South Dakota State University

Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange

Doctor of Nursing Practice (DNP) Practice Innovation Projects

College of Nursing

2023

Implementing a Walking Program for Sedentary Patients in a Weight Management Clinic

Bailey Tetrault
South Dakota State University

Follow this and additional works at: https://openprairie.sdstate.edu/con_dnp

 Part of the Nursing Commons, and the Physical Therapy Commons

Recommended Citation

Tetrault, Bailey, "Implementing a Walking Program for Sedentary Patients in a Weight Management Clinic" (2023). *Doctor of Nursing Practice (DNP) Practice Innovation Projects*. 195.
https://openprairie.sdstate.edu/con_dnp/195

This DNP - Open Access is brought to you for free and open access by the College of Nursing at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Doctor of Nursing Practice (DNP) Practice Innovation Projects by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.

Implementing a Walking Program for Sedentary Patients in a Weight Management Clinic: Review of Literature

BY

Bailey Tetrault

A paper submitted in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

South Dakota State University

2023

Walking Program in Sedentary Patients

This Doctor of Nursing Practice (DNP) Project is approved as a credible and independent investigation by a candidate for the DNP degree and is acceptable for meeting the project requirements for this degree. Acceptance of this DNP Project does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Robin Arends, DNP, CNP, FNP-BC, PMHNP-BC, CNE, FAAN, FAANP Date

DNP Project Advisor

Heidi Mennenga PhD, RN Date
Associate Dean for Academic Programs

Acknowledgments

I wish to acknowledge the assistance of my project chair, Robin Arends, committee members, Dr. Jo Voss and Dr. Dannica Callies, and statistics specialist Dr. Hossein Moradi. I wish to thank the facility stakeholder, Keena Byrd-Moro DNP, for providing her time and interest in this project. I would also like to express my gratitude to my husband, Trevin, our daughter, and our families for their constant love and encouragement over the last few years. I couldn't have done it without you.

Abstract

Introduction: A sedentary life is defined as consistent physical inactivity. To encourage sedentary patients to adopt active lifestyles, structured exercise programs activate healthier living.

Methods: A literature search consisted of EBSCO, CINAHL, ClinicalKey Nursing, Cochrane, Google Scholar, and PudMed database search with inclusion criteria of English language in the outpatient setting and within the last 5 years. Articles excluded were non-English language and done in the inpatient setting. The final number of articles selected was 22. The articles were evaluated using the Johns Hopkins Nursing Evidence-Based Practice: Evidence Level and Quality Guide.

Evidence Summary: Walking programs improve overall quality of life, increase physical activity capabilities, and decrease sedentary behavior.

Gaps: Few studies have been published in the last five years that focus on objective data related to walking programs. Other gaps included gender, race, and participation.

Recommendations for Practice: Practice recommendations include promoting walking exercises for sedentary individuals to improve healthy behaviors. A structured exercise program led by trained clinicians in an outpatient setting can increase a patient's number of steps over time. Initiating a walking routine can decrease sedentary behavior and promote an active lifestyle and healthy weight in inactive patients. Decreasing sedentary lifestyles while maintaining a healthy weight improves overall health and well-being.

Keywords: Walk with Ease, weight management, sedentary lifestyle, sedentary behavior, physical activity, exercise, obesity, walking program

Implementing a Walking Program for Sedentary Patients in a Weight Management Clinic: Review of Literature

Many components contribute to an unhealthy lifestyle; sedentary behavior is one critical component. Living a physically inactive life is associated with a greater risk for type 2 diabetes, cardiovascular disease, metabolic syndrome, depressive symptoms, advancing age-related diseases, obesity, and all-cause mortality (Almevall et al., 2022; Patel et al., 2018). Sedentary behavior is defined as a high volume of awake time spent sitting, reclining, or lying down and is interpreted as low energy expenditure (Monteagudo et al., 2020; Silveira et al., 2022). An estimated 5-10% of noncommunicable diseases are a result of an inactive lifestyle (Patel et al., 2018).

Along with sedentary behavior, obesity correlates to poor health outcomes. Obesity affects over 33% of United States (US) citizens (Silveira et al., 2022). Obesity is defined as having a body mass index (BMI) greater than 30 kg/m^2 and consists of excessive amounts of body fat contributing to poor health (Silveira et al., 2022). Both sedentary behavior and obesity are modifiable risk factors for noncommunicable diseases such as heart disease (Yuenyongchaiwat, et al., 2017). It can be challenging to determine causation when comparing sedentary behavior and obesity. Higher body weight may contribute to impaired physical functioning. Meanwhile, studies show the more inactive a person becomes, the more their weight will likely increase (Fanning et al., 2021; Saad et al., 2021; Yuenyongchaiwat et al., 2017).

Physical activity is essential in the process of losing weight or maintaining a desirable weight (Fanning et al., 2021; Silveira et al., 2022). Individuals with higher activity levels and less sedentary time are more apt to maintain a healthy BMI in

comparison to those who are less active (Saad et al., 2021). Walking is an excellent initiating exercise activity and allows for gradual physical growth leading to behavior change over time (Sheikh et al., 2019).

The cause of poor or low mobility can often be multifactorial; multiple contributing factors can hinder a person's ability or willingness to engage in physical activity (Almevall et al., 2022; Mierzwicki et al., 2018). Physical disabilities, such as musculoskeletal impairments, chronic pain conditions, or mobility limitations can directly impact a person's ability to engage in physical activity. These disabilities may affect their range of motion, strength, balance, or coordination, making certain exercises difficult or impossible to perform (Cooper et al., 2018; Mierzwicki et al., 2018). Mental disabilities or mental health conditions can also influence an individual's motivation and ability to participate in exercise. Depression and anxiety disorders can impact a person's energy levels, motivation, and interest in physical activity (Almevall et al., 2022; Hensman-Kettrey et al., 2021)

Accountability is critical when starting an exercise routine. Participating in a group exercise program versus exercising alone yields better results in physical, mental, and emotional quality-of-life measures as well as perceived stress levels (Yorks et al., 2017). Initiating a walking routine can be more effective in a structured, group environment (Blain et al., 2017; Sheikh et al., 2019; Silveira et al., 2020).

Significance

Sedentary behavior has been linked to negative health outcomes and poorer quality of life (Patel, 2018; Yuengyongchaiwat et al., 2017). Obesity rates continue to rise significantly and contribute to approximately 3.4 million deaths annually. Together,

obesity and overweight classification rank fifth on a global death factor scale (Cavero-Redondo, 2020). Obesity paired with sedentary lifestyles results in greater all-cause mortality (Almevall et al., 2022; Patel, 2018). The cost of managing physically inactive patients is around 11% of all healthcare costs (Patel et al., 2018). Additionally, costs related to overweight and obese patients in the US are estimated to be $173 billion per year and will increase as average BMI levels continue to rise in the US (Ward, 2021).

Clinical Question

To guide the review of the evidence, the PICOT question developed states, "In sedentary adult patients who do not require assistive devices (P), how does a walking program (I) in comparison to no walking program (C) affect steps taken over 20 minutes (O) in 6 weeks (T)?

Methods

A literature review was completed using EBSCO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Clinical Key Nursing, Cochrane, Google Scholar, and PubMed. Keywords used for the literature search included *Walk with Ease, weight management, sedentary lifestyle, sedentary behavior, physical activity, exercise, obesity,* and *walking program*. Inclusion criteria were articles written in the English language, peer-reviewed articles from 2017-2023, and articles with the setting listed as an outpatient environment. Exclusion criteria consisted of non-English languages, inpatient populations, pediatric populations, and articles greater than 5 years old.

Sixty-four articles were extracted; 22 articles remained after further analysis and specific selection focusing on measurable outcomes and eliminating association with COVID-19. Appendix A presents an evidence table of the 22-article analysis. The Johns

Hopkins Nursing Evidence-Based Practice (JHNEBP) model (Appendix B) was used in determining the appropriate level and grade for each article. Appendix C provides a table breakdown of 13 level I articles, 6 level II articles, 2 level III articles, and 1 level IV article. Article quality consisted of 10 grade A, 11 grade B, and 1 grade C article. Appendix D presents the JHNEBP permission documentation.

Evidence Findings

There were six themes found in the evidence. The themes addressed outcomes of a sedentary lifestyle, benefits of activity, risks of physical injury, patient motivation for lifestyle change, walking programs, and Walk with Ease (WWE).

Outcomes of a Sedentary Lifestyle

Walking less than 5,000 steps a day and consistent inactivity are key indicators of sedentary behavior (Almevall et al., 2022; Saad et al., 2021; Silveira et al., 2022; Yuengyongchaiwat et al., 2017). Sedentary lifestyles have been linked to adverse effects on mental health, including depression symptoms and cognitive decline (Almevall et al., 2022). Engaging in consistent exercise has been associated with positive effects on mental health, including reduced symptoms of depression and anxiety, as well as improved mood and overall psychological well-being (Cavero-Redondo 2020; Freak-Poli, 2020).

Consistent exercise goals have been shown to improve the ability to maintain a healthy weight through increased caloric expenditure, improved muscle mass, and joint movement (Almevall et al., 2022; Saad et al., 2021). Obesity, often accompanied by chronic musculoskeletal pain, places additional stress on weight-bearing joints, leading to accelerated wear and tear of joint cartilage and the development of osteoarthritis (March

& Cross, 2022; Mierzwicki et al., 2018; Saad et al., 2021). As a result, individuals who are obese and experience pain or musculoskeletal conditions may avoid walking or exercise (Fanning, 2021).

Sedentary behavior and obesity's association highlight the need to promote physical activity to address the rising prevalence of obesity (Perreault & Laferrere, 2022; Powell-Wiley et al., 2021). Overweight or obese individuals are at a higher risk of cardiovascular complications such as myocardial infarction, stroke, heart failure, diabetes, atherosclerosis, elevated low-density lipoprotein (LDL), cholesterol, and increased blood pressure (Powell-Wiley et al., 2021; Ward et al., 2021). These complications may result in disability and further sedentary behavior (Patel et al., 2018).

Prolonged periods of inactivity, known as sedentary behavior, can lead to negative physical and mental health outcomes and increase mortality risk (Patel et al., 2018; Mierzwicki et al., 2018; Monteagudo et al., 2020). Obesity is strongly linked to sedentary behavior, emphasizing the importance of promoting physical activity to combat this growing issue (Chopra et al., 2020; Saad et al., 2021; Silveira et al., 2022). Living a sedentary lifestyle can also increase the risk of mortality and chronic diseases, ultimately leading to premature death (Almevall et al., 2022).

Benefits of Walking Exercise

Exercise is a key component of weight management and reducing the risks of health conditions (Powell-Wiley, 2021). Whether a patient is trying to lose or maintain a healthy weight, calories burned may help guide weight goals (weight loss with exercise $p < .0001$; Fanning, 2022; Powell-Wiley et al., 2021). There is evidence supporting that

physical activity improves morale, cardiorespiratory fitness ($p < 0.050$), quality of life ($p = 0.007$), and BMI (Almevall et al., 2022; Monteagudo et al., 2020; Yorks et al., 2017).

Walking exercises have been shown to improve depression symptoms and decrease cardiovascular disease risk by improving blood pressure ($p < 0.001$; Yuenyongchaiwat, 2017), increasing high-density lipoprotein (HDL), decreasing LDL, and lowering glucose levels ($p < 0.001$; Yuenyongchaiwat, 2017) and BMI ($p = 0.007$; Cavero-Redondo et al., 2020). In addition, walking programs increase muscle strength, promote strenuous activity, encourage more outdoor walking, and improve quality of life (Kettrey et al., 2021). Saad et al. (2021) indicated that a 7,000-step daily goal and group walking program increased daily steps ($p < 0.001$) and decreased body weight ($p < 0.001$), BMI, visceral fat percentage ($p < 0.001$), and body fat percentage. There are numerous measurements across physical activity studies that support walking as a beneficial exercise activity.

Walking can be highly beneficial for individuals with a sedentary lifestyle due to its low-impact nature and positive impact on joint health. Walking is a low-impact form of exercise, meaning it puts minimal stress on the joints compared to higher-impact activities like running or jumping. This makes it an excellent choice for individuals with a sedentary lifestyle who may have joint discomfort or concerns (Cooper et al., 2018; March & Cross, 2020). Walking promotes joint health by providing gentle movement and lubrication to the joints. The repetitive motion of walking helps to nourish the cartilage, which cushions the joints and increases the production of synovial fluid, which lubricates the joints. This can help reduce stiffness, improve flexibility, and alleviate joint pain,

making it easier for sedentary individuals to incorporate physical activity into their daily lives (Arthritis Foundation, 2021; March & Cross, 2020; Sheikh et al., 2019).

Walking allows for gradual progression and can be adapted to different fitness levels (Vilen et al., 2022). Sedentary individuals can start with short, comfortable walks and gradually increase the duration and intensity over time. This gradual progression minimizes the risk of injury or excessive strain on the joints, allowing individuals to develop a sustainable exercise routine. Walking requires no special equipment or gym membership. It can be done almost anywhere and at any time making it a convenient option for sedentary individuals. Walking is a practical way to incorporate physical activity into daily life. By emphasizing the low-impact nature of walking and its positive impact on joint health, individuals with a sedentary lifestyle can see walking as an accessible, effective, and safe exercise option. It can serve as a starting point to gradually increase physical activity levels ($p < 0.0001$, Blain et al., 2017), improve joint mobility, and experience the numerous health benefits associated with regular exercise (Almevall et al., 2022; Arthritis Foundation, 2021; Blain et al., 2017; Hsu et al., 2021).

Sedentary lifestyles often lead to obesity as well as decreased muscle tone, mobility, and metabolism abnormalities (Cavero-Redondo et al., 2020). Inactivity and obesity are closely intertwined. Being active helps target those complications (Gocer et al., 2017; Mierzwicki et al. 2018; Perreault & Laferrere, 2022). Walking was shown to be the safest and most effective intervention for patients with these complications. Moderate-intensity walking decreased visceral fat thickness ($p < 0.001$), cardiopulmonary capacity ($p < 0.05$), and BMI in women (Gocer et al., 2017).

Risks of Physical Injury

Safety topics for a walking program include proper warm-up, appropriate footwear and location, and resting when short of breath, weak, or fatigued. Cool-down stretches are reserved for the last 5 minutes of sessions to reduce the heart rate to baseline and allow muscles to relax (Hensman-Kettrey, 2021). Group walking programs carry little risk but may provide high levels of long-term adherence (Fanning et al., 2022; Patel et al., 2018; Vilen et al., 2022). Group-based structured activity programs may expose patients to the risk of physical injury, but the accountability benefits far outweigh that risk. When initiating any exercise regimen, pain or injury on exertion may occur. When walking, there is a risk of falls, and when stretching, there is a risk of muscle strain. (Sheik et al., 2019; Monteagudo et al., 2020). Medical clearance is recommended to assess these risk potentials regarding unforeseen instability (Mierzwicki et al., 2018).

Primary provider clearance is advised to assess for potential complications associated with exercise participation such as unstable angina, uncontrolled hypertension, or unmanaged arrhythmia (Mierzwicki et al., 2018; Sheikh et al., 2019). Including medical clearance helps provide safety support for walking participants to move forward with activity and decreases the risk of potential harm (Hensman Kettrey et al., 2021).

Patient Motivation for Lifestyle Change

To maintain motivation for change, it can be helpful to set realistic and achievable goals, track progress, celebrate successes, and find enjoyment in the chosen forms of physical activity (Arthritis Foundation, 2021; Blain et al., 2017). Ultimately, the key is to find personal reasons and meaningful incentives that resonate with one's values and aspirations, paving the way for a successful exercise routine (Lopez-Roig, 2021). Adults

should partake in 150 minutes of moderate-intensity activity according to health guidelines (Patel et al., 2018). Studies show, however, that even with clear exercise recommendations of 150 minutes per week, or 10,000 steps per day, the majority of adults fall short of those recommendations on their own (Almevall et al., 2022; Patel et al., 2018; Saad et al, 2021). Along with the positive physical attributes discussed above, it is also appropriate to consider levels of motivation for participation (Caevero-Redondo, 2020). For patients who have been sedentary, slow progression of exercise is recommended (Fanning et al., 2022; Saad et al., 2021). Patients seeking to improve activity routines for health benefits may build off of the basics of walking programs to get active and stay active for life (Patel et al., 2018; Saad et al., 2021). Living an active lifestyle can provide endless benefit that grows over time. Participants are more likely to carry over behaviors learned and practiced amongst others; organized groups provide a sense of accountability (Mierzwicki et al. 2018).

Walking Programs

Evidence-based structured exercise activity programs include Fit and Strong (F&S) (1998) by Roybal Center, Silver Sneakers (SS) (1992) created by Mary Swanson, Active Living Every Day (ALED) (2001) by the Cooper Institute, and WWE (1999) from the Arthritis Foundation,

The F&S program, endorsed by the National Cancer Institute, focuses on strength training exercises that help build and maintain muscle mass, improve bone density, and enhance overall functional fitness. The program's goal is to improve strength, balance, and mobility, allowing individuals to perform daily activities with ease and reduce the risk of falls or injuries. The program typically includes a combination of resistance

training, bodyweight exercises, and flexibility exercises to cater to different fitness levels and abilities. Benefits of F&S are bone density enhancement, reducing the risk of osteoporosis and fractures, and balance and mobility improvement which reduces the risk of falls. Disadvantages of F&S are the requirement of access to appropriate exercise equipment or a gym facility. Participants need to learn proper form and technique to prevent injury, which may require guidance from a trainer or instructor. Some individuals may find strength training physically demanding, especially if they are new to exercise or have certain health conditions (National Institute on Aging, 2022).

Silver Sneakers (SS) is a fitness program specifically tailored for older adults. It provides access to a variety of exercise classes, ranging from low-impact aerobics and yoga to water-based workouts and strength training sessions. SS emphasizes the importance of social connections and community engagement, promoting a supportive environment where individuals can pursue their fitness goals while enjoying the company of others. The program is often offered through participating gyms and fitness centers. Wellness seminars and online resources are also included. The advantages of SS are a range of exercise classes, catering to different interests and fitness levels, encouraging social connections and community engagement, and promoting overall well-being. Access to participating gyms and fitness centers offers a supportive and inclusive environment. Disadvantages of SS to consider are that availability may vary depending on location and participation of local fitness centers. Some communities may not have a participating facility. Additionally, some individuals may prefer a more individualized exercise routine rather than group classes (Kell et al., 2019).

Active Living Every Day (ALED) was determined to be effective by the Cooper Institute in the Project Active research study. ALED is a comprehensive program that promotes regular physical activity and healthy lifestyle choices for individuals of all ages, with a particular focus on older adults. It goes beyond traditional exercise routines and encourages participants to incorporate physical activity into their daily lives. ALED aims to help individuals overcome barriers to physical activity and develop sustainable habits that support long-term health and well-being. The program includes educational sessions, behavior change strategies, and practical tools to facilitate active living, such as walking groups, home exercises, and tips for incorporating movement into daily routines. The advantages of ALED emphasize the integration of physical activity into daily routines, making it accessible and sustainable. Disadvantages to ALED include a need for self-motivation and commitment to incorporate physical activity into daily routines. Participants may require ongoing support and accountability to maintain active habits (National Council on Aging [NCOA], 2020).

Informal walking groups may lack structured supportive movements like stretching, wellness discussion, resistance training education, and overall consistency. However, they do provide more autonomy and flexibility in personal schedules (Arthritis Foundation, 2021.). Independent activity versus supervised activity yields less weight loss and less BMI reduction (Gocer et al., 2017; Hsu, 2021). Participants seem to be less compliant with self-directed walking programs due to the lack of accountability (Sheikh et al., 2019). Individual walking exercises provide privacy, and flexibility in location, time of day, and length of activity (Arthritis Foundation, 2021).

Walk with Ease

The instructor-guided WWE curriculum is group-based and helps promote accountability throughout the course (SDSU Extension, 2022). Hensman-Kettrey (2021) showed that WWE participants walked significantly more at the end of the program than at the beginning. Walking more translates into taking more steps and as a result, achieving healthier lifestyle and weight targets (Almevall et al., 2022).

WWE was created in 2009 by Thurston Arthritis Research Center and the Institute on Aging of the University of North Carolina. This program helps people to live healthier lifestyles by increasing activity safely. The WWE program is a 6-week program designed to improve overall health, instill self-confidence in physical activity goals, decrease arthritis-associated pain, and increase muscle tone (Arthritis Foundation, 2021). WWE is a set of 18 sessions (Arthritis Foundation, 2021). The developers included both a self-guided and group format to tailor to different users. Using a WWE workbook as a guide, participants can choose which direction is a better fit for them. The program provides 3 formats: self-guided, self-directed enhanced, and in-person. The WWE workbook provides step-by-step instructions for each session including setting goals, warm-up movements, tracking walking distance, timing pace, cool-down movements, and behaviors to adopt and carry forward each session (Arthritis Foundation, 2021).

The program was designed for adults and the elderly with arthritis but has proven to help individuals increase their confidence, stability, and strength while decreasing arthritis-associated pain and sedentary habits (Arthritis Foundation, 2021.; Mierzwicki et al., 2018). Focusing on goals to get moving while improving quality of life through

measures like decreasing pain and increasing strength, participants will seek to be routinely active (Mierzwick et al., 2018).

The WWE program is structured with a trained leader to guide a group, instill confidence, provide feedback, and monitor improvement. The WWE leader conducts three meetings per week for 6 weeks. Each meeting includes a pre-walk discussion and warmup followed by a 10–40-minute walk and wraps up with a cool down (Arthritis Foundation, 2021). Program instructors are educated to lead programs to reduce risks associated with participation. Leader training is a thorough process that teaches step-by-step program procedures. All WWE leaders are CPR-certified and trained in adverse event responses (Arthritis Foundation, 2021).

Several patient goals were achieved through WWE. One measurement was the ability to walk farther and for longer as the program progressed. Results showed improvement in walking time ($p = 0.01$), mobility, stiffness, and fatigue (Mierzwicki et al., 2018; Sheikh et al., 2019). By incorporating exercise goals into daily routines, individuals may experience improved mood, self-esteem, and body image, creating a more positive mindset toward physical activity, weight management, and healthy living (Almevall et al., 2022; Hensman-Kettrey et al., 2021).

Gaps in the Literature

The gaps discussed are based on the methods of this project and the literature search. There was limited evidence with a focus on objective data. Gaps included studies analyzing evidence-based steps walked using pedometers, length of walking time, or settings such as weight management clinics. Gender differences were highlighted in very

few studies. Reports of participation or drop-out were limited. No studies focused on the variability of race or ethnicity.

Recommendations for Practice

Being overweight and inactive may lead to poor health outcomes. Sedentary lifestyles leading to obesity can lead to several comorbidities including diabetes, heart disease, and stroke (Cavero-Redondo, 2020). Weight loss and long-term weight management help patients decrease their risk of comorbidities and poor outcomes. Structured weight management programs seek to aid patients in the physical, psychological, nutritional, and activity components of health. A key piece of weight management is physical activity. In the beginning stages of developing a physical activity routine, it can be important to start small. Walk with Ease is an evidence-based walking program that has proven to increase ambulatory function, lower extremity strength, and improved quality of life (Hensman Kettrey et al., 2021).

WWE has been shown to improve pain, fatigue, stiffness, stress, and quality of life (Hensman Kettrey, 2021; Yorks et al., 2017). Implementing the WWE program in a weight management clinic provides patients with a physical activity starting point upon which they can build. Walking programs address the fast-growing population obesity problem (Gocer et al., 2020).

Conclusion

Weight management is a growing obstacle that can put patients at greater risk for several comorbidities. Walking programs help increase ambulatory function, build lower extremity strength, and over time reduce physical limitations to achieve functional outcomes (Mierzwicki et al., 2018; Hensman Kettrey et al., 2021). A structured walking

program has the potential to educate weight management patients on many factors that contribute to healthy living. The WWE program has positive outcomes towards encouraging participants to improve their ambulatory stamina and live active lifestyles (Mierzwicki et al., 2018; Hensman Kettrey et al., 2021).

References

Almevall, A. D., Wennberg, P., Zingmark, K., Öhlin, J., Söderberg, S., Olofsson, B., Nordmark, S., & Niklasson, J. (2022). Associations between everyday physical activity and morale in older adults. *Geriatric Nursing*, *48*, 37-42. https://doi.org/10.1016/j.gerinurse.2022.08.007

Arthritis Foundation. (2021). *Walk with Ease: Your guide to walking for better health, improved fitness, and less pain.* The Arthritis Foundation.

Arthritis Foundation. (2021). *Walk with Ease: About the program.* https://www.arthritis.org/health-wellness/healthy-living/physical-activity/walking/walk-with-ease/wwe-about-the-program.

Blain, H., Jaussent, A., Picot, M. C., Maimoun, L., Coste, O., Masud, T., Bousquet, J., & Bernard, P. L. (2017). Effect of a 6-month brisk walking program on walking endurance in sedentary and physically deconditioned women aged 60 or older: A randomized trial. *The Journal of Nutrition, Health & Aging*, *21*(10), 1183–1189. https://doi.org/10.1007/s12603-017-0955-7

Cavero-Redondo, I., Martinez-Vizcaino, V., Fernandez-Rodriguez, R., Saz-Lara, A., Pascual-Morena, C., & Álvarez-Bueno, C. (2020). Effect of behavioral weight management interventions using lifestyle mHealth self-monitoring on weight loss: A systematic review and meta-analysis. *Nutrients*, *12*(7), 1977. http://dx.doi.org/10.3390/nu12071977

Center for Disease Control and Prevention (CDC). (2022, June 16). *Physical activity for a healthy weight*. https://www.cdc.gov/healthyweight/physical_activity/index.html

Chopra, S., Malhotra, A., Ranjan, P., Vikram, N. K., & Singh, N. (2020). Lifestyle-related advice in the management of obesity: A step-wise approach. *Journal of Education and Health Promotion*, 9, 239. https://doi.org/10.4103/jehp.jehp_216_20

Cooper, L., Ryan, C. G., Ells, L. J., Hamilton, S., Atkinson, G., Cooper, K., Johnson, M. I., Kirwan, J. P., & Martin, D. (2018). Weight loss interventions for adults with overweight/obesity and chronic musculoskeletal pain: A mixed methods systematic review. *Obesity Reviews, 19*(7), 989–1007. https://doi.org/10.1111/obr.12686

Fanning, J., Rejeski, W. J., Leng, I., Barnett, C., Lovato, J. F., Lyles, M. F., & Nicklas, B. J. (2022). Intervening on exercise and daylong movement for weight loss maintenance in older adults: A randomized, clinical trial. *Obesity (Silver Spring*), 30(1), 85–95. https://doi.org/10.1002/oby.23318

Freak-Poli, R. L. A., Cumpston, M., Albarqouni, L., Clemes, S. A., Peeters, A. (2020) Workplace pedometer interventions for increasing physical activity. *Cochrane Database of Systematic Reviews, 7.* https://doi.org/10.1002/14651858.CD009209.pub3

Göçer, E., Ardıç, F., Akkaya, N., & Herek, D. (2017). Efficacy of moderate-intensity walking provided feedback by ECE PEDO on abdominal fat in overweight and obese women: A randomized, exercise study. *Turkey Journal Physical Medicine Rehabilitation.* 29;63(4):340-347. https://doi.org/10.5606/tftrd.2017.1956

Hensman-Kettrey, H., Schaffer, K. A., & King, S. B. (2021, October 1). Evaluating physical activity and quality of life for older adults through walk with ease.

Archives of Rheumatology and Arthritis Research, *1*(5). https://doi.org/10.33552/ARAR.2021.01.000522

Hsu, C., Wu, H., Liao, H., Liao, T., Su, S., & Lin, P. (2021). Self-monitored versus supervised walking programs for older adults. *Medicine, 100* (16), e25561. https://doi.org/10.1097/MD.0000000000025561

Kell, K. P., & Rula, E. Y. (2019). Increasing exercise frequency is associated with health and quality-of-life benefits for older adults. *Quality of Life Research.* https://doi.org/10.1007/s11136-019-02264-z

March, L. & Cross, M. (2022, May 28). Epidemiology and risk factors for osteoarthritis. *UpToDate.* Retrieved July 1, 2022, from https://www.uptodate.com/contents/epidemiology-and-risk-factors-for-osteoarthritis?sectionName=Obesity&search=obesity%20&topicRef=5370&anchor=H4111593320&source=see_link#H4111593320

Mierzwicki, J. T., Good, T. A., Reed, D. C., & Greer, C. D. (2018). The impact of the Walk with Ease program on lower extremity strength and ambulation in individuals with osteoarthritis. *Physical Therapy and Rehabilitation*, *5*(12). http://dx.doi.org/10.7243/2055-2386-5-12

Monteagudo, P., Roldán, A., Cordellat, A., Gómez-Cabrera, M. C., & Blasco-Lafarga, C. (2020). Continuous compared to accumulated walking training on physical function and health-related quality of life in sedentary older persons. *International Journal of Environmental Research and Public Health*, *17*(17), 6060. https://doi.org/10.3390/ijerph17176060

National Council on Aging. (2020). *Evidence-based program: Active Living Every* Day. Retrieved May 18, 2023 from https://www.ncoa.org/article/evidence-based-program-active-living-every-day

Patel, A. V., Hildebrand, J. S., Leach, C. R., Campbell, P. T., Doyle, C., Shuval, K., Wang, Y., & Gapstur, S. M. (2018). Walking in relation to mortality in a large prospective cohort of older U.S. adults. *American Journal of Preventive Medicine*, *54*(1), 10–19. https://doi.org/10.1016/j.amepre.2017.08.019

Perreault, L. & Laferrere, B. (2022, September 30). Overweight and obesity in adults: Health consequences. *UpToDate.* Retrieved October 14, 2022, from https://www.uptodate.com/contents/overweight-and-obesity-in-adults-health-consequences?search=obesity%20&topicRef=5371&source=see_link#H807212073

Powell-Wiley, T. M., Poirier, P., Burke, L. E., Després, J.-P., Gordon-Larsen, P., Lavie, C. J., Lear, S. A., Ndumele, C. E., Neeland, I. J., Sanders, P., & St-Onge, M.-P. (2021). Obesity and cardiovascular disease: A scientific statement from the American Heart Association. *Circulation* (New York, N.Y.), *143*(21), e984–e1010. https://doi.org/10.1161/CIR.0000000000000973

Saad, M. F., Cheah, W. L., & Hazmi, H. (2021). The Effects of a 7000-Step Goal and Weekly Group Walking Program for Overweight and Obese Elderly People in Sarawak, Malaysia: A Quasi-experimental Study. *Journal of Preventive Medicine and Public Health*, *54*(3), 199–207. https://doi.org/10.3961/jpmph.20.584

Sheikh, S. Z., Kaufman, K., Gordon, B. B., Hicks, S., Love, A., Walker, J., Callahan, L. F., & Cleveland, R. J. (2019, April). Evaluation of the self-directed format of

Walk with Ease in patients with system lupus erythematosus: the walk-SLE pilot study. *Lupus*, *28*, 764-770. https://doi.org/10.1177/0961203319846387

Silveira, E. A., Mendonça, C. R., Delpino, F. M., Souza, G. V. E., de Souza Rosa, L. P., de Oliveira, C., & Noll, M. (2022). Sedentary behavior, physical inactivity, abdominal obesity and obesity in adults and older adults: A systematic review and meta-analysis. *Clinical Nutrition Espen*. https://doi.org/10.1016/j.clnesp.2022.06.001

South Dakota State University Extension. (2022, October 24). *Walk with Ease*. https://extension.sdstate.edu/walk-ease

University of Illinois at Chicago: Institute for Health & Research Policy. (2011). *Fit and Strong: An award-winning, evidence-based physical activity program for older adults*. https://www.fitandstrong.org/about/evidence.html

Vilen, L. H., Mary, A., & Leigh, C. F. (July, 2022). Overcoming the barriers to Walk with Ease implementation in community organizations. *Health Promotion Practice*, *23*(4), 707-718. https://doi.org/10.1177/15248399211002851

Ward, Z. J., Bleich, S. N., Long, M. W., & Gortmaker, S. L. (2021). Association of body mass index with healthcare expenditures in the United States by age and sex. *PLOS ONE, 16*(3): e0247307. https://doi.org/10.1371/journal.pone.0247307

Yorks, D. M., Frothingham, C. A., & Schuenke, M. D. (2017). Effects of group fitness classes on stress and quality of life of medical students. *The Journal of the American Osteopathic Association*, *117*(11), e17-e25. https://doi.org/10.7556/jaoa.2017.140

Yuenyongchaiwat, K., Pipatsitipong, D., & Sangprasert, P. (2017). Increasing walking steps daily can reduce blood pressure and diabetes in overweight participants. *Diabetology International*, *9*(1), 75–79. https://doi.org/10.1007/s13340-017-0333-z

Evidence Table

Authors & Date	Study Design/ Method	Participants, Sample, Setting	Intervention/ Variables Studied	Measurement	Data Analysis	Findings/ Recommendations for Practice	Strengths/ Weaknesses	Level of Evidence / Quality
Almevall, A. D., Wennberg, P., Zingmark, K., Öhlin, J., Söderberg, S., Olofsson, B., ... & Niklasson, J. (2022).	Cross-sectional study	77	Walking program, # of steps Time spent walking, time spent sitting	activPAL (onbody movement monitor) PGCMS (morale survey)	For every 1000 steps, morale total score was .190 higher	Walking as physical activity improves morale scores	Small sample, Limited ways to measure morale	II, B
Blain, H., Jaussent, A., Picot, M. C., Maimoun, L., Coste, O., Masud, T., Bousquet,	RCT	121 women	150 min/week walking program	Distance walked ($p< 0.0001$) duration, mean heart rate ($p=0.004$), BMI ($p<0.01$)	6MinuteWalkingDistance increase in exercises than control 41.5% vs 11% $p<0.0001$//	Brisk walking programs improve endurance	Sample bias	I, B

J., & Bernard, P. L. (2017).					Exercisers with lowest 6MWD p<0.001and highest BMI p<0.01 baselines showed most improveme nt			
Cavero-Redondo, I., Martinez-Vizcaino, V., Fernandez-Rodriguez, R., Saz-Lara, A., Pascual-Morena, C., & Álvarez-Bueno, C. (2020).	Systemic review and meta-analysis	20 studies	Weight, BMI, Waist circumferenc e	Weight (kg) Waist circumferenc e (cm) BMI	DerSimoni an and Laird method; Cohen's d index	lifestyle mHealth self-monitoring interventions, as part of a behavioral weight management approach, are suitable interventions for short-term weight management in adults with overweight/obe sity	Bias, different app use, little control on other covariates, some studies with small sample sizes	I, A

Chopra, S., Malhotra, A., Ranjan, P., Vikram, N. K., & Singh, N. (2020).	Stepwise review-expert advice	NA	Physical activity planning, Diet, psychocosial intervention for weight BMI	Weight kg Height cm	social pressures, mood disturbances, food craving and obesogenic environment (easy accessibility to calorie dense food and low walkability) as prime reasons for limited compliance to dietary and physical activity advice	practical dietary approaches which can be incorporated in standard obesity care by general practitioners	No data collected, expert review and advice	II, B
Cooper, L., Ryan, C. G., Ells, L. J., Hamilton, S., Atkinson,	Systemic review	4,511, obese adults, outpatient/ community	Mean change in weight or change in OA pain	kg and pain rating 0-10	Meta-aggregation of individual syntheses	Significant changes in body weight and pain monitoring	Large sample,	I, A

G., Cooper, K., Johnson, M. I., Kirwan, J. P., & Martin, D. (2018).								
Fanning, J., Rejeski, W. J., Leng, I., Barnett, C., Lovato, J. F., Lyles, M. F., & Nicklas, B. J. (2022).	Randomized clinical trial	183	Weight loss program, Guided walking exercise, sedentary behavior and physical activity	Body weight in kg Post-intervention weight regain, activity time	Significant weight loss over 6 months p< 0.001 in sitLess groups improved total activity time p <0.05 and aerobic exercise subjects improved activity time p< 0.003	Diet and exercise helps with less wt regain and similar loss as exercise by itself	Moderate sample size, COVID prevented collection of data, limited population diversity	I, B
Freak-Poli, R. L. A., Cumpston,	Systemic review	4762	multi-component health	Pedometer-steps taken	appeared to observe an increase in	current evidence is insufficient to	High risk of bias, limitations	I, A

M., Albarqouni, L., Clemes, S.A., Peeters, A. (2020)			promotion interventions		physical activity (RoM 1.26, 95% CI 0.96 to 1.66; 60 participants	suggest that a pedometer-based intervention would be more effective than other options.	in the completeness of available evidence	
Göçer E, Ardıç F, Akkaya N, Herek D. (2017)	Randomized control trials	28 women	Treadmill walking versus ECE PEDO walking/ BMI, waist circumference ,	BMI, waist circumference	visceral fat thickness ($p<0.05$) Cardiopulm status $p<0.05$)	individualized moderate-intensity physical activity with the ECE PEDO would be able to do in anywhere for gaining the health benefit	small number of participants completing the intervention and short follow-up.	I, B
Hensman Kettrey, H., Schaffer, K. A., & King, S. B. (2021, October 1)	Single group pre-post evaluation	86	Physical activity and quality of life	Physical Activity Scale for the Elderly (PASE), Brief Inventory of Thriving (BIT) scale	Standardized mean difference scores, OLS regression models	Elderly that participate in WWE appreciate improved quality of life.	/ no control group, 40% of participants didn't complete the post - test	I, A
Hsu, Wu, H. , Liao, H. , Liao, T. , Su, S.	Observational study	42 participants	Step count, BMI, physical function	# of steps, grip strength, knee extension	Two way repeated anova	Walking with a pedometer either self-monitored or	small sample, weather	I, B

& Lin, P. (2021).				muscle strength, arm curl, 30 second sit to stand.		supervised improves walking consistency. Supervised is more appropriate for older participants.	inconsistency	
Kell, K. P. & Rula, E. Y. (2019)	Non-experimental	46,564 ages 65 and older	frequency of program participation	average visits per week	Friedman test	SilverSneakers participation frequency is associated with higher quality of life for seniors.	S: large sample size W: nconsistent survey answers	III, A
Mierzwicki, J. T., Good, T. A., Reed, D. C., & Greer, C. D. (2018).	Experimental study	8	Pain, fatigue, stiffness, minute walking test ($p<0.01$), 5X sit to stand test	Minutes (6MWT) Seconds (5xSST),	Friedman test	Formal, guided walking programs likely promotes improved strength in lower extremities and ambulatory functionality	long term follow-up (6 months after completion)/ no control group, small sample size	I, B
Monteagudo, P., Roldán, A.,	Quasi-experimental and	23	Walking interval training,	6 minute walk test, 5 time sit to stand,	P <0.05, significant improveme	Accumulative walking interval is best	Small sample, no follow-up	II, C

Cordellat, A., Gómez-Cabrera, M. C., & Blasco-Lafarga, C. (2020).	longitudinal study		continuous versus accumulating	timed up and go (s)	nt in cardiorespiratory fitness, agility, walking speed and BMI	for health related quality of life	data collected	
Patel, A. V., Hildebrand, J. S., Leach, C. R., Campbell, P. T., Doyle, C., Shuval, K., Wang, Y., & Gapstur, S. M. (2018).	Prospective cohort analysis	139,255	Walking versus other types of physical activity (unspecified), correlation with mortality	Physical activity scores based on active minutes to hours in 1 week	Inactivity associated with higher all cause mortality HR 1.26, 95% CI 1.21-1.31	Walking lowers risk of cardiovascular mortality	Large sample size Some studies restrictive to gender, self reported physical activity	I, A
Powell-Wiley, T. M., Poirier, P., Burke, L. E., Després, J.-P., Gordon-Larsen, P.,	Scientific statement	NA	NA	NA	NA	there is a need to evaluate mechanisms underlying obesity-related cardiac dysfunction and to improve	Expert opinion but data based, thorough	IV, B

Lavie, C. J., Lear, S. A., Ndumele, C. E., Neeland, I. J., Sanders, P., & St-Onge, M.-P. (2021).						the management of patients with obesity and CVD through future research (		
Saad, M. F., Cheah, W. L., & Hazmi, H. (2021).	Quasi-experiemental	109	Gradual walking program	Pedometer, steps taken	Increase in mean number of steps pre and post	12 wk walking program has a positive effect on anthropometric measures in sedentary individuals	Small sample	II, B
Sheikh, S. Z., Kaufman, K., Gordon, B. B., Hicks, S., Love, A., Walker, J., Callahan, L. F., & Cleveland,	Pre/post pilot	75	Pain, stiffness, fatigue Walking program	Visual analog scale	Multivariate linear regression	WWE improves pain, fatigue and stiffness in the systemic lupus erythematosus	Small sample, no control group, poor follow-up	I, A

R. J. (2019, April).								
Silveira, E. A., Mendonçxa, C. R., Delpino, F. M., Souza, G. V. E., de Souza Rosa, L. P., de Oliveira, C., & Noll, M. (2022).	Systemic review, met analysis	638,000	Objective and subjective associations	Mutlitple: objective and subjective, sedentary behavior, physical inactivity, obesity, (pedometers, accelerometer)	Meta-analysis	+ Correlation between SB and PA and obesity. Drive for patients to focus on adjusting SB	Large, in depth study, correlational obesity with SB, fewer objective studies	I, A
Vilen, L. H., Mary, A., & Leigh, C. F. (July, 2022).	Systemic review of qualitative studies	NA	Interview questions identifying personnel involvement and early implementation effects.	NA	Planning for sustainability framework	Results could be useful helping other organizations to streamline WWE implementation by identifying barriers and solutions. Ways to make future lasting programs more flexible.	Identifies short-term uptake only, small sample size, only includes OAAA grantees.	III, B

Ward, Z. J., Bleich, S. N., Long, M. W., Gortmaker, S. L. (2021).	Meta-analysis	175,726	BMI, cost in US dollar	BMI scale, healthcare cost in dollars	two-part regression model	Higher health care costs are associated with excess body weight across a broad range of ages and BMI levels	Unobserved physical activity, only looked at direct costs	I, A
Yorks, D. M., Frothingham, C. A., Schuenke, M. D. (20	Non randomized control study	69	Quality of life, surverys.	Visual analog scale	Increased QOL p=0.007	Group fitness classes= improved QOL, mood and decreased stress.	Small sample, participants selected own groups	II, A
Yuenyongchaiwat, K., Pipatsitipong, D., & Sangprasert, P. (2017).	Longitudinal quasi-experimental study	35	Walking program, steps walked, BP, glucose	BP mmHG, steps taken - pedometer, blood glucose levels	Blood glucose levels in intervention group was significant p< 0.001	10,000 daily steps decreases SBP and blood glucose in overweight patients	Small sample, no control group, little gender variability	II,B

Appendix B
Johns Hopkins Nursing Evidence Based Practice Model

Evidence Levels	Quality Guides
Level I Experimental study, randomized controlled trial (RCT) Systematic review of RCTs, with or without meta-analysis	**A High quality:** Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence **B Good quality:** Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence **C Low quality or major flaws:** Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn
Level II Quasi-experimental study Systematic review of a combination of RCTs and quasi-experimental, or quasi-experimental studies only, with or without meta-analysis	
Level III Non-experimental study Systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only, with or without meta-analysis Qualitative study or systematic review with or without a meta-synthesis	

Evidence Levels	Quality Guides
Level IV Opinion of respected authorities and/or nationally recognized expert committees/consensus panels based on scientific evidence Includes: • Clinical practice guidelines • Consensus panels	**A High quality:** Material officially sponsored by a professional, public, private organization, or government agency; documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years **B Good quality:** Material officially sponsored by a professional, public, private organization, or government agency; reasonably thorough and appropriate systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years **C Low quality or major flaws:** Material not sponsored by an official organization or agency; undefined, poorly defined, or limited literature search strategy; no evaluation of strengths and limitations of included studies, insufficient evidence with inconsistent results, conclusions cannot be drawn; not revised within the last 5 years

Level V Based on experiential and non-research evidence Includes: • Literature reviews • Quality improvement, program or financial evaluation • Case reports • Opinion of nationally recognized experts(s) based on experiential evidence	**Organizational Experience:** **A High quality:** Clear aims and objectives; consistent results across multiple settings; formal quality improvement, financial or program evaluation methods used; definitive conclusions; consistent recommendations with thorough reference to scientific evidence **B Good quality:** Clear aims and objectives; consistent results in a single setting; formal quality improvement or financial or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence **C Low quality or major flaws:** Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial or program evaluation methods; recommendations cannot be made **Literature Review, Expert Opinion, Case Report, Community Standard, Clinician Experience, Consumer Preference:** **A High quality:** Expertise is clearly evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field **B Good quality:** Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions **C Low quality or major flaws:** Expertise is not discernable or is dubious; conclusions cannot be drawn

Appendix C

Levels of Evidence

Level of Evidence		Grade	
I	**13**	**A**	**10**
II	**6**	**B**	**11**
III	**2**	**C**	**1**
IV	**1**		
	22		**22**

Appendix D

Permission for Use

Thank you for your submission.
We are happy to give you permission to use the Johns Hopkins Evidence-Based Practice model and tools to adhere to our legal terms noted below.
No further permission for use is necessary.

Implementing a Walking Program for Sedentary Patients in a Weight Management Clinic: Methodology

Bailey Tetrault

College of Nursing, South Dakota State University

Abstract

Background: Promoting physical activity in weight management patients promotes better patient outcomes.

Methods: Weight management clinic patients were enrolled in the 6-week Walk with Ease (WWE) program. At the first session, each participant's walking distance was measured over a 20-minute timeframe using pedometers. WWE group met 3 times weekly for six weeks for walking activities and with education on movement, mobility, and strength. At each session, the walking distance of participants was measured over 20 minutes. Race, gender and age descriptive were also collected.

Results: Statistical tests included the Friedman Test, ANOVA, and linear regression were calculated at the 5% level. Data over the course of 6 weeks showed increased steps taken with p-value of $.03e$-05. The ANOVA test

Discussion: Even with a small sample size, the program improved steps taken and was well received by participants through attendance and feedback. A structured walking program promoted activity in daily routines and educated patients how to move forward with walking and other exercise in the future.

Implications for Practice: The walking program helped initiate exercise changes in patients who were otherwise generally inactive and not involved in an exercise routine. WWE provided an opportunity for patients to see where they started, track improvement over a number of weeks, and reach a goal that leads to a more active lifestyle.

Implementing a Walking Program For Sedentary Patients in a Weight Management Clinic: Methodology

Sedentary lifestyles and obesity are two major public health concerns that significantly impact individuals' well-being and increase the risk of various chronic diseases. Research indicates that a large proportion of the United States (US) adult population fails to meet recommended physical activity standards, and obesity rates continue to rise (Patel et al., 2018). This sedentary behavior and excess body weight contribute to a range of comorbidities, including diabetes, hypertension, hyperlipidemia, and arthritis (Almevall et al., 2022; Patel et al., 2018). Obesity puts strain on the musculoskeletal system, leading to joint pain, limited mobility, and inflammation (Hensman-Kettrey et al., 2021; National Institute of Health: Diabetes and Digestive and Kidney Diseases [NIDDK], 2022; World Health Organization [WHO], 2023).

Background/Purpose

Increasing physical activity, especially through walking programs, has emerged as a vital strategy for weight management and overall wellness (Almevall et al., 2022; Arthritis Foundation, 2021; Blain et al., 2017). Walking serves as an accessible and low-impact form of exercise that can be adapted to different fitness levels and integrated into daily routines. Structured walking programs provide individuals with guidance, setting both short-term and long-term goals to gradually increase activity levels and adopt healthier habits (Saad et al., 2021).

Significance

The effect of obesity and sedentary lifestyles is profound. The link between sedentary behavior and obesity stems from prolonged periods of inactivity and can

negatively impact energy balance, metabolic health, and overall body weight (Silveira et al., 2022). Risk for cancers, mental health disorders, cardiovascular disease, type II diabetes, sleep apnea, generalized pain, and overall morbidity are increased because of elevated body mass index (BMI) (Center for Disease Control (CDC), 2022; Yuenyongchaiwat et al., 2017). Along with major organ disease like hypertension, diabetes, and cancer, obesity contributes to musculoskeletal damage. Obese individuals experience osteoarthritis and joint pain at a greater incidence than those with a normal BMI (Mierzwicki et al., 2018).

Obesity is a multifactorial, chronic condition that needs to be addressed by providers. Education on nutrition, sleep, hydration, and exercise all contribute to a healthy weight, and maintaining a healthy weight requires support, motivation, and determination (CDC, 2022; Gocer et al., 2017; Silveira et al., 2022). Addressing sedentary behaviors allows for cost effective intervention, profound growth, and significant effects (Monteagudo et al., 2020). This Doctor of Nursing Practice (DNP) Project focused on the exercise component of weight management.

PICOT

For the purpose of the project focus, a PICOT question was established. The PICOT reads “In sedentary adult patients who do not require assistive devices (P), how does a walking program (I) in comparison to no walking program (C), affect steps taken over 20 minutes (O) in 6 weeks (T)?

Evidence Findings

Exercise, particularly walking, is crucial for weight management and reducing the risk of health conditions. Exercise helps burn calories, improve cardiorespiratory

fitness, and lower BMI. Walking exercises have additional benefits such as improving depression symptoms, reducing cardiovascular disease risk factors, and lowering glucose levels and BMI (Almevall et al., 2022; Monteagudo et al., 2020; Powell-Wiley et al., 2021).

Walking is particularly beneficial for sedentary individuals as it is low-impact, promotes joint health, and can be adapted to different fitness levels (Gocer et al., 2017). Walking requires no special equipment and can be done anywhere, making it a convenient exercise option. Walking has been shown to be a safe and effective intervention for addressing complications associated with sedentary lifestyles, such as obesity and decreased muscle tone, regardless of demographic factors. Moderate-intensity walking can decrease visceral fat thickness, improve cardiopulmonary capacity, and reduce BMI, making it an accessible and practical way for sedentary individuals to increase physical activity levels and improve joint mobility (Arthritis Foundation, 2021; Blain et al., 2017; Yuenyongchaiwat, 2017).

Engaging in group exercise programs offers additional benefits beyond physical improvements. These programs provide social support, positive encouragement, and accountability, which are crucial for sustaining motivation and adherence to regular exercise. Exercising in a group setting has been associated with better physical, mental, and emotional well-being, as well as reduced perceived stress levels. By emphasizing the link between physical activity, weight management, and improved health outcomes, healthcare professionals can empower individuals to break sedentary habits and prioritize an active lifestyle (Hensman-Kettrey et al., 2021; Patel et al., 2018;Saad et al., 2021; Silveira et al., 2022). Encouraging the adoption of walking programs and promoting

group exercise can significantly contribute to combating sedentary behavior, reducing obesity rates, and improving overall health in the population (Fanning et al., 22; Saad et al., 2021; Yorks et al., 2017).

Recommendations for Practice

Structured weight management programs aim to address patients' physical, psychological, and nutritional well-being. Long-term weight management helps decrease the risk of comorbidities and poor outcomes. When starting a physical activity routine, it is important to start small. Walking programs have provided evidence that implementation can increase steps taken, change sedentary behavior, and improve exercise stamina among other benefits (Arthritis Foundation, 2021; Blain et al., 2017; Saad et al., 2021). Walk with Ease (WWE) is an evidence-based walking program that has been shown to increase ambulatory function and lower extremity strength, while improving quality of life scores and cultivating physical activity confidence (Hensman Kettrey et al., 2021; Mierzwicki et al., 2018).

Gaps

Few studies have examined the effects of different evidence-based walking programs, the duration of walking time, or the setting of the program, such as a weight management clinic. Gender differences were only considered in a small number of studies, and there was limited reporting on participation and dropout rates. No studies investigated the variability of the effects of walking programs across different racial and ethnic groups. There was support for walking programs increasing steps walked and decreasing sedentary behavior with positive effect on weight; however, specific walking programs were not listed.

Methods

The evidence-based practice model used in this project was the Johns Hopkins Evidence-Based Practice (JHEBP) Model and Guidelines (Dang & Dearholt, 2017). Pender's Health Promotion Model guides the project with a focus on desirable patient outcomes. The model consists of three main factors: individual characteristics, behavior cognitions, and behavioral outcomes (Pender, 2011). The change theory selected was the Theory of Planned Behavior as it focuses on participant motivation and behavioral control to change routines (Ajzen, 1991).

Setting

The DNP Project took place in a weight management outpatient clinic in a small Midwest community. The weight management clinic has been functioning as a bariatric center for excellence since 2020. The staff consisted of three registered nurses, three nurse practitioners, and three medical doctors. Providers saw adult patients of any race and BMI. The staff meet patients where they are with their diet, activity, and weight goals. Providers offer weight loss through medication therapy, surgery, psychotherapy, and nutrition consultation.

Sample

Participants in the project were required to be adults over the age of 18 and participants in a weight management program. Patients had to be capable of standing without assistance for at least 10 minutes without increased pain and possess a desire for a structured physical activity regimen. Patients could speak English or Spanish. In addition, participants needed to have a desire to make walking a daily habit with a

structured walking/fitness program. Patients must have received support from one of the weight management medical professional in order to participate in the project.

Patients who were non-ambulatory, required the use of an assistive ambulatory device, were unable to stand unassisted for at least 10 minutes, and were deemed unfit by a healthcare provider were excluded. For this DNP Project, the desired sample size was 12 adult participants who were committed to being active in 18 walking sessions.

Evidence-Based Intervention

The WWE program is a group-based curriculum that promotes accountability and helps participants increase their walking activity. The program, developed by the Thurston Arthritis Research Center and the Institute on Aging, aims to improve overall health, build self-confidence in physical activity goals, reduce arthritis-related pain, and increase muscle tone. and the program offers three formats: self-guided, self-directed enhanced, and in-person and includes 18 sessions total. Participants use a WWE workbook as a guide, which provides step-by-step instructions for each session, including goal setting, warm-up movements, tracking walking distance, timing pace, cool-down movements, and behaviors to adopt (Arthritis Foundation, 2021).

The WWE leader conducts three sessions per week. Each meeting consists of a pre-walk discussion and warmup followed by a 20-minute walk. Discussions at the beginning of each session consist of goals, personal barriers, and questions participants may have. The session concludes with a cool down, reflection of the hour, and confirmation of the next scheduled session (Arthritis Foundation, 2021). Patients are encouraged to set their own goals. There are several patient goals that can be achieved

through this program including distance walked, length of time walking, weight loss, and improved mental health scores (Arthritis Foundation, 2021; Mierzwicki et al., 2018).

Procedure

Through the assistance of weight management clinic staff, the DNP Project Manager created a recruitment flyer which was handed out by providers if the patient met inclusion criteria (See Appendix C). Recruitment for the project spanned 40 days, resulting in 37 patients referred to the program, of whom 10 agreed to participate.

This DNP Project followed the in-person format. Walking sessions took place at the local city park with a shelter area for warm-up and deliberation. Flat sidewalks and level ground were important features. Prior to project implementation, the DNP Project Manager and weight management advanced practice provider (APP) were both trained by South Dakota State University (SDSU) Extension. Training was done remotely. Both individuals watched videos provided by the Arthritis Foundation. Leader books were provided. Step-by-step instructions for each session are outlined in the leader book along with optional posters to post at the session location or handout to patients. Permission to share the booklet and poster content (Appendix D) was received by The Arthritis Foundation.

Meeting sessions took place three times per week on Monday, Wednesday, and Friday mornings from 8AM to 9AM. For this project, one WWE leader was present at each session. One half of the sessions were led by a weight management APP with the other sessions being led by the DNP Project Manager. At the first session, participants were given a booklet to journal and guide their walking journey. A written consent (Appendix E) was obtained. The WWE contract provided the patient with documentation

of the walking plan and a section for participants to identify and record a personal goal at the halfway and completion time points. Leaders identified a universal starting point and measured steps taken during each session by each participant with the use of pedometers purchased by the DNP Project Manager. Participants returned pedometers at the end of each session. Steps taken were recorded on an Excel spreadsheet.

During the program, there were 18 sessions, each with a slightly different focus. Each session was divided into the following components:

1. Greeting: The group was welcomed, and participants greeted one another.
2. Group sharing: Participants received feedback. Leaders answered questions from the participants.
3. Lecturette: A different topic was discussed at each session (see Appendix F).
4. 5-Step Basic Walking Pattern Activity: Each session consisted of a warm-up, gentle stretch, walking with increasing intensity, cool down, and gentle stretch.
5. Closing: Participant questions were answered. Leaders encouraged participants to read the associated chapters with the next session and urged them to walk on their own.

Each session lasted 1 hour. Step-by-step instructions guided the flow of the hour. Each participant was given a 6-chapter WWE booklet with recommended chapter readings to coincide with the respective week.

There is always a concern for injury with activity. A plan was developed prior to implementation should a participant suffer an injury. Fortunately, there were no accidents or injuries during the DNP Project.

Ethics

Considering the public location of sessions, confidentiality could have been a factor. This was addressed with participants prior to meetings to ensure awareness and comfort with this format. All participants shared information about involvement in the weight management program. Their first name, short-term and long-term goals, and other physical activity discussion topics took place during sessions.

Data was stored on an Excel spreadsheet that was password protected and only available to the DNP Project Manager. Each participant was given a number at the first session and retained the same number until program completion. No personal patient information was stored on the spreadsheet. Approval from the healthcare facility Institutional Review Board and SDSU Institutional Review Board along with the healthcare Nursing Research Council was obtained prior to implementation.

Results

Demographics

A total of 10 patients participated in this project. Participants were not removed from the project if they were absent from walking sessions. Of these 10 participants, 6 (60%) were female, and 4 (40%) were male. The population was exclusively white. Ages ranged from 31 years old to 83 years old with the average age of 52.4 and the median age of 54.5 (Appendix H).

Statistical Results

Ten participants completed the 6-week walking program. The goal of the analysis was to determine if there was statistically significant evidence to conclude that the

walking program increases the steps a patient can take. This was done through methods including a Friedman test, ANOVA, and linear regression.

A Friedman test for repeated measures was used to analyze the data results from pedometers. The total number of steps during each of the 18 walking sessions was tracked on a spreadsheet (See Appendix H). The number of steps taken increased each week for all patients with an average increase of 833.1 steps. From the Friedman test for all participants, a *p*-value of 3.86e-05 was calculated indicating that steps were increased significantly for the cohort. the range of increased steps across all 10 walkers was 273 to 1,382 steps while the average increase in steps was 833.1 over 6 weeks.

For the parametric ANOVA test, in which we assume normality within weeks, a *p*-value of 5.99e-07 was calculated indicating that the mean of at least 1 week was different from the means of the other weeks. This test did not reveal which weeks were different from the others nor how much change there was from week to week. To explore this further, linear regression was performed on the dataset. The main value of interest from this regression was to find the relationship between the week and the steps taken. Specifically, a rate of how many steps gained or lost over each week was evaluated. Since each patient had a different base rate of steps that they took, the test allows for each patient's individual steps. A corresponding *p*-value of < 2e-16 for all 10 patients was calculated indicating that one week leads to, on average, 68 more steps were walked with each consecutive week.

There was not a single participant who attended all 18 sessions. The range of sessions missed was 1-6. The average number of missed sessions per walker was 3.6 sessions. Given that patients had missed sessions throughout the project, it was of interest

to explore whether missed sessions had an effect on steps taken. To do this, an indicator was added to the linear regression model which had a value of 1 if at least one session was missed. This test revealed a *p*-value of 0.179 which would indicate missing days did not influence steps taken. It is important to note this does not conclude that missing days does? not effect steps walked, but rather there is not enough evidence to conclude that it does have an effect.

Clinical Results

Throughout the 6-week program, patient feedback from session deliberation was very positive. Participants felt the scheduled sessions helped hold them accountable for being at a location at a certain time. Positive comments were shared regarding the lecturette content including correct walking posture, stretches, and body-weight movements. As part of the WWE program, patients received all content discussed during sessions in book form to utilize as a resource going forward. Participants also reported the 3 times per week frequency was often inconvenient in combination with busy schedules.

Discussion

Walking programs can be effective in increasing activity and improving physical health. Evidence-based literature have shown that walking programs can lead to increased physical activity levels, weight loss, improved blood pressure and cholesterol levels, and reduced risk of heart disease, stroke, and type 2 diabetes. Improving walking ability and physical activity can have a positive impact on patient wellness.

Barriers

There were minimal barriers to completing this project. The most prominent barrier was recruiting participants for the program. Although the program was free, it required time commitment and physical input from participants. Another potential barrier was patient dropout. Asking participants to attend 18 sessions over 6 weeks was a commitment. Attending all sessions was not mandatory, this provided participants with flexibility to participate when they could. None of the participants were able to attend all 18 sessions, which posed some limitations to the data analysis. Having weight management provider support was a concern at the beginning of the project, but ultimately provider buy-in was not a barrier. Provider recommendations encouraged patients to utilize all the resources the weight management program could offer to achieve their goals.

Although this project had a small sample of 10 participants, the results revealed the walking program increases a patient's steps over 6 weeks. Information on the number of steps taken over the 18 sessions was provided to participants at the end of the program. Participants were very pleased with their results and many reported they plan to continue the routine. Just like other evidence-based walking programs showed, the WWE program helped walkers start with a realistic goal, stay motivated, track progress and implement walking exercises beyond program completion.

Implications

The DNP Project was carried out through the outpatient weight management program at the local clinic attached to a critical access hospital. The cost of the program startup was approximately $440 dollars which includes the cost of pedometers, instructor

training and books for up to 15 participants. Currently, SDSU Extension will cover costs of the program implementation.

Implementing this program into weight management addressed a key component for weight loss. However, at this time the facility stakeholder does not plan to put the program into policy. Although the program did show an increase in steps over 20 minutes for 6 weeks indicating an improvement in sedentary behaviors in weight management patients, it is not sustainable for the rural clinic at this time. Yet, the importance of physical activity is discussed at length in the throughout the program. These discussions could include more specific guidelines along with the mental health and nutrition components as well. Identifying policies to guide care in this setting going forward has the potential to improve the overall health of weight management patients and reduce complications throughout the program. Including a walking program like WWE or the like provides another optional resource for patients to make improvements in their health.

Sustainability

The dependence on volunteers makes WWE vulnerable to sustainability challenges. Walk with Ease is a great initiative that helps sedentary adults become active. However, it is not a sustainable program for the weight management clinic due to its reliance on volunteers. Finding other volunteers aside from the project leader and facility stakeholder was a challenge. The program requires a significant time commitment. Due to being unable to recruit and retain other volunteers, it is unrealistic for the clinic to continue the program in this way. Continued interest in the program by participants was another factor. Although 10 patients participated in the initial program, patients reported difficulty attending all in person sessions. There was discussion between the stakeholders

to trial a similar form of the program that is considered a hybrid. This consists of one in-person session per week with the other 2 sessions each week being individual and, on the participant's own time and choice of location. This is the current plan in place in order to proceed with a sustainable exercise program.

Limitations

The main limitation to the project was the small sample size, and thus limited generalizability.

Future Projects

Future projects could consider a focus on more patient perspective values such as quality of life scores. Other considerations for future projects include anyone interested in a walking program versus only those who are deemed to be living sedentary lifestyles by weight management providers.

Conclusion

Implementation of the Walk with Ease program in a weight management clinic aimed to improve the exercise capabilities of sedentary patients. Implementing an evidenced-based walking program as part of the weight management clinic repertoire provided more resources for patients. Overall, the proposed practice change was a smooth implementation process. Cost and buy-in are two factors that often hinder change in the workplace, this intervention was held back very little by these determinants. Moving forward with a consistent walking program is an important part of a weight management program because it is a safe and effective way to increase physical activity, improve cardiovascular health, and build muscle. Walking is also a low-impact activity that is accessible to people of all fitness levels. If people know about a leader-guided program

and are interested in joining, it is more likely that the program will lead to changes in practice.

References

Ajzen I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes.* 1991;50:179–211.

Arthritis Foundation. (2021.) *Walk with Ease. Your guide to walking for better health, improved fitness, and less pain.* The Arthritis Foundation.

Blain, H., Jaussent, A., Picot, M. C., Maimoun, L., Coste, O., Masud, T., Bousquet, J., & Bernard, P. L. (2017). Effect of a 6-month brisk walking program on walking endurance in sedentary and physically deconditioned women aged 60 or older: A randomized trial. *The Journal of Nutrition, Health & Aging*, *21*(10), 1183–1189. https://doi.org/10.1007/s12603-017-0955-7

Cavero-Redondo, I., Martinez-Vizcaino, V., Fernandez-Rodriguez, R., Saz-Lara, A., Pascual-Morena, C., & Álvarez-Bueno, C. (2020). Effect of behavioral weight management interventions using lifestyle mHealth self-monitoring on weight loss: A systematic review and meta-analysis. *Nutrients*, 12(7), 1977. http://dx.doi.org/10.3390/nu12071977

Center for Disease Control and Prevention (CDC) (2022, June 16). Physical activity for a healthy weight. https://www.cdc.gov/healthyweight/physical_activity/index.html

Cooper,L., Ryan, C. G., Ells, L. J., Hamilton, S., Atkinson, G., Cooper, K., Johnson, M. I., Kirwan, J. P., & Martin, D. (2018). Weight loss interventions for adults with overweight/obesity and chronic musculoskeletal pain: a mixed methods systematic review. *Obesity Reviews*, 19(7), 989–1007. https://doi.org/10.1111/obr.12686

Fanning, J., Rejeski, W. J., Leng, I., Barnett, C., Lovato, J. F., Lyles, M. F., & Nicklas, B. J. (2022). Intervening on exercise and daylong movement for weight loss maintenance in older adults: A randomized, clinical trial. *Obesity (Silver Spring*), 30(1), 85–95. https://doi.org/10.1002/oby.23318

Göçer, E., Ardıç, F., Akkaya, N., & Herek, D. (2017). Efficacy of moderate-intensity walking provided feedback by ECE PEDO on abdominal fat in overweight and obese women: A randomized, exercise study. *Turkey Journal Physical Medicine Rehabilitation.* 29;63(4):340-347.

Hensman-Kettrey, H., Schaffer, K. A., & King, S. B. (2021, October 1). Evaluating physical activity and quality of life for older adults through walk with ease. *Archives of Rheumatology and Arthritis Research,* 1(5). https://doi10.33552/ARAR.2021.01.000522

Hossain, M. A., Amin, A., Paul, A., Qaisar, H., Akula, M., Amirpour, A., Gor, S., Giglio, S., Cheng, J., Mathew, R., Vachharajani, T., Bakr, M., & Asif, A. (2018). Recognizing obesity in adult hospitalized patients: A retrospective cohort study assessing rates of documentation and prevalence of obesity. *Journal of Clinical Medicine,* 7(8), 203. https://doi.org/10.3390/jcm7080203

Hsu, C. , Wu, H. , Liao, H. , Liao, T. , Su, S., & Lin, P. (2021). Self-monitored versus supervised walking programs for older adults. *Medicine*, 100 (16), e25561. Doi: https://doi.org/10.1097/MD.0000000000025561

Johns Hopkins Medicine. (n.d.). The skinny on visceral fat. *Johns Hopkins Diabetes Education.* https://www.hopkinsmedicine.org/gim/faculty-

resources/core_resources/Patient%20Handouts/Handouts_May_2012/The%20Skinny%20on%20Visceral%20Fat.pdf

March, L. & Cross, M. (2022, May 28). Epidemiology and risk factors for osteoarthritis. *UpToDate*. https://www.uptodate.com/contents/epidemiology-andriskfactorsforosteoarthritis?sectionName=Obesity&search=obesity%20&topicRef=5370&anchor=H4111593320&source=see_link#H4111593320

Mierzwicki, J. T., Good, T. A., Reed, D. C., & Greer, C. D. (2018). The impact of the Walk with Ease program on lower extremity strength and ambulation in individuals with osteoarthritis. *Physical Therapy and Rehabilitation*, 5(12).

National Institute of Health: Diabetes and Digestive and Kidney Diseases [NIDDK]. (2022). Weight management. https://www.niddk.nih.gov/health-information/weight-management

Patel, A. V., Hildebrand, J. S., Leach, C. R., Campbell, P. T., Doyle, C., Shuval, K., Wang, Y., & Gapstur, S. M. (2018). Walking in relation to mortality in a large prospective cohort of older U.S. adults. *American Journal of Preventive Medicine*, *54*(1), 10–19. https://doi.org/10.1016/j.amepre.2017.08.019

Pender, N. (2011). The Health Promotion Model. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/85350/HEALTH_PROMOTION_MANUAL_Rev_5-2011.pdf.

Pereira, D., Afonso, A. & Medeiros, Fátima. (2015). Overview of Friedman's test and post-hoc analysis. *Communications in Statistics - Simulation and Computation*, 44: 2636-2653. http://dx.doi.org/10.1080/03610918.2014.931971

Perreault, L. & Laferrere, B. (2022, September 30). Overweight and obesity in adults: Health consequences. *UpToDate.* https://www.uptodate.com/contents/overweight-and-obesity-in-adults-health-consequences?search=obesity%20&topicRef=5371&source=see_link#H807212073

Powell-Wiley, T. M., Poirier, P., Burke, L. E., Després, J.-P., Gordon-Larsen, P., Lavie, C. J., Lear, S. A., Ndumele, C. E., Neeland, I. J., Sanders, P., & St-Onge, M.-P. (2021). Obesity and cardiovascular disease: A scientific statement from the American Heart Association. *Circulation* (New York, N.Y.), 143(21), e984–e1010. https://doi.org/10.1161/CIR.0000000000000973

Sheikh, S. Z., Kaufman, K., Gordon, B. B., Hicks, S., Love, A., Walker, J., Callahan, L. F., & Cleveland, R. J. (2019, April). Evaluation of the self-directed format of Walk with Ease in patients with system lupus erythematosus: The walk-SLE pilot study. *Lupus*, 28, 764-770.

Ward, Z. J., Bleich, S. N., Long, M. W., & Gortmaker, S. L. (2021). Association of body mass index with healthcare expenditures in the United States by age and sex. *PLOS ONE*, 16(3): e0247307. https://doi.org/10.1371/journal.pone.0247307

World Health Organization (WHO). (2023). Obesity. https://www.who.int/health-topics/obesity#tab=tab_1

Yale University. (n.d.) Protocol design – Inclusion and exclusion criteria. Yale University. https://assessment-module.yale.edu/human-subjects-protection/protocol-design-inclusion-and-exclusion-criteria

Yorks, D. M., Frothingham, C. A., & Schuenke, M. D. (2017). Effects of group fitness classes on stress and quality of life of medical students. *The Journal of the American Osteopathic Association*, 117 (11):e17-e25. https://doi.org/10.7556/jaoa.2017.140.%20PMID:%2029084328

Yuenyongchaiwat, K., Pipatsitipong, D., & Sangprasert, P. (2017). Increasing walking steps daily can reduce blood pressure and diabetes in overweight participants. *Diabetology International*, *9*(1), 75–79. https://doi.org/10.1007/s13340-017-0333-z

Appendix A

Facility Approval

HUMAN SUBJECTS RESEARCH DETERMINATION

Federal regulations and Institutional Review Board IRB) policy requires **ALL** research projects involving **humans as subjects** (including involvement of humans in one or more of the categories of research exempted or waived under the federal regulations), **OR the use of identifiable protected health information** be reviewed and approved by an IRB **PRIOR** to initiation of any research related activities, including recruitment and screening activities. The IRB is the sole body designed to make official human subjects research (HSR) determinations at

will not review submissions after the project has been initiated or completed.

This completed form is the official determination of the project information submitted to the IRB. Please keep this information for your records.

Researcher / Credentials:	Bailey Tetrault, RN
Email Address:	
Telephone Number:	
Project Title:	Implementing a Walking Program in Sedentary Patients in a Weight Management Clinic
Date of the Submission:	7/20/2023
Determination Date:	7/24/2023
Approved Data Elements:	Participant Assigned Number (1-16) Session Numbers (0-18)

IRB Determination:

☐ INSUFFICIENT INFORMATION: Additional information is needed to complete the assessment of this project.

☑ WAIVED: the proposed activity, as described, **DOES NOT** meet criteria of Human Subjects Research. Submission of a IRB research application is not required.

☐ REQUIRED: The proposed activity, as described, **DOES** meet criteria of Human Subjects Research. The IRB office will contact you with the additional documents you are required to submit for further review. **IRB approval or the IRB of Record approval must be obtained before the investigator begins research.**

Additional Documents Required:

In efforts to ensure protection of our patient's data and before accessing, reviewing, using, collecting, or analyzing an protected health information (PHI), proper authorizations must be in place **BEFORE** these activities occur. If PHI is going to be removed from our covered entity, approval is required to ensure the process for transfer of the data is secure and aligns with policies. It is everyone's responsibility to protect patient's PHI. **DO NOT begin project/research activities until confirmation of receipt of these documents from the IRB has been provided to you.**

- ☐ Data Use Agreement or.
- ☐ Data Use Agreement for Medical Students
- ☐ Confidentiality Agreement

** Note: New agreements are required for each project/Human Subject Research submission.

This determination applies only to the activities described in this IRB submission and does not apply should any changes be made. If changes are being considered or there are questions about whether IRB re-review is needed, please submit a study modification to the IRB for determination.

Thank you for your project submission. If you have any questions or concerns, please feel free to reach out to the IRB Office by callin -mailing

If you Suspect a Breach of Information or Potential Identity Theft – report concerns to the rivacy Officer within 24 hours by e-mailing your report to:
!CorporateResponsibility(or f

MH IRB Determination form completed by:

7.24.2023

B Research Compliance Specialist or designee Date

Appendix B

University Approval

Even though your project does not require IRB approval, study activities continue to fall under SD BOR and SDSU policies and procedures, and state and federal laws and regulations such as HIPAA and FERPA will still apply. Please make sure that you consider these additional requirements and build appropriate compliance procedures into your project plan.

Feel free to forward this email to your advisor or anyone else who needs to see confirmation that nothing further is required from the SDSU IRB. Good luck with your study.

Marc Guilford, JD
Interim SDSU Institutional Review Board Coordinator
South Dakota State University
605-658-3767

Appendix C

WWE Recruitment Flyer

WALK WITH EASE

Starting August 7th 2023

EVERY Mon-Wed-Friday

8:00-9:00am

Ends September 15th 2023

Location: City Park

Contact Information:

To Register:

Or Scan QR CODE

SDSU Extension is an equal opportunity provider and employer in accordance with the nondiscrimination policies of South Dakota State University, the South Dakota Board of Regents and the United States Department of Agriculture.

Learn more at extension.sdstate.edu. © 2021, South Dakota Board of Regents.

Appendix D

Permission to Reprint Arthritis Foundation Materials

Bailey,

On behalf of the Arthritis Foundation, you may include the Walk With Ease program appendix in your academic work. I'd a copy of your finished paper. Thank you!

Nick Turkas, MS
Arthritis Foundation
Senior Director, Patient EducationlCommunity Connections
704-802-7339 - direct
704.238.3919 - mobile

Appendix E

Waiver and Consent

Participant Release Form

I understand and agree that there are risks, foreseeable and unpredictable, associated with any exercise or education program. I am aware of these risks and agree that my participation is at my own risk. I hereby agree that neither the Arthritis Foundation, nor any co-sponsoring agency or facility, nor their respective chapters, officers, directors, employees, agents, members or volunteers, shall assume or have any responsibility or liability for the expenses or medical treatment or for compensation for any injury I may suffer during or resulting from my participation in the Arthritis Foundation program, regardless of whether any injury occurs or whether any such injury occurred in a formal or informal program. I do hereby, for myself, my heirs, executors and administrators, waive release and forever discharge the Arthritis Foundation (and any related entities) and any co-sponsoring agency or facility (as well as their agents, employees and volunteers) from any and all rights and claims for damages that I may have or that may hereafter accrue to me arising out of or in any way connected with my participation in this or any future Arthritis Foundation program.

I understand that this Participant Release From has important legal consequences and limits my ability to recover money if I am injured as a result of my participation in this program. I have been given the opportunity to discuss its terms and consequences with an attorney of my choosing if I wish to do so.

I also represent and warrant that I have been advised to seek consultation from my doctor about whether I can safely participate in this program and whether there are precautions or limitations to my participation.

I understand and agree that the goal of the Arthritis Foundation and the co-sponsoring facility is to provide a safe program environment free from disruption or harassment. To this end, the Arthritis Foundation and the co-sponsoring agency reserve the right to deny admission to those individuals whose behavior is disruptive, or who harass other program members and staff.

I understand and agree that a copy of this form will be provided to the Arthritis Foundation as well as any co-sponsoring agency or facility. The Arthritis Foundation (and any related entities) and any co-sponsoring agency or facility may rely upon this Participant Release Form

My signature below indicates that I have read and accept the Arthritis Foundation Release form.

_____ _____

Signature (if under 18 parent must sign) Date

In case of emergency, please call:

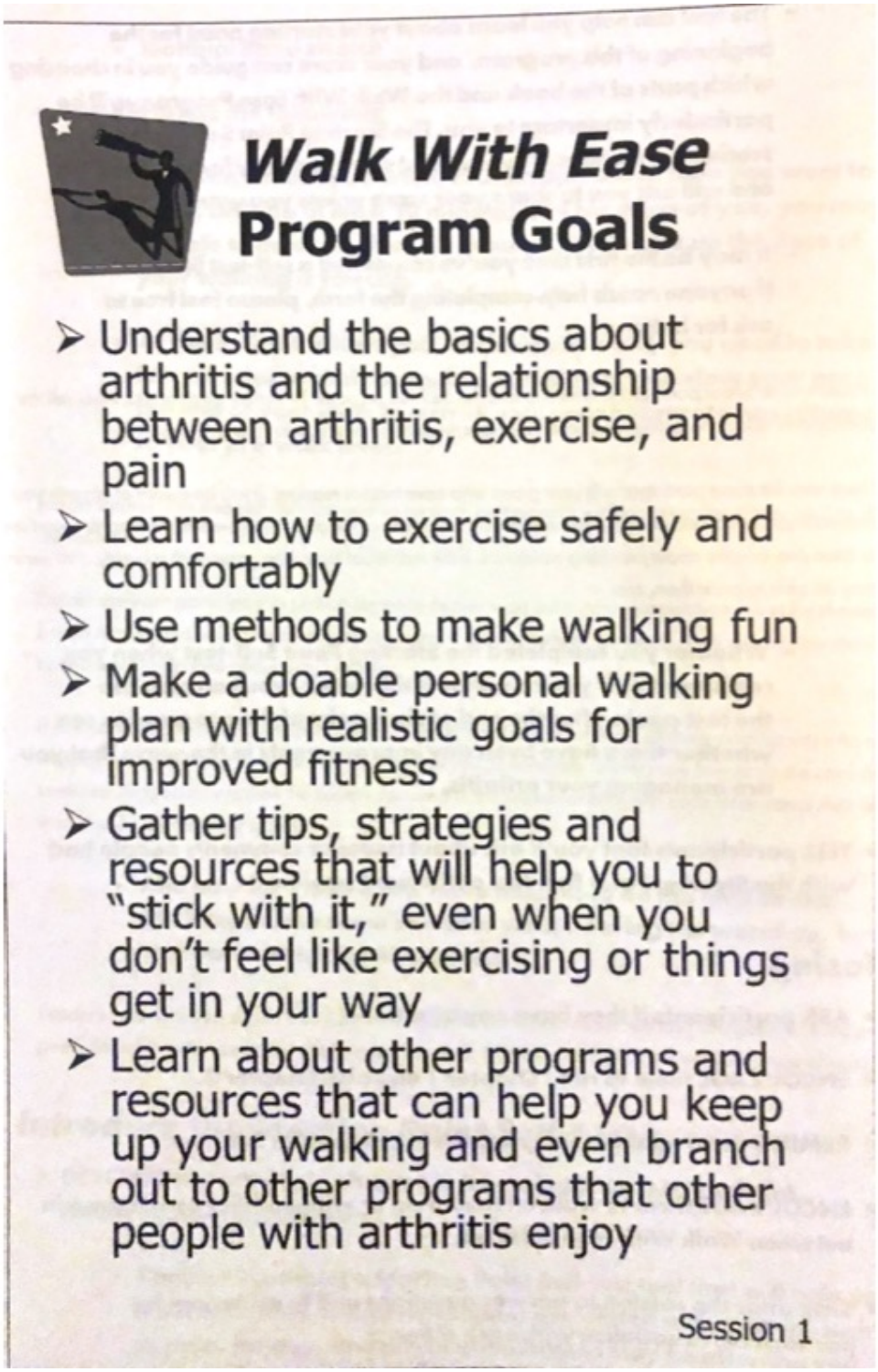
Name _____ Phone _____

Relationship to you_____

v.5.28.14

Appendix F

Lecturette Content



Health Concerns Checklist

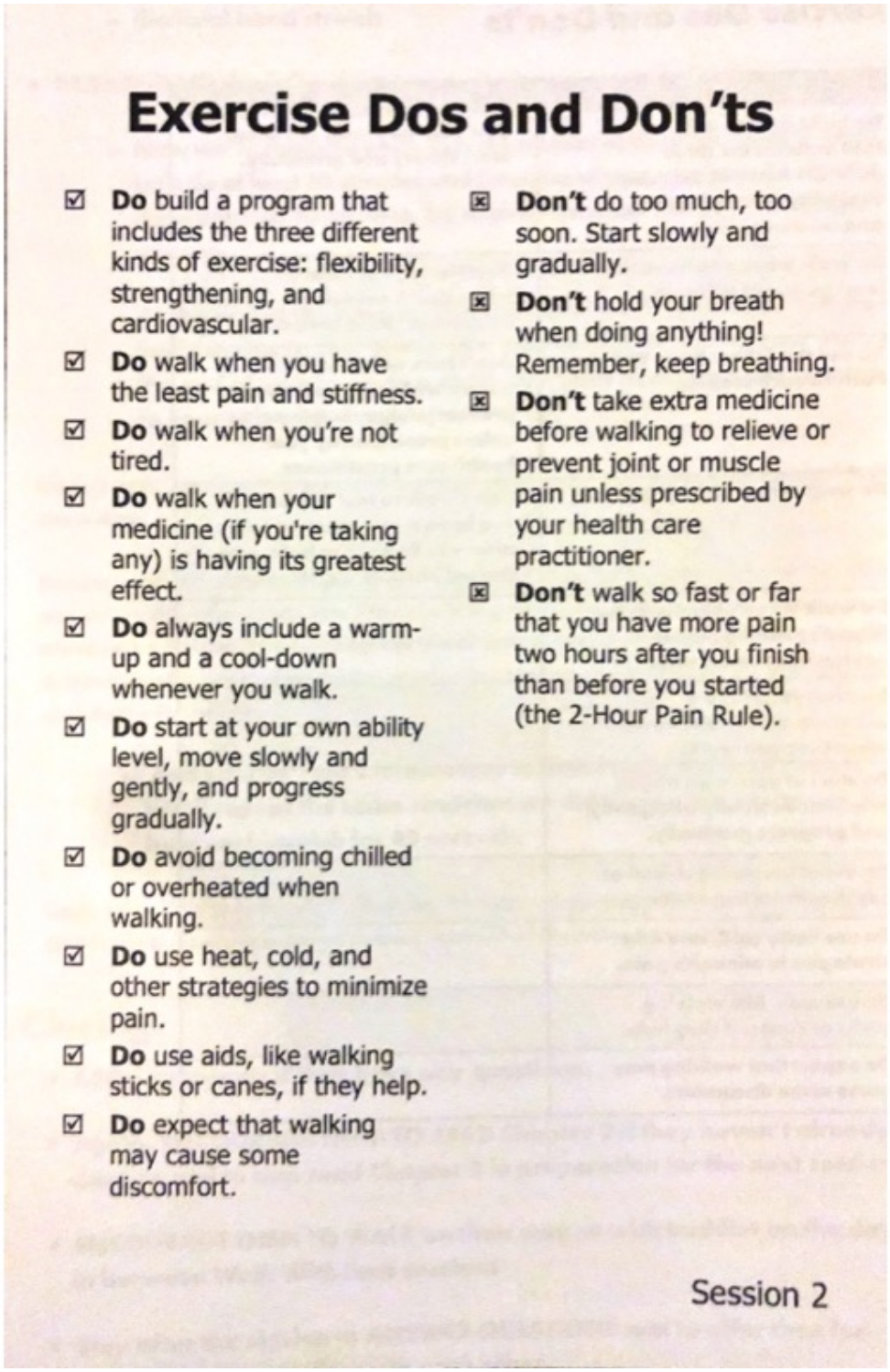
Do you:

- Have heart trouble?
- Have chest pains or pain on your left side (neck, shoulder, or arm) or breathlessness when you are physically active?
- Often feel faint or have dizzy spells?
- Have high blood pressure?
- Have bone or joint problems that could worsen if you are physically active?
- Are you age 50 and have not been physically active?

If you can answer NO to all, you can probably participate in this program with no problem.

If you answer YES to any, you should probably check with your health care practitioner before participating.

Session 1

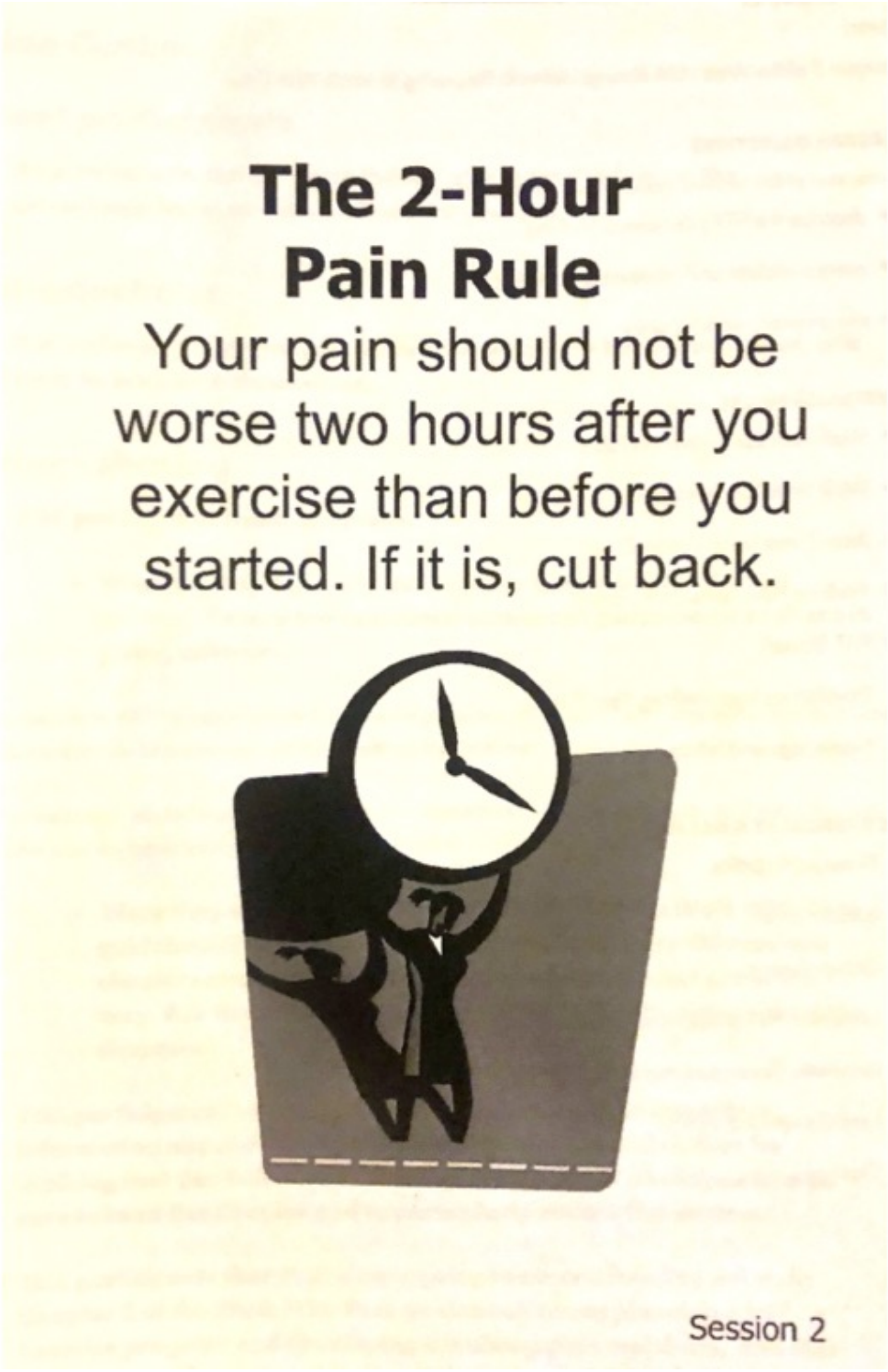


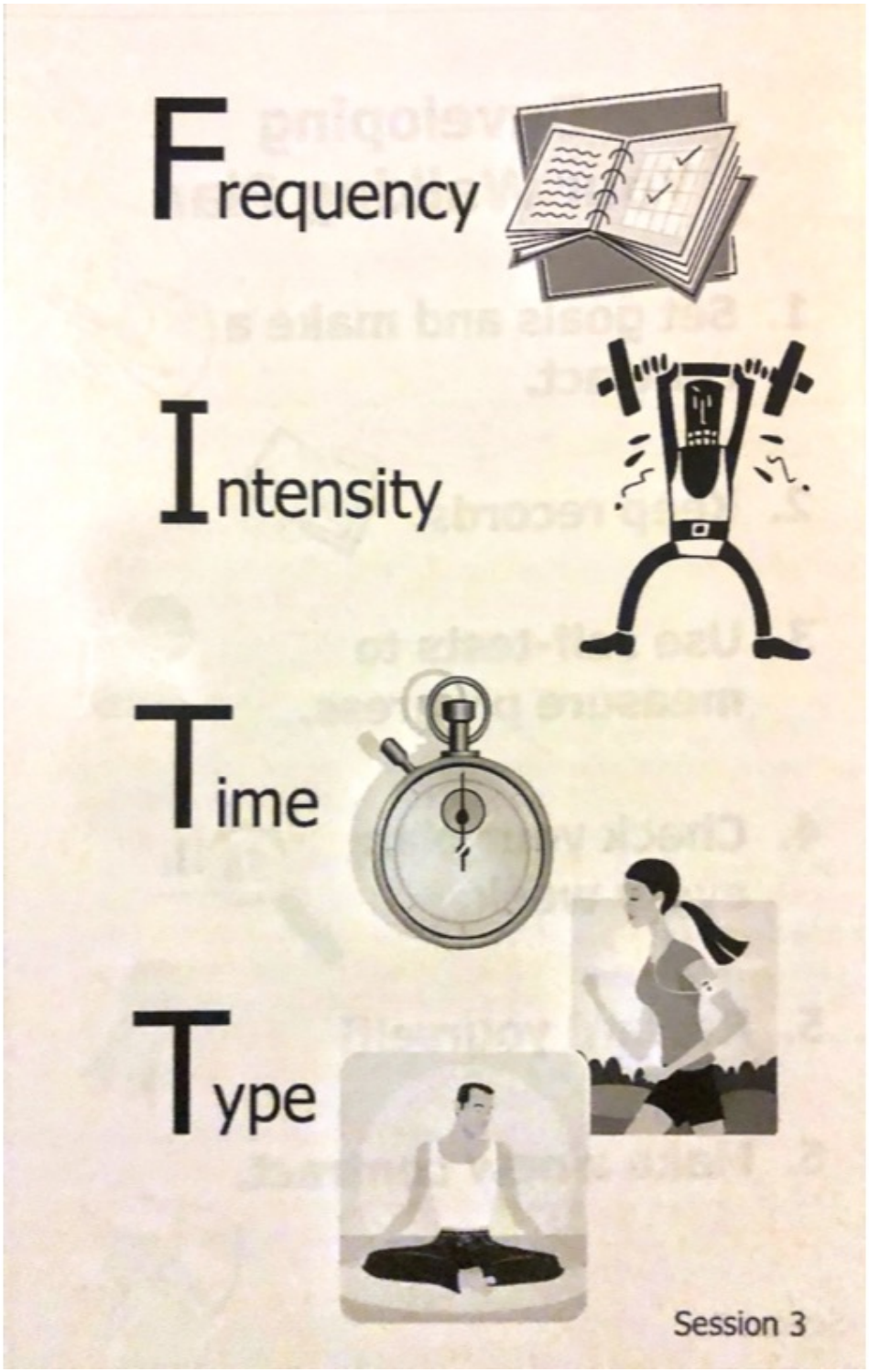
Exercise Dos and Don'ts

- ☑ **Do** build a program that includes the three different kinds of exercise: flexibility, strengthening, and cardiovascular.
- ☑ **Do** walk when you have the least pain and stiffness.
- ☑ **Do** walk when you're not tired.
- ☑ **Do** walk when your medicine (if you're taking any) is having its greatest effect.
- ☑ **Do** always include a warm-up and a cool-down whenever you walk.
- ☑ **Do** start at your own ability level, move slowly and gently, and progress gradually.
- ☑ **Do** avoid becoming chilled or overheated when walking.
- ☑ **Do** use heat, cold, and other strategies to minimize pain.
- ☑ **Do** use aids, like walking sticks or canes, if they help.
- ☑ **Do** expect that walking may cause some discomfort.

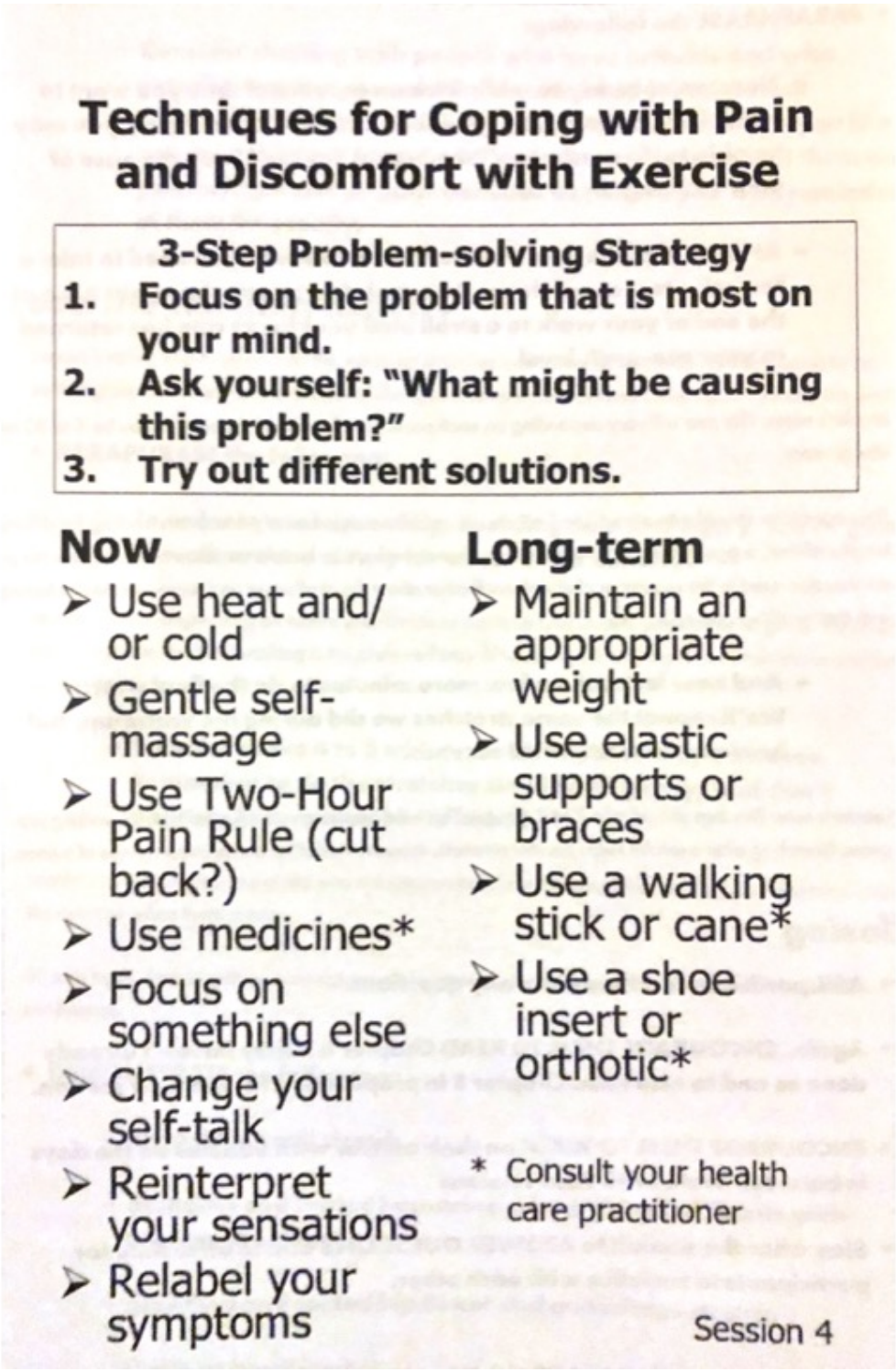
- ☒ **Don't** do too much, too soon. Start slowly and gradually.
- ☒ **Don't** hold your breath when doing anything! Remember, keep breathing.
- ☒ **Don't** take extra medicine before walking to relieve or prevent joint or muscle pain unless prescribed by your health care practitioner.
- ☒ **Don't** walk so fast or far that you have more pain two hours after you finish than before you started (the 2-Hour Pain Rule).

Session 2


The 2-Hour
Pain Rule
Your pain should not be worse two hours after you exercise than before you started. If it is, cut back.
Session 2


Frequency
Intensity
Time
Type
Session 3


Developing
Your Walking Plan
1. Set goals and make a contract.
2. Keep records.
3. Use self-tests to measure progress.
4. Check your plan every week.
5. Reward yourself!
6. Make a new contract.
Session 3


Techniques for Coping with Pain and Discomfort with Exercise
3-Step Problem-solving Strategy
1. Focus on the problem that is most on your mind.
2. Ask yourself: "What might be causing this problem?"
3. Try out different solutions.
Now
Use heat and/ or cold
Gentle self-massage
Use Two-Hour Pain Rule (cut back?)
Use medicines*
Focus on something else
Change your self-talk
Reinterpret your sensations
Relabel your symptoms
Long-term
Maintain an appropriate weight
Use elastic supports or braces
Use a walking stick or cane*
Use a shoe insert or orthotic*
* Consult your health care practitioner
Session 4

Pick the Right Surface! Go for Level I

Level I: Flat, firm surfaces such as school tracks, streets with sidewalks, shopping malls, fitness trails, or quiet neighborhoods. (Most people with arthritis should select Level I surfaces when walking as a cardiovascular exercise.)

Level II: Some inclines or stairs, somewhat uneven ground such as sand, gravel, or soft earth.

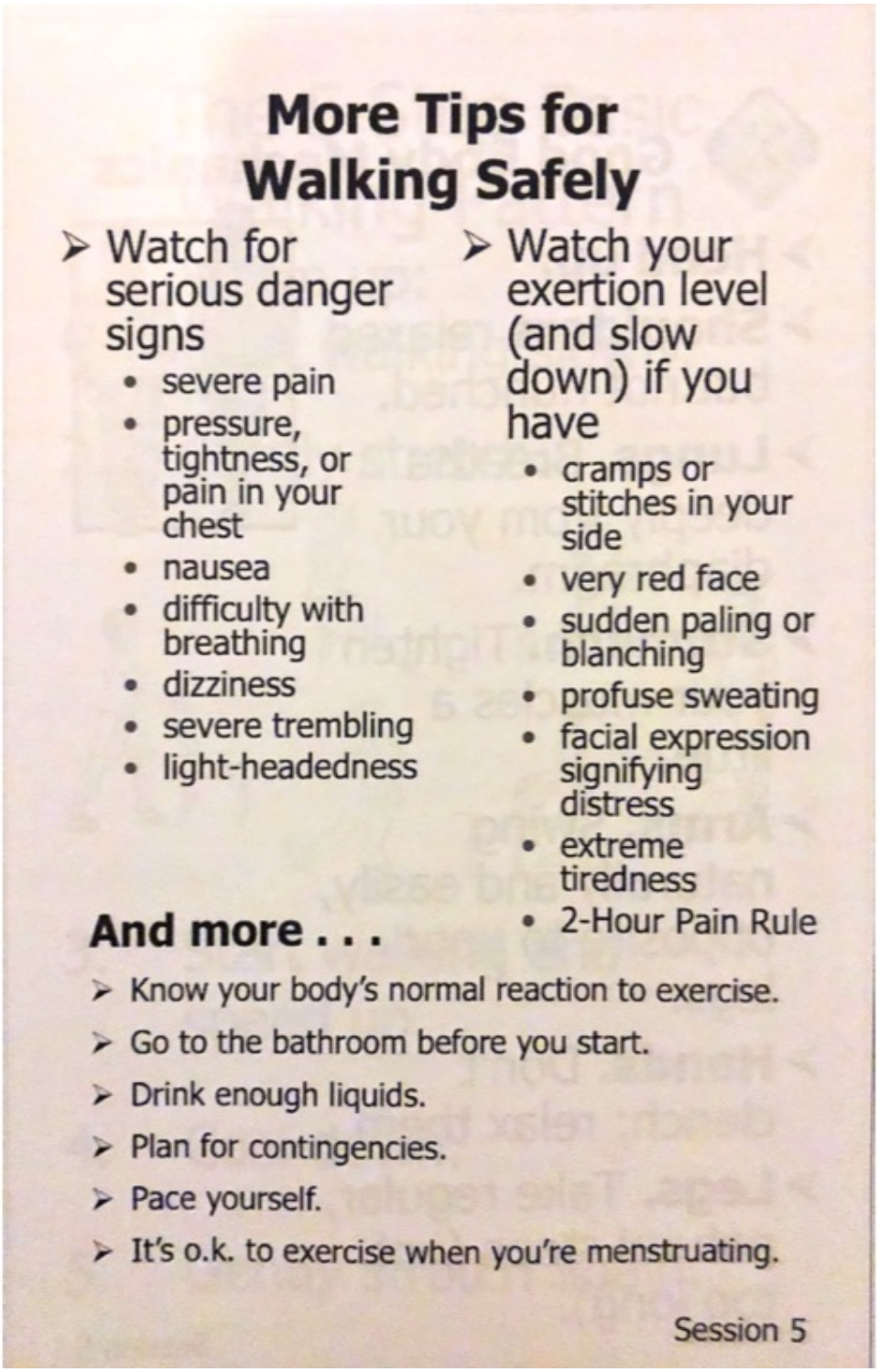
Level III: Hills, very uneven ground with very loose gravel or stones, or lots of stairs. (Most people with arthritis should avoid Level III surfaces when walking as a cardiovascular exercise.)

Session 4

The Walking Progression Chart

Week	Duration	Times/Week
1	10 minutes	3–5
2	15 minutes	3–5
3	20 minutes	3–5
4	25 minutes	3–5
5	30 minutes	3–5
6	35-40 minutes	3–5

Session 5



More Tips for Walking Safely

- Watch for serious danger signs
  - severe pain
  - pressure, tightness, or pain in your chest
  - nausea
  - difficulty with breathing
  - dizziness
  - severe trembling
  - light-headedness
- Watch your exertion level (and slow down) if you have
  - cramps or stitches in your side
  - very red face
  - sudden paling or blanching
  - profuse sweating
  - facial expression signifying distress
  - extreme tiredness
  - 2-Hour Pain Rule

And more . . .

- Know your body's normal reaction to exercise.
- Go to the bathroom before you start.
- Drink enough liquids.
- Plan for contingencies.
- Pace yourself.
- It's o.k. to exercise when you're menstruating.

Session 5

Good Body Mechanics

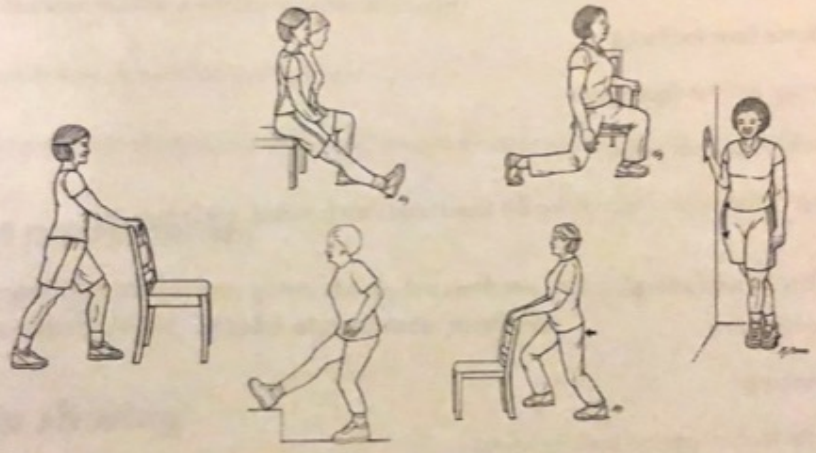
- **Head up.**
- **Shoulders** relaxed but not hunched.
- **Lungs.** Breathe deeply from your diaphragm.
- **Stomach.** Tighten your muscles a little.
- **Arms.** Swing naturally and easily, opposite to your legs.
- **Hands.** Don't clench; relax them.
- **Legs.** Take regular, natural steps (not too long).

Session 5

The 5-Step Basic Walking Pattern

1. Warm up:
   Start walking slowly.

2. Gently stretch.



3. Start walking and speed up.

4. Cool down.

5. Gently stretch again.

Session 5

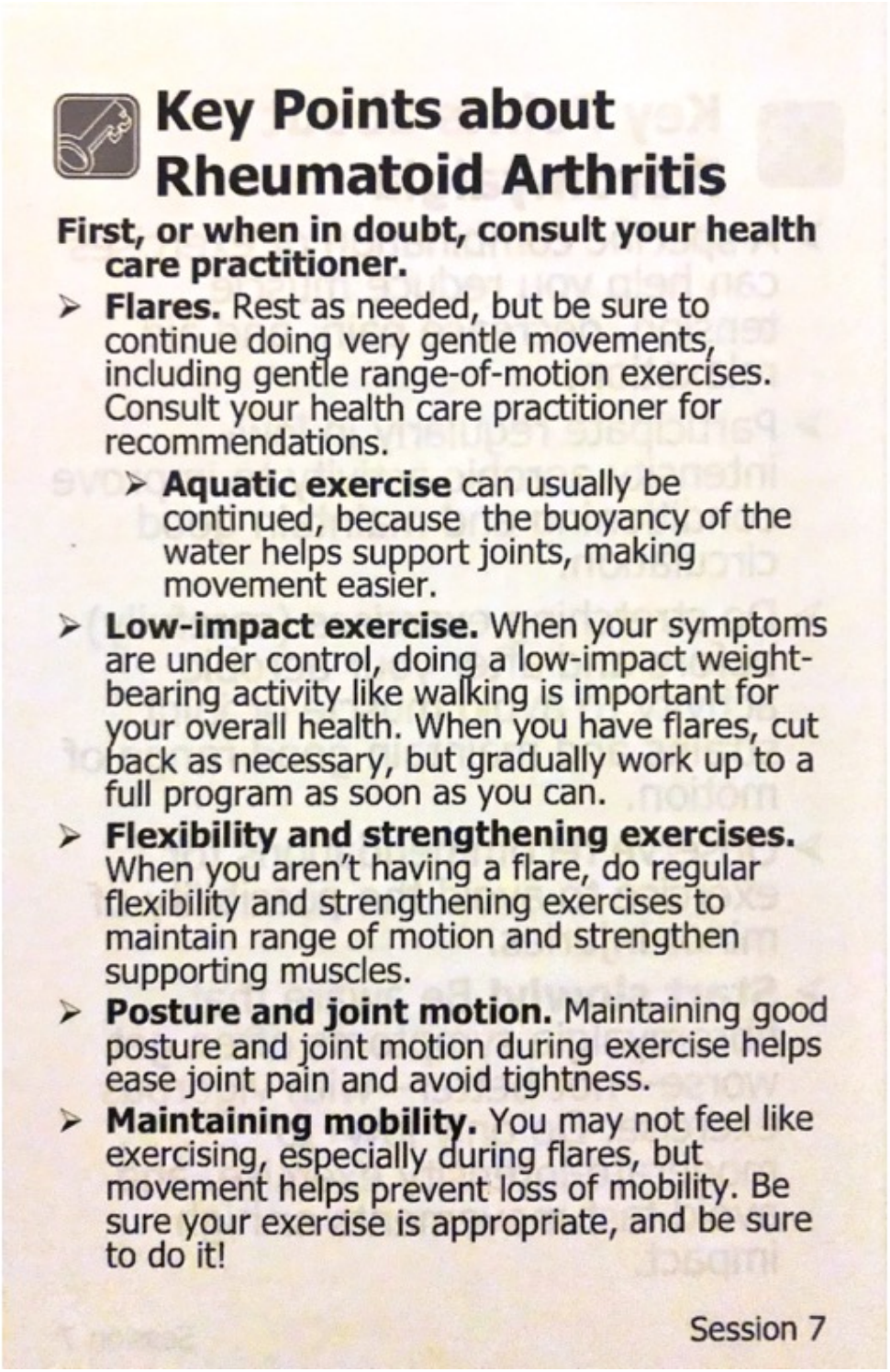
Target Heart Rate Scale

		One Minute Count		10-Second Count	
Age	Max Heart Rate	60% of max	75% of max	60% of max	75% of max
20–24	200	120	150	20	25
25–29	195	117	146	19	24
30–34	190	114	142	19	24
35–39	185	111	139	18	23
40–44	180	108	135	18	22
45–49	175	105	131	17	22
50–54	170	102	127	17	21
55–59	165	99	124	16	21
60–64	160	96	120	16	20
65–69	155	93	116	15	19
70–74	150	90	112	15	19
75+	145	87	108	14	18

Key Points about Osteoarthritis

- **Joints** need to be moved regularly and taken through their full range of motion several times a day to maintain flexibility Observe safety precautions, but avoid babying joints.
  - **Overloaded joints.** If you have osteoarthritis in your hips or knees, avoid exercise that overloads these joints, such as climbing or very fast walking. After exercise try to rest off your feet to give cartilage time to decompress.
  - **Precautions for artificial joints**. Consult your health care practitioner before attempting any stretching or strengthening exercises for that part of your body, and take precautions he or she recommends to help the joint last as long as possible.
- **Moderate activity.** Just as too much rest is bad for joints with osteoarthritis, so is too much activity. Alternate activity and rest throughout the day.
- **Exercise and rest.** Strike a balance between getting enough exercise and getting enough rest. Follow the **2-Hour Pain Rule**: your pain should not worse two hours after you exercise than before you started. Cut back, if necessary.
- **Good shoes and posture**. Always practice good posture and wear supportive shoes.
- **Strengthening exercises.** Do strengthening exercises to tone your muscles that support your joints, particularly in your hips, knees, and ankles.
- **Body weight.** Keep your weight under control. Extra weight speeds up damage to joints.

Session 7

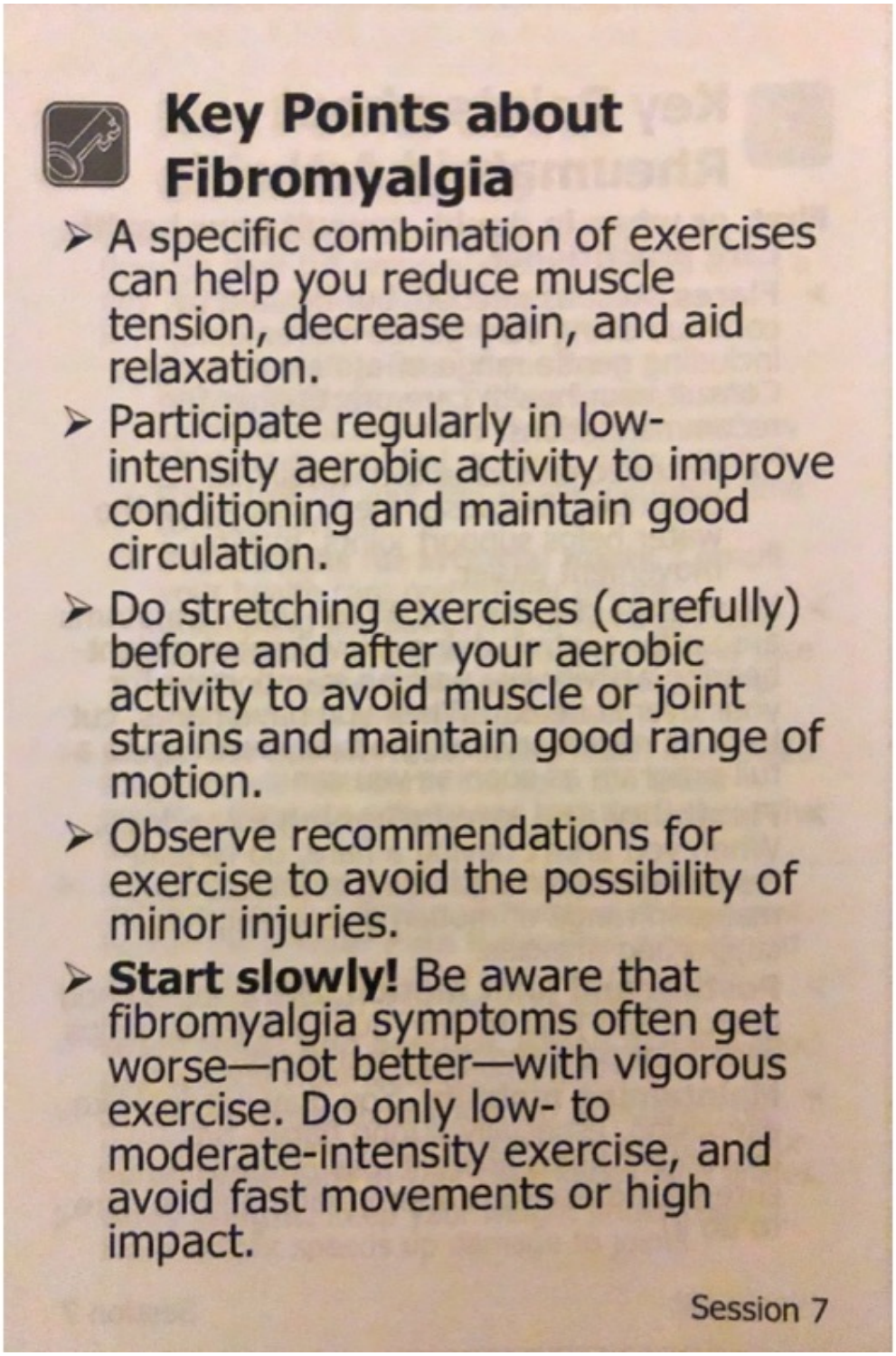


Key Points about Rheumatoid Arthritis

First, or when in doubt, consult your health care practitioner.

- **Flares.** Rest as needed, but be sure to continue doing very gentle movements, including gentle range-of-motion exercises. Consult your health care practitioner for recommendations.
  - **Aquatic exercise** can usually be continued, because the buoyancy of the water helps support joints, making movement easier.
- **Low-impact exercise.** When your symptoms are under control, doing a low-impact weight-bearing activity like walking is important for your overall health. When you have flares, cut back as necessary, but gradually work up to a full program as soon as you can.
- **Flexibility and strengthening exercises.** When you aren't having a flare, do regular flexibility and strengthening exercises to maintain range of motion and strengthen supporting muscles.
- **Posture and joint motion.** Maintaining good posture and joint motion during exercise helps ease joint pain and avoid tightness.
- **Maintaining mobility.** You may not feel like exercising, especially during flares, but movement helps prevent loss of mobility. Be sure your exercise is appropriate, and be sure to do it!

Session 7

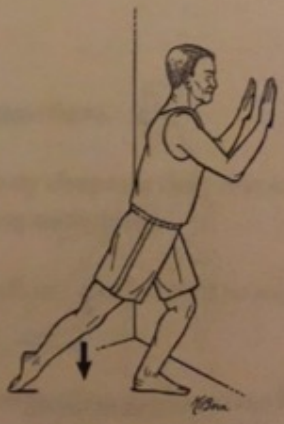

Key Points about Fibromyalgia
A specific combination of exercises can help you reduce muscle tension, decrease pain, and aid relaxation.
Participate regularly in low-intensity aerobic activity to improve conditioning and maintain good circulation.
Do stretching exercises (carefully) before and after your aerobic activity to avoid muscle or joint strains and maintain good range of motion.
Observe recommendations for exercise to avoid the possibility of minor injuries.
Start slowly! Be aware that fibromyalgia symptoms often get worse—not better—with vigorous exercise. Do only low- to moderate-intensity exercise, and avoid fast movements or high impact.
Session 7


Strengthening Exercises
Standing back leg lift
Heel & Toe
Mini-squat
Quadriceps, seated
Quadriceps, standing
Quadriceps, lying down
(you may add weights)
Session 10

Some Additional Stretches to Try at Home

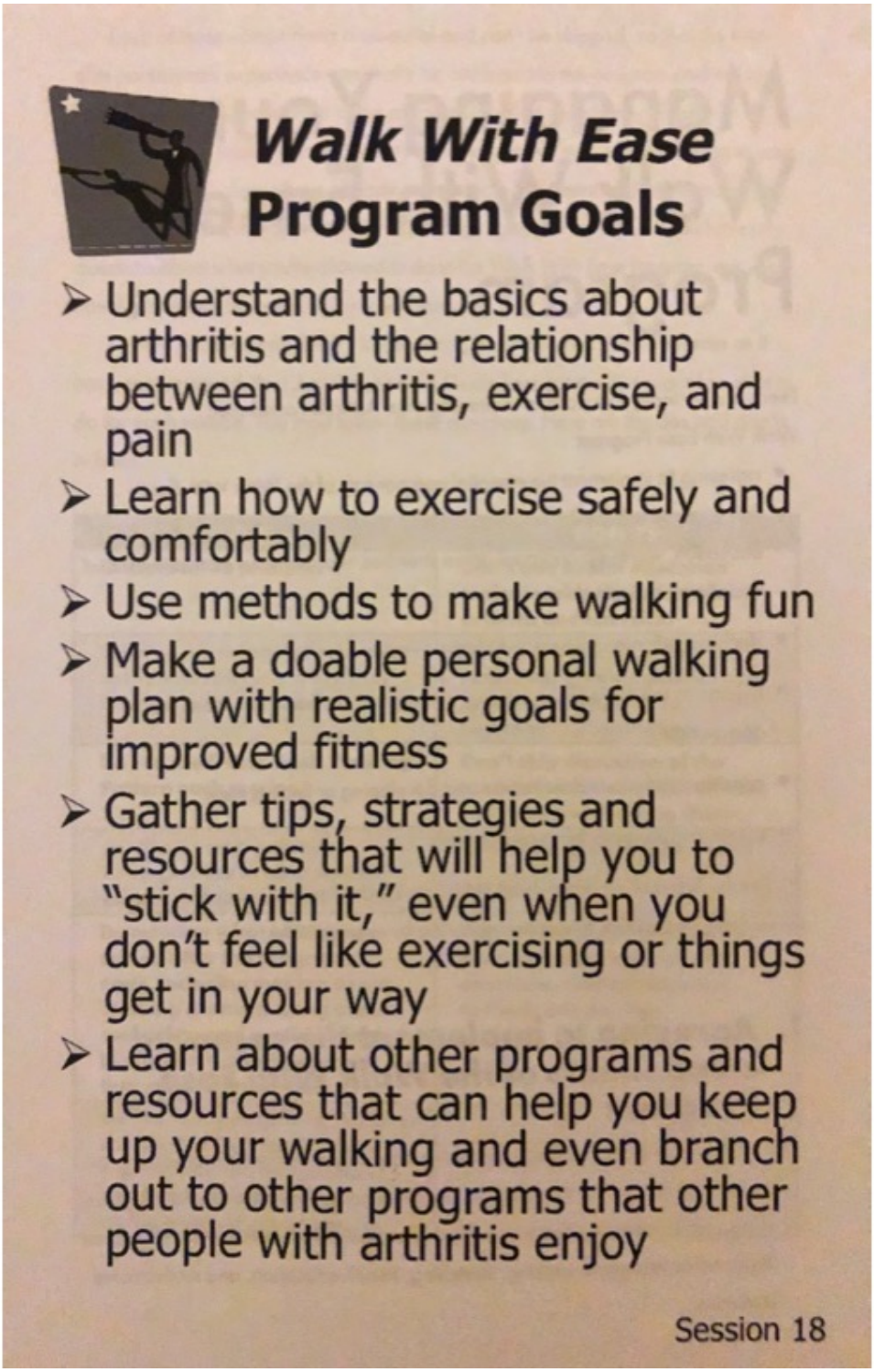
Instructions for these and other stretches and strengthening exercises are in Appendix B

Bent leg calf stretch



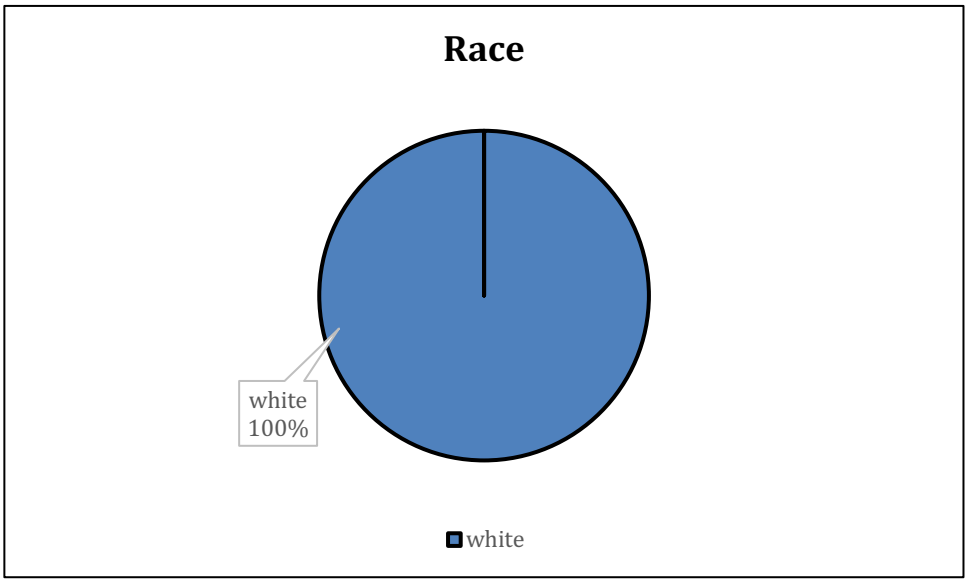
Front of calf and toe stretch

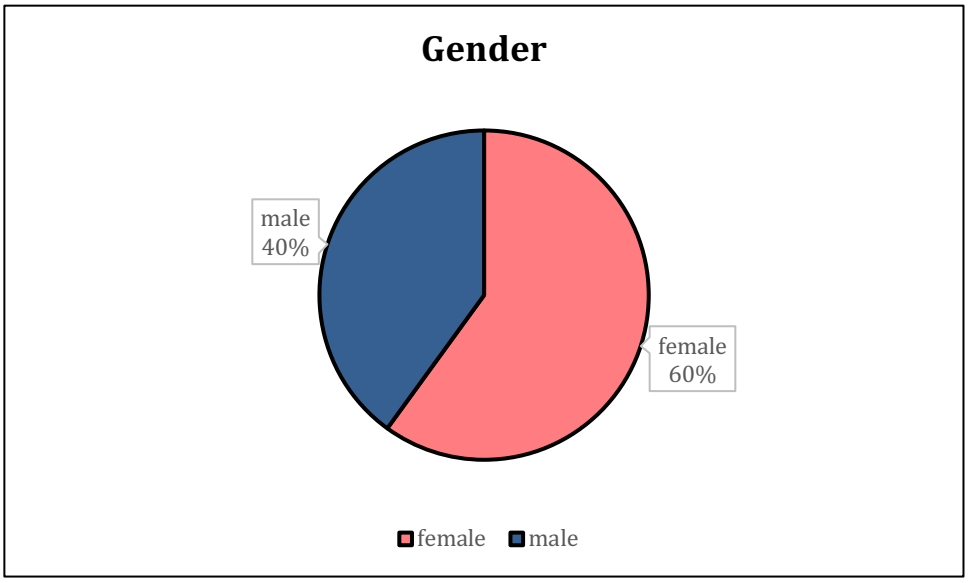
Session 10

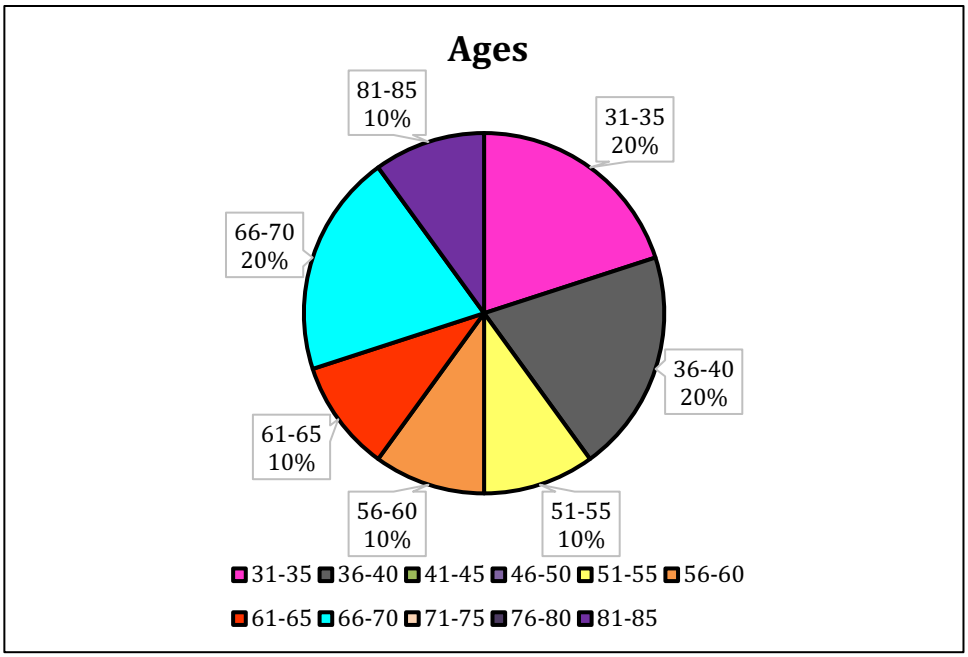

Walk With Ease
Program Goals
Understand the basics about arthritis and the relationship between arthritis, exercise, and pain
Learn how to exercise safely and comfortably
Use methods to make walking fun
Make a doable personal walking plan with realistic goals for improved fitness
Gather tips, strategies and resources that will help you to "stick with it," even when you don't feel like exercising or things get in your way
Learn about other programs and resources that can help you keep up your walking and even branch out to other programs that other people with arthritis enjoy
Session 18

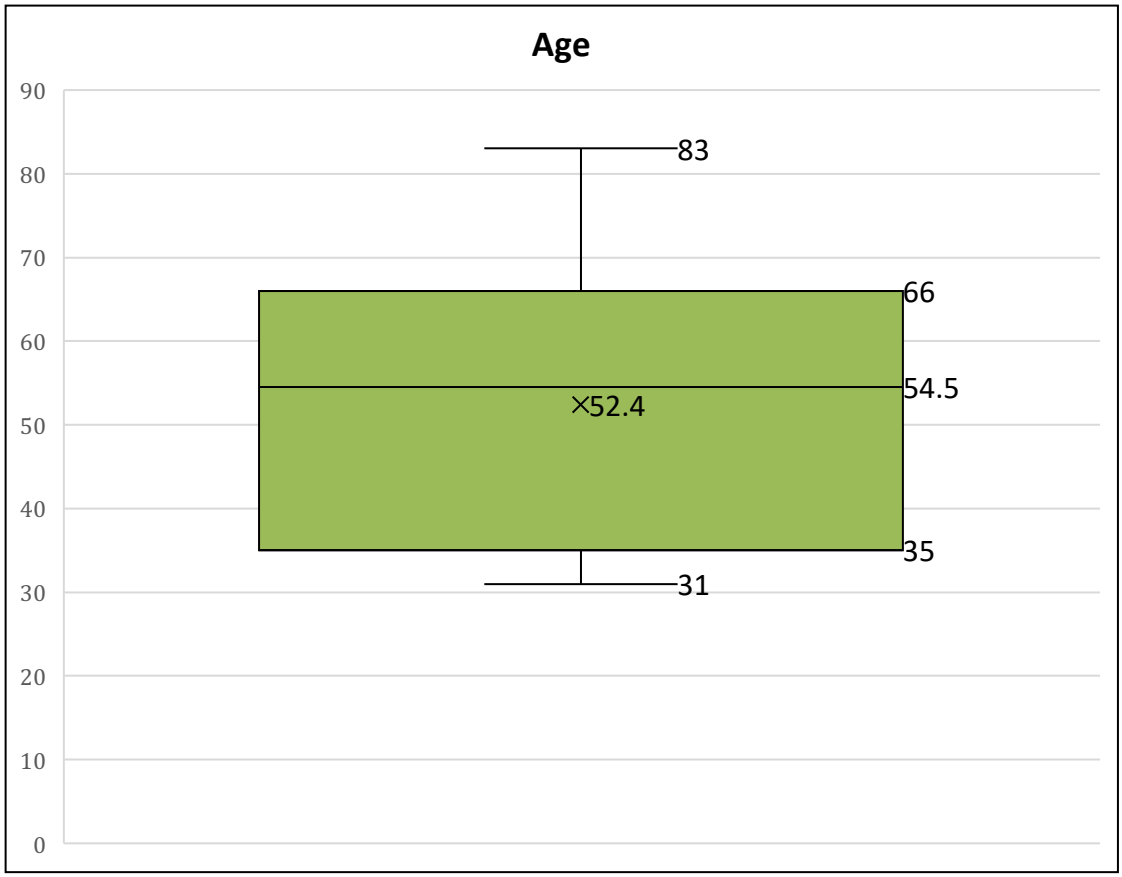
Appendix G

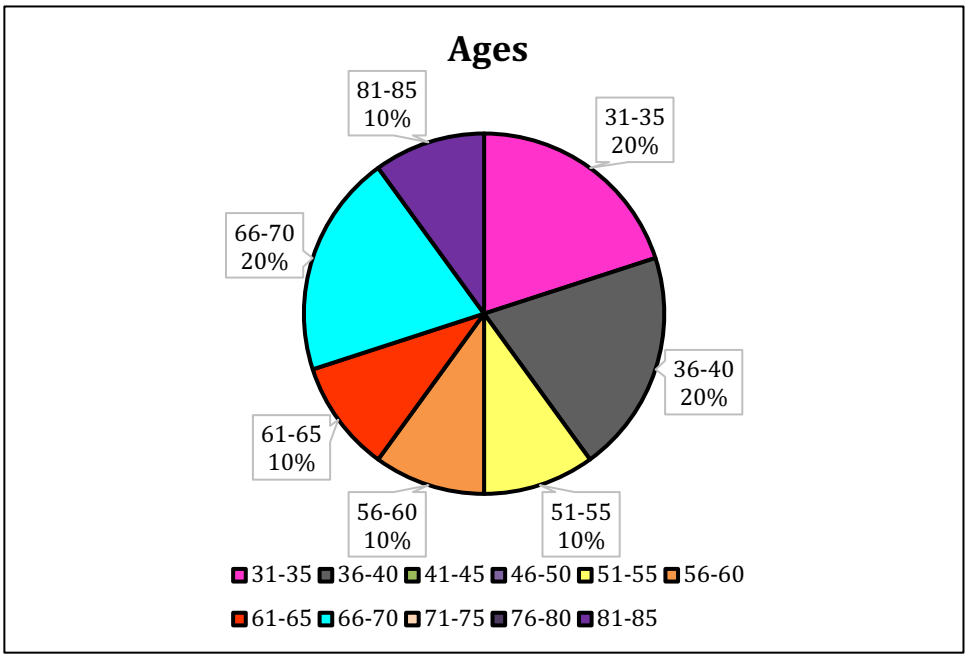
Demographic Data

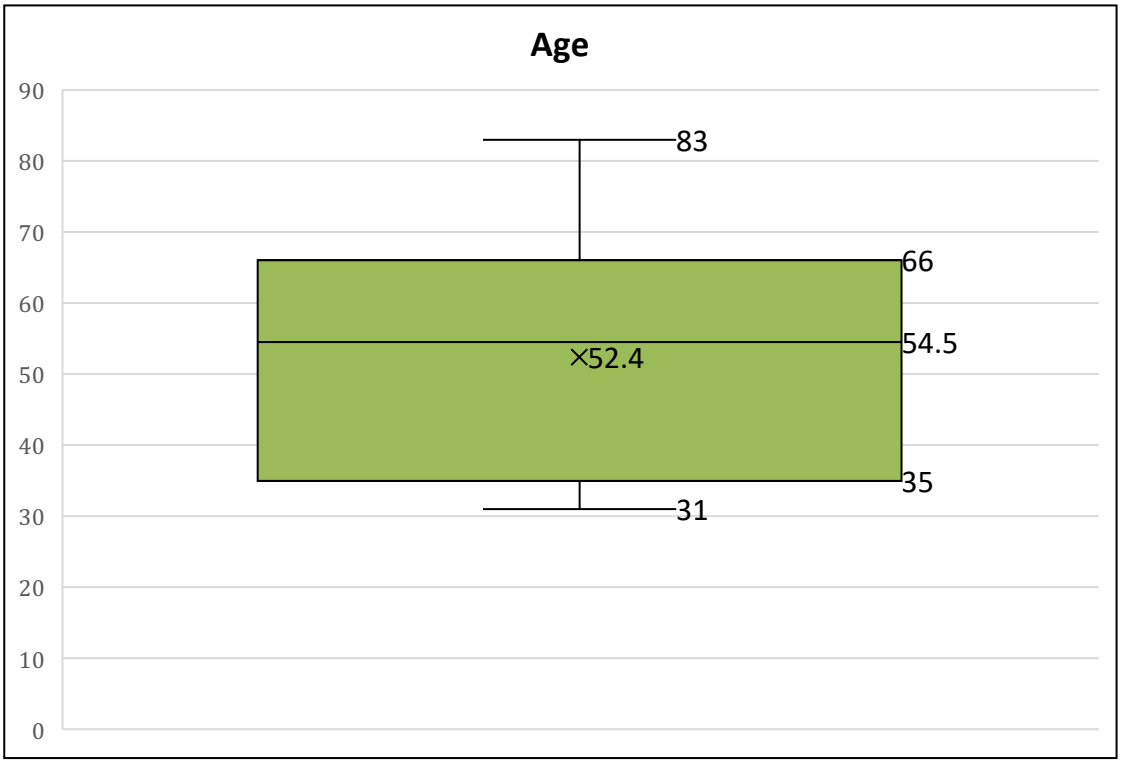





Ages
81-85
10%
31-35
20%
66-70
20%
36-40
20%
61-65
10%
56-60
10%
51-55
10%
31-35 36-40 41-45 46-50 51-55 56-60
61-65 66-70 71-75 76-80 81-85


Age
90
80
70
60
50
40
30
20
10
0
83
66
54.5
52.4
35
31


Ages
81-85
10%
31-35
20%
66-70
20%
36-40
20%
61-65
10%
56-60
10%
51-55
10%
31-35 36-40 41-45 46-50 51-55 56-60
61-65 66-70 71-75 76-80 81-85


Age
90
80
70
60
50
40
30
20
10
0
83
66
54.5
52.4
35
31

Appendix H

Data Collection Tables

Participant	Session 1 (steps taken)	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9	Session 10	Session 11	Session 12	Session 13	Session 14	Session 15	Session 16	Session 17	Session 18
1	1930	2023	1978	1996	2014	1952	1966	1949	2046		1970	1832	1926	1999	1967	2094	2105	2055
2	1356	1555			1965	1500	1582	1525			1890	1850		1644		1759	2031	2140
3	2109	1899	2037	2159	2463	2212	2275	2331	2415	2509	2195	2138	2389	2357	2430	2400	2451	2555
4	2248	2353	2504	2610	2648	2240	2310	2542		2325	2463	2375	2312	2500	2611	2811	2711	3011
5	1730	2500	2203	1874	1797			1938	2208	2187		2298	2308	2054			2253	2603
6	1025	1220	1225	1226	620	1008	1250	1220	1230	1240			1240		1240	1242	2002	1258
7	1061	708	1201	1050	1950			975	1250		1010	1185		795	825		1380	1895
8	1087	1321	811				1218	793			825	1447		1422	1616	1657	1557	
9	1131	626		1346	1419	1346	887	1218		1094		1298	1356	1112	1273		1494	1697
10	1224	1309			1265	1280	1179	1222		1250	1380	1344	1391		1463	1507	1594