aided adults with ID to become sedentary. The study findings displayed adults with ID pass most of their leisure time in front of a screen, engaged in sedentary activities such as watching television,

gaming, texting, or searching online, which is similar to other studies on this topic (Agiovlasitis et al., 2020; Ghosh, 2020; Harvey et al., 2013; Melville et al., 2018). On average, adults with ID in this study spent 310 – 615 minutes in front of a screen on a daily basis. These findings are in line with two systematic reviews that were done by Melville et al. (2017) and Agiovlasitis et al. (2020). Both reviews found that spending up to 10 hours a day in front of a screen caused increase levels of sedentary behaviours in adults with ID.

Reading was indented as the hobby of choice for adults with ID, which requires sitting or reclining for long periods of time. Beside reading, all other hobbies such as arts and craft, knitting, and listening to music while sitting are considered sedentary activities. In this study, adults with ID spent more than 4 hours engaging in activities that require sitting on a daily basis which has also been reported in Harvey et al.'s systematic review (2013). Adults with ID's participation in activities of daily living was very limited and minimal. The in-depth interviews indicated that adults with ID tend to cook simple meals or purchase ready-to-eat meals, nap up to 3 hours during the day, and watch television while waiting for their laundry. All of the above-mentioned activities of daily living contributed to increase sedentary behaviours of adults with ID.

Moreover, comorbidities were identified as incidents that led adults with ID to become more sedentary (Chow et al., 2019; Dixon-Ibarra et al., 2013). The chronic pain, weakness, and obesity that were reported as hindrances could be related to being sedentary for most of the waking hours in adults with ID (Agiovlasitis et al., 2020; Chastin et al., 2014; Dixon-Ibarra et al., 2018; Ghosh, 2020; Kim & Yi, 2018; Melville et al., 2017; Melville et al., 2018; Walsh et al., 2018; Yilmaz et al., 2014). Other health

conditions reported in this study, which contributed to increased likelihood of becoming more sedentary, include episodes of seizure, depression, and anxiety (Koyanagi et al., 2018; Melville et al., 2018; Roll, 2018; Westrop et al., 2019; Tyrer et al., 2019). These health conditions and comorbidities could be caused by extended periods of sedentary behaviours or contribute to sedentary lifestyle in adults with ID. They may also be maintaining sedentary behaviour as persons with seizure and depression may be more anxious or hesitant to partake in physical activities, especially outdoors, in fear of triggering a seizure or putting themselves in an undesirable or vulnerable situation when one inevitably comes (Koyanagi et al., 2018; Melville et al., 2018).

External incidents that were caused by the environment and led adults with ID to increase sedentary behaviours were identified in this study. Incidents such as the COVID-19 pandemic, financial hardship, discrimination, safety, weather, lack of social support, distance, and noise levels were extracted from the data (Carbó-Carreté et al., 2016; Chastin et al., 2015; Melville et al., 2018; Walsh et al., 2018). The COVID-19 pandemic restrictions increased sedentary behaviours of adults with ID. The fear of getting COVID-19 or becoming exposed led adults with ID to stay home and engage in sedentary behaviours. The fear and nervousness of getting COVID-19 also contributed to increased anxiety, depression and isolation due to decrease in social interaction (Harris et al., 2018; Koyanagi et al., 2018; Melville et al., 2018). Also, adults with ID became more sedentary when the COVID-19 restrictions resulted in sudden loss of social support and a switching of in-person activities to fully virtual settings.

Another external incident that led adults with ID to become more sedentary is financial hardship. This study is consistent with previous studies that explored

determinants of sedentary behaviours in term of the financial hardship adults with ID experience most of the time (Council of Canadians with Disabilities, n.d.; Dixon-Ibarra et al., 2018; Ghosh, 2020; Melville et al., 2015; Roll, 2018). The outcomes of the interviews in this study displayed that many adults with ID in Ontario live on ODSP. It was reported that ODSP does not cover all basic needs for adults with ID. Adults with ID receive a monthly payment from ODSP that is lower than the minimum amount a person needs to live in Ontario (Ministry of Children, Community and Social Services, 2022; Statistics Canada, 2022). Also, health insurance received through ODSP covers the bare minimum of dental and prescription glasses. Adults with ID live in poverty as they rely on ODSP (Council of Canadians with Disabilities (n.d.); Ministry of Children, Community and Social Services, 2022). Further, they face difficulties finding jobs in general.

Melville et al. (2018) suggested a negative relationship between the severity of ID and sedentary behaviour which is apparent in this study. All adults with ID participated in this study have mild ID and reported spending up to 10 hours a day engaging in sedentary behaviours. The interviews indicated that some of the reasons for choosing to be at home and not being in the community was to avoiding discrimination, saving money, and lacking social support that appears critical in encouraging adults with ID to be more active inside and outside of their homes (Council of Canadians with Disabilities, n.d.; Dixon-Ibarra et al., 2018; Ghosh, 2020; Melville et al., 2015).

Adults with mild ID understand discrimination, ableism, sexism, and Islamophobic attitudes directed towards them (Carbó-Carreté et al., 2016; Chastin et al., 2015; Melville et al., 2018; Oviedo et al., 2019; Walsh et al., 2018). Thus, many may

prefer to stay home to avoid experiencing these adversities, especially when they do not have access to an adult without a disability to ensure their safety. Hence, sedentary behaviours appear to be a by-product of a defense mechanism adults with ID embody in order to feel safe (Agiovlasitis el al., 2020; Chastin et al., 2014; Hsieh et al., 2017; Koyanagi et al., 2018). Additionally, being on ODSP means they cannot afford paying for memberships or activity programs to become less sedentary (Council of Canadians with Disabilities, n.d.). Adults with ID preferred to save their money to spend on basic needs than obtaining a gym membership or enrolling in exercise classes.

Other external incidents that were extracted from the in-depth interviews are weather, distance, and noise levels (Agiovlasitis el al., 2020; Chastin et al., 2014; Hsieh et al., 2017; Koyanagi et al., 2018). Adults with ID face difficulties travelling to places where they can be more active due to weather and distance. Living in cities where public transportation is not accessible or reliable created more struggle for adults with ID and led to increase sedentary behaviours. Weather also played a big role in the adoption of sedentary lifestyle by adults with ID as extreme cold or heat led them to stay home. Adults with ID often cannot afford paying for private transportation to go outside as they live in poverty. Additionally, some of them lack social support as they live alone. Therefore, they become more sedentary. Only one of the participants reported going to the gym daily because the gym they frequent is in the same place they live in, eliminating the need to walk or drive there.

On the other hand, data extracted from the interviews showed some incidents that helped adults with ID become less sedentary. For example, walking, sports, and having social support are incidents that helped decrease sedentary behaviours of adults with ID

(Dixon-Ibarra et al., 2013; Hsieh et al., 2017; Melville at al., 2015; Tyrer et al., 2019). Outdoor activities such as walking in the community, to the convenient store, or as part of a summer camp helped adults with ID to decrease sedentary periods. However, this was the case for adults with ID who had a social support worker or a respite worker, not for those who lived by themselves. Walking is the most affordable exercise for adults with ID, but some hindrances play a great part in making it difficult. Safety, weather, comorbidities, lack of social support and, in some situations, high levels of noise are some of the hindrances that made walking not a helpful incident for adults with ID.

Most of the adults with mild ID who took part in this study reported not being able to exercise on a daily basis. The reasons that were often reported by them were that they do not have someone to accompany them, they live in poverty, and they live far away from the gym or community centres (Agiovlasitis el al., 2020; Chastin et al., 2014; Ghosh, 2020; Hsieh et al., 2017; Koyanagi et al., 2018). None of the adults with ID reported participating in kayaking, biking, or hiking as outdoor activities when asked during the interviews despite these activities being popular in Ontario. The reason could be related to the said hindrances such as poverty, lack of social support, distance, and health conditions (Oviedo et al., 2017). Most of these outdoor activities, if not all of them, cost money for training, equipment, and transport to a specific location.

Considering the amount of money adults with ID live on in Ontario from ODSP or Passport Funding, it is nearly impossible for them to enjoy these types of outdoor activities especially if they do not have support with finances or budgeting (Ministry of Children, Community and Social Services, 2021; 2022). Adults with ID receive less than the minimum amount per year to spend on basic necessities, rent, some medical

expenses, and transportation. This means that adults with ID who live alone often cannot afford to rent a one bed room apartment. Therefore, the amount of money they receive from Passport Funding that is supposed to be spent on recreation is likely spent on basic necessities. Also, they are not always able to hire a private PSW or find a Respite Worker. Hence, many of them end up living in a group home to get the social support they need. Fortunately, some adults with ID are lucky enough to still live with their families where they receive financial and social support on a daily basis.

Some indoor sports such as rugby and wheelchair basketball that are offered to adults with ID helped them decrease their sedentary behaviours. These sports and other indoor activity programs such as community yoga classes, balancing and strengthening exercise programs, and home setting restorative yoga are incidents that helped adults with ID live a less sedentary lifestyle (Carbó-Carreté et al., 2016; Chow et al., 2018). Going back to the hindrances that led adults with ID to become more sedentary, the findings showed that all these indoor activities were stopped due to COVID-19 pandemic restrictions. Thus, adults with ID who lacked social support stayed home engaging in sedentary activities because suddenly, walking in the community was not an option for them to overcome these behaviours. Some adults with ID who live with their families were able to purchase devices such Fitbit and Da Fit to help them become less sedentary. Looking to the indoor activity programs that helped adults with ID to be less sedentary, it is clear that they were accessible largely due to the presence of financial and social support.

Adults with ID named some incidents that could help them decrease sedentary lifestyles in their population by providing wish-lists when asked how can professionals

and researchers help them. Adults with ID pointed out the need to increase and enhance knowledge and education regarding sedentary behaviours in a way that would be accessible to them. All adults with mild ID that participated in this study obtained higher levels of education as all of them carry a post-secondary diploma or a bachelor degree. Adults with mild ID are able to read and comprehend printed and posted online materials (Roll, 2018; Rose et al., 2019). Adults with ID implied that the amount of literature available about sedentary behaviours is not sufficiently accessible to their specific population. The literature and information available do not provide a clear explanation about sedentary behaviours and its effect of the health and well-being of adults with ID.

It appeared that adults with ID may be misunderstanding the meaning of sedentary behaviours, as they reported being 'active' simply because they spend hours during the day engaging in any activity such as using a screen, knitting, reading or listening to music while sitting for hours. They did not appear to understand that all of these activities are considered sedentary behaviours due to spending extended periods in sitting or reclining positions. They advocated to have free online websites or apps that can help them understand sedentary behaviours and how to decrease it through easy and affordable ways.

Adults with ID believe that resources such as offering social stories may help them to become less sedentary (Roll, 2018; Rose et al., 2019). Social stories are tools used to accurately share social information with individuals with autism or other neurodevelopmental disabilities in a descriptive way (Camilleri et al., 2022). Through social stories, adults with ID will become more familiar with the new routine they have to adopt to become less sedentary. For example, a social story could be about why they

should move after 20-30 min of sitting or reclining activities, and how these movements should be taken for example walking inside their place, doing some stretches or aerobic exercises, dancing.

The availability of hand-held sensory tools is another resource suggested by adults with ID that may help decrease their levels of anxiety when leaving their homes to walk; therefore, decrease time spent at home in sitting or reclining postures (Koyanagi et al., 2018; Melville et al., 2018). Providing small prizes or incentives at gyms or community centres to adults with ID may encourage them to continue coming and joining classes; thus, engaging in less sedentary behaviours. Examples of simple prizes that were suggested by adults with ID themselves include colouring books and crayons, mini-individualized whiteboards, or a squishy ball. These items may also be used as communication tools to express their feelings of fear or nervousness, and sensory regulatory tools to help them cope with stress and anxiety related to noise levels in busy areas in the community.

Adults with ID recommended posting posters that contain simple directions using words or pictures that explain what is sedentary behaviours and why these behaviours are not healthy. Posters also could be used as advertisements or announcements to a new activity program specific to adults with ID. Physical activity programs offered for adults with ID should use simple and easy to understand language of direction (Atkin et al., 2012; Roll, 2018; Rose et al., 2019). The music playing in the gym or during physical activity programs should not be very loud or ear-splitting as noise level is considered one of the hindrances of less sedentary behaviours. Also, many adults with ID prefer uncrowded places. Thus, gym and community centres would increase the likelihood of

getting more adults with ID in their establishments if they dedicate a time per day for adults with ID in their facilities with environmental accommodations.

Increasing accessibility to facilities where adults with ID can be less sedentary was another suggestion. Accessibility should include the place, transportation, and fees or memberships (Dixon-Ibarra et al., 2018; Ghosh, 2020; Melville et al., 2018; Melville et al., 2015; Roll, 2018). The place where adults with ID could be active should refrain from loud music or noise, minimize crowding, and use nature lights. In some cities in Ontario, public transportation should provide more services and stations so adults with ID would not have to walk for longer distances. Gym's memberships and activity programs' fees should be subsidized or discounted for adults with ID. Considering most adults with ID live in poverty as they receive ODSP and may be working in a casual position or be unemployed, they will highly benefit from these discounts. As ODSP is not enough to help adults with ID meet their basic needs, it is understandable then that they would be unable to easily prioritize future health. As per Maslow's hierarchy of needs (Maslow, 1943), individuals focus on meeting physiological needs such as food, shelter, and clothing before focusing on safety needs such as health and personal security. Thus, there is a massive need for more investments in education and finances for adults with ID.

Study Strengths and Limitations

The use of CIT enhanced the strength of the study as it provided a great emphasis on incidents that led to increase or helped decrease sedentary behaviours of adults with ID. CIT offered flexibility using a wide range of key and prompting questions during the interviews which allowed for detailed data collection, a deep understanding of the

participant's opinions, and provision of solutions to the practical problem of the study (Butterfield et al., 2009; Kostamo et al., 2019; Persolja, 2020; Viergever, 2019). CIT helped minimize the collection of irrelevant data which led to more efficient data analysis and very quick data saturation. CIT is a time- and cost-efficient data collection method that offers deeper data analysis, extensive evaluation, the ability to develop guides and build theories and models (Bott & Tourish, 2016; Cunningham et al., 2020; Viergever, 2019). Using the socio-ecological model combined with CIT enhanced the strength of this study as it looked at adults with ID within the community. This study explored the experiences of adults with ID within the society and emphasised incidents that increased or decreased sedentary behaviours.

The focused sample size used in this study is another strength as it allowed for more in-depth understanding of the what-and-why questions regarding sedentary behaviours of adults with ID. Using semi-structured interviews permitted adults with ID to elaborate on their answers when sharing their thought, views, and beliefs regarding sedentary behaviours. Adults with mild ID were able to identify incidents that led them to become more sedentary and those that helped them to become less sedentary. Moreover, they provided a well-thought-out wish lists and recommendations that can allow and aid them to become less sedentary. These recommendations will aid in developing programs and activities that lower sedentary behaviours for adults with ID.

Another strength in this study is the fact that adults with mild ID were offered the opportunity to share their thoughts and opinions regarding their living condition (Roll, 2018; Rose et al., 2019). This is the first study in Canada that focused on sedentary behaviours of adults with ID. Also, it is one of the few studies that provided a platform

for adults with ID to speak about their issues directly. During the interviews, adults with ID were given a chance to share their perceptions of being sedentary before and during the COVID-19 pandemic. All collected data originated from adults with mild ID themselves, unlike the more popular method of relying on a family member or a caregiver to communicate on behalf of the person with ID. This showed that, contrary to common misconceptions, adults with mild ID are well spoken and able to advocate for themselves and others with the same diagnosis.

Adults with ID were able to participate in virtual interviews with no difficulties. Considering the financial hardship adults with ID face throughout their lives, conducting a virtual interview is considered a cost-effective method of data collection (Gray et al., 2020). Using the Zoom Video Communication website was a good choice as adults with mild ID were familiar with this platform likely due to its recent popularity and common use due to the COVID-19 pandemic. Also, adults with mild ID did not have to spend additional money to travel for the interviews. They were able to participate in the interviews from their homes or familiar environments at their preferred time, making the study more accessible to them. Additionally, participants used their home internet, and so did not need to cover new or additional costs for having participated in the study.

Some of the study limitations include participants' improper understanding of sedentary behaviours that may have contributed to insufficient reporting, missing information, and lack of follow-up measurements (Bott & Tourish, 2016; Jo et al., 2018; Kim & Yi, 2018; Kostamo et al., 2019; Willems et al., 2018). Other limitations include: (a) the participants in the study may have forgotten important incidents when recalling their experience retrospectively (Bott & Tourish, 2016; Kostamo et al., 2019); (b) CIT is

focused on elements that help or hinder a specific incident or experience, which may limit the level of engagement with a participant's broader life (Viergever, 2019); (c) participants were selected based on the presence of a mild intellectual disability, so their ability to communicate in the interview may have been limited despite authors' attempts at reducing communication barriers during interviews (Dixon-Ibarra et al., 2018).

While the interviews were successfully conducted in a virtual environment due to the COIVD-19 pandemic restrictions, in-person interviews remain important as they capture non-verbal cues and non-spoken language (Roll, 2018; Rose et al., 2019). Hands gestures, head movement, facial expression, and body posture are non-verbal cues that help with data collection while conducting qualitative research. Virtual interviews are sometimes a barrier to identifying these vital non-verbal cues as the angle of the camera, the quality of the internet connection, and a participant's choice not to make use of the video option can prevent parties from observing those cues. Indeed, some of the participants in this study chose to turn off their cameras during the interviews while others directed their cameras to an empty wall. These behaviours were accepted for the participants' comfort, and were found not to prevent the data collector from completing the process of the interview and data collection at the time. However, the availability of non-verbal cues remains crucial in understanding the information shared by participants and analyzing the data collected as it can provide context. Supplementing participants' verbal answers with non-verbal cues would have strengthened the data and findings.

The time allocated for the study was not sufficient to conduct more follow-up sessions with adults with ID, which is considered another limitation of the study. It may have been beneficial for the researcher to organize two follow-up sessions with the study

participants. These sessions should be separated by a few weeks to give adults with mild ID time to retrieve incidents they may have forgotten during the initial interviews. Adults with mild ID are able to remember and recall incidents and experiences retrospectively, but need extra time to do so (Roll, 2018). Adults with ID who partook in the study were highly educated, well-spoken, and able to give detailed information regarding their sedentary lifestyle. They were willing to suggest solutions to their issues that should be considered while developing programs and interventions that decrease sedentary behaviours. Providing adults with ID more chances to share their experiences, whether to add on incidents they forgot or to elaborate on previous answers, would have enriched the collected data and better supported the population in sharing their voices.

The subject of sedentary behaviours of adults with ID is relatively novel; thus, few research studies were previously done. As this topic is new, it affected the process of recruiting participants for this study. The recruitment process of adults with ID was difficult as it went through multiple organizations. Many organizations in Ontario that provide services to adults with ID were contacted to recruit participants. Yet only two organizations responded to the researcher. Recruitment was done electronically due to COVID-19 restrictions through the organization website and social media platforms (Community Living Ontario, 2021; Ontario Disability Coalition, 2021). As a result, adults with ID who are not active on social media or do not have access to electronic devices did not receive the recruitment poster. Therefore, only a selective group of adults with ID were able to participate in the study. This led to a relatively small size sample with specific way of life, which may not represent all adults with mild ID. As this study was exploratory and included only adults with mild ID, the results cannot be generalized

among the entire population of adults with ID. In light of the abovementioned limitations, more studies on the nature and reasons of the abundance of sedentary behaviours in adults with ID is needed.

Recommendation for Future Research

This study should be replicated to include adults with ID from all provinces in Canada in order to better understand their experiences and the nuances that affect those experiences. A bigger sample should be used to give opportunity for more adults with ID to express their opinions and share critical incidents. Also, it will help with generalizing the findings as a bigger sample will more closely represent this specific population. The need of replication is important to further explore potential incidents of sedentary behaviours of adults with ID in the Canadian population. The incidents of sedentary behaviours of adults with ID are likely to differ depending on their province of residence. It is very possible to repeat the study virtually to decrease the cost of travel that would otherwise be associated with a broader study. A combination of in-person and virtual interviews could be very helpful in collecting verbal and non-verbal data. The study should be repeated when the COVID-19 pandemic restrictions are lifted and community and social interaction resume their regular activity. This will ensure that high levels of sedentary behaviours of adults with ID was not solely related to the pandemic, and allow for a better understanding of the impact of the COVID-19 pandemic on this population.

The study can also be duplicated using the same interviews while including family members or caregivers of adults with ID. To further understand the sedentary lifestyle of adults with ID, it is crucial to include the perspective of their family members or caregivers who may be able to provide additional insight on the behaviours and habits

of the study population. Using triangulation could clarify the what-and-why questions about sedentary behaviours of adults with ID. The more perspectives collected, the more in-depth understanding about sedentary behaviours of adults with ID is achieved. This also will allow the researcher to collect data from non-verbal adults with ID as well as adults with ID who are using communication devices. By doing so, more adults with ID could participate in the study and the findings will be more inclusive and representative of this population.

Future studies could add accelerometer devices to accurately measure sedentary behaviours of adults with ID. These devices will provide objective data by measuring time spent being sedentary. Measurements include counting the heart rate of adults with ID while engaging in sedentary behaviours. Also, it will help determine and differentiate time of sedentary behaviours during weekdays and weekends and the influencing incidents. These measures will support the subjective data collected from adults with ID through in-depth semi-structured interviews. Subjective data collected from adults with ID may be less accurate as it is subject to bias. Thus, it is crucial to combine both objective and subjective data when exploring sedentary behaviours of adults with ID. Through the findings, the modifiable incidents leading to increased sedentary behaviours in adults with ID in the Canadian population will be identified. By recognizing these incidents, more strategies and approaches could be developed to decrease sedentary behaviours of adults with ID.

Most adults with ID have other medical and neurological conditions that may affect their level of activities. Future studies may examine these underlying conditions and their effects on increasing sedentary behaviours of adults with ID. It is vital to

identify the incidents that hinder, or increase sedentary behaviours and incidents that help decrease sedentary behaviours of adults with ID. This will aid them to become more active in the community and enhance their health and well-being. More qualitative studies should be conducted to help this vulnerable population engage in more community activities and employment. The findings of qualitative studies will target the expansion of interventions that will help maintain the functional independence of adults with ID. This will aid them to participate in recreation activities provided to them in the community while also improving their quality of life.

The information captured through this study can be used to design more studies that target this topic. The knowledge about incidents that lead to increased sedentary behaviours of adults with ID is considered the starting point for developing approaches aimed at decreasing these behaviours. The findings may contribute to the shaping of future policies, practices, and guidelines that help adults with ID and the community. Implementing affordable and accessible programs that help adults with ID reduce sedentary behaviours is considered the main approach in supporting a healthy lifestyle for this population by adults with ID themselves. These improvements can be measured using adapted measurement scales in addition to in-depth interviews, observations, and diaries. The findings will provide assistance in improving the delivery and policies of health services as they allow for better understanding of sedentary behaviours in adults with ID.

Implications for Practice/Policy

Nurses and other healthcare providers who work with people with ID can benefit from understanding the individual, familial, environmental, and system-level barriers and

facilitators to reducing sedentary behavior. While people with ID face many of the same challenges that other people do in reducing sedentary behavior, this research demonstrated additional constraints such as income and poverty, experiences of stigma, and concerns about safety. With their focus on health promotion, understanding of the social determinants of health, and ethical obligation for advocacy, nurses in a variety of settings should be knowledgeable about ID and have the competencies to effectively work with this population. For all professionals who work in health promotion, strategies should not only include individually tailored interventions, but also advocacy for policy changes at the system level that would enable people with ID to reduce sedentary behavior more easily. Further, it is essential to advocate for the inclusion of adults with ID in conversations that will shape programs, policies, and services affecting this population.

Chapter 7. Conclusion

This study explored the views, perceptions and beliefs of adults with ID living in Ontario, Canada regarding their levels of sedentary behaviours. The research question focused on investigating the factors led to increased or decreased sedentary behaviours specific to this population. This study concluded that four main incidents played a big role in increasing or decreasing sedentary behaviours. Personal related incidents, environmental related incidents, helpful incidents, and recommendations identified by adults with ID were all incidents that enhanced or reduced sedentary behaviours. This study also concluded that adults with mild ID are capable of speaking for themselves, answering questions, and engaging in virtual interviews similar to adults without ID. They can be direct participants in research instead of relying on their support workers or family members to share their views and beliefs. They were able to provide valuable suggestions and recommendations that assisted and aided them to become less sedentary.

Through descriptions of real events, this thesis contributes to the field of nursing and health services by:

- Investigating incidents that led adults with mild ID to become sedentary,
- Exploring incidents that helped adults with mild ID to be less sedentary,
- Presenting insights and perceptions through own-voices of adults with mild ID by capturing the experiences, activities, and hobbies (etc.) they engaged in, and
- Presenting wish-lists/recommendations made by participants regarding ways that adults with mild ID can be supported to become less sedentary.

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Appendix A: **Recruitment Poster**

PARTICIPANTS NEEDED FOR RESEARCH IN

Examining Sedentary Behaviours of Adults with Intellectual Disabilities

We are looking for volunteers who are (1) **adults (18-65),** (2) have **mild intellectual disability**, and (3) able to **communicate verbally** to take part in a study on examining sedentary behaviours of adults with intellectual disabilities **living in Ontario**.

As a participant in this study, you would be asked to participate in multiple virtual interviews using Zoom Communication website.

Your participation is **entirely voluntary** and would take up approximately two hours of your time over two virtual interviews. By participating in this study, you will help us to understand and analyze sedentary behaviours of adults with intellectual disabilities.

In appreciation for your time, you will be invited to choose a $30 gift card for one of the following coffee shops: Tim Hortons, Starbucks, or Second Cup following the interviews as a thank you.

To learn more about this study, or to participate in this study, please contact the researcher

Researcher:
Sana Safi, Master of Nursing student, Athabasca University
ssafi1@athabasca.edu
+1-647-710-2721

This study is supervised by: Dr. Jeff Vallance
jeffv@athabascau.ca
+1-888-441-4651

This study has been reviewed by the Athabasca University Research Ethics Board

Athabasca University

Appendix B: Capacity Assessment Tool

I would like to ask you some questions about the study.

1. Are we offering you a medical care, or are we asking you to be in a research study?
2. Do you have to take part in this study, or is it OK to say ‘no’?
3. Tell me the main thing that you would do in this study
4. Tell me the main risk of this study
5. Tell me the benefits of this study
6. Will this study mainly help you or others?
7. Considering the risks and benefits we have discussed; would you like to take part in this study? Why?

Adapted from UC Davis Alzheimer’s Disease Centre (2002).

Appendix C: Capacity Assessment Record

Research Candidate (RC) Name _____ ID Number _____

Research Study Name _____

Researcher Name _____

Consent Dialogue

1. Was the study presented and discussed with RC? Yes ( ) No ( ) Other: _____

2. Was the study presented and discussed with family? Yes ( ) No ( ) Other: _____

Consent Abilities

3. Did RC make a choice about participating in the study?
   Participate ( ) Not Participate ( ) Defer Decision ( ) Decision Unclear ( ) Other ( )
   Briefly explain: _____

4. Did RC show understand of the study purpose? its risks and benefits?
   Yes ( ) No ( ) Marginal ( )
   Briefly explain: _____

5. Did RC show understand of the study risks and benefits?
   Yes ( ) No ( ) Marginal ( )
   Briefly explain: _____
6. Did RC provide rational reasons for participation/non-participation in the study?
   Yes ( ) No ( ) Marginal ( )
   Briefly explain: _____

Capacity / Informed Consent

7. Was RC competent to consent to participation / not participation in the study?
   Yes ( ) No ( ) Other: _____
   Briefly explain: _____

8. Was informed consent for research participation obtained from the RC?
   Yes ( ) No ( ) Other: _____
   Briefly explain: _____

Completed by: _____ Date: _____
[Signature]

Adapted from University of Alabama (n.d.).

Appendix D: Ethics Board Approval

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: **24383**

Principal Investigator:
Ms. Sana Safi, Graduate Student
Faculty of Health Disciplines\Master of Nursing

Supervisor:
Dr. Jeff Vallance (Supervisor)

Project Title:
Examining Sedentary Behaviours of Adults with Intellectual Disabilities

Effective Date: June 13, 2021 **Expiry Date**: June 12, 2022

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

A Project Completion (Final) Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: June 13, 2021**

Barbara Wilson-Keates, Chair
Athabasca University Research Ethics Board

Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.213.2033

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL - RENEWAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: **24383**

Principal Investigator:
Ms. Sana Safi, Graduate Student
Faculty of Health Disciplines\Master of Nursing

Supervisor:
Dr. Jeff Vallance (Supervisor)

Project Title:
Examining Sedentary Behaviours of Adults with Intellectual Disabilities

Effective Date: June 12, 2022 **Expiry Date**: June 11, 2023

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

A Project Completion (Final) Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: May 27, 2022**

Carolyn Greene, Chair
Athabasca University Research Ethics Board

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Appendix E: Key Interview Questions and Prompts About Sedentary Behaviours in Adults With ID

Demographic Information

Key question	How old are you?
Prompts	In what year were you born?
Key question	What is your sex? (Male, female, prefer not to say)
Key question	What diagnosis do you have?
Prompts	What is the severity of your diagnosis?
Key question	Where do you live?
Prompts	Do you live alone or with others? Do you live in a house or apartment?

Examining and Analyzing Sedentary Behaviour in Adults With ID

Key question	Would you consider yourself an active or a sedentary person overall?
Prompts	On a scale of 0-10, with 10 being extremely sedentary, how would you describe yourself in the past month?
Key question	What does a typical day look like for you?
Prompts	What are your hobbies? (e.g., reading, arts and crafts, knitting, playing a musical instrument while sitting, listening to music while sitting) What activities do you do? (e.g., housekeeping, cooking, napping, self-grooming)
Key question	Do you attend school?
Prompts	Yes: Which school? No: Do you work?
Key question	What do you do for a living?
Prompts	Do you sit while at work? Do you need to use a screen for work purposes? How do you get to work? (e.g., riding a car, bus, train)

Key question	What do you do during leisure time?
Prompts	Morning, evening, weekends? Do you watch television? What do you like to watch more on the television? (e.g., TV show, music videos, news, movies) Do you use any electronic devices? (e.g., computer, cellphone, tablet, video game console) How many hours per day do you watch or work on a device? Which of these activities do you do on your electronic device: phone calls, texting, playing games, listening to music?
Key question	How do you connect with your family and friends?
Prompts	How often do you talk to them per week? What do you do with your family and friends when you spend time together?
Key question	What kinds of things affect your level of activity throughout the day?
Prompts	Do you like to stay home? Yes: What motivates you to stay home? No: What would you prefer to do? What makes it difficult to do…? Do you engage in physical activities? Do you play sports? Do you spend time outdoors, such as for hiking, nature or community walks, running, camping, kayaking, or biking?
Key question	You shared your score to be X on the scale, what increases that number? What kinds of things decrease that number?
Key question	Has COVID-19 been a factor in your activity level?
Prompts	Yes: In what ways? No: What activity were you able to do during COVID-19?
Key question	Have you tested positive for COVID-19?
Prompts	Yes: How do you feel now? How did COVID-19 affect your daily activity? No: Did you come into contact with anyone who tested positive? Yes: How did you feel?

	Were you concerned during the experience? Did it affect your daily activity?
Key question	Have you received the COVID-19 vaccine?
Prompts	Yes: How did receiving the vaccine affect your activity level? No: How did not receiving the vaccine affect your daily activity? Was there any restriction on your ability to go out? Did you stay at home more because you are not vaccinated, compared to before the pandemic?
Key question	Are you satisfied with your current level of activity on a day-to-day basis?
Prompts	Yes: Why? No: How do you think it can be changed?
Key question Prompts	Have you been part of any programs or initiatives to improve your activity level? Yes: What programs? No: What is the reason?
Key question	What types of things do you think would be helpful to you in becoming more active if this was something you desired?
Key question	Is there anything else you want to share about sedentary behaviours?

Adapted from van Schijndel-Speet et al. (2014).

Appendix F: Tabulated Summary of Results

Table 1

Socio-Demographic Characteristics of Study Sample

Characteristics	Frequency	Percentage %
Age	Average = 34.8	Median = 34
Diagnoses of mild ID	5	100
Gender		
Female	4	80
Male	1	20
Post-secondary education	5	100
Employment status		
Full-time	1	20
Casual	1	20
Unemployed	3	60
Living condition		
Ontario resident	5	100
Live in a house	2	40
Like in an apartment	3	60
Social support		
Live with family	3	60
Live alone	2	40
Having a Personal Support Worker	3	60

ID: intellectual disability

Table 2

Themes, Subcategories, and Wish-lists Provided by Participants

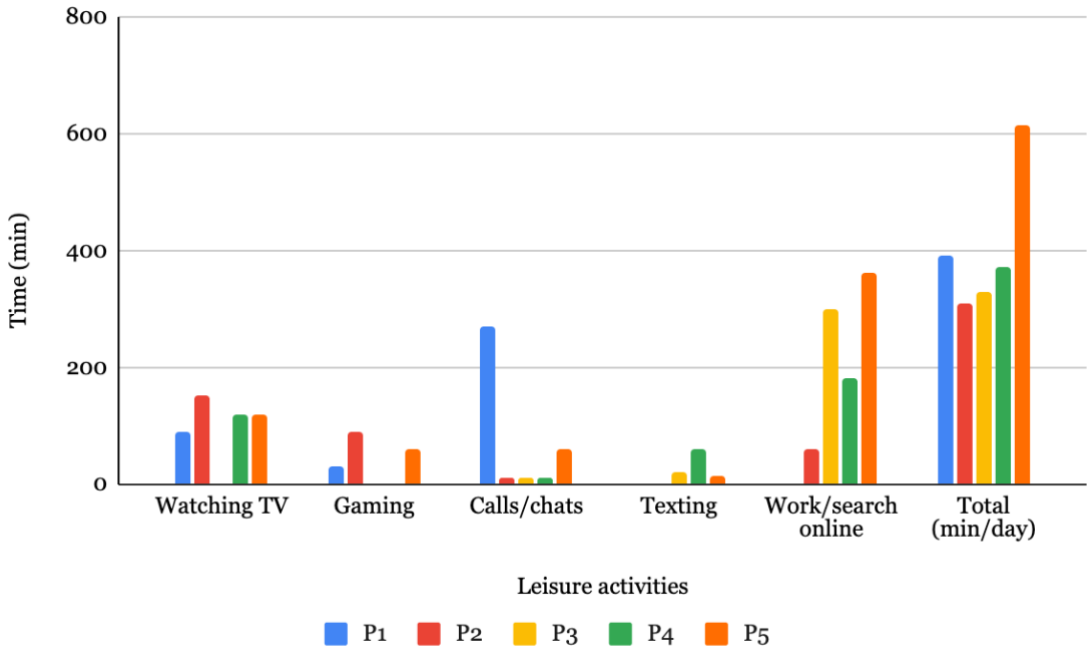
Themes	Number of incidents	Subcategories
Personal related factors (incidents leading to increased SB)	48	Leisure time (19) Hobbies (14) Activities of daily living (12) Health Condition (3)
Environmental related factors (incidents leading to increased SB)	24	COVID-19 (5) Financial hardship (4) Discrimination (3) Safety (3) Weather (3) Lack of social support (3) Distance (2) Noise levels (1)
Helpful factors (incidents leading to decreased SB)	14	Outdoor walking (6) Indoor activity (5) Presence of PSW (3)
Wish-lists / participant suggested factors	16	Resources (8) - Social stories - Sensory tools - Posters - Prizes - Special program (cooking, summer camp) Education (3) Accessibility (3) Increased financial support (2)

SB: sedentary behaviours; PSW: Personal Support Worker

Appendix G: Participants' Time Reporting by Activity

Figure 1

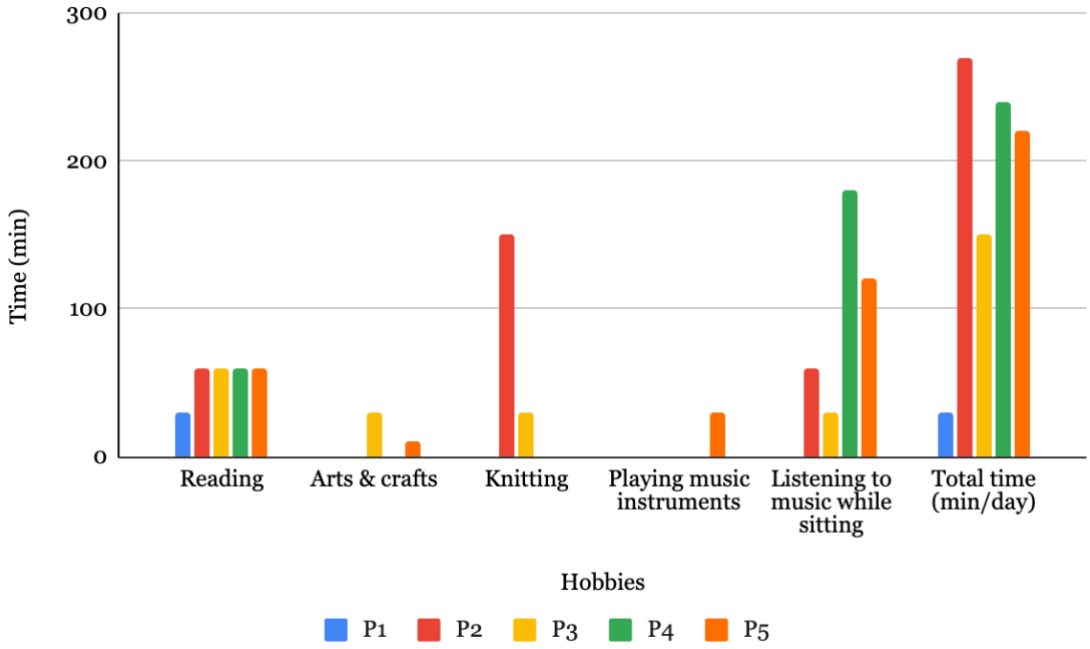
Time Spent on Leisure Activities



Note. Average time spent per day by each participant engaged in leisure activities

Figure 2

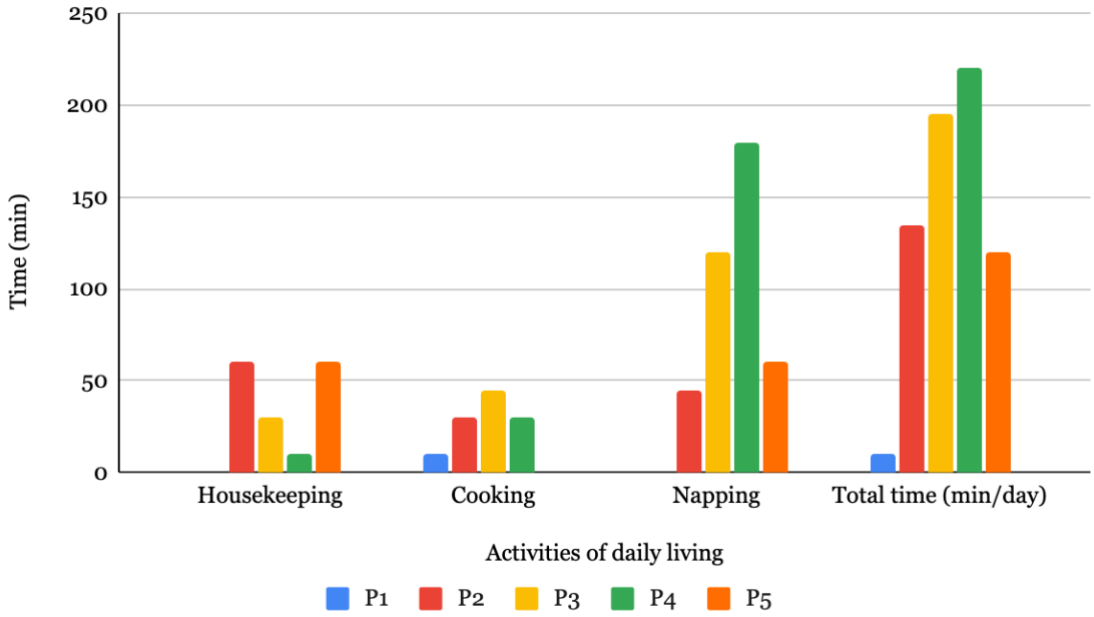
Time Spent on Hobbies



Note. Average time spent per day by each participant engaged in hobbies

Figure 3

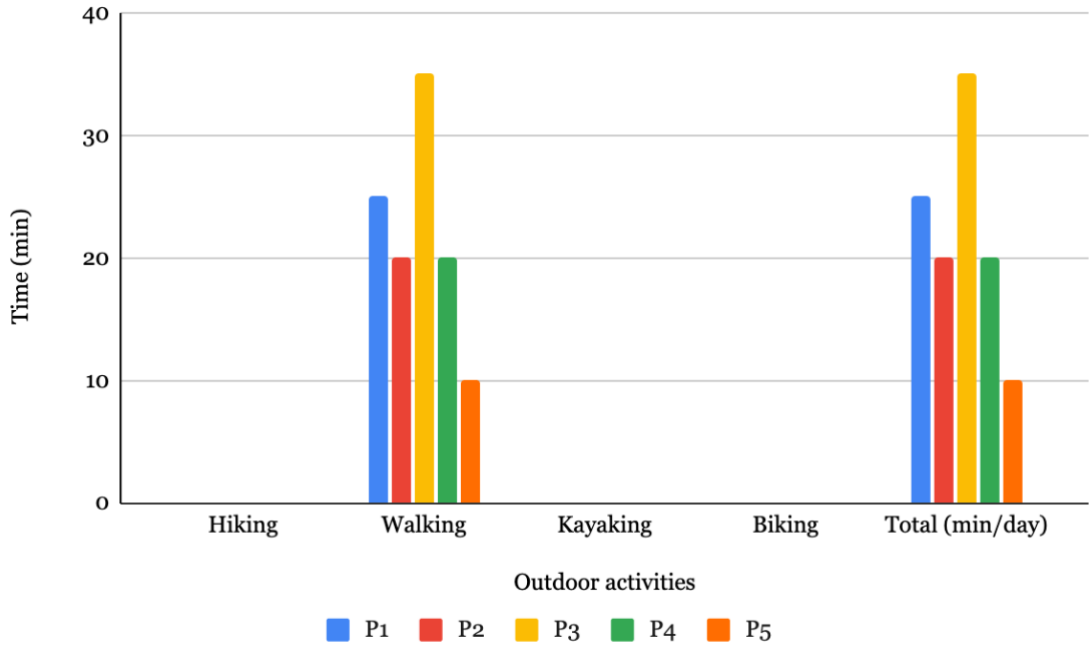
Time Spent on Activities of Daily Living



Note. Average time spent per day by each participant engaged in activities of daily living

Figure 4

Time Spent on Outdoor Activities



Note. Average time spent per day by each participant engaged in outdoor activities