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Evaluation of "Positive Motion" Dance Program

for Older People and People with Disabilities in Atlanta, Georgia

By

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An abstract of

A thesis submitted to the Faculty of the

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Abstract

Physical activity is beneficial for older adults, but those residing in Atlanta have not attained enough physical activity because of personal and social barriers. This study evaluated the impact of “Positive Motion,” a 10-week dance program based out of The Atlanta Dance Academy’s Foundation and included qualitative and quantitative methods to assess the program’s impact on to explore their motivation, facilitators, and barriers to physical activity and evaluate the program. Among the participants, 81.3% were female, and 68.8% were Black/African American. The participants had intrinsic and extrinsic motivations (introjected and identified regulation) for physical activity. The facilitators included social interaction with families and friends/neighbors, while the barriers were personal health conditions and social determinants of health, such as walkability, public transportation. The “Positive Motion” program had high satisfaction, but 50% of the participants dropped out of the program. The evaluation found that the program supports older people who are not very physically active. Older people in Atlanta experienced some social barriers to physical activity, such as neighborhood context, transportation, or inclement weather. The flexible and inclusive culture of the “Positive Motion” program helped the participants to be retained in the program, continue their physical activity, and improve their overall well-being. The program also stimulated their intrinsic and extrinsic motivation. Future program recruitment could be focused on older adults who are not very physically active. Social support for older adults in Atlanta needs to be offered. Future research should investigate participants who drop out of the program.

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Table of Contents

Acronym

CDC	Centers for Disease Control and Prevention
COVID	Coronavirus Disease
IRB	Institutional Review Board
MARTA	Metropolitan Atlanta Rapid Transit Authority
MET	Metabolic Equivalent of Task
MPAM-R	Motives for Physical Activities Measure – Revised
MS	Multiple Sclerosis
PA	Physical Activity
QoL	Quality of Life
RCT	Randomized Controlled Trial
SCT	Social Cognitive Theory
SDOH	Social Determinants of Health
SDT	Self-Determination Theory
SEM	Socio-Ecological Model
TADA	The Atlanta Dance Academy
TPB	Theory of Planned Behavior
TTM	Transtheoretical Model

Chapter 1 Introduction

Today more than 1 in 7 Americans are 65 or older, according to the Centers for Disease Control and Prevention (CDC) (2022a). The number of Americans who are aging at the rate of the population of 65 or older was 15.2% in 2016 and will be 23.4% in 2060 (Vespa, 2018). Among older people, 80% have at least one chronic condition (Healthy aging team, 2021). These common chronic conditions include hypertension, high cholesterol, arthritis, ischemic/coronary heart diseases, diabetes, chronic kidney disease, heart failure, depression, Alzheimer's disease and dementia, and chronic obstructive pulmonary disease (Healthy aging team, 2021). Physical activity (PA) is the main strategy for preventing and treating these diseases. However, many older people suffer from physical *inactivity*, including 26.9% among people aged 65-74 years and 35.3% among people aged 75 years or older (Watson et al., 2016).

The CDC defined PA as any bodily movement produced by the contraction of skeletal muscle that substantially increases energy expenditure (CDC, 2017b). According to the Physical Activity Guidelines for Americans 2nd edition, older adults are recommended to have at least 150 minutes a week of moderate-intensity and muscle-strengthening activities at least twice a week if their conditions are tolerated (United States Department of Health and Human Services, n.d.-a).

Even though PA is essential for older adults, motivation for PA is often challenging (O'Neil-Pirozzi et al., 2022). Older people's motivation for PA varies from person to person depending on their age, gender, and health conditions (Dacey et al., 2008; Stehr et al., 2021). The National Institute of Aging (2020) recommends walking with your coworkers, playing team

sports, and participating in a dance class to keep older people motivated for PA. This strategy is aimed at incorporating PA into social activities (National Institute on Aging, 2020). However, social determinants of health negatively influence older people's health and PA (Baer et al., 2016; Martins et al., 2021). For example, walkability is a significant factor for PA (Van Holle et al., 2014). Because of the complex impact of multiple factors, social determinants of PA are different by various cultural populations (Becerra et al., 2015). Atlanta is the most populous city located in the South and has a huge socioeconomic status discrepancy (Best Neighborhood, n.d.). Therefore, Atlanta has unique social determinants of PA, but little is known about the motivation for PA for older people in Atlanta.

Many intervention trials have been conducted to increase older adults' PA. These interventions have been diverse, from single-component exercises to multi-component trials (de Labra et al., 2015). These single-component exercises are different from each other, such as various aerobic, muscle, flexibility, or balance training (Galloza et al., 2017). In addition, there are few common features of programs or consistent program evaluation methods for PA programs for older adults; the program duration and intensity are diverse, and the outcome can be from physiology, physical function, cognitive function, to social aspects (Esmail et al., 2020; Kendrick et al., 2014; Sun et al., 2021).

The Atlanta Dance Academy (TADA) is a dance studio located in Atlanta. TADA aims to find the joy in movement with a fun, healthy, and collaborative energy for all, provide people with confidence and expression, true body connection, and the learning process of creative arts, and break down the barriers that are often present in more traditional schools of dance

education (TADA, n.d.). TADA launched a dance program for older people with the principal investigator in August 2022.

The thesis project is based on self-determination theory (SDT). SDT is a framework to address factors related to motivation and personality (Ryan & Deci, 2000). SDT defines multi-levels of motivation: amotivation, extrinsic motivation, and intrinsic motivation. SDT suggests three essential needs that support intrinsic motivation: autonomy, competence, and relatedness. The thesis project will use SDT to understand older people's motivation for PA, especially the facilitators and barriers for the population living in Atlanta.

The thesis project will contribute to understanding how to encourage older adults in Atlanta to have more PA. The following are the research questions for this project.

Research questions

- What are the facilitators and barriers to PA for older adults living in Atlanta participating in the program?
- What can improve the motivation for PA for older adults living in Atlanta?
- How can a community dance program contribute to the participants' motivation for PA?

Chapter 2 Literature Review

The following chapter will focus on what has been known about physical activity (PA), older adults' motivation for PA, and social determinants of health (SDOH) for the older adult population as it relates to PA. The topics that will be discussed in this literature review chapter include older Americans in the United States, PA and its guidelines, inactivity for older adults in the United States and Georgia, benefits of PA for older adults, barriers to PA, social determinants of PA, theoretical models to explain PA and create PA interventions, interventions for PA among older adults, and motivation for PA for older people. Lastly, it will have a summary of Chapter 2.

Older Americans in the United States

Out of 328 million Americans, 54 million people (16.5%) were 65 or older in 2019, according to the Census (United States Census Bureau, 2019). The number is expected to increase to 81 million in 2040 and 95 million (about 25%) in 2060 (The Centers for Disease Control and Prevention (CDC), 2022a). The rapidly aging population will create greater demands for healthcare and social security benefits because the ratio of working-age adults to older people will decrease from 3.5 in 2020 to 2.5 in 2060 (Vespa, 2018). The CDC offers guidance to meet health demands of aging populations, including supporting older people with a cognitive disability, helping caregivers, preventing disease, and early detection for preventable diseases (CDC, 2022a). Promoting PA is one of the essential recommendations (CDC, 2022a).

Georgia has an aging population. Out of 10.8 million people in Georgia, 1.6 million people (14.7%) were 65 or older in 2021 (Governor's office of planning and budget, n.d.; United

States Census Bureau, n.d.-b). It will increase to 2.7 million (21.7%) in 2040 and 3.4 million (24.2%) in 2060 (Governor's office of planning and budget, n.d.).

PA and its guidelines

The Physical Activity Guidelines for Americans 2nd edition mentions that adults should have at least 150 minutes a week of moderate-intensity or 75 minutes a week of vigorous-intensity aerobic PA and muscle-strengthening activities at least twice a week (United States Department of Health and Human Services, n.d.-a). On an absolute scale, energy expenditure is addressed using the metabolic equivalent of task (MET). MET is defined as the amount of consumed oxygen (Jetté et al., 1990). Sedentary behavior is less than or equal to 1.5 METs (United States Department of Health and Human Services, n.d.-b). Light-intensity, moderate-intensity, and vigorous-intensity activity are less than 3.0, 3.0 to less than 6.0, and 6.0 or more METs, respectively. Moderate-intensity activities include walking briskly, playing doubles tennis, or raking the yard, while vigorous-intensity activities include jogging, running, carrying heavy groceries, or participating in a strenuous fitness class.

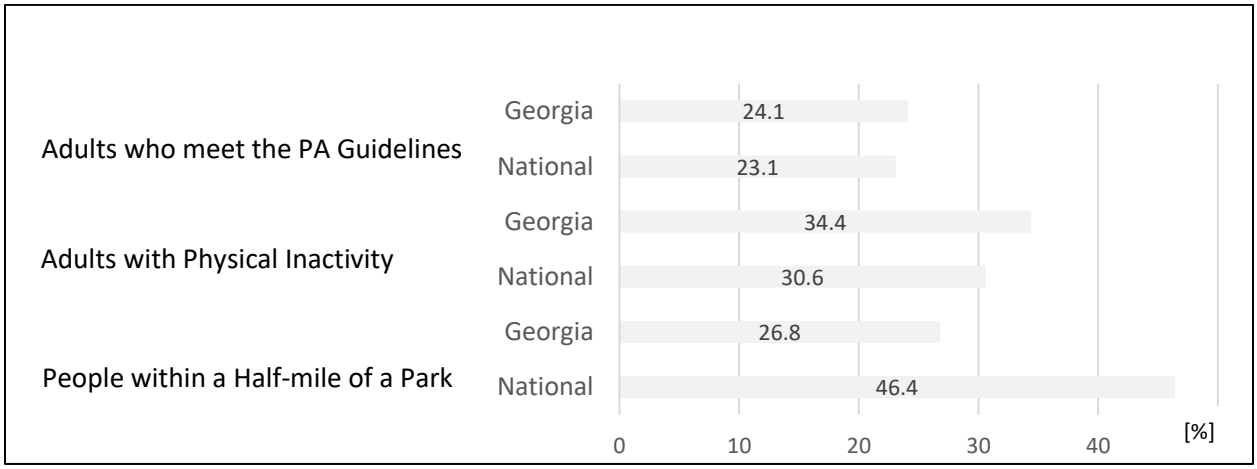
The guidelines above also indicate that the same components apply to older adults, but they do not need to follow the 150-minute rule when their fitness level or chronic conditions do not let them do so. However, they are expected to be as physically active as possible (United States Department of Health and Human Services, n.d.-a). Some experts suggest it is important and realistic to decrease sitting time and increase lower-intensity activity (Sparling et al., 2015). American College of Sports Medicine emphasized the importance of PA for older people in the position stand (Chodzko-Zajko et al., 2009). Moreover, the latest randomized controlled trial

(RCT) suggested that more than five times a week for more than 32 weeks interventions were more beneficial for older adults (Sun et al., 2021).

Inactivity for Older Adults in the United States and Georgia

Although the guidelines advise older people to have at least 150 minutes a week of moderate-intensity PA and twice a week muscle-strengthening activities, the 2014 Behavioral Risk Factor Surveillance System found that 26.9% of those aged 65–74 years and 35.3% of those aged 75 years or more had no PA outside of work (United States Department of Health and Human Services, n.d.-a; Watson et al., 2016). Moreover, only 23.1% of those aged 65 and older met this guideline in 2019 [Figure 1] (America's health rankings, n.d.-a).

Figure 1 Statistics related to PA



In Georgia, the PA rate was worse than the national average. According to the CDC (2019), 24.1% of adults met the guidelines in Georgia in 2019 [Figure 1]. Although Georgia had a higher percentage of people who met the guidelines; in total, people in Georgia had less PA than the national average (America's health rankings, n.d.-b). In 2021, 34.4% of older Georgians reported physical *inactivity*, while the national average was 30.6% [Figure 1]. The rate was

similar in both men and women. The reasons have not have been clearly illustrated, but multiple factors can be related. Georgia has worse accessibility to parks (CDC, 2019). Although 46.4% of the United States population lived within a half-mile of a park, only 26.8% of the population in Georgia did in 2015 [Figure 1] (CDC, 2019)

The CDC (2017a) says that *inactivity* causes 1 in 10 premature deaths and 117 billion dollars per year in health care costs. Therefore, PA needs to be promoted more (Lavie et al., 2019).

Benefits of PA for Older Adults

Numerous exercise interventions have been conducted, and multiple benefits of PA have been reported. At first, regular PA lowers the risk of all-cause mortality. PA also reduces various physical diseases, including cardiovascular disease, hypertension, type 2 diabetes, and cancers, and improves cognition, quality of life (QoL), and sleep (Piercy et al., 2018). These benefits can be applied to healthy older people and senior citizens with frailty (McPhee et al., 2016). The guidelines refer to many other benefits of PA, including less frequency of falls or less severity after the fall (Piercy et al., 2018). To achieve this goal, especially preventing the fall, older adults are advised to perform multi-component PA, including balance exercises in addition to aerobic and muscle-strengthening exercises, which adults in general should conduct.

More specifically, exercise interventions positively impacted older adults' physical health. An RCT showed that incorporating aerobic exercise into motivational interviews enhanced older people with multimorbidity cardiorespiratory fitness (Lo et al., 2020). Another

RCT suggested that dance training improved cardiovascular fitness compared to aerobic training (Esmail et al., 2020). Moreover, a systematic review determined that high-certainty evidence indicated that exercise interventions reduced falls for seniors (Sherrington et al., 2019); a meta-analysis showed that exercise programs reduced fall-related fractures (Wang et al., 2020). However, another review concluded that poor evidence suggested that exercise interventions could decrease the fear of falling for seniors (Kendrick et al., 2014).

Moreover, PA interventions can have more impact beyond physical health. A systematic review with the meta-analysis found that combining aerobic and muscle training contributed to improving cognitive function (Northey et al., 2018). In addition, a meta-analysis found that exercise interventions improved depression symptoms (Schuch et al., 2016). Furthermore, an RCT showed virtual exercise programs reduced loneliness during the coronavirus disease (COVID) pandemic (Gilbody et al., 2021). Another systematic review suggested that PA interventions slowed the decrease in QoL compared to the lecture-based health education groups (Groessl et al., 2019).

Barriers to PA

Regardless of these benefits, there are various barriers to PA for older people (Franco et al., 2015). The obstacles vary from individual unawareness to the importance of PA to the societal system (Franco et al., 2015). Then, the Socio-Ecological Model (SEM) could be beneficial to order a wide range of these obstacles (Bammann et al., 2021). The SEM was developed to illustrate an ecology of human development (Bronfenbrenner, 1977). The SEM has multiple

versions, but the CDC uses a four-level SEM: individual, relationship, community, and societal (CDC, 2022b).

Franco's systematic review of older people's recognition of PA identified six themes: social influences, physical limitations, competing priorities, access difficulties, personal benefits of PA, and motivation and beliefs (Franco et al., 2015). The four themes out of six - physical limitations, competing priorities, personal benefits of PA, and motivation and beliefs - can be classified as an individual level factor in the four-level SEM. The social influences can be assigned to a relationship and community level factor. People's behavior, including their families, friends as well as the PA classes, can influence a person's PA. Finally, the access difficulties are related to a societal level factor in the SEM. The access difficulties include environmental barriers and affordability. Environmental barriers have a wide variety of causes like weather, transportation, safety, programs, or facilities.

Social Determinants of PA

Additional considerations are social determinants of health (SDOH). SDOH are defined as the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and QoL outcomes and risks (Office of Disease Prevention and Health Promotion, n.d.). SDOH can have 5 domains: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context (Office of Disease Prevention and Health Promotion, n.d.).

The statistics in Georgia indicated that PA was related to SDOH. Educational and economics are important factors (Cleland et al., 2012; Rawal et al., 2020). First, education levels are associated with PA. In Georgia in 2021, the ratio of people with less than high school, high school/general educational development test, some post-high school, and college graduate, who had physical *inactivity* were 42.5, 34.3, 23.0, 12.7%, respectively (America's health rankings, n.d.-b). Next, income levels are related to PA too. In Georgia in 2021, the ratio with income of less than $25,000, $25,000 to less than $50,000, $50,000 to less than $75,000, $75,000 or more, who had physical *inactivity* were 39.4, 27.3, 22.4, 12.5%, respectively (America's health rankings, n.d.-b).

Other SDOHs are also associated with PA. Martins (2021) described multiple factors related to physical *inactivity*, such as low socioeconomic status, level of knowledge of PA, using public transportation, or being in the oldest age group. Lower socioeconomic status can be related to a lack of PA-related resources and unequal opportunities (Devereux-Fitzgerald et al., 2021).

From a neighborhood and built environment perspective, public transportation could be related to increased PA (Laverty et al., 2018). Atlanta was tied as one of the second longest commute time for public transportation users among the 20 largest cities in the United States (Geotab, n.d.). Even for car users, Atlanta was ranked fifth (Geotab, n.d.). Senior drivers had more PA than senior non-drivers (Amagasa et al., 2018). Also, despite inadequate evidence, infrastructure interventions are recommended with additional interventions (Devereux-Fitzgerald et al., 2021).

Another SDOH neighborhood and built factor is walkability. Better walkability is connected to a higher amount of walking for older people (Van Holle et al., 2014). Then, it is positively associated with PA (Colley et al., 2019); it is also related to a higher possibility of reaching 100 years old (Bhardwaj et al., 2020). However, walkability is not the only determining factor, and more profound context, including history and geography, should be assessed because multiple factors are linked in a complicated way (Braveman & Gottlieb, 2014).

Especially for people with disabilities, walkability and transportation could be more difficult (Bezyak et al., 2020). Metropolitan Atlanta Rapid Transit Authority (MARTA) is a public transportation agency in Metro Atlanta (MARTA, n.d.-a). Even though MARTA is designed to accommodate people with disabilities, MARTA Mobility services are available for people whose disabilities make it harder to use MARTA fixed services (MARTA, n.d.-b). MARTA sometimes provides people with door-to-door services when requested (MARTA, n.d.-b).

The walkability/transportation barriers are so diverse and complicated that each community or group of people has its own barrier (Becerra et al., 2015). One study suggested ethnic minorities were likely to suffer from insufficient institutions or access to support, resulting in inadequate PA (Seefeldt et al., 2002). On the other hand, another research mentioned that no racial difference was observed among prostate cancer patients, but the stage of the diseases was more influential to the amount of PA (Halbert et al., 2021). Motivation is an essential component of engaging in PA for the population who do not have social determinants of PA (Bernard et al., 2020).

A lack of social support is related to the social and communal determinant of PA. Among older people in England, isolated people had longer sedentary time (Schrempft et al., 2019). In Canada, older adults who do not live alone had more PA (Chad et al., 2005). A systematic review supports that social support, especially from family, is more related to PA (Lindsay Smith et al., 2017). Quantitative research on older people in the Czech Republic showed that self-efficacy and social support were related to self-regulation, which is associated with PA (Mudrak et al., 2017). In addition, a group-based intervention worked better to increase PA than personal intervention (Cleland et al., 2012).

Even though the factors are not simply connected, it is vital to educate older people about the benefits of PA and make PA opportunities more accessible (Franco et al., 2015).

Theoretical Models to Explain PA and Create PA Interventions

The PA for older people needs to be assessed with theory because the intervention with theory is more effective (Muellmann et al., 2018). However, using one theory could be more helpful than using more than one theory, and there is no difference in usefulness between each theory (Gourlan et al., 2016). The motivation for PA is associated with constructs of the Theory of Planned Behavior (TPB), Transtheoretical Model (TTM), and Social Cognitive Theory (SCT) (Pinto & Ciccolo, 2011). A systematic review of TPB showed that goal setting, action planning, and credible source are frequently used techniques to change behaviors (Senkowski et al., 2019). A dimension of Stages of Change in TTM can be related to the level of PA for older adults (Jiménez-Zazo et al., 2020). A systematic review demonstrated that SCT, especially the components of self-efficacy and goals, helps explain PA (Young et al., 2014). In addition, a

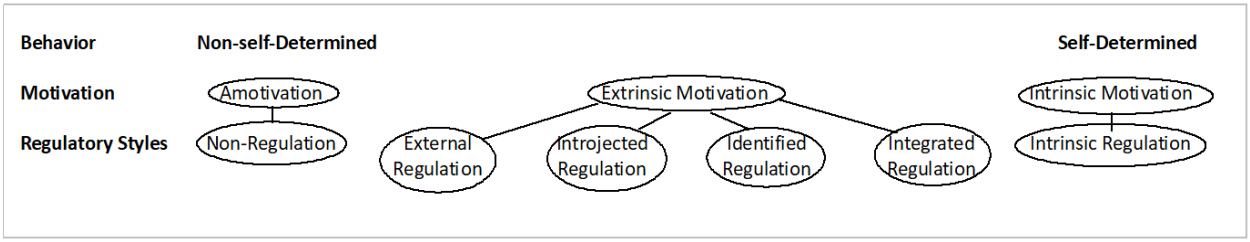
systematic review of self-determination theory (SDT) explains that intrinsic motivation for PA is related to more positive exercise participation (Teixeira et al., 2012). The SEM helped explore relevant themes about older people's thoughts about walking (Leung et al., 2021). Qiao et al. (2021) developed a measurement to assess beliefs in PA among prefrail and frail older people based on Health Belief Model and TPB. Furthermore, the PRECEDE-PROCEED Model has been used to develop multi-level interventions (Bammann et al., 2021).

The theoretical framework for this thesis project was SDT. The theory is an approach to human motivation and personality (Ryan & Deci, 2000). The theory has been utilized in many situations, including health, sport, education, and work (University of Rochester medical center, n.d.).

In SDT, motivation is classified into three types: amotivation, extrinsic motivation, and intrinsic motivation [Figure 2] (Ryan & Deci, 2000). Intrinsic motivation encourages people to do some activities due to their inherent satisfaction (Deci & Ryan, 2013). In extrinsic motivation, people do the activities to get results different from the activities themselves, but extrinsic motivation can have various types based on the degree of autonomy (Ryan & Deci, 2000). Extrinsic motivation includes four types of regulation. The four types are between amotivation and intrinsic motivation and are 1) ordered external regulation, 2) introjected regulation, 3) identified regulation, and 4) integrated regulation [Figure 2]. External regulation is most similar to amotivation, and integrated regulation is most similar to intrinsic regulation. With external regulation, people conduct behaviors to obtain a necessity externally. Introjected regulation indicates a mainly external motivation related to an individual's feeling, such as guilt, anxiety,

or ego. Identified regulation is a more self-determined form of motivation, and individuals take the behavior as important. Integrated regulation is the most self-governing motivation with expectations for the outcome for the behavior. The classification was stated in one of six sub-theories, organismic integration theory, within SDT.

Figure 2 Type of Motivation based on Self-Determination Theory



Also, SDT explains that three innate psychological needs, which are autonomy, competence, and relatedness, will foster people's motivation and participation for activities. Autonomy is the feeling an individual voluntarily chooses something (University of Rochester medical center, n.d.). Next, competence is the feeling an individual is improving something. In addition, relatedness is the feeling a person is connected to someone or groups. Especially autonomy and competence will stimulate intrinsic motivation (Frederick & Ryan, 1995). Relatedness is also somewhat important for intrinsic motivation to secure the base (Ryan & Grolnick, 1986). It was mentioned in another among six sub-theories, cognitive evaluation theory (Ryan & Deci, 2000). SDT is appropriate for illustrating PA motivation and behavior (Hagger & Chatzisarantis, 2008; Teixeira et al., 2012).

Interventions for PA among Older Adults

Encouragement and intervention for PA are critical for older people. Older people tend to sit longer (be sedentary), so it is necessary to assist them in participating in some activities with others (Palmer et al., 2019). In addition, better physical ability could lead to better cognitive function for older people (Arrieta et al., 2018). Therefore, interventions to encourage older people to have more PA have to be developed and implemented (Knott et al., 2021).

Many intervention trials have been conducted, but the ideal program remains unclear (de Labra et al., 2015). This de Labra et al. systematic review included nine RCTs. Six were multi-component interventions, including aerobic and muscle training. Two of the six included progressive resistance training, and the other four involved functional walking, balance exercises, or circuit training. The other three were single component interventions, mainly focused on muscle training. These nine RCTs had diverse measurement methods from effect on falls, mobility or functional ability, muscle strength, to body composition. Overall, they showed positive results, but each study had a variant effect size.

The guidelines recommend combining aerobic and muscle-strengthening exercises, including balance exercises based on the research (United States Department of Health and Human Services, n.d.-a). A new RCT had combined physical and cognitive training to improve the gait speed, although it did not significantly improve the gait speed compared to the physical training alone (Sipilä et al., 2021).

A recent RCT compared the efficacy of group-based exercise programs: similar age same gender group, similar age mixed gender group, and mixed age mixed gender group as a

control (Beauchamp et al., 2018). The first two groups had a higher attendance rate for the intervention than the control group. It suggested that the group should be age-targeted.

Another style of PA intervention for older adults is dance. The review showed that dance interventions generally improved physical and cognitive abilities and had high participation rates (Hwang & Braun, 2015; Liu et al., 2021). The benefit of dance was also indicated for the population with mobility disabilities (McNeely et al., 2015; Meng et al., 2020). Older adults recognized dance as fun activities and enjoyed socialization through dance (Bungay et al., 2022). The style of dance did not affect significant impact in older people (Hwang & Braun, 2015). Dance participation is social and cultural activity and can be one of SDOH (Stewart & Irons, 2018). Dance's impact on wellbeing has not been researched in some neglected communities (Sheppard & Broughton, 2020). In Atlanta, Tango intervention was conducted, and socialization was detected as participants' motivation regardless of participants' mobility levels (Hackney et al., 2013; Zafar et al., 2017).

These interventions' results suggest that PA can be beneficial regardless of the formats. However, more research needs to be conducted to ascertain specific suggestions for each older adult and determine their effects.

Motivation for PA for older people

Little research about the motivation for PA has been conducted for older people, although the population is growing (Spiteri et al., 2019). An RCT indicated that older people need more reasons than their health benefits when they start or continue their behaviors (Parra et al., 2019). Different generations have different motivations for PA, and the factors

change as people age chronologically. In addition, the factors vary based on the situation for PA, such as leisure and transport (Bauman et al., 2012). In adolescents, an exercise-supportive environment and positive recognition for PA will increase their PA (Palmer et al., 2020). In younger adults, better body image and health contribute to more PA (Ashton et al., 2017).

Older adults' motivation varies based on age, gender, or health conditions (Dacey et al., 2008; Stehr et al., 2021). Six factors to affect motivation were detected, including health and fitness, social/emotional benefits, weight management, stress management, enjoyment, and appearance; enjoyment was related to more PA level and connected socialization and music (Dacey et al., 2008). For people living in senior living facilities, some factors, such as the quality and place of the PA program, staff limitations, physical health and activities of daily living, perception of PA, perception of health status, and interest in PA and community involvement, specifically impact the motivation for PA (Bender et al., 2021; Vos et al., 2019). Previous qualitative research has found other perspectives of older adults to exercise interventions. Research on patients with myeloid neoplasms discovered that the patients perceived that walking and resistance exercises were feasible and that the patients valued preserving existing physical functions (Loh et al., 2021). Older people with visual impairment had similar facilitators and barriers to exercise interventions to people without visual impairment (de Jong et al., 2021). Also, older adults with post-traumatic stress disorder indicated the importance of shared experiences with other participants as a facilitator of participation to exercise interventions (Browne et al., 2021). Another research for pre-frail and frail older adults pointed out the

difficulty of getting information about exercise opportunities and the importance of exercise recommendations from their general practitioners (Jadczak et al., 2018).

In general, intrinsic motivation is essential for older people (Stehr et al., 2021). The National Institute of Aging suggests several tips for older adults to start and continue their PA. One of them is "make exercise a social activity." As one example, the National Institute of Aging recommends participating in a dance class to keep older people motivated for PA (National Institute on Aging, 2020). Dance is one of the most efficient methods to encourage older people to have more PA (Hwang & Braun, 2015). Dance improves functional capacity, cognitive functions, and QoL (Gronek et al., 2021; Rodríguez & Paris-Garcia, 2022; Rudolph et al., 2018). In addition, dance improves social participation, mood, and self-confidence, which could lead to sustainable lifetime engagement because people perceive the dance as fun (Lakes et al., 2016; Merom et al., 2013). Then, strict classes could decrease the participants' motivation and participation (Rudolph et al., 2018).

Summary of Chapter 2

The literature review found that PA activity among older adults in Georgia is suboptimal. Although PA benefits the population in various aspects, barriers, including SDOH, still exist. To overcome the barriers, there are many types of interventions for older adults to increase PA with varying results. Dance intervention is as beneficial as other kinds of PA interventions and can encourage participants on socialization. SDT helps demonstrate individual's motivation for PA. Each group has a different motivation for PA, but intrinsic motivation is the key. In Atlanta, how dance intervention impacts on older people in terms of SDOH is still unknown.

Chapter 3 Methods

This chapter will describe the research methods for the project. It will describe inclusion and exclusion criteria, research design and intervention, procedures, measures, data analysis, and data storage.

This thesis project was a formative evaluation of motivation for dance as physical activity (PA) for older people and included surveys and focus groups. The principal investigator (thesis student) collaborated with The Atlanta Dance Academy (TADA). TADA and the principal investigator (ST) launched a 10-week dance program for older adults in August 2022, named "Positive Motion." The principal investigator asked the dance program participants some questions about the motivation for PA and the change in their recognition of PA through the dance program. The Institutional Review Board (IRB) review and approval were obtained from Emory IRB. All research-related recruitment materials underwent review by the IRB. Investigators promptly informed the IRB of protocol. All personnel involved in the study had the appropriate IRB training and certification before the study started.

Inclusion and Exclusion Criteria

The research participants were recruited from the dance program "Positive Motion" participants. The inclusion criteria included individuals who are: 1) 50-year-olds or older, 2) residents in greater Atlanta, and 3) people who can attend a 45-minute weekly dance program. The exclusion criteria included those individuals who had: 1) severe physical disability thus limiting participation in a weekly 45-minute dance program, 2) severe cognitive disability who could not understand the contents of the research or complete the assessments, and 3)

unstable physical problems that caused a dance instructor or researcher to withdraw their participation.

Research design and Intervention

The study design was a pre-post-test evaluation combined with focus groups. The participants completed the surveys and attended focus groups twice. TADA had ten 45-minute weekly dance classes. Volunteer dance instructors taught weekly dance classes. The program included a 5-minute warm-up and a 5-minute cool-down. The classes always used music and encouraged the dance participants to feel the music, stretch, and move their bodies. The program is 2.0-3.5 Metabolic Equivalent of Task (METs) based on the participants' posture on dancing, sitting or standing. The dance program was provided free of charge. TADA is located in a commercial shopping center which includes a supermarket, several restaurants, and a movie theater, in Atlanta. The participants had available free parking. In addition, several bus stops were accessible.

Procedures

The research participants completed a baseline survey and attended a focus group between the first dance program and the third dance session as baseline data collection. Then, they completed an after-program survey and focus group after the tenth dance session as an after-program data collection.

The researchers or employees at TADA asked dance program participants to participate in the research. When a prospective participant was interested in participating in research, the

principal investigator gave more detailed explanations based on the consent document reviewed by IRB. The consent was obtained in a written format.

The principal investigator and another research member (KJ) performed the survey and focus group. They gave the participants pens and paper for the survey. In the focus group, the principal investigator and research staff (KJ) invited all the participants to talk. The baseline survey took 10-50 minutes. The baseline focus group took 14-63 minutes. The after-program survey took 5-30 minutes. The after-program focus group took 31-48 minutes. All the focus groups were recorded with a voice recorder after the primary investigator got additional verbal permission to record from the research participants.

The researchers conducted baseline and after-program surveys and focus groups at TADA or a senior living facility, some participants' residences or workplaces. The researchers provided the research participants with water and refreshments when they had surveys and focus groups. The researchers also gave a $50 Kroger gift card to a participant when they finished the baseline and after-program surveys and focus groups and eight or more out of 10 dance sessions.

Measures

The baseline survey included a survey about the participants' demographic data, PA level, Motives for Physical Activities Measure – Revised (MPAM-R) for motives for PA, and EQ-5D-3L for quality of life (QoL). Demographic questions included age, gender, race/ethnicity, education level, people living together, housing conditions, marital status, household income,

transportation to TADA, height, weight, and chronic conditions. PA level asked about recognition of a level of their PA and genres, frequency, and amount of their PA.

The MPAM-R is a scale to evaluate reasons for participation in PA (Center for self-determination theory, n.d.). It has 30 questions of 7 Likert (1-7) scales. These questions assess five motivations for PA: fitness, appearance, competence, social, and enjoyment. MPAM-R was developed based on SDT and validated (Ryan et al., 1997). Higher scores mean applicable motivation for PA.

EQ-5D-3L is a non-disease-specific measurement to describe and value health states, which is health-related QoL (EuroQol Group, 1990). EQ-5D-3L consists of 2 components (EuroQol Office, 2022). One is five questions of 3 Likert (1-3) scales: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. In this part, lower scores mean better status. The other is a visual analog scale (0-100) about self-rated health. In this part, higher scores indicate better status. EQ-5D-3L was developed by EuroQol Group (EuroQol Group, 1990; Shaw et al., 2005).

The baseline semi-structured focus group included eight questions about the facilitators and barriers to PA and the impact of their living conditions on PA.

The after-program survey included MPAM-R, EQ-5D-3L, and a program satisfaction question. The program satisfaction question was a 5-Likert (very satisfied, satisfied, somewhat, dissatisfied, and very dissatisfied) scale question about the satisfaction of the 10-week dance program. A higher score means higher satisfaction.

The after-program semi-structured focus group included seven questions about the program's impact on their perception of PA and the motivation change throughout the program.

The participants were asked to complete the surveys using paper and pens. The researchers helped the participants fill out the surveys, if needed. The researchers facilitated semi-structured focus groups about PA and barriers/facilitators to staying physically active. The researchers asked the participants to let the researchers audio-record, document, and summarize all of the comments.

Data Analysis

The researchers analyzed the baseline and after-program surveys with SAS software version 9.4. Data was entered into Excel and run in SAS. Descriptive statistics were conducted. For reference, Mann Whitney U tests were conducted to compare the motivation for PA and QoL between the baseline and after-program data. For sub-analysis, Mann Whitney U tests were conducted to compare the demographic data, PA level, motivation for PA, and QoL between people who did not finish the program (the *drop* group) and people who finished the program (the *retention* group). Significance level was set to $p<0.05$.

The focus groups discussions were audio-recorded. The primary investigator transcribed audio-recordings into Word documents. A codebook was developed by main questions and answers. The primary investigator read and coded qualitative focus group data and summarized it into themes using the transcripts of the recordings. The primary investigator used MAXQDA 2022 for the coding and analysis. The thematic analysis summarized key themes. Deductive and

inductive thematic analysis was done (Hennink et al., 2020). Deductive coding was based on the questions in the interview guide. Inductive coding was based on the themes the participants brought. The recordings will be destroyed one year after transcription.

Data Storage

Participant demographic, surveys, and focus group data were collected and stored on password-protected research drives for one year at the Rollins School of Public Health. The researchers maintained the paper surveys in a locked cabinet or office at Rollins School of Public Health or were secured online with a password. Survey data were also stored on password-protected research network drives at Rollins.

Chapter 4 Results

This chapter will cover the survey results and the focus group results. The survey results include demographics, physical activity (PA) level, motivation for PA, quality of life (QoL), and program satisfaction. Also, the focus group results include three themes, facilitator for PA, barriers of PA, and program evaluative feedback.

For the research, 16 people agreed on participation in the "Positive Motion" program. Out of 16 people, all completed the baseline survey, and 15 participants participated in the focus group. After 10-week program, eight people (we can call them *retention* group) participated in the after-program survey and focus group. The other 8 people (we can call them *drop* group) dropped out of the dance program. The principal investigator and another researcher (KJ) tried to follow up the drop group, but none of them came back for the after-program survey and focus group.

Survey Results

Demographics

The demographics of all the participants at baseline are shown in Table 1. Most participants were female (n=13, 81.3%) and African American (n=11, 68.8%). The mean age was 68.7 ± 10.3 (64.1 ± 7.2 in the drop group, 72.8 ± 11.3 in the retention group; not statistically significant), and the mean body mass index was 28.3 ± 6.8. Out of 16 participants, nine people (56.3%) came to The Atlanta Dance Academy (TADA) by car, and the other seven people (43.8%), including four residents (25.0%) and three employees (18.8%) of a senior living facility, came by the facility bus.

Table 1 Demographic of Positive Motion Participants (n=16)

		Mean ± Standard Deviation
Age		68.7 ± 10.3
Height [cm]		165.2 ± 10.0
Weight [kg]		77.4 ± 20.4
Body Mass Index		28.3 ± 6.8
		Number (%)
Gender	Female	13 (81.3%)
	Male	2 (12.5%)
	Non binary	0
	Other	0
	No Answer	1 (6.3%)
Race/Ethnicity	white	2 (12.5%)
	Black/African American	11 (68.8%)
	Hispanic	0
	Asian	0
	Native American	0
	Other	1 (6.3%)
	No Answer	1 (6.3%)
Education	Not Graduated from High School	0
	Graduated from High School	5 (31.3%)
	Graduated from Undergraduate or Professional School	8 (50.0%)
	Higher	2 (12.5%)
	No Answer	1 (6.3%)
Living situation	Live Alone	4 (25.0%)
	Live with One Person	4 (25.0%)
	Live with Two People	1 (6.3%)
	Live with Four People	1 (6.3%)
	Live in a Senior Living Facility	4 (25.0%)
	No Answer	2 (12.5%)
Travel to TADA	By Car	9 (56.3%)
	By Senior Living Facility Bus	7 (43.8%)

Note: TADA: The Atlanta Dance Academy.

PA Level

The participants' self-reported level of PA is shown in Table 2. Out of 16 participants, 9

participants (56.3%) were satisfactorily or very physically active. All four participants who answered “very physically active” dropped out of the dance program. All 16 participants mentioned they were doing something out of sitting in a day. Out of them, 9 participants (56.3%) mentioned walking as their primary PA; 5 people (31.3%) described walking as their secondary PA. Regarding the primary PA, 14 participants (87.5%) did their primary PA more than 3 times a week; 11 participants (68.8%) did it for an hour or longer. Out of 16 people, 13 people (81.3%) practiced muscle training once a week or more often.

Table 2 PA Level of Participants

	Number (%)		
	All	Drop	Retention
Not Sufficiently Active	1 (6.3%)	0	1 (12.5%)
Some Physically Active	6 (37.5%)	3 (37.5%)	3 (37.5%)
Satisfactorily Physically Active	5 (31.3%)	1 (12.5%)	4 (50.0%)
Very Physically Active	4 (25.0%)	4 (50.0%)	0

Motivation for PA

We explored motives for PA and QoL before and after the program. The result of Motives for Physical Activities Measure – Revised (MPAM-R) is shown in Table 3. The mean at baseline was 5.5 ± 1.4 and the after-program was 5.8 ± 1.3. The participants had the highest score (baseline 5.9 ± 1.5, after-program 6.5 ± 0.5) in fitness category, the second highest score (baseline 5.8 ± 1.3, after-program 6.1 ± 1.4) in interest/enjoyment category and the lowest score (baseline 4.9 ± 1.7, after-program 5.0 ± 1.7) in social category. In the social category, the lower scores among 15 group participants (one participant’s score was missing) was 1.6 (a participant who dropped out of the program) and 2.2 (a participant who retained). There was no significant score difference between baseline and after-program survey in any

classifications.

Table 3 MPAM-R

	Baseline (Mean ± Standard Deviation)	Post-program (Mean ± Standard Deviation)
Total	5.5 ± 1.4	5.8 ± 1.3
Interest/Enjoyment	5.8 ± 1.3	6.1 ± 1.4
Competence	5.7 ± 1.4	5.6 ± 1.5
Appearance	5.2 ± 1.4	5.5 ± 1.1
Fitness	5.9 ± 1.5	6.5 ± 0.5
Social	4.9 ± 1.7	5.0 ± 1.7

Note: Each question is 1-7 Likert scale. The higher scale means the reason that applies for a participant.

QoL

The result of EQ-5D-3L is shown in Table 4. The participants had the highest score (baseline 1.6 ± 0.7, after-program 2.0 ± 0.8) in pain/discomfort category and the lower score (baseline 1.1 ± 0.3, after-program 1.3 ± 0.5 in self-care and baseline 1.2 ± 0.4, after-program 1.1 ± 0.4 in anxiety/depression category.) There was no significant difference between baseline score and after-program score in any category. The mean score of today's QoL decreased from 74.6 ± 22.8 at baseline survey to 60.0 ± 17.7 at after-program survey. In the baseline score, the mean score of today's QoL was 84.8 ± 17.5 and 64.4 ± 24.0 for the drop group and the retention group, respectively, which was statistically significant different ($Z=2.06$, $p = 0.04$).

Table 4 EQ-5D-3L

	Baseline (Mean ± Standard Deviation)	Post-program (Mean ± Standard Deviation)
Mobility	1.6 ± 0.5	1.5 ± 0.5
Self-care	1.1 ± 0.3	1.3 ± 0.5
Usual activity	1.4 ± 0.5	1.6 ± 0.5
Pain/Discomfort	1.6 ± 0.7	2.0 ± 0.8
Anxiety/Depression	1.2 ± 0.4	1.1 ± 0.4

Today's QoL	74.6 ± 22.8	60.0 ± 17.7

Note: QoL: Quality of Life. Mobility, self-care, usual activity, pain/discomfort, and anxiety/depression is 1-3 Likert scale. The higher scale means the problem applies to a participant. Today's QoL is 0-100 Likert scale. The higher scale means a better QoL.

Program Satisfaction

Out of 8 participants at the after-program survey, 6 (75.0%) and 2 (25.0%) participants were very satisfied and satisfied with the "Positive Motion" program, respectively.

Focus Group Results

The key findings of thematic analysis of focus groups are shown in Table 5. The three themes were identified deductively: 1) facilitator for PA, 2) barriers of PA, and 3) program evaluative feedback.

Table 5 Thematic Analysis Results of Focus Group

Theme	Sub-theme	
Facilitator for PA	Intrinsic motivation	
	Social support	Family, Friends/Neighbors
	Transportation	MARTA Mobility Bus
Barriers of PA	Health conditions	Health conditions, COVID pandemic
	SDOH	Neighborhood context, Transportation in Atlanta, Increment weather
Program evaluative comments	General evaluation	
	Program characteristics	Socialization, Diversity and inclusion, Program flexibility
	Program Impact	Impact on eating habits, Impact on mental health

Note: COVID: Coronavirus Disease. MARTA: Metropolitan Atlanta Rapid Transit Authority. SDOH: Social Determinants of Health.

Theme 1: Facilitator for PA

The key facilitators to PA were intrinsic motivation, family, friends/neighbors, and Metropolitan Atlanta Rapid Transit Authority (MARTA) Mobility Bus. Family and friends/neighbors are grouped into social support; MARTA Mobility Bus is a transportation. Both groups are classified as social determinants of health (SDOH).

First, some participants expressed their intrinsic motivation.

Intrinsic Motivation

They participated in the program because they liked dancing.

"I wanna go dancing privately once a week. That's my ultimate goal."

"I just love to dance."

"We didn't know what to explain this (our motivation). But after we got there (TADA) and found out what it (the 'Positive Motion' program) was about, it became interesting."

Second, social support was identified as a key facilitator for PA. It includes family and friends/neighbors.

Family

Family can mainly be a facilitator for PA for example when a person takes care of their children/grandchildren.

"My grandchildren. They keep moving me."

Also, the participants discussed that family was supportive when they had safety issues

in their neighborhood and helped them walk outside.

"I used to hike a lot of more. I don't hike as much because of the safety issues. … my husband will go with me."

A family member could be a facilitator for PA if they served as a bad role model, who did not do many PAs and got sick.

"She (my mother) needs help at the time. She was in good health, she does (did) anything, but she cannot (could not) anymore (because of her illness). You have to do (I had to take care of her) everything for her. I wonder why it's like that. I think I don't wanna be like that. I have to keep moving and moving."

Friends/Neighbors

Interaction with friends or neighbors was also a good facilitator for PA. Having time with friends was a good reason to jointly participate in PA.

"Just me, my neighbor, or walk. That's it. Today we go shopping in IKEA because she's never been to IKEA, so I told her, I said, well, why don't we go to IKEA, for me, that's the walk."

Walking in the neighborhood as PA was a facilitator because people reported having interactions with neighbors.

"When I walk in my neighborhood ... And I walk, sometime people say 'Oh, Hi!'"

There is no clear difference as a facilitator for PA between family and friends.

"I called her (my sister), when I was having a heart attack. ... My sister was on vacation

with her husband. ... She (my friend) stayed with me the whole time (in the hospital). ... (In general,) We all need that special someone who you know is gonna come to your rescue. And it's not always your family. ... My first trip to Italy, it was with her (the friend) and her family, because they were Italian, and she said, 'Come with us to my cousin's wedding.'"

Next, transportation was detected as another key facilitator for PA. More specifically, MARTA Mobility Bus was mentioned.

MARTA Mobility Bus

A senior living facility residents and employees came to TADA with their bus. However, one day it broke down and became unavailable. They began to use MARTA Mobility Bus while they could not use their bus. MARTA Mobility Bus delivered the residents and the employers from the senior living facility to TADA and prevented them from dropping from the "Positive Motion" program.

"When we, you know, have the issue with our van, ... I said, 'Well, we have to find another way to get there (TADA.)' You know, and so that's when we started utilizing MARTA services. … They (other senior living facility) could utilize their (MARTA Mobility) service (to join the dance program.)"

<u>Theme 2: Barriers of PA</u>

We explored barriers to PA. The main themes consisted of health conditions, Coronavirus Disease (COVID) pandemic, and SDOH area such as neighborhood context, transportation in Atlanta, and increment weather.

Health Conditions

Personal health conditions negatively affect their PA. Sometimes, health conditions directly affected participants' ability to walk.

"It's my health. I'm diabetic, and I have a heart disease, and I have MS (multiple sclerosis). … My body doesn't want doing anything. It hurts. And I cannot walk properly."

"My physical disability. … Getting in my way, pain issues. Ambulatory issues."

Health conditions could indirectly limit PA because people had to stay inside.

"It's very difficult to move. Seems like my body gets inflamed … because I have a lupus, the inflammation in my body. … when I have the active lupus, the inflammation, then I have to be careful. … I don't walk outside because so many allergies. So I usually walk. … once I had allergies, I had to do indoors."

COVID Pandemic

During the COVID pandemic, people reduced their PA.

"Since the COVID started out, I stopped exercising. … So fear of COVID exposure."

However, some people are trying to increase their PA now as they used to do before the pandemic.

"I have really gone backwards in my ability to move, and cause basically I had popped down movement two years since the COVID popped up in. I was like before I was much more than what I was able to do now, so, I'm motivated to get back to, baby steps, trying to increase

my movement."

Neighborhood context

The safety issue in the neighborhood seriously damaged walkability.

A male participant said, *"Women no longer walk in my neighborhood because there's been since the people trying to abduct them. It's very sad. We have a security patrol around. That doesn't bother me to be doing it. … yeah, it's just some of my friends yeah, yeah need someone to walk with to feel it is safe."*

Transportation in Atlanta

Walkability is not well guaranteed; public transportation is not still useful because of unstable operation of MARTA bus regular operations.

"I don't know how often the bus comes, and I have no clue where it goes."

When people cannot walk safely or use public transportation, how about cars? Atlanta residents suffer from terrible traffic.

"Depending on the traffic, you never know when you're trying to get here."

The residents in Atlanta may not have easier methods to leave their houses with walkable communities. Many still rely on cars as their only option.

"I drive."

Increment weather

Participants mentioned that increment weather limited peoples' PA, such as too hot or

cold temperatures or rain.

"I cannot handle the cold. When it's raining, it's (affected) all our joints."

"I don't want to be cold. I don't wanna have anything to do with cold. My hands hurt. My toes hurt."

At the same time, people were trying to overcome the barriers somehow.

"But if I have to go out, if I have to go to the supermarket to pick up something, I will go, and I'll just go to the supermarket (by car) that has a covering so that I don't get wet."

"If it's over 94 (F), I will go to the gym, where it's air conditioning. … So it didn't limit the activity. It change(s) the menu."

Theme 3: Program Evaluative Comments

We also elicited comments or feedback about the program. Overall, the comments were positive. The comments included: general evaluation, socialization, diversity and inclusion, program flexibility, impact on eating habits, and impact on mental health.

General Evaluation

In general, the "Positive Motion" program had a good review.

"I thought it was a good form of exercise."

"I thought it was excellent. … It's a good community program."

“You (the interviewer) can't stop the class, or they (TADA) can't stop the class.”

During a focus group, a participant showed her dance she learned and enjoyed through the dance classes with the song “Macarena.”

"Hand, Hand, Shoulder, Shoulder, Head, Head, Back, Back, Hip, Hip, Shake it up!"

However, the only improvement point mentioned in the focus group was monotony of the program.

“For the most part, I like it. I enjoy it a lot, but I think we need more of variety, I need more variety of things to do.”

Socialization

One reason the participants like the program was socialization. Meeting other participants motivated the participants to come back to the class every week.

“That was my first reason for coming was so that I can get out the house and meet people, since I'm new to Atlanta. … I'm looking forward to seeing everybody every Monday.”

“I mingled in new people and I've been happy then.”

Diversity and Inclusion

The participants have different levels of PA. Some people came by wheelchair, some walked with canes, and others walked alone. The diversity made the participants feel more inclusive.

A participant who walked with a handcart for elderly said, *“The different variety of*

mobility in the class is helpful for me, because I don't feel so pressured to perform. … I think it's a kind of good thing we have different levels there. Everybody not really performing a very high level."

The senior living facility residents mainly used wheelchairs. A senior living facility employee said, *"I think it's really nice how everyone, has embraced us (the senior living facility residents and employees). You know, and getting to, you know, meet the other people in the group, you know, it's a lot of fun."*

Program Flexibility

The freedom or flexibility of the program is a good part for people with disabilities.

"We're kinda like allowed to be at our own level. So, I feel comfortable that way."

"I thought it was a good form of exercise because when you can't stand up and dance when you sit down, and move your body."

Impact on Eating Habits

The program focuses only on dances, but the participants positively impacted their eating habits.

A person whose BMI was optimum range stated, *"(On) Mondays (when we have classes), I have the biggest dinner on the whole week … because I'm like super hungry when I leave here (TADA)."*

On the other hand, a person whose BMI was class III obesity (more than 40) said, *"I*

understand when you work out, you keep burning fat and calories, so I guess it does positively affect. … When I'm active, I eat less. Sitting around and doing nothing, I eat more; so I think it positively affect(s)."

Impact on Mental Health

The program improved the participants' mental health. The program gives the participants confidence and socialization opportunities.

"Well, I've got a problem, myself to do something beneficial to my health. I'm bragging it to my family; I'm back working it again! So, you know... So it helped my self-esteem."

"For me, in a in a good way, it's a positive because I'm doing something because I'm moving around and I love people. … If I'm not busy the rest of the week, I become sort of stuck in the house, and then I become sad because when I'm in the house, there's nobody there but me. … It's enjoyable. It's fun. It provides exercise, and for your health, for your mind."

Summary of Chapter 4

In this Chapter 4, the survey results and focus group results were stated. Many participants were female and African Americans. Out of 16 baseline survey participants, only eight people finished the after-program survey and focus group. The drop group more likely had higher PA levels before the participation. The participants somewhat engaged in PA before the dance program. SDOH factors, such as social support, transportation, and neighborhood context were mentioned as facilitators and barriers for PA. The "Positive Motion" program generally received good reviews. The participants appreciated the socialization opportunity and

inclusive culture of the program.

Chapter 5 Conclusions, Implications, and Recommendations

In this chapter, there will be a summary of key results, strength and limitation, recommendations, and conclusions. The study is about the motivation for physical activity (PA) for older people. The "Positive Motion" dance program was conducted for 10 weeks for 16 participants. The surveys and focus groups were conducted before and after the dance intervention.

Summary of key results

In this section, we discuss the research participants' demographics, their PA levels, and facilitators and barriers to PA. Then, we describe the after-program focus group results and the comparison between baseline and after-program surveys. At the end of the section, a summary of the evaluation of the "Positive Motion" program is presented.

Demographics and PA levels

The study participants represent the demographics of older adults in Atlanta on some accounts but diverge on others. In our study, most participants (93.8%) graduated from at least high school, and 62.5% of participants had higher education, and similarly in Atlanta, 92.1% and 55.6% of the adults were a high school graduate or higher or a bachelor's degree or higher in 2017-2022 (United States Census Bureau, n.d.-a). The majority of the participants were female (81.3%) and Black/African American (68.8%), whereas at the city-level in Atlanta, 51.1% were female, and 48.2% were Black/African American in 2022 (United States Census Bureau, n.d.-a). There was no consistent tendency shown in living situation; 4 people lived alone, 4 people lived with 1 person, and 4 participants lived in a senior living facility.

The research participants engaged in PA at higher levels than the target population in Atlanta. Since the research participants were recruited from the "Positive Motion" dance program participants, they were interested in that form of PA. Walking was a primary PA for 56.3% and a secondary PA for 31.3% of the participants. This is aligned with the Centers for Disease Control and Prevention (CDC) recommendation of brisk walking as PA because it does not require any special skills or equipment (CDC, 2022c). All the participants in our study were doing some form of non-sedentary activity. This is contradictory to adults in Georgia in 2021, wherein 34.4% were physically *inactive* (America's health rankings, n.d.-b) and probably due to their participation in an exercise/dance program.

Baseline surveys and focus group findings: facilitators to PA

The baseline surveys and focus group demonstrated that the key facilitators were intrinsic motivation, social support, and transportation, while the key barriers were health conditions and social determinants of health (SDOH).

The participants in this study also described various motivation styles for engaging in PA. In the Self-Determination Theory (SDT), motivation is classified into amotivation, extrinsic motivation, and intrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation is more self-determined than extrinsic motivation (Ryan & Deci, 2000). The study participants' descriptions only cover *extrinsic motivation*, such as socialization or physical health, and *intrinsic motivation*, but do not discuss *amotivation*.

There is a discrepancy of results related to extrinsic motivation between the Motives for Physical Activities Measure – Revised (MPAM-R) and the focus group. In the MPAM-R at our

baseline study, they had the lowest score in the social category (4.9 ± 1.7) among the five categories. It could directly suggest that they had less extrinsic (social) motivation. The same tendency was shown in the after-program survey. However, in the focus group, most topics related to extrinsic motivation were highly focused on socialization, although the interview style as focus group could affect the results. This difference between MPAM-R and the focus group is caused because two participants had very low scores (1.8 and 2.2 out of 7 in the baseline survey) in the social category, which lowered the average baseline social category MPAM-R score. The low number of research participants makes it harder to interpret the average MPAM-R scores. In the previous research, MPAM-R was validated in multiple situations (Battistelli et al., 2016; Wilson et al., 2002). Also, the research that combined MPAM-R and qualitative research did not present this type of discrepancy (Withall et al., 2011). Another study of dance intervention for older people used qualitative research and indicated wellbeing as extrinsic motivation for PA (Zygmont et al., 2023).

On the other hand, regarding intrinsic motivation, there was no large discrepancy between MPAM-R and focus group in our research, although intrinsic motivation was not the main topic in the previous qualitative research (Withall et al., 2011). Our participants had the higher score at interest/enjoyment (5.8 ± 1.3). It could mean that they had intrinsic motivation. Also, some participants expressed their intrinsic motivation; for example, a participant mentioned she always wanted to join a dance class. In the similar previous research in the United Kingdom, however, few participant mentioned intrinsic motivation for PA in their focus group, although people had a higher MPAM-R score in interest/enjoyment category than in

other categories (Withall et al., 2011). In the research, the PA intervention included dance as well as other components; the participants were more likely to mention their extrinsic motivation related to fitness or health.

More detailed analysis based on SDT suggested that introjected regulation could be seen among various PA levels of the participants. Ryan & Deci (2000) classified extrinsic motivation into external regulation, introjected regulation, identified regulation, and integrated regulation. In our research, the participants mentioned family and friends/neighbors as examples of introjected regulation and identified regulation at the baseline focus group, although no external regulation was stated. Regarding introjected regulation, a participant mentioned her mother as an example of physical *inactivity* and suffering from diseases. The fear of getting sick could be an external motivation in this case. Also, the interview excerpts related to identified regulation include PA as taking care of grandchildren or visiting IKEA with a friend for shopping. Both people enjoyed the objectives of the behaviors – caring for grandchildren and having time with a friend – but the main reasons for the behaviors were not PA. In the previous research, less physically active older people mentioned external regulation or introjected regulation, while more physically active older people mentioned introjected regulation and intrinsic motivation (Ferrand et al., 2012). We also found that the participants had somewhat non-sedentary PA, but they did not meet the Physical Activity Guidelines for Americans recommendations; the participants were low-moderate PA level and showed their introjected regulation.

Knowledge about the impact of PA on health could be relevant to increase in PA. Many

benefits of PA are known, such as improving physical and mental health (Piercy et al., 2018). The knowledge would be considered introjected regulation. The existing literature suggested that more knowledge could increase older adults' PA (Goggin & Morrow, 2001). In our study, even though knowledge was not explicitly discussed in the focus group, the background knowledge positively affected their PA as a facilitator. Furthermore, one of our participants mentioned her mother as an example of someone who is physically *inactive*. This participant's remark was based on her knowledge of the relationship between physical *inactivity* and getting sick. This example shows that PA-related knowledge would encourage older people to have more PA.

Baseline surveys and focus group findings: barriers for PA

We also identify several barriers to PA, such as health conditions and social determinants of health (SDOH). In terms of health conditions, barriers are the participants' health status and the coronavirus disease (COVID) pandemic. Many participants in our research had difficulty walking and had to use a cane, handcart for elderly, or a wheelchair when moving. This is consistent with one of six themes Franco et al. (2015) mentioned; physical limitation could be a barrier to PA. In addition, our study participants mentioned how COVID pandemic negatively influenced their PA, which is also supported by previous research (Oliveira et al., 2022).

When considering SDOH as barriers to PA, results of the focus groups reveal some reasons that are specific to Atlanta and our population with their movement limitations. The transportation system was mentioned as not reliable because of unprecise service availability,

although Metropolitan Atlanta Rapid Transit Authority (MARTA) Mobility Bus was helpful for people living in a senior living facility. In addition, safety concerns negatively affect walkability in Atlanta. Moreover, cold or hot weather disturbs people's opportunities for PA. The finding is also supported by previous research. Access difficulties, including transportation, safety, and weather, are one of the six themes that impact older people's PA (Franco et al., 2015).

However, the participants are eager to overcome the barriers. When the neighborhood context or health conditions interrupted their PA, they overcame the barriers with the help of their family and friends/neighbors. For example, when a participant could not walk due to safety issue, her husband walked with her; therefore, the companionship increased her PA. Also, when a participant had a heart attack, her friend helped her, and it resulted in a good relationship. Then, they went on a trip together. The focus group suggests that family and friends/neighbors are helpful to overcome the barriers to PA. Although this research suggests that family could help older people overcome their barriers to PA, the previous research suggests that families are often barriers to PA because family responsibilities lead to a lack of time for PA (Bantham et al., 2021; Gothe & Kendall, 2016). The impact of family on older people's PA could be complex and different from person to person and needs to be more researched.

Further research on how older people can overcome inclement weather needs to be assessed more. In our research in Atlanta, when the inclement weather (hot/cold weather or rain) bothered their PA, they overcame the barrier by doing PA indoors or using cars. The previous research only indicated the factors of weather that could affect PA. In general

population, day length and temperature affects moderate to vigorous PA (Welch et al., 2018). For older adults in Scotland, the United Kingdom, day length and minimum temperature are associated with their PA (Witham et al., 2014). Perhaps exploring community venues, such as malls, senior centers, and churches, that could host physical activity is needed for seniors.

Barriers to PA are various from individual level to societal system (Franco et al., 2015). The focus group in our research identified from the individual and interpersonal levels to the environmental barriers specific to Atlanta. The previous research also recognized older peoples' personal health problems and community/society level problems, such as weather, transportation, and safety (Colley et al., 2019; Laverty et al., 2018; Van Holle et al., 2014).

After-program focus group findings

External regulation could be related to the participants' motivation. As mentioned above, there was no clear comment that could be categorized into external regulation because participation in the "Positive Motion" program was voluntary. Also, in the previous research, only lower physically active people mentioned external regulation (Ferrand et al., 2012). However, the participants in our study received a Kroger gift card after eight or more session participants out of ten in addition to the baseline and after-program surveys and focus groups, which could be their external regulation.

In terms of integrated regulation, some participants mentioned that they enjoyed the "Positive Motion" program through their socialization. Dance originally has social components (Malkogeorgos et al., 2011). Therefore, the participants enjoyed PA and socialization through the dance at the same time.

Comparison between baseline survey and after-program survey

We conducted MPAM-R and EQ-5D-3L (survey for quality of life (QoL)) at baseline and after-program survey. There was no difference in the results. However, at EQ-5D-3L, the mean score of today's QoL decreased from 74.6 ± 22.8 at baseline survey to 60.0 ± 17.7 at after-program survey. The difference looked statistically significant, but it was not. In the baseline score, the mean score of today's QoL was 84.8 ± 17.5 and 64.4 ± 24.0 for the drop group and the retention group, respectively, which was statistically significant different ($Z=2.06$, $p = 0.04$). Among the participants who finished both baseline and after-program surveys, the mean score of today's QoL changed from 64.4 ± 24.0 to 60.0 ± 17.7, which was not a significant change.

The reason for the not-significant change between baseline and after-program surveys could be due to the number of participants, the low response of participants, and the weak intensity of program. Only eight people (50%) joined the after-program survey. Also, the intervention was only 45-minute once-a-week low-to-moderate-intensity program. Because of the physical disability of the participants, they are not recommended to have 150-minutes-a-week moderate-intensity PA, according to the guidelines (United States Department of Health and Human Services, n.d.-a). However, it would not be enough to affect the change in MPAM-R or 5Q-5D-3L. Although the quantitative data do not show statistically significant changes, the focus group results indicate that the participants recognized the benefits from the "Positive Motion" program such as eating habits and mental health. It will be discussed in the next section "evaluation of the 'Positive Motion' program."

Evaluation of the "Positive Motion" program

The program has overall good feedback. All participants mentioned that they were very satisfied (75%) or satisfied (25%) with the program. The participants preferred the "Positive Motion" program because of the program characteristics. Through the dance session, the participants enjoyed socialization. Also, they appreciated diverse and inclusive culture, especially various levels of their physical disability. In the focus group, the participants mentioned the program flexibility, which created diverse and inclusive culture. In the previous research, an exercise intervention for older Korean immigrants to the Unites States achieved a high satisfaction and attendance by adjusting the program based on the participants' values (Sin et al., 2005). A systematic review indicated that intrinsic motivation and identified regulation leads to program participation (Teixeira et al., 2012).

From the demographic data, the "Positive Motion" program would be appropriate for individuals with low-medium levels of PA. As mentioned in Table 2, all four participants who thought they were "very physically active" dropped out of the program. In addition, the mean age of the drop group was 64.1 ± 7.2; the mean age of the retention group was 72.8 ± 11.3, which was not statistically significantly different. However, older people, in general, have less PA (Evenson et al., 2012). Therefore, the program will be favorable to older generations who need to have more PA.

At the education or economic level, there were no clear statistical trends between the retention and drop groups. We cannot discuss the association between participation and gender, race/ethnicity, or living situation because the number of participants limited further

data analyses.

The participants in the retention group realized some positive impacts on eating habits and mental health. The impact of PA intervention on eating habits needs to be assessed in the future, although there is much existing research that combines PA and nutrition (Racey et al., 2021). The previous research supported the positive impact of PA on mental health (Patel et al., 2013).

Strength and limitation

The research has several strengths and limitations. Regarding the strength, the research was conducted in good collaboration with the community. The surveys and focus groups were conducted in The Atlanta Dance Academy (TADA) or a senior living facility, where seven (43.8%) participants lived or worked. The senior living facility prepared three employees and a shuttle bus to support the four residents' participation in the "Positive Motion" program. All seven people also participated in the research.

Second, the researchers investigated the participants' motivation for PA from multiple perspectives, including the baseline and after-program surveys and focus groups. The researchers elicited their general perceptions of PA in baseline surveys and focus groups. In after-program surveys and focus groups, the researchers explored the "Positive Motion" program's impact on their perceptions of PA. By doing so, the researchers identified some Atlanta-specific barriers for PA for older people and their coping methods.

Third, the participants had various backgrounds and physical levels. As shown in Table 1,

the participants had different education levels or living situations. Also, some participants could walk alone, while others depended on wheelchairs. The participants also represented the diverse community of older people or people with disabilities living in Atlanta.

Despite the various strengths, the research had several weaknesses. First, the retention rate of the research was low (50%). Although TADA succeeded in increasing the number of participants of the "Positive Motion" program by word of mouth, the research participants ended in small numbers because we only recruited for only a few weeks. On the other hand, the research participants were recruited at the very early stage of the "Positive Motion" program; the dance program did not severely influence their baseline survey or focus group results. Also, the researchers tried to contact the individuals who dropped out but were not able to reach participants.

Second, the participants could have better PA motivation or social support than the general population, older people and people with disabilities living in Atlanta. The research participants were recruited from the "Positive Motion" participants. They applied for the dance program voluntarily or with the help of their family/friends. Also, all 16 participants mentioned they were doing something out of sitting in a day. Therefore, the research participants could have better access to PA because of their better PA motivation and their social support.

Third, the focus group was chosen instead of individual interviews. Although the motivation for PA was relatively casual topics to discuss, some participants could not be comfortable with talking in front of other program participants. The participants gathered at TADA weekly for the dance classes, and some participants may not have wanted to share their

motivation for PA with other participants.

Recommendations

This section includes recommendations for the "Positive Motion" program, recommendations for older people living in Atlanta, and suggestions for future research.

Recommendations for the "Positive Motion" program

First, the "Positive Motion" program is recommended for older adults or people with disabilities living in Atlanta, especially for people who are not very physically active. The program had a highly satisfactory review from the participants who finished 10-week dance classes. The program gave the population the light to moderate-intensity PA. Based on the Physical Activity Guidelines for Americans, the "Positive Motion" program is assigned as light-intensity activity if a participant sits or moderate-intensity activity if they stand. Adults are recommended to have at least 150 minutes a week of moderate-intensity, but older adults do not need to follow the 150-minute rule when their fitness level or chronic conditions do not let them do so. The "Positive Motion" program succeeded in providing 45-minute light- or moderate-intensity activity to the population.

Next, the inclusive culture should be respected and continued. The participants highlighted that they liked the instructor's flexibility and the participants' diverse physical levels. These characteristics created an inclusive culture for the "Positive Motion" participants. Also, the participants enjoyed socialization through the program. The inclusive culture could encourage the participants to communicate with each other and help with program retention.

Third, new music or dance could be incorporated into the "Positive Motion" program every 2 or 3 weeks based on their preference. Most program reviews were positive, and only one improvement comment said, "*I need more variety of things to do."* The comment did not specify the speaker's desired variety, but the new dance could expand the movement in the program. However, another participant mentioned the "Macarena" dance she learned through the dance program. The dance skills were not often mentioned in the focus group; MPAM-R did not show a higher score in the competence category. Even though skill acquisition has not often been identified as motivation for older adults, it is essential in general dance education (Stehr et al., 2021). Therefore, changing many songs every week could disturb the learning process. The program uses about 13-15 songs in one session, so it could be recommended that one or two songs could be changed to encourage the participants to dance new songs.

Recommendations for older people living in Atlanta

First, social support could always be offered and evaluated. Social isolation is a critical issue for all older adults; intervention developed for the population should be tailored to individuals or groups based on their personality or context (Fakoya et al., 2020). In the focus group, the participants mentioned the importance of social support. As the "Positive Motion" program improved some participants' mental health, social isolation support could be monitored for older adults living in Atlanta.

Next, transportation could be improved for participation in structured PA programs. Even though MARTA Mobility Bus was helpful for the "Positive Motion" participants, older adults living in Atlanta generally suffered from inconvenient public transportation and traffic

jams. Also, the participants reported safety concerns. Better transportation could be assessed for participants and encouraged in order for the population to have more PA.

Suggestions for future research

First, more participants could be recruited for future delivery of the program. We had only eight participants for the after-program surveys and focus groups. In addition, no participant in the drop group came back for the after-program survey or focus group. TADA decided to continue the "Positive Motion" program after the research team finished the data collection. Therefore, future program evaluation could explore qualitatively reason for why the participants who were retained in the program stayed longer, how to recruit new program participants, and drop-out of some participants.

Next, more perspectives of the supporters, individuals who can offer support, could be investigated. In the focus group, social support was repeatedly highlighted. However, the focus group did not give us the physical or psychological burden of social support givers. The need for social support for older adults will increase in the aging society, but the resource could be decreasing. Sustainable social support should be discussed in the future. To figure it out, the perspectives of support givers (caregivers) could be incorporated into the research.

Third, older people overcoming the environmental barriers to PA could be further researched. In our research, older people overcame safety issues or inclement weather with the support of their families or friends/neighbors; however, little was researched on the topic for older adults among previous research.

Conclusions

This study examined motivation for PA for older adults living in Atlanta and the impact of the "Positive Motion" program. The program supports older adults who do not have enough PA. Social support, including families or friends/neighbors, can facilitate PA for this population and help them overcome the barriers to PA. The social interaction results in PA as extrinsic motivation. Intrinsic motivation, enjoying PA itself, helped the participants join and retain in the program. Depending on each participant's SDOH barrier, such as neighborhood context, transportation, or inclement weather, necessary social support could be provided to overcome the barriers to PA and improve their overall well-being.

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Appendices

Baseline survey

Demographic Questions

- What is your age?
- What is your gender?

  ☐ Female

  ☐ Male

  ☐ Non binary

  Other (specify)

- Could you tell me your race or ethnicity?

  ☐ White

  ☐ Black

  ☐ Hispanic

  ☐ Asian

  ☐ Native American

  ☐ Other (Describe below)

- What is your highest level of education?

  ☐ Not graduated from high school

  ☐ Graduated from high school

☐ Graduated from undergraduate or professional school

☐ Higher

- Could you tell me who you live with? How many people do you live with?
- Could you tell me what kind of house you live in?

☐ House

☐ Apartment

If so, what floor?

Do you have an elevator in your apartment?

☐ Yes

☐ No

☐ Other (Describe below)

- Could you tell me your marital status?

☐ Never married

☐ Married

☐ Divorced

☐ Separated

☐ Widowed

☐ Member of unmarried couple

☐ Other (Describe below)

- What is your annual household income?

  ☐ Less than $30,000

  ☐ $30,000 – less than $60,000

  ☐ $60,000 – less than $90,000

  ☐ More than $90,000

  ☐ Do not know / Do not want to answer

- With whom did you come here today?

  ☐ Alone

  ☐ Not alone (Describe below with whom)

- How can you describe today's weather? Did you need an umbrella today?

  ☐ Rain / I needed an umbrella today.

  ☐ No rain / I did not need an umbrella today.

- How did you come here today?

  ☐ Walk

  ☐ By car If so, who drove the car?

  ☐ By bus

  ☐ Other (Describe below)

- Could you tell me your height and weight?

  Height _____ Feet _____ Inches (or _____ cm)

Weight _____ lbs (or _____ kg)

- What chronic conditions do you have?

Physical Activity Questions

- What do you think about the level of your physical activity?

  ☐ Not sufficiently active

  ☐ Some physically active

  ☐ Satisfactorily physically active

  ☐ I am very physically active

- Do you do anything out of sitting in a day, like walking outside, doing housework, jogging?

  ☐ Yes -> go to the next question

  ☐ No -> go to the Demographic Questions

- What kind of movement/physical activity do you do the most?
- How often do you do the activity?

  ☐ 1-2 days per week

  ☐ 3-4 days per week

  ☐ 5-7 days per week

- How long do you do the activity?

☐ Less than 1 hour

☐ 1-2 hours

☐ More than 2 hours

- What kind of movement/physical activity do you do the second most?
- How often do you do the activity?

  ☐ 1-2 days per week

  ☐ 3-4 days per week

  ☐ 5-7 days per week

- How long do you do the activity?

  ☐ Less than 1 hour

  ☐ 1-2 hours

  ☐ More than 2 hours

- How often do you have the exercise to strengthen your muscle?

  ☐ 0 days per week

  ☐ 1-2 days per week

  ☐ 3-4 days per week

  ☐ 5-7 days per week

MPAM-R

The following is a list of reasons why people engage in physical activities, sports and exercise. Keeping in mind your primary physical activity/sport, respond to each question using the scale given, on the basis of how true that response is for you.

1	2	3	4	5	6	7
not at all true for me						very true for me

I participate in physical activity:

Because I want to be physically fit.	1	2	3	4	5	6	7
Because it's fun.	1	2	3	4	5	6	7
Because I like engaging in activities which physically challenge me.	1	2	3	4	5	6	7
Because I want to obtain new skills.	1	2	3	4	5	6	7
Because I want to look or maintain weight so I look better.	1	2	3	4	5	6	7
Because I want to be with my friends.	1	2	3	4	5	6	7
Because I like to do this activity.	1	2	3	4	5	6	7
Because I want to improve existing skills.	1	2	3	4	5	6	7
Because I like the challenge.	1	2	3	4	5	6	7
Because I want to define my muscles so I look better.	1	2	3	4	5	6	7
Because it makes me happy.	1	2	3	4	5	6	7
Because I want to keep up my current skill level.	1	2	3	4	5	6	7
Because I want to have more energy.	1	2	3	4	5	6	7

Because I like activities which are physically challenging.	1	2	3	4	5	6	7
Because I like to be with others who are interested in this activity.	1	2	3	4	5	6	7
Because I want to improve my cardiovascular fitness.	1	2	3	4	5	6	7
Because I want to improve my appearance.	1	2	3	4	5	6	7
Because I think it's interesting.	1	2	3	4	5	6	7
Because I want to maintain my physical strength to live a healthy life.	1	2	3	4	5	6	7
Because I want to be attractive to others.	1	2	3	4	5	6	7
Because I want to meet new people.	1	2	3	4	5	6	7
Because I enjoy this activity.	1	2	3	4	5	6	7
Because I want to maintain my physical health and well-being.	1	2	3	4	5	6	7
Because I want to improve my body shape.	1	2	3	4	5	6	7
Because I want to get better at my activity.	1	2	3	4	5	6	7
Because I find this activity stimulating.	1	2	3	4	5	6	7
Because I will feel physically unattractive if I don't.	1	2	3	4	5	6	7
Because my friends want me to.	1	2	3	4	5	6	7
Because I like the excitement of participation.	1	2	3	4	5	6	7
Because I enjoy spending time with others doing this activity.	1	2	3	4	5	6	7

EQ-5D-3L

Questions about your health **Health Questionnaire English version for the USA**

Under each heading, please check the ONE box that best describes your health TODAY.

MOBILITY

I have no problems in walking about..... ❑

I have some problems in walking about..... ❑

I am confined to bed…….. ❑

SELF-CARE

I have no problems with self-care……. ❑

I have some problems washing or dressing myself…….. ❑

I am unable to wash or dress myself…… ❑

USUAL ACTIVITIES *(e.g. work, study, housework, family or leisure activities)*

I have no problems with performing my usual activities…… ❑

I have some problems with performing my usual activities…….... ❑

I am unable to perform my usual activities…….. ❑

PAIN / DISCOMFORT

I have no pain or discomfort…….. ❑

I have moderate pain or discomfort…….. ❑

I have extreme pain or discomfort…… ❑

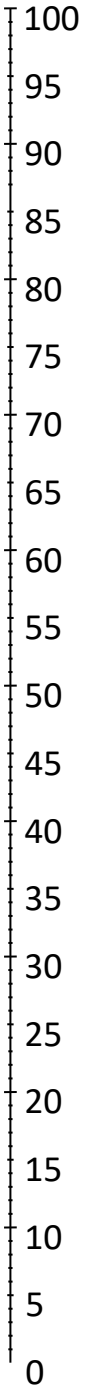
ANXIETY / DEPRESSION

I am not anxious or depressed…….... ❑

I am moderately anxious or depressed…… ❑

I am extremely anxious or depressed……... ❑

The best health you can imagine



We would like to know how good or bad your health is TODAY.

This scale is numbered from 0 to 100.

100 means the best health you can imagine.
0 means the worst health you can imagine.

Mark an X on the scale to indicate how your health is TODAY.

Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY = ☐

The worst health you can imagine

Interview guide for baseline focus group

- What do you think about your current physical activity?
- What helps you get active? (facilitators)
- What gets in the way of your being physically active? (barriers)
- How does your living conditions or your community affect your physical activity?

    Probe: walkability, public transportation, weather

- Who helps you do physical activity? And how do they help?
- How could you improve the situation? / What kind of support do you think is necessary or helpful?
- Why were you interested in the program? / What do you expect from the program?
- Is there anything additional you want to share with me?

Interview guide for after-program focus group

- What were your overall thoughts about the program? What are your thoughts about the activity in the course?

    Probe: fun, motivated, bored, dangerous, aspects you like, aspects you dislike

- How has the program affected your attitude to physical activity?
- Did you feel you wanted to drop from the program? If yes, what prevented you from dropping out of the program?
- How has your living condition or things about the community affected the participation to the program?

    Probe: stairs, transportation, weather

- How did the program affect other aspects of your life besides physical activity?

    Probe: health, food, sleep, physical health, mental health

- How could we improve the program to encourage more physical activity out of the program?
- Is there anything additional you want to share with me?

Codebook

Code #	Code	Subcode	Definition	Inclusion/Exclusion Criteria	Example
1.0	Perception of Current PA		How a participant perceives their PA	**Include** how a participant perceives their PA	I need to do more physical activity.
2.0	Type of PA		Types of PA a participant did or does conduct	**Include** the types of PA a participant mentions, regardless their previous or current experience **Exclude** the description or opinions about the Positive Motion program for seniors	I used to go to ... Zumba!
3.0	Motivation for PA		Factors that influence on participation or nonparticipation for PA		
3.1		Facilitators	Factors that encourage a participant to conduct PA	**Include** a participant's experience and/or opinion about factors that do or could increase a participant's PA	Music help(s) me (move).
3.2		Barriers	Factors that discourage a participant to conduct PA	**Include** a participant's experience and/or opinion about factors that do or could decrease a participant's PA	I think everything is too expensive almost.
4.0	Social Determinant of Health (SDOH)/Living Conditions		A participant's living conditions related to PA		
4.1		Family	A participant's family (social support) related to PA	**Include** a participant's experience and/or opinions about how their family do or could influence their	we are close to the family. We support each other, and so they help motivate

				PA	me to do
4.2		Friends/Neighbors	A participant's friends/neighbors (social support) related to PA	**Include** a participant's experience and/or opinions about how their friends/neighbors do or could influence their PA	when I walk in my neighborhood ... And I walk, everybody sometime people say "Oh, Hi!" … it's a rural neighborhood
4.3		Walkability	A participant's neighborhood's walkability related to PA	**Include** a participant's experience and/or opinions about how their neighborhood's walkability do or could influence their PA	I used to hike a lot of more. I don't hike it as much because of the safety issues.
4.4		Public Transportation	A participant's neighborhood's public transportation related to PA	**Include** a participant's experience and/or opinions about how their neighborhood's public transportation do or could influence their PA	I don't know how often the bus comes, and I have no clue how it's close.
4.5		Cars	A participant's or their family's cars related to PA	**Include** a participant's experience and/or opinions about how their or their family's cars do or could influence their PA	A traffic issue
4.6		Weather	Weather related to PA	**Include** a participant's experience and/or opinions about how weather do or could influence their PA	I cannot handle the cold.
4.7		Stairs	Stairs related to PA	**Include** a participant's experience and/or opinions about how stairs do or could influence their PA	stairs are killing me
4.8		Shopping	A participant's shopping related to PA	**Include** a participant's experience and/or opinions about how their shopping habits do or could influence their PA	one neighbor and I are like best friends. We go shopping together.
4.9		Others	Other factors related to PA	**Include** a participant's experience and/or opinions about other social determinants of health or	I had a dog for a little while and the dog was walking me.

				living conditions **Exclude** a participant's experience and/or opinions about family, friends/neighbors, walkability, public transportation, cars, weather, stairs, or shopping	
5.0	Health Conditions		A participant's health conditions that could influence their PA	**Include** a participant's experience and/or opinions about how their health conditions do or could influence their PA	once I had allergies, I had to do indoors.
6.0	Dance Skills		A participant's perception of dance skills that could influence their PA	**Include** a participant's experience and/or opinions about how their dance skills do or could influence their PA	What do I expect? To move more and to start dancing better.
7.0	COVID		COVID pandemic that could influence a participant's PA	**Include** a participant's experience and/or opinions about how COVID pandemic do or could influence their PA	Since the COVID started out, I stopped exercising.
8.0	Positive Motion program				
8.1		General Feedback about the Program	A participant's general preference about the program	**Include** a participant's general preference, satisfaction, or feedback about the Positive Motion program	I thought it was excellent. … It's a good community program.
8.2		Program Participants	Program participants that could influence a participant's PA	**Include** a participant's experience and/or opinions about how other Positive Motions participants do or could influence their PA	The different variety of mobility in the class is helpful for me, because I don't feel so pressured to perform.
8.3		Program Instructors	Program instructors that could influence a participant's PA	**Include** a participant's experience and/or opinions about how Positive Motions' instructors do or could influence their PA	I bet she (the instructor) know how to do that.

8.4		TADA Studio	A participant's perception about TADA studio	**Include** a participant's experience and/or opinions about how TADA studio do or could influence their PA	it's a beautiful studio.
8.5		Other Comments	A participant's comments about other perspective's program	**Include** a participant's experience and/or opinions about the Positive Motion program **Exclude** a participant's experience and/or opinions about general feedback, participants, instructors or studio	We're kinda like allowed to be at our own level.
9.0	Influences of PA		How the dance program influences a participant		
9.1		Eating	The dance program's influence on a participant's eating habit	**Include** a participant's experience and/or opinions about how the Positive Motion program influenced their eating habit **Exclude** a participant's experience and/or opinions about their eating habit before the Positive Motion program	When I look in the mirror at the dance studio, ... I try to eat as healthy as possible.
9.2		Sleep	The dance program's influence on a participant's sleep habit	**Include** a participant's experience and/or opinions about how the Positive Motion program influenced their sleeping habit **Exclude** a participant's experience and/or opinions about their sleeping habit before the Positive Motion program	I haven't noticed any changes.
9.3		Physical Health	The dance program's influence on a participant's physical health	**Include** a participant's experience and/or opinions about how the Positive Motion program influenced their physical health	I'm more energetic to to to be able to move.

				Exclude a participant's experience and/or opinions about their physical health before the Positive Motion program	
9.4		Mental Health	The dance program's influence on a participant's mental health	**Include** a participant's experience and/or opinions about how the Positive Motion program influenced their mental health **Exclude** a participant's experience and/or opinions about their mental health before the Positive Motion program	it helped my self-esteem.
10.0	Others		Other comments		because I just like to dance