

Experiences of Pleasure During Physical Activity in Later Life:

A Systematized Scoping Review

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Abstract

Physical activity (PA) offers several benefits that promote the health of older adults; however, PA participation is low within this population. Supporting PA participation is a priority. This study aim was to synthesize existing definitions of pleasure used in older adult PA research and to describe how PA pleasures are experienced in later life. This review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines. Eligible studies included peer-reviewed studies that directly assessed experiences of pleasure regarding the PA of older adults aged 60+ years. A search was conducted across eight databases, yielding 1,058 results. A total of 35 articles were eligible. Findings highlighted the importance of pleasure as a meaningful PA motivator and identified various typologies of PA pleasures. Findings clarify the role of pleasure in future PA research and support the inclusion of pleasure to PA applied practice to enhance PA participation in later life.

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CHAPTER 1

Literature Review of Topic Area

Benefits of Physical Activity in Later Life

Physical activity (PA) presents a multitude of benefits that promote the health and wellbeing of older adults. Not only is physical activity protective against noncommunicable diseases (e.g., cardiovascular disease, some forms of cancer, etc.), but it is also associated with benefits such as delays in dementia and improved mental health, quality of life, and wellbeing (Langhammer et al., 2018). Regular physical activity also increases active life expectancy and decreases the physiological effects of sedentary lifestyles in later life (Chodzko-Zajko, 2009). When it comes to defining physical activity, Caspersen et al. (1985) defines physical activity as “...any bodily movement produced by skeletal muscles that results in energy expenditure, and increases heart rate and breathing.” (as cited in the Canadian Society for Exercise Physiology, 2017, p. 14). However, for the purpose of this review, when referring to physical activity, it is referring to any form of physical movement.

Engaging in physical movement also addresses the heterogeneous needs within the older adult population as findings have also demonstrated positive outcomes for high-risk older adults. For example, a study examining a 12-week physical-exercise training intervention among frail and non-frail older adults denoted benefits across variables within the dimensions of physical capacity, cognition, and quality of life (Langlois et al., 2012). Both frail and non-frail participants within the intervention group were observed to acquire similar benefits, and those with frailty conditions attained greater gains in working memory, processing speed, and

executive control within the dimension of cognition (Langlois et al., 2012). Similarly, engagement in regular exercise has also been shown to improve physical function among older adults residing in long-term care homes. A cluster randomized control trial evaluating the effects of a 12-month long exercise intervention on measured frailty, gait, cognitive ability, and self-reported quality of life across eight long-term care homes denoted several acquired outcomes within the intervention group. This includes reduced phenotypic frailty scores at the end of the 12 months as well as significantly improved gait parameters (i.e., step length, stride velocity, cadence, and stride time), and improvements in cognitive ability and self-reported quality of life (Liu et al., 2022).

The role of physical activity in reversing the effects of frailty also extends to older adults recovering in acute care wards. A study examining the effects of two daily multicomponent exercise sessions compared the measured frailty index scores between an intervention group and a control group that did not receive the intervention in addition to their usual care. The study reported an improvement in the measured frailty scores of the intervention group from admission to discharge when compared to the control group whose score worsened at discharge (Pérez-Zepeda et al., 2022). Thus, engagement in physical activity during later life can provide a variety of benefits across individuals within this particular age demographic.

Rates of Physical Activity Among Older Adults

Despite the preventive and health-promoting nature of exercise, participation among the older adult population continues to remain low. Recommended guidelines by the World Health Organization (WHO) highlight that older adults should be engaging in at least 150-300 minutes of moderate-intensity physical activity per week (WHO, 2022). However, WHO (2022) reported

that worldwide, 28% of adults 18 years and over did not meet their guidelines in 2016. Notably, these low participation rates have been witnessed across older adults in the United States and Canada. According to the *Physical Activity Guidelines for Americans Midcourse Report: Implementation Strategies for Older Adults*, older adults have the lowest rates across all age groups, with less than 15% of Americans aged 65 and older meeting the recommendations (U.S. Department of Health & Human Services, p. 8-10, 2023). Across the Canadian provinces (excluding territories), 40% of individuals 65 years of age and older were self-reported to meet the recommended 150 minutes of exercise per week in 2020 and in 2021 (Statistics Canada, 2023). Thus, as of currently, less than half of older Canadians report not meeting the recommended guidelines.

Motivators and barriers for exercise engagement among older adults have been identified within past literature. However, ensuring their engagement becomes habitual remains a concern (Schutzer & Graves, 2004). When considering facilitators for physical activity participation, one component that may not be accounted for, yet should be considered, is pleasure. Within public health promotion, there are few attempts to bring attention to pleasure as the topic may be viewed as too frivolous within the greater context of health discourse (Coveney & Bunton, 2003). However, when focusing on motivators for physical activity, the known benefits that are reaped from exercise does not always motivate the participation of older adults in sufficient physical activity engagement (Gardener & Lally, 2013). Thus, as pleasure remains to be under researched and a forgotten dimension in relation to the health and wellbeing of older adults (Phoenix & Orr, 2014), gaining an understanding on what is pleasurable for older adults when engaging in physical activity is important (Humberstone & Stuart, 2016).

Seminal Work in Pleasure and Defining Pleasure

One seminal study conducted on pleasure and physical activity in later life was performed by Phoenix and Orr (2014). Through their work, Phoenix and Orr (2014) have prepositioned pleasure as an important but underrated mechanism of physical activity in later life. Through the implementation of interviews, the authors sought to understand how pleasure was experienced within the context of physical activity in the later stages of life and in doing so, uncovered the complexities of defining and conceptualizing pleasure. For example, their definition of pleasure, which was defined by Smith (1980), understood pleasure as “being the diverse emotions that make a person ‘feel good’, including “happiness, joy, fun, sensuality, amusement, mirth, tranquility” (p. 75, as cited in, Phoenix & Orr, 2014, p. 96).

However, through their work, Phoenix and Orr (2014) highlight that “pleasure is not a singular, unidimensional concept” (Phoenix & Orr, 2014, p. 100). This is congruent within the broader field of psychology literature where it has been also noted that the concept of pleasure is “sometimes considered ineffable” (Frijda, 2010, p. 99). Phoenix and Orr’s (2014) work also identified four typologies of pleasure that were present in the physical activity experiences of older participants partaking in a range of activities. These typologies included: a) sensual pleasures; b) documented pleasures; c) pleasures of habitual action; and d) pleasures of immersion (Phoenix & Orr, 2014) (see Appendix A). The prevalence of these four unique forms of pleasure have also been denoted in subsequent studies following the work of Phoenix and Orr (2014). In addition to these four typologies, some studies have also extended the work of Phoenix and Orr (2014) by identifying other categorizations of pleasure that were present within the physical activity experiences of older adults.

Extended Typologies of Pleasure

Studies following Phoenix and Orr (2014) reinforce the significance of the four typologies of pleasure within physical activity and offer some important extensions of physical activity pleasure experiences among older adults as well. For example, sensory pleasure was identified in the experiences of older adults participating in ballroom dance. Chipperfield and Bissell (2023) found that movement and body awareness combined with the audible music brought a sense of sensual pleasure to the participants. In addition, there was pleasure in the ability to follow a partner's lead through touch, allowing partners to dance together (Chipperfield & Bissell, 2023). Within another study examining the experiences of older women in music and yoga classes, the typology of habitual pleasure was present among the older women who were engaging in low-impact exercise to music, describing pleasure that was experienced in the rehearsal of exercise-to-music routines (Humberstone & Stuart, 2016). Based on their findings, the study highlights the importance of the senses in bringing forth subjective pleasurable experiences within the older women's physical activity.

Furthermore, these studies also reinforce the significance of additional forms of pleasure beyond Phoenix and Orr's (2014) seminal work that have been identified within the engagement of older adults' physical activity. For example, one study used semi-structured interviews to explore how older men understand their bodies through hockey discovered the importance of pleasures of *emplacement* in the men's participation (Allain, 2020), which refers to how the materials associated with hockey (e.g., chasing the puck, sweat-drenched jerseys, and the skates) as well as the spaces associated with the sport (e.g., dressing rooms) facilitate a sense of enjoyment within the players (Allain, 2020). It was this pleasure that kept the older men returning to the sport of hockey, rather than the pressures to stay fit (Allain, 2020). Another

study found that pleasure in physical activity can also take shape through pleasures of *practice* and pleasures of *community* (Chipperfield & Bissell, 2023). To illustrate, the experiences of 26 older adults who were partaking in ballroom dancing expressed that their regular engagement in that physical activity brought forward a sense of “physical competence” (Chipperfield & Bissell, 2023, p. 283) and they were motivated to continue through their ability to acquire and expand their skills. These participants also noted how pleasure in physical activity is also generated by a social component. More specifically, it was reported that a sense of community brought pleasure to the participants (Chipperfield & Bissell, 2023). While a majority of participants joined ballroom dancing with their significant others, some aimed to gain social connections after the loss of work-life companions (Chipperfield & Bissell, 2023). Thus, enjoyment is not only rooted in the activity itself, but in the opportunity to socialize within the activity space as well.

The importance of other categorizations and contexts of physical activity pleasures in later life is also apparent in other studies that do not draw directly on Phoenix and Orr (2014). It was found that participants in a ballet class for older adults experienced pleasures of being challenged and their interests would wane without it (Ali-Haapala et al., 2020). More specifically, the authors found that ballet presented a physical and cognitive challenge for participants that motivated their engagement in the activity. These challenges were presented through their developing ability to perform dance sequences and follow a faster teaching pace (Ali-Haapala et al., 2020). Encompassed within this type of pleasure, a sense of achievement was also felt by some of the participants due to the presence of muscle soreness that was experienced after their dancing, symbolizing their “physical capability” (Ali-Haapala et al., 2020, p. 540). Thus, based on these studies, pleasure in physical activity is therefore not only rooted in the

bodily movements of an individual, but takes form through specific components that become inherent to the positive experiences of an activity.

Pleasure is an important area of interest in regard to physical activity engagement as positive feelings of pleasure elicited through exercise is a facilitator for exercise adherence (Williams et al., 2009). More specifically, in the context of exercise adherence in later life, enjoyment has been identified as one of the key motivators for the engagement of older adults in physical activity, alongside other motivators such as exercising for one's health (Buman et al., 2010; Miller & Brown, 2017). As the current literature exploring pleasure in later life physical activity has brought forth varying and unique typologies of pleasure, it is evident that experienced pleasure in physical activity is diverse and serves an important role in stimulating on-going exercise engagement. From the Phoenix and Orr (2014) publication and the work that has transpired from or after it, there has yet to be a synthesis of the emerging and scattered findings within this advancing subject area. A systematized scoping review is appropriate and needed to organize the current state of the findings within this novel area to understand the role that pleasure, as a forgotten dimension, plays in the physical activity of older adults. More specifically, a systematized review will allow for an analysis consisting of what is known within the primary literature, what remains to be unknown, and provide recommendations for future research, policy, and practice (Grant & Booth, 2009). Synthesizing the existing categorizations of pleasure may also allow for further consideration to put forth an updated definition of pleasure based on the findings of eligible studies examining enjoyment in later life.

Research Rationale

Pleasure remains under-researched within the sphere of older adults' health and physical activity (Phoenix & Orr, 2014). More generally, it has also been argued that within health research, pleasure is typically disregarded (Coveney & Bunton, 2003). However, it has been argued that discerning what is pleasurable to older adults and thus offers a sense of wellbeing through physical activity is critical. Further understanding into what it means to be physically active among this age demographic is necessary (Humberstone & Stuart, 2016). More studies are beginning to advocate for public health policies to hone into pleasure to encourage active engagement or exercise adherence among older adults (Bennett et al., 2017; Chipperfield & Bissell, 2023; Phoenix & Orr, 2014). In this regard, new studies on pleasure are also contributing novel information, highlighting the nuances that exist within the pleasurable experiences of physical movement in later life. As a result of these nuances, it is evident that the experience of pleasure is complex and thus requires further examination. The positive and reinforcing experience of pleasure is not only tethered to the type of activity, but to the specific components associated with the engagement of an activity that become important for eliciting unique forms of felt pleasure that encourage or motivate one's participation in a specific type of activity. Within the existing literature, there remains an inquiry on how "pleasure" is defined, if at all, within studies focusing on physical activity in later life. In addition, there is a need to uncover how pleasure is experienced by older adults during physical activity and the specific ways in which pleasure experiences can be evoked. In doing so, pleasure as one potential motivator for physical activity participation among certain older adults may be understood more clearly.

Research Objectives

The objectives of this systematized-scoping review are two-fold. First, this review will synthesize the existing definitions and synonyms of pleasure used in older adult physical activity research. Second, this review will describe the different ways in which older adults' pleasure is achieved through physical activity.

CHAPTER 2

Methodology and Methods

Methodology

A systematized review was appropriate to achieve the aims of this proposed study. A systematized review was also most appropriate to research, appraise or assess, and synthesize research evidence while ensuring the use of a methodological approach (Grant & Booth, 2009). More specifically, this methodology enables researchers to address a defined research question (Pollock & Berge, 2017) and to pull together all existing knowledge on a specific area of interest (Grant & Booth, 2009). This systematized scoping review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (2020) guidelines. PRISMA is the standard guideline that aids in the high-quality design and reporting of systematic reviews and meta-analyses. Items within the PRISMA (2020) guidelines are appropriate for multi- and mixed-method systematic reviews (Page et al., 2021). Alongside PRISMA, a scoping review protocol and framework was used to guide and enhance the rigor of this study (see Arksey & O'Malley, 2005). The implementation of a scoping review allowed for the organization of primary research in a transparent manner through the summary of important findings in an accessible format and the identification of research gaps (Arksey & O'Malley, 2005). As such, the PRISMA extension for Scoping Reviews (PRISMA-ScR) Checklist was used to design and report on this study.

Eligibility Criteria

For this review, eligible studies included: a) peer-reviewed studies that directly assessed b) experiences of pleasure in relation to c) the physical activity of d) older adult participants.

This assessment could be accomplished in the primary studies through using quantitative measures (e.g., experimental randomized control trials), qualitative means (e.g., semi-structured interviews), and multiple or mixed methods. To ensure experiences of pleasure within physical activity were being assessed, eligible studies needed to clearly assess pleasure through their methods, as well as include the term “pleasure” somewhere within the full text of their publication. To capture the varying physical activities participated in by older individuals, the definition of physical activity was kept broad, where in which physical activity referred to any form of bodily movement. This definition allowed for a variety of physical activities and interventions to be eligible for the review. Example physical activities included, but were not limited to, walking, swimming, hockey, dance, gardening, and exercise intervention programs. Lastly, for participant eligibility, the term “older adult” was considered a relative term with an age of 60 years or older among the recruited study participants. Thus, data needed to be able to be extracted to individuals 60+ within a potential study. Based on the research questions of this proposed review, studies that did not directly assess experiences of pleasure among older adult participants through either qualitative, quantitative, or mixed measures were not eligible and excluded. Additionally, for this proposed review, no restrictions on the language or year of publication were applied to help ensure a wider scope of available literature was captured.

Information Sources

For the primary search, eight electronic databases were consulted. To capture and examine the existing literature across varying fields of study, these databases consisted of APA PsycInfo (ProQuest), CINAHL (EBSCO), Embase (Ovid), Google Scholar, Medline (Ovid), Sociological Abstracts (ProQuest), Sport Discus (EBSCO), and Web of Science. These databases were also consulted for reference checks and snowball searches using the reference lists of the

eligible studies that were included in this review. The implementation of a snowball search strategy ensured that the range of existing knowledge on this topic was thoroughly explored.

Search Strategy

Through an iterative process, a search strategy was developed to situate published literature examining pleasurable experiences within physical activity among older adults. In addition, the strategy was developed in consultation with the entire research team (i.e., the thesis supervisor and supervisory committee member). In accordance with PRISMA, full search strategies (as well as filters or limits) for all databases were presented (Page et al., 2021). Based on the eligibility criteria described above (i.e., peer-reviewed studies, experiences of pleasure, physical activity, older adults) the following search strategy was developed and performed within publication titles and abstracts within each of the eight databases. The first part of the search strategy identified publications that included the term “pleasur*” in the title and/or abstract. The second part of the search strategy identified publications with older adult participants and a later-life or aging context by including the following string of terms: “(aged OR old* OR elder* OR senior* OR later life OR later-life OR centenarian* OR nonagenarian* OR octogenarian* OR septuagenarian* OR sexagenarian* OR late life OR late-life OR third age OR fourth age).” The third and final part of the search strategy identified publications that pertained specifically to physical activity by including the following string of terms: “(sport* OR physical exercise OR physical* mov* OR physical* activ* OR physical* mobil* OR physical recreation OR physical leisure).” These three components of the search strategy were entered into each of the eight databases using the “AND” Boolean operator to identify a preliminary population of publications that met the eligibility criteria for this review. The final search was conducted in January of 2024, yielding 1073 articles across the eight databases.

Selection Process

With an established search strategy, the study selection process was carried out. In accordance with PRISMA, this was a multi-stage process where titles and abstracts were screened first with a full-text review following second (Page et al., 2021). For each of the eight databases, an individual RIS file was created to contain the articles retrieved from the established search strategy. The RIS files were then uploaded onto Covidence to begin the screening process of the 1073 articles. Covidence is a web-based systematic review software that enables multiple reviewers to screen publications and complete data extraction (Babineau, 2014). Prior to screening, duplicate records were removed by Covidence. In addition, during the title/abstract screening process, both the primary and the secondary reviewer manually removed duplicates. Next, publications entered the first screening process in which potentially eligible publications were screened independently by the primary and secondary reviewer based on titles and abstracts. The secondary reviewer was also consulted to verify the exclusion of screened articles (Page et al., 2021). In the presence of discrepancies, other members of the research team were consulted to procure consensus. To determine the eligibility of non-English articles, abstracts and titles that required translation were assessed using a translation software (i.e., Google Translate) or through the consultation of a native speaker.

Following the screening of titles/abstracts, eligible publications for the full-text review were sought for retrieval. The two reviewers independently carried out a full-text review to ensure that potential articles met the proposed study's inclusion criteria. Again, the broader research team was consulted to reach an agreement in the case of any discrepancies that arose throughout this process. Finally, to conclude the screening process, a snowball search was conducted by the two reviewers using the reference lists of the eligible articles. Once completed,

it was determined that 35 articles would be included in the final review. The selection process and results have been depicted through a flow diagram following PRISMA's guidelines (Table 1).

Data Charting/Data Extraction Process

As per the PRISMA guidelines, data collection methods, as well as any relevant automation tools, must be specified (Page et al., 2021). A data extraction form (or in the case of a scoping review, a data charting form) was created through an iterative process based on the identified and eligible publications to extract data from primary reports. To form the basis of analysis, the data form gathered information from the eligible publication regarding the eligibility criteria and direct relevance to the research objectives. This included general information on the study and information about the study authors, publication and location, intervention type, population, aims of the publication, methodological approach and/or methods used, outcome measures, and results (Arksey & O'Malley, 2005). To proceed with the selection and data charting/extraction processes, the data extraction form was created on Covidence. The two reviewers worked independently on Covidence to chart data from the 35 eligible articles using the created data extraction form. Involvement from a second reviewer helped ensure congruence between the extracted data and the primary publication source (Noyes & Lewin, 2011). Any potential variability that arose throughout this process was settled through discussion between the two reviewers or the larger research team. Again, eligible non-English studies that required translation for the data collection process were carried out using a translation software (i.e., Google Translate) or through consultation of a native speaker.

Data Items

For this review, the outcome domain of interest was pleasure. As eligible studies consisted of qualitative, quantitative, or mixed-method studies with varied designs (i.e., longitudinal, cross-sectional, etc.), the time frame of measurement for pleasure also varied depending on the study. Additionally, other variables of interest (such as the characteristics of the study, characteristics of the study design, characteristics of the participants, the number of participants, results pertaining to the assessed domain of pleasure, definition or conceptualization of pleasure, synonyms of pleasure, and competing interests of primary authors) or relevant information from the eligible studies was also be charted through the data extraction form (Page et al., 2021). Lastly, to inform the charting of data regarding study characteristics and potential intersectional approaches to understand pleasure in PA within the primary studies, the Progress Plus Tool was used to format the data extraction form. PROGRESS-Plus was a tool that reported on factors associated with health inequity, including: place of residence; race, ethnicity, culture, language; occupation; gender, sex; religion; education; socioeconomic status; and social capital (O'Neill et al., 2014). Definitions of each social location were informed by previous research as detailed in O'Neill et al., 2014. The “plus” component of this tool referred to additional factors regarding personal characteristics that may bring forth discrimination (such as age), features of relationships (such as parents who smoke), and a component representing time-dependent relationships (such as situations where individuals may be temporarily at a disadvantage) (O'Neill et al., 2014).

Study Risk of Bias and Quality Assessment

The inclusion of a risk of bias assessment allows individuals who refer to a review to be aware of any risk of bias within the included quantitative studies (Page et al., 2021). In addition,

the inclusion of risk of bias assessments within systematic reviews allowed for the identification of strengths and limitations of a particular study, to investigate or address potential discrepancies within the synthesized findings, and to assess the strength of evidence (Hartling et al., 2012). As this review also included studies using qualitative designs, critical appraisal assessment tools were also implemented to assess qualitative methodological approaches. While risk of bias assessments and critical appraisals both assess the validity of studies, these two forms of assessment are not the same (Delavari et al., 2023). This is because critical appraisal tools do not assess biases of findings within the primary studies, and instead focus on appraising the methodological quality, reliability, and applicability of results (Delavari et al., 2023).

To account for varying study designs that were included in this review, several appropriate risk of bias assessment tools were employed (National Health and Medical Research Council, 2019). In total, four risk of bias assessment tools were applied according to the study design of the 35 included articles. This included a) the Joanna Briggs Institute (JBI) Critical Appraisal Tool for Analytical Cross Sectional Studies; b) the JBI Critical Appraisal Tool for Qualitative Studies; c) version 2 of the Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2.0) and d) the Cochrane Risk Of Bias In Non-randomised Studies - of Interventions (ROBINS-I) tool. Lastly, for studies that used mixed methods to assess pleasure, the appropriate risk of bias assessment tools were applied accordingly to each section based on their method. Across each of the four tools, two reviewers independently applied and assessed the risk of bias of the 35 articles in an individual Google excel sheet where the risk of bias assessment templates were inserted. Similar to the full-text review of non-English publications, a translation software (i.e., Google Translate) was used. Any potential variability that arose in the final appraisal decision

for each article was settled through discussion between the two reviewers or by consulting the larger research team.

To assess studies that employed a cross-sectional approach for data charting, (n= 12) the JBI critical appraisal tool for cross sectional studies was applied. This tool contained 8 domains (which appraised whether the criteria for inclusion were clearly defined, if the study subjects and setting was clearly detailed, if the measurement of the exposure variable was valid and reliable, whether there were any identified confounding variables, the strategies used to manage the confounding variables, whether the outcomes were measured in a valid and reliable way, and whether an appropriate statistical analysis was implemented) that aimed to assess the methodological quality of a cross-sectional study (Moola et al., 2020). To assess the methodological quality and determine the possibility of bias in the design or analysis of qualitative research (n= 10), the JBI critical appraisal tool contained ten domains (such as whether there was congruity between factors such as the theoretical or philosophical premise of the study and the research methodology, between the stated research methodology and the research objectives, between the research methodology and the data charting methods, between the research methodology and the researcher's interpretation of the results, whether there was a statement locating the researcher either culturally or theoretically, if the influence of the researcher on the researcher was discussed, whether participants were adequately represented in the study, whether the research has provided evidence for ethical approval, and whether the conclusions from the study flow from the analysis of the data) that were used to inform the interpretations of a qualitative study (Lockwood et al., 2015). The JBI tool has a predominant focus on both the rigor of methodology as well as quality of research and is deemed to allow for adequate assessment of studies when compared to other existing tools (Saaiq & Ashraf, 2024).

Both JBI tools concluded with an overall appraisal decision on whether to include, exclude, or seek further information regarding the study.

For studies conducting randomized trials ($n = 2$), the Cochrane RoB 2.0 tool was applied independently by the two reviewers for assessment. This tool, which is recommended by the Cochrane of Systematic Review (Higgins et al., 2023), consisted of five domains, each consisting of a range of questions that aimed to garner information regarding components of the trial and assess their potential risk of bias. The five domains addressed 1) bias due to the randomization process, 2) bias due to deviation from the intended intervention, 3) bias due to missing outcome data, 4) bias in the measurement of the outcome, and 5) bias in the selection of the reported results (Sterne et al., 2019). A judgment decision was made for each domain following an algorithm provided by the tool, where in which the judgment is considered to be 'Low,' 'Some Concerns,' or 'High' risk of bias (Sterne et al., 2019). The tool concluded with a final, overall decision (i.e., overall 'Low,' 'Some Concerns,' or 'High' risk of bias) based on the initial judgment assigned to each domain. For the RoB 2.0 tool, the overall judgment of 'Low' risk of bias referred to a study that is deemed to be at low risk of bias across all domains. The overall judgment of 'some concerns' was given to a study when at least one domain was judged to raise 'some concerns' but did not have any domains labeled as 'High' risk of bias. Lastly, a study was deemed to be 'High' risk of bias if at least one domain was judged as 'high risk of bias' or if the study had several domains that were judged to contain 'some concerns' (Sterne et al., 2019).

For non-randomized trials ($n = 6$), the Cochrane ROBINS-I tool was applied independently by the two reviewers conducting the risk of bias assessment. This tool contained seven domains, each of which covered a range of questions to assess the risk of bias in

comparative effectiveness of interventions of studies that did not implement randomization across their examined interventions (Sterne et al., 2016). These domains included 1) assessing risk of bias due to confounding 2) bias in the selection of participants in a study 3) bias in the classification of interventions 4) bias due to deviations from the intended interventions 5) bias due to missing data 6) bias in the measurement of outcomes and 7) bias in the selection of reported results (Sterne et al., 2016). Similarly, each domain of the ROBINS-I tool also received a decision on whether it was deemed to be ‘Low,’ ‘Moderate,’ ‘Serious,’ or ‘Critical,’ risk of bias or to label the study as ‘No Information’ (Sterne et al., 2016). The tool concluded with a final, overall decision (i.e., overall ‘Low,’ ‘Moderate,’ ‘Serious’ or ‘Critical,’ risk of bias) based on the initial judgments assigned across the domains. To help support the overall decision, the tool provides a table that expands on how to interpret the domain levels and reach an overall decision based on the tool’s provided criteria. For the ROBINS-I, the judgment of ‘Low’ risk of bias was applied when all domains of the tool were judged to be at a low risk of bias. The overall judgment of ‘Moderate risk of bias’ was applied when all domains were either labeled as ‘Low’ or ‘Moderate’ risk of bias based on the tool’s criteria. A study was overall deemed to be a ‘Serious risk of bias’ if at least one domain was judged to be at ‘Serious risk of bias’, but none are ‘Critical’. A study was overall judged to be at ‘Critical risk of bias’ if at least one domain was observed to be at ‘critical’ risk. Lastly, the framework also provided the option to select ‘No information’. The criterion for this overall judgment was that there is no clear indication that the study is at serious or critical risk of bias and there is a lack of information across one or several domains in the tool (Sterne et al., 2016). Tables regarding the overall results of the risk of bias assessments for all 35 articles were provided in the results section of this review (Table 2, 3, 4, and 5).

Finally, it is important to note that while risk of bias and quality assessments allow for consideration of excluding articles that are deemed to be at high risk for bias, for this review, articles that were deemed as “high risk” based on the assessment criteria for any of the four tools were not excluded from the final review. This is because the implementation of these assessments was descriptive and used for the purpose of determining the quality of research that currently exists on this topic area.

To tabulate findings that were extracted from the included publications in this review, three tables were created based on the eligible study designs (i.e., quantitative, qualitative, and mixed methods) to summarize and visually display the findings for each individual publication. Tabulating findings based on the study design allowed for a comparison and contrast between the findings regardless of the intervention. This approach allowed for key findings from the included studies to be identified and presented in a transparent manner. Moreover, this was an appropriate approach for a systematized-scoping review as the synthesis of systematized reviews commonly consist of narrative synthesis alongside tabulation, while the data synthesis of a scoping review is most often a tabular summary accompanied with some narrative commentary (Grant & Booth, 2009).

For this study, a meta-analysis was not conducted. As per the Cochrane Handbook of Systematic Reviews of Interventions, meta-analyses must be meaningful and undertaken when participants, interventions, comparisons, and the outcomes of interest are deemed to be similar or consistent with one another, recognizing the presence of heterogeneity affects the ability to provide generalizable conclusions (Deeks et al., 2023). Therefore, as the eligible studies included in this review varied across a range of intervention types, study designs, and measure of outcomes, a meta-analysis was not conducted.

Research Team, Background, and Positionality

The primary researcher of this study, Diana Jalilolghadr, has an undergraduate degree in Kinesiology and Health Science, as well as taken two courses in aging at the undergraduate level and one course in aging at the graduate level. Through these courses, the role and potential value of pleasure within the physical activity context of older adults were critically discussed. This learning also provided critical thought on potential applied areas of this topic to therapeutic settings that some older adults engage in, such as physical therapy or occupational therapy, and the role that pleasurable meaningful movement might play to support the wellbeing and recovery of older individuals within those settings.

It is also important to note that the methods of this study was a collaborative effort. Gurher Sidhu, a Global Health Undergraduate Student, who had previous experience with systematized reviews, was the secondary reviewer throughout the two-phase screening process and the data extraction process. The secondary reviewer of the risk of bias and quality assessment process was Deanna Vervaecke, a PhD Candidate in Kinesiology and Health Science, who had previous experience in primary research and systematized reviews. Both secondary reviewers have taken courses in aging as well. As the primary researcher, I, Diana Jalilolghadr, led all aspects of the study as well as the meetings with the broader research team that included both secondary reviewers as well as the thesis supervisor, Dr. Brad Meisner.

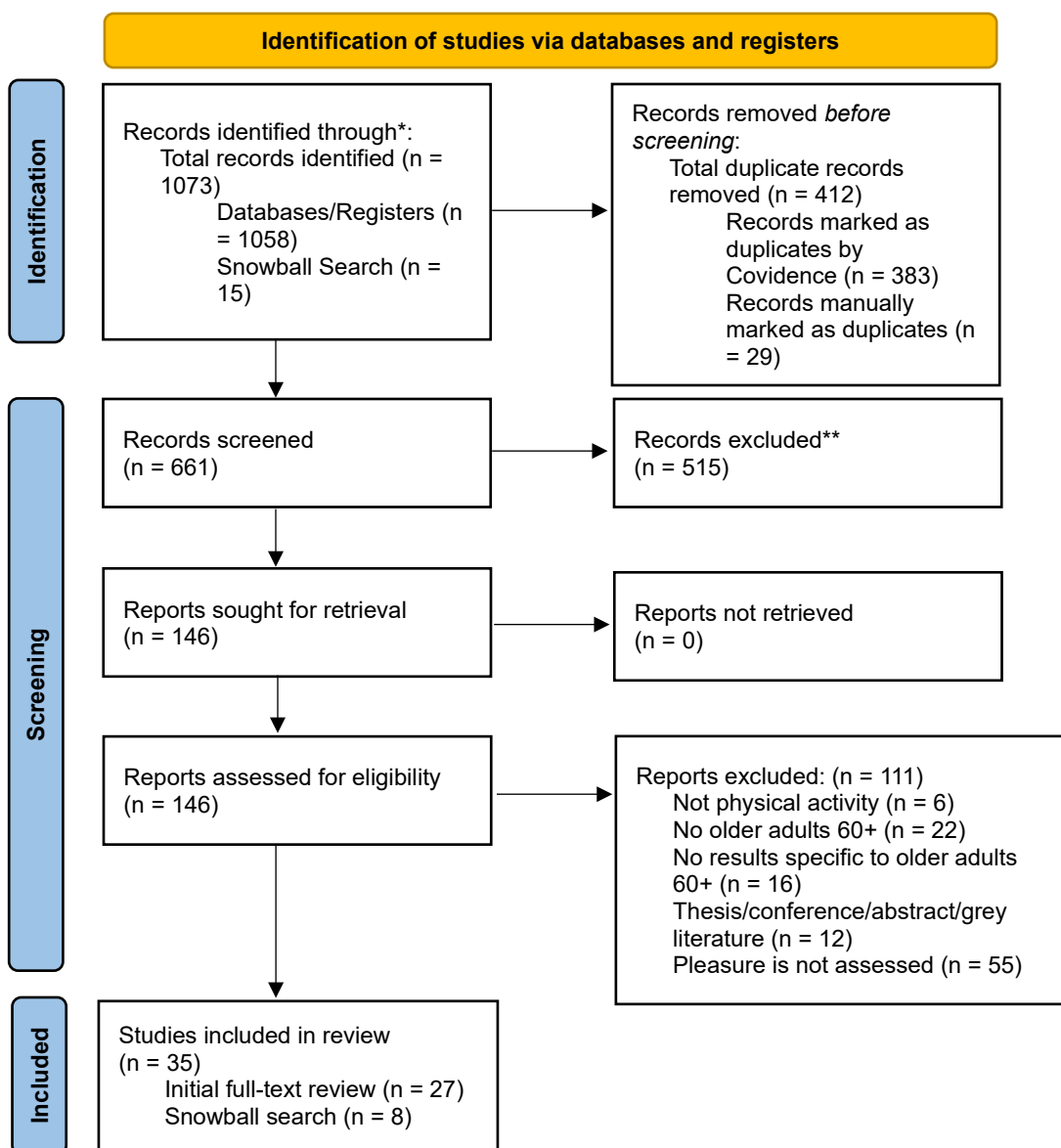
CHAPTER 3

Results

Search Results and Study Selection

The described search strategy yielded a total of 1073 studies across eight databases (Figure 1). Of this total, 412 duplicates were identified and removed either by Covidence (n= 383) or manually by one of the two independent reviews (n= 29). The remaining publications (n= 661) proceeded into the screening process in which 515 articles were excluded based on the eligibility criteria of this review. The title/abstract screening process yielded an agreement rate of 55.5% between the two independent researchers. Once this first stage of the screening process was completed, the studies that passed the title/abstract screening (n= 146) were further assessed for eligibility through a full-text review. Through this process, 111 articles were excluded due to either a) not focusing on physical activity (n= 6), b) not including older adult participants 60+ (n= 22), c) not having results that could be extracted to older adult participants 60+ (n= 16), d) being a published abstract, conference abstract, thesis, or form of grey literature (n= 12) or e) not having assessed pleasure through their methods (n= 55). During the full-text screening process, a snowball search was conducted across the initial 27 articles that passed the full-text review. After the two stages of screening (i.e., title/abstract screening and a full-text review), a total of eight articles met the eligibility criteria of this review. Thus, a final total of 35 articles were included in this review and the full-text screening process yielded an agreement rate of 62.8% between the two independent reviewers.

Figure 1. PRISMA Flow Chart



Study Characteristics

Most of the studies were conducted in Brazil (n= 9/35, 26%), followed by the UK (n= 4/35, 11.4%), Japan (n= 3/35, 8.6%), USA (n= 3/35, 8.6%), the Netherlands (n= 2/35, 5.7%), Canada (n= 1/35, 2.9%), Norway (n= 1/35, 2.9%), France (n= 1/35, 2.9%), Hungary (n= 1/35, 2.9%), Finland (n= 1/35, 2.9%), Sweden (n= 1/35, 2.9%), Australia (n= 1/35, 2.9%), and Spain

(n= 1/35, 2.9%). Six studies (n= 6/35, 17.1%) had not explicitly stated the location of data collection. Majority of the studies were published in English (n= 31/35, 88.6%) (Table 1).

Table 1. Study Characteristics

Author	Year	Study Design	Sample Size	Sex/Gender	Ages	Country	Language
Allain	2020	Qualitative, semi structured interviews	n= 18	n= 18 (0% female)	54-74	Canada	English
Alves et al.	2015	Quantitative, nonrandomized pre-experimental	n=14	n= 14 (100% female)	65-75	Brazil	Portuguese
Batt-Rawden and Tellnes	2011	Qualitative longitudinal study with an exploratory approach	n= 22	n= 13 (59% female)	35-65	Norway	English
Benites et al.	2016	Quantitative, repeated measures design (pre/post intervention)	n= 11	n= 11 (100% female)	65-75	Brazil	English
Beraud-Peigne et al.	2023	Quantitative, randomized single-center interventional study (pre/post intervention)	n= 34	n= 26 (76% female)	I2WE group: Mean 69.63 $\pm$ 5.31 WMS group: Mean 70.27 $\pm$ 5.82	France	English
Cabrita et al.	2017	Quantitative, cross-sectional design	n= 10	n= 6 (60% female)	65-83	The Netherlands	English
Cassol and Pereira	2020	Quantitative, cross-sectional design	n= 52	55.8% female	18-60	Brazil	Portuguese
Chao et al.	2014	Quantitative, cross-sectional design	n= 16	n= 16 (100% female)	47-79	Brazil	English
Chipperfield and Bissell	2023	Qualitative, semi-structured interview	n= 23	n= 13 (56.5% female)	58-83	UK	English
Colon-Semenza et al.	2021	Quantitative cross-sectional design	Total: n=55 People with Parkinson's Disease (PwPD): n=32 Healthy Controls (HC): n=23	PwPD: n= 16 (50% female) HC: n= 17 (73.9% female)	PwPD: Mean 62.8 $\pm$ 7.4 HC: Mean 60.1 $\pm$ 9.4	USA	English
Elsangedy et al.	2021	Quantitative, randomized control trial	n= 32	n= 32 (100% female)	60-72	Brazil	English

Focht et al.	2007	Quantitative, nonrandomized and uncontrolled design (pre/post intervention)	Total: n= 33 Older adults: n= 15 Younger adults: n= 18	Older adults: n= 7 (46.6% female) Young adults: n= 10 (55.5% female)	Older adults: 60-76 Young adults: 19-30	USA	English
Follador et al.	2019	Quantitative, nonrandomized and ex-post facto design	n= 70	n= 70 (100% female)	60-82	Brazil	English
Hancock et al.	2021	Quantitative cross-sectional observational design	n= 67	n= 38 (56.7% female)	50-78	UK	English
Humberstone and Stuart	2016	Qualitative focus groups, semi-structured ethnographic interviews, and participant observation	n= 17	n= 17 (100% female) ETM group: n= 9 women Yoga group: n= 8 women	ETM group: 59-77 Yoga group: 56-72	UK	English
Hyodo et al.	2019	Quantitative, nonrandomized design (pre/post intervention)	n= 21	n= 11 (52.3% female)	65-74	Japan	English
Hyodo et al.	2021	Quantitative, nonrandomized and counterbalanced within-subject design	n= 15	n= 8 (53.3% female)	65-74	Japan	English
Jallinoja et al.	2010	Qualitative focus groups	n= 30	n= 17 (56.6% female) Weight reducers' interview group: n= 5 Weight gainers' interview group: n= 12	52-65	Finland	English

Krekula	2022	Ethnographic and explorative methodological approach with qualitative interviews and participatory observations	n=33	n= 25 (75.8% female)	52-81	Sweden	English
Lamoth and Caljouw	2011	Quantitative repeated measures design (pre/post intervention)	n= 9		65+	The Netherlands	English
McAuley et al.	2003a	Quantitative randomized control trial	n= 153		60-75		English
McAuley et al.	2003b	Quantitative randomized control trial	n= 153		60-75	USA	English
Orsano et al.	2018	Quantitative randomized control trial	n= 15	n= 15 (100% female)	60-80		English
Parkington et al.	2022	Quantitative randomized crossover design	n= 20	n= 10 (50% female)	Mean 64.3 $\pm$ 4.2		English
Paxton et al.	1997	Mixed method: Quantitative cross-sectional design and qualitative open-ended interviews	Total n= 105 Exercise group: n=55 Non-exercising group: n=50	n= 105 (100% female)	60-89	Australia	English
Pereira et al.	2022	Quantitative, randomized counterbalanced, crossover design	n= 16	n= 16 (100% female)	Mean 66.1 $\pm$ 3.9	Brazil	English
Phoenix and Orr	2014	Qualitative life history interviews	n= 51	n= 29 (56.9% female)	60-92	UK	English
Ribeiro et al.	2021	Quantitative, nonrandomized design	n= 46	n= 46 (100% female)	Mean 68.4 $\pm$ 5.7	Brazil	English
Richardson et al.	2020	Quantitative, randomized multiarmed and parallel design	n= 40	n= 20 (50% female)	60-79		English
Rodriguez Cayetano et al.	2020	Quantitative, cross-sectional design	n= 146	n= 64 (43.8% female)	16-60	Spain	Spanish

Shige-matsu et al.	2008	Quantitative parallel group-randomized trial	n= 39	n= 18 (46.1% female)	65-74	Japan	English
Silva et al.	2022	Mix-method: Quantitative cross-sectional design and descriptive approach interviews	n= 21	n= 21 (100% female)	60-86	Brazil	Portuguese
Szabo et al.	2021	Quantitative, cross-sectional design	n= 25	n= 25 (100% female)	52+, with exception of two participants aged 35 and 40	Hungary	English
Van Roie et al.	2015	Quantitative randomized design	n= 56	n= 30 (53.6% female)	60-80		English
Varge-midis et al.	2023	Mixed-method: Online surveys and interviews	n= 44 Online surveys: n=27 Interviews: n=17	n= 23 (53.3% female)	61-88		English

Notes:

Abbreviations: I2WE = Immersive and Interactive Wall Exergames; WMS = Walking and Muscle Strengthening; PwPD = People with Parkinson's Disease; HC = Healthy Control; ETM = Exercise to Music.

Overall, 25 studies (n= 25/35, 71.4%) used only quantitative approaches, seven studies (n= 7/35, 20%) only used qualitative approaches, and three studies (n=3/35, 8.6%) were mixed-method. 10 studies (n= 10/35, 28.6%) applied randomized allocation and six studies used non-randomized designs (n= 6/35, 17.1%). 12 studies (n= 12/35, 34.3%) had used uncontrolled, cross-sectional designs. The smallest sample size across the studies included nine participants and the largest sample size consisted of 153 participants (Table 1). The age ranges of included participants ranged from 16 (as the youngest) to 92 (as the oldest).

Results of Risk of Bias and Quality Assessments

Tables 2 and 3 summarized the qualitative critical appraisal assessments and Tables 4 and 5 summarized the risk of bias assessments across the 35 studies. Overall, of the studies that had included a qualitative design as part of their study ($n = 10/35$, 28.6%), four studies had scored 7/10 on the 10 domains of the JBI Qualitative Assessment tool (Table 2). Two studies had scored 10/10, another two had scored 3/10, and the remaining three studies had either scored 2/10, 8/10 or 9/10. Almost all studies ($n = 9/10$, 90%) had demonstrated clear congruity between the research methodology and the research questions or objectives. Most studies ($n = 6/10$, 60%) did not provide a statement locating the authors either theoretically or culturally (question 6). Similarly, half of the studies ($n = 5/10$, 50%) did not address the influence of researcher on the study or vice-versa (question 7).

Table 3 presented the results of the JBI quality assessment for studies that implemented a cross-sectional design ($n = 12/35$, 34.3%). Overall, across the 12 studies that used a cross-sectional design, no studies ($n = 0/12$, 0%) had achieved an overall score of 8/8 across all the domains (Table 3). Four studies ($n = 4/12$, 33.3%) had scored 6/8 across domains, three studies ($n = 3/12$, 25%) had scored 5/8, two studies ($n = 2/12$, 16.7%) had scored 4/8, and two studies ($n = 2/12$, 16.7%) had scored 3/8. The last remaining study had scored 7/8 ($n = 1/12$, 8.3%). All studies ($n = 12/12$, 100%) were found to demonstrate the use of appropriate statistical analysis (question 10). Most studies ($n = 10/12$, 83.3%) had measured the exposure in a valid and reliable way (question 3). Half of the studies ($n = 6/12$, 50%) did not describe the study subjects or setting in detail (question 2) and more than half did not clearly identify potential confounders ($n = 9/12$, 75%) (question 5).

Table 4 presented the results of the ROBINS-I risk of bias assessment tool for studies that applied a nonrandomized approach ($n = 6/35$, 17.1%). Overall, all six studies ($n = 6/6$, 100%)

were overall judged to be at a serious risk of bias due to at least one domain being labeled as a serious risk of bias. All the six studies (n= 6/6, 100%) were judged to be a serious risk of bias for not addressing or identifying confounding variables (domain 1). All six studies (n= 6/6, 100%) were judged to be at a low risk for classification of interventions (domain 3) and missing data (domain 5). One study (n= 1/6, 16.7%) was judged to provide no information regarding the potential risk of bias across two domains (domain 2 and 6).

Table 5 presented the results of the ROB2 risk of bias assessment tool for studies that included a randomized design (n= 10/35, 28.6%). Overall, all 10 studies (n= 10/10, 100%) were judged overall to be at a high risk of bias due to at least one domain being labeled at a high risk of bias. Almost all studies were considered to be at high risk for the measurement of outcome (n= 9/10, 90%) (domain 4). A majority of the studies were considered to be at low risk of bias in the selection of reporting results (n= 9/10, 90%) (domain 5) as well as judged to be at a low risk of bias for missing outcome data (n= 8/10, 80%) (domain 3).

Table 2. Quality Assessment of Qualitative Designs (JBI)

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Score
Allain, 2020	U	Y	Y	Y	Y	U	N	Y	Y	Y	7/10
Batt-Rawden and Tellnes, 2011	Y	Y	Y	Y	Y	N	U	U	Y	Y	7/10
Chipperfield and Bissell, 2023	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10/10
Humberstone and Stuart, 2016	U	Y	Y	Y	Y	Y	Y	U	N	Y	7/10
Jallinoja et al., 2010	U	U	U	U	U	N	N	Y	Y	Y	3/10
Krekula, 2022	Y	Y	Y	Y	Y	U	Y	U	Y	Y	8/10
Phoenix and Orr, 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10/10
Paxton et al., 1997	Y	Y	Y	U	N	N	N	N	N	U	3/10
Silva et al., 2022	Y	Y	Y	Y	Y	N	N	Y	Y	U	7/10
Vargemidis et al., 2023	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	9/10

Notes:

Judgements: Y= Yes; N= No; U= Unclear; NA = Not Applicable

Overall scores were provided to represent a score for assessment quality. It is important to note that these scores do not directly represent a risk of bias, hence the absence of a risk of bias classification (i.e., low, moderate, or high).

Q1: Is there congruity between the stated philosophical perspective and the research methodology?

Q2: Is there congruity between the research methodology and the research question or objectives?

Q3: Is there congruity between the research methodology and the methods used to collect data?

Q4: Is there congruity between the research methodology and the representation and analysis of data?

Q5: Is there congruity between the research methodology and the interpretation of results?

Q6: Is there a statement locating the researcher culturally or theoretically?

Q7: Is the influence of the researcher on the research, and vice versa, addressed?

Q8: Are participants, and their voices, adequately represented?

Q9: Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?

Q10: Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

Table 3. Quality Assessment of Cross-Sectional Designs (JBI)

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Total
Benites et al., 2016	Y	Y	Y	Y	N	N	Y	Y	6/8
Cabrita et al., 2017	N	Y	Y	Y	Y	Y	N	Y	6/8
Cassol and Pereira, 2020	Y	U	Y	Y	U	Y	N	Y	5/8
Chao et al., 2014	Y	U	Y	Y	U	N	Y	Y	5/8
Colon Semenza et al., 2021	Y	N	Y	Y	Y	Y	Y	Y	7/8
Hancock et al., 2021	N	Y	Y	U	Y	Y	Y	Y	6/8
Lamoth and Caljouw, 2011	Y	N	U	U	N	N	Y	Y	3/8
Paxton et al., 1997	Y	Y	Y	Y	U	U	U	Y	5/8
Silva et al., 2022	Y	Y	Y	Y	U	U	Y	Y	6/8
Szabo et al., 2021	N	N	Y	U	N	N	Y	Y	3/8
Rodriguez Cayetano et al., 2020	N	U	Y	Y	N	N	Y	Y	4/8
Vargemidis et al., 2023	Y	Y	N	Y	NA	NA	N	Y	4/8

Notes:

Judgements: Y= Yes; N = No; U = Unclear; NA = Not Applicable

Overall scores were provided to represent a score for assessment quality. It is important to note that these scores do not directly represent a risk of bias, hence the absence of a risk of bias classification (i.e., low, moderate, or high).

Q1: Were the criteria for inclusion in the sample clearly defined?

Q2: Were the study subjects and the setting described in detail?

Q3: Was the exposure measured in a valid and reliable way?

Q4: Were objective, standard criteria used for measurement of the condition?

Q5: Were confounding factors identified?

Q6: Were strategies to deal with confounding factors stated?

Q7: Were the outcomes measured in a valid and reliable way?

Q8: Was appropriate statistical analysis used?

Table 4. Risk of Bias Assessment of Non-Randomized Designs (ROBINS-I)

Study	Confounding	Participant Selection	Classification of Intervention	Deviations	Missing Data	Measurement of Outcomes	Reported Results	Overall
Alves et al., 2015	●	●	●	●	●	●	●	●
Focht et al., 2007	●	●	●	●	●	●	●	●
Follador et al., 2019	●	●	●	●	●	●	●	●
Hyodo et al., 2019	●	●	●	●	●	●	●	●
Hyodo et al., 2021	●	●	●	●	●	●	●	●
Ribeiro et al., 2021	●	●	●	●	●	●	●	●

Notes:

Judgements: Red= Serious risk of bias; Yellow= Moderate risk of bias; Green= Low risk of bias; Black= No information on risk of bias

Domain 1: Bias due to confounding

Domain 2: Bias in selection of participants into the study

Domain 3: Bias in classification of interventions

Domain 4: Bias due to deviations from intended intervention

Domain 5: Bias due to missing data

Domain 6: Bias in measurement of outcomes

Domain 7: Bias in selection of the reported results

Table 5. Risk of Bias Assessment of Randomized Designs (ROB-2)

Study	Randomization Process	Deviations	Missing Outcome Data	Measurement of Outcome	Reported Results	Overall
Beraud-Peigne et al., 2023	●	●	●	●	●	●
Elsangedy et al., 2021	●	●	●	●	●	●
McAuley et al., 2003a	●	●	●	●	●	●
McAuley et al., 2003b	●	●	●	●	●	●
Orsano et al., 2018	●	●	●	●	●	●
Parkington et al., 2022	●	●	●	●	●	●
Pereira et al., 2022	●	●	●	●	●	●
Richardson et al., 2020	●	●	●	●	●	●
Shigematsu et al., 2008	●	●	●	●	●	●
Van Roie et al., 2015	●	●	●	●	●	●

Notes:

Judgements: Red= High risk of bias; Yellow= Some concerns of bias; Green= Low risk of bias; NI= No information on risk of bias

Domain 1: Risk of bias arising from randomization process

Domain 2: Risk of bias due to deviations from intended interventions (effect of assignment to intervention)

Domain 3: Missing outcome data

Domain 4: Risk of bias in measurement of outcome

Domain 5: Risk of bias in selection of the reported results

Definitions of Pleasure

The first objective of this review was to synthesize the existing definitions and synonyms of pleasure used in older adult PA research. To do this, a table with the presented definitions, synonyms, and antonyms of pleasure was provided (Table 6). Majority of studies ($n= 30/35$, 85.7%) within this review did not explicitly define pleasure (Allain, 2020; Alves et al., 2015; Batt-Rawden & Tellnes, 2011; Benites et al., 2016; Beraud-Peigne et al., 2023; Cabrita et al., 2017; Cassol & Pereira, 2020; Chao et al., 2014; Colon Semenza et al., 2021; Elsangedy et al., 2021; Focht et al., 2007; Follador et al., 2019; Hancock et al., 2021; Humberstone & Stuart, 2016; Hyodo et al., 2019; Hyodo et al., 2021; Jallinoja et al., 2010; Krekula, 2022; Lamothe & Caljouw, 2011; McAuley et al., 2003a; McAuley et al., 2003b; Orsano et al., 2018; Parkinson et al., 2022; Paxton et al., 1997; Pereira et al., 2022; Ribeiro et al., 2021; Richardson et al., 2020; Rodriguez Cayetano et al., 2020; Shigematsu et al., 2008; Silva et al., 2022; Szabo et al., 2021; VanRoie et al., 2015). However, across the few studies that did provide formal definitions of pleasure ($n= 5/35$, 14.3%) there was some variance (Chipperfield & Bissell, 2023; Elsangedy et al., 2021; Follador et al., 2019; Phoenix & Orr, 2014; Vargemidis et al., 2023). Based on explicitly defined conceptualizations of pleasure, a definition provided by Smith (1980) was one commonly presented conceptualization within studies ($n= 3/35$, 8.6%) in which pleasure was defined as “being the diverse emotions that make a person ‘feel good,’ including, happiness, joy, fun, sensuality, amusement, mirth, tranquility” (p. 75; Phoenix & Orr, 2014, p. 96; Chipperfield & Bissell, 2023; Vargemidis et al., 2023).

Table 6. Definitions and Synonyms of Pleasure

Author	Definition of Pleasure	Synonyms (authors)	Synonyms (participants)	Synonyms (tools)	Antonyms (authors)	Antonyms (tools)
Allain, 2020		Fun, Enjoyment, Joy, Passion, Joyful embodiment, Joyful experience, Delight	Fun, Joy, Feel good, Satisfaction, Passion			
Alves et al., 2015		Positive affective responses				
Batt-Rawden and Tellnes, 2011		Enjoyable				
Benites et al., 2016		Enjoyment, Pleasant feelings				
Beraud-Peigne et al., 2023						
Cabrita et al., 2017		Enjoyment, Enjoyable, Positive emotions				
Cassol and Pereira, 2020						
Chao et al., 2014		Positive affect				
Chipperfield and Bissell, 2023	Pleasure was defined as “being the diverse emotions that make a person ‘feel good,’ including, happiness, joy, fun, sensuality, amusement, mirth, tranquility” (p. 75; Phoenix & Orr, 2014, p. 96; Chipperfield & Bissell, 2023; Vargemidis, 2023).	Fun, Enjoyment, Joy (via Smith's (1980) definition), Feel good (via Smith's (1980) definition), Happiness, Enjoy, Sensuality (via Smith's (1980) definition), Amusement (via Smith's (1980) definition), Mirth (via Smith's (1980) definition), Tranquility (via	Enjoy			

		Smith's (1980) definition)				
Colon Semenza et al., 2021						
Elsangedy et al., 2021	Russell (2003) defined the core affect as “a neurophysiological state consciously accessible as a simple, nonreflective feeling that is an integral blend of hedonic (pleasure–displeasure) and arousal (sleepy–activated) values” (p.147). In this regard, a consistent body of literature has shown that psychological responses to exercise, especially affective responses (pleasure/displeasure), have an important impact on future exercise behavior (Rhodes & Kates, 2015; Williams et al., 2008).					
Focht et al., 2007		Affective state, Pleasant affective states, Pleasant feeling states		Tranquility, Revitalization, Positive engagement (via the Exercise-Induced Feeling Inventory), High arousal, Low arousal (via the Felt Arousal Scale)	Unpleasant feeling states	Physical exhaustion (via the Exercise-Induced Feeling Inventory)
Follador et al., 2019	"Pleasure and displeasure are constitutive of basic or core affect, an experiential component	Feel good, Positive affect experience, Arousal, Emotional excitement		High arousal, Low arousal (via Felt Arousal Scale)		

	that is present in the absence of cognitive appraisal...” (Ekkekakis & Petruzzello, 2000 as cited in Follador et al., 2019, p. 225)					
Hancock et al., 2021		Happiness		Happiness (via the Ecological Momentary Assessments app)		
Humberstone and Stuart, 2016		Enjoyment, Feeling good, Pleasant	Pleasantly, Peace, Calm, Relaxed-chilled out, Buzz			
Hyodo et al., 2019		Enjoyable		Calm, Energetic, Lively, Relaxed (via the Two Dimensional Mood Scale)		Lethargic, Listless, Irritated, Nervous (via the Two Dimensional Mood Scale)
Hyodo et al., 2021		Fun, Enjoyment, Enjoyable		Calm, Energetic, Lively, Relaxed (via the Two Dimensional Mood Scale)		Lethargic, Listless, Irritated, Nervous (via the Two Dimensional Mood Scale)
Jallinoja et al., 2010		Fun, Enjoyment, Contentment	Fun, Proud, Wonderful			
Krekula et al., 2022		Joy, Passion, Flow, Euphoria	Enjoyment, Joy, Enjoy, Sensuality			
Lamoth and Caljouw, 2011		Enjoyable				
McAuley et al., 2003a		Enjoyed, Enjoying, Feeling good, Positive affect			Negative affect	
McAuley et al., 2003b		Enjoyment, Enhanced positive affect, Pleasant affective experience				
Orsano et al., 2018		Positive affective responses				
Parkington et al., 2022		Enjoyment, Positive affective responses		Fun, Like (via the modified Physical		Frustration (via modified Physical

				Activity Enjoyment Scale), Enjoyment, Enjoyable, (via Virtual Analogue Scale), Positive affect responses (via the Physical Activity Affect Scale), Enjoy (via modified Physical Activity Enjoyment Scale), Tranquility, Calm, Energetic, Relaxed, Peaceful, Enthusiastic, Upbeat (via Physical Activity Affect Scale), Physical feeling (via modified Physical Activity Enjoyment Scale)		Activity Enjoyment Scale tool), Fatigue (via Visual Analogue Scale and Physical Activity Affect Scale), Tired, Worn-out, Negative affect (via Physical Activity Affect Scale), No enjoyment (via Visual Analogue Scale), Dislike (via modified Physical Activity Enjoyment Scale)
Paxton et al., 1997		Enjoyment				
Pereira et al., 2022		Enjoyable				
Phoenix and Orr, 2014	Pleasure was defined as “being the diverse emotions that make a person ‘feel good,’ including, happiness, joy, fun, sensuality, amusement, mirth, tranquility” (Smith, 1980, p. 75, as cited in Phoenix & Orr, 2014, p. 96)	Joy, Happiness, Sensuality, Amusement, Mirth, Tranquility (all via Smith's (1980) definition), Excitement, Enjoyed, Satisfaction	Enjoyable, Enjoyed, Wonderful, Happy			
Ribeiro et al., 2021		Positive emotions, Affectivity, Affective valence, Affective emotions		Positive/Pleasant and Activated /Pleasant (via the Feeling Scale), Low		

				arousal, High arousal (via Felt Arousal Scale)		
Richardson et al., 2020		Enjoyment, Positive affective response, Pleasantness, Affective valence		Enjoyable (via Visual Analogue Scale), Positive affect, Tranquility (via Physical Activity Affect Scale), Calmness (low arousal), Relaxation (low arousal), Excitement (high arousal) (via Felt Arousal Scale), Like (via Physical Activity Enjoyment Scale)		Fatigued, Tired, Worn out, Negative affect (via Physical Activity Affect Scale), Dislike (via Physical Activity Enjoyment Scale), Anxiety (high arousal), Anger (high arousal), Boredom (low arousal) (via Felt Arousal Scale)
Rodriguez Cayetano et al., 2020		Fun		Fun (via Participation Motivation Questionnaire and the Intrinsic Satisfaction in Sports Questionnaire)		Boredom (via the Intrinsic Satisfaction in Sports Questionnaire)
Shigematsu et al., 2008		Pleasant, Enjoying				
Silva et al., 2022		Fun, Feelings of fun and joy, Enjoy	Fun, Inner peace, Freedom			
Szabo et al., 2021		Positive affect, Momentary well-being		Positive affect (via Positive and Negative Affect Schedule Scale), Arousal (via Felt Arousal Scale)		Negative affect (via Positive and Negative Affect Schedule Scale)
Van Roie et al., 2015		Enjoyment		Enjoy (via questions on an 11-point scale)		

Vargemidis et al., 2023	"Plato defined pleasure as the replenishment of a lack, and the opposite of distress, e.g., drinking to suppress thirst, scratching to end an itch, or the pleasures of the memory or anticipation of bodily replenishment... In recent work, others describe pleasure as a combination of emotions that can make someone feel good, e.g., fun, amusement, happiness, etc... This description of pleasure implies a rather subjective, ephemeral, and intangible nature of pleasure. This is contrasted by performance, which can be seen as the capability to engage in PA and be physically independent, and is often considered something that can be objectively tested, monitored, and substantiated with numbers..." (p. 21:6)	Fun, Enjoyment, Happiness, Amusement (all via Phoenix & Orr (2014) and Smith (1980) definition), Enjoy	A good feeling			
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Pleasure was also understood through a combination of past and present definitions. Vargemidis et al. (2023) had understood pleasure through a conceptualization provided by Plato, as well as recent research on pleasure in physical activity. They described that, “Plato defined pleasure as the replenishment of a lack, and the opposite of distress, e.g., drinking to suppress thirst, scratching to end an itch, or the pleasures of the memory or anticipation of bodily replenishment... In recent work, others describe pleasure as a combination of emotions that can make someone feel good, e.g., fun, amusement, happiness, etc... This description of pleasure implies a rather subjective, ephemeral, and intangible nature of pleasure. This is contrasted by performance, which can be seen as the capability to engage in PA and be physically independent, and is often considered something that can be objectively tested, monitored, and substantiated with numbers...” (Vargemidis et al., 2023, p. 21:6).

In contrast, pleasure was also understood as being part of core affect across some studies ($n = 2/35$, 5.7%) (Elsangedy et al., 2021; Follador et al., 2019). For example, one study defined pleasure (as well as displeasure) as being “...constitutive of basic or core affect, an experiential component that is present in the absence of cognitive appraisal...” (Follador et al., 2019, p. 225). Similarly, Elsangedy et al. (2021) provided a definition of core affect that encapsulates the spectrum of pleasure and displeasure, stating that core affect is “...a neurophysiological state consciously accessible as a simple, nonreflective feeling that is an integral blend of hedonic (pleasure–displeasure) and arousal (sleepy–activated) values.” (Russell, 2003, p.147, as cited in Elsangedy et al., 2021, p. 469).

Synonyms and Antonyms of Pleasure

Across the 35 studies in this review, pleasure was found to be conceptualized in a range of ways across authors and participants alike. This was evident through the way in which the authors themselves, the tools in which the researchers used to assess pleasure, and the participants (through quotations) described experiences of pleasure during PA, providing varying synonyms to help capture the pleasurable essence that was felt during PA (Table 6). Thus, as various synonyms were apparent within the explanations of the authors, the associated tools, and participants across the 35 studies, it was found that there was no singular or identical experience of pleasure, rather, pleasure in later life PA captured a range of experiences, moods, and/or feelings that may have been present and felt by a certain individual when engaging in meaningful bodily movement.

When examining the top five most common synonyms provided for pleasure overall, the term “enjoyment” (as well as the variation terms of “enjoyable” and “enjoy”) was the most common to describe the pleasurable experiences of older adults in PA ($n = 22/35$, 62.9%) (Allain, 2020; Batt-Rawden & Tellnes, 2011; Benites et al., 2016; Cabrita et al., 2017; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Hyodo et al., 2019; Hyodo et al., 2021; Jallinoja et al., 2010; Krekula, 2022; Lamothe & Caljouw, 2011; McAuley et al., 2003a; McAuley et al., 2003b; Parkington et al., 2022; Paxton et al., 1997; Pereira et al., 2022; Phoenix & Orr, 2014; Richardson et al., 2020; Rodriguez Cayetano et al., 2020; Silva et al., 2022; Van Roie et al., 2015; Vargemidis et al., 2023). Of the studies where “enjoyment” was found, this term was predominantly used by authors ($n = 20/22$, 90.9%) followed by the tools they used to assess pleasure ($n = 2/22$, 9.1%), and the participants themselves via direct quotation ($n = 2/22$, 9.1%)

The second most common synonym that was identified within the findings was “positive affect,” as well as variations of “affective state,” “pleasant affective states,” and “affective

valence” (n= 11/35, 31.4%) (Alves et al., 2015; Chao et al., 2014; Elsangedy et al., 2021; Follador et al., 2019; McAuley et al., 2003a; McAuley et al., 2003b; Orsano et al., 2018; Parkington et al., 2022; Ribeiro et al., 2021; Richardson et al., 2020; Szabo et al., 2021). Of the 11 studies, “positive affect” was predominantly used by authors (n= 10/11, 91%) (Alves et al., 2015; Chao et al., 2014; Elsangedy et al., 2021; Follador et al., 2019; McAuley et al., 2003a; McAuley et al., 2003b; Orsano et al., 2018; Parkington et al., 2022; Richardson et al., 2020; Szabo et al., 2021) followed by conceptualizations by tools of assessment (n= 3/10, 30%) (Parkington et al., 2022; Richardson et al., 2022; Szabo et al., 2021). Another term related to positive affect included “positive emotions” (n= 2/35, 5.7%) (Cabrita et al., 2017; Ribeiro et al., 2021), “positive feelings,” (n= 1/35, 2.9%) (Van Roie et al., 2015) and “pleasant feelings” (n= 1/35, 2.9%) (Benites et al., 2016) which captured physical and emotional dimensions.

In terms of other synonyms, the third most common term was “fun” (n= 8/35, 22.9%) (Allain, 2020; Chipperfield & Bissell, 2023; Hyodo et al., 2021; Jallinoja et al., 2010; Parkington et al., 2022; Rodriguez Cayetano et al., 2020; Silva et al., 2020; Vargemidis et al., 2023). Among these eight studies, it was found that this term was used by both authors directly (n= 7/8, 88%) (Allain, 2020; Chipperfield & Bissell, 2023; Hyodo et al., 2021; Jallinoja et al., 2010; Rodriguez Cayetano et al., 2020; Silva et al., 2022; Vargemidis et al., 2023) and by the participants when they recounted or reflected upon their experiences in PA (n= 4/8, 50%) (Allain, 2020; Jallinoja et al., 2010; Silva et al., 2022; Vargemidis et al., 2023). In addition, it was also present in the applied tools that researchers used to assess pleasure (n= 2/8, 25%) (Parkington et al., 2022; Rodriguez Cayetano et al., 2020),

The fourth most common description of pleasure was found to be “feel good” or “feeling good” (n= 6/35, 17.1%) (Allain, 2020; Chipperfield & Bissell, 2023; Follador et al., 2019;

Humberstone & Stuart, 2016; McAuley et al., 2003a; Phoenix & Orr, 2014). This was predominantly provided by authors ($n= 5/6$, 83.3%) in comparison to participants ($n= 1/6$, 16.7%) (Allain, 2020).

Finally, the fifth most common term provided was “tranquility”. Across the five studies ($n= 5/35$, 14.3%) (Chipperfield & Bissell, 2023; Focht et al., 2007; Parkington et al., 2022; Phoenix & Orr, 2014; Richardson et al., 2020), this term was predominantly offered by the tools that the researchers used to assess pleasure ($n= 3/5$, 60%) (Focht et al., 2007; Parkington et al., 2022; Richardson et al., 2020). The other two studies had provided the term “tranquility” through a definition of pleasure that was offered by Smith (1980) ($n= 2/5$, 40%) (Chipperfield & Bissell, 2023; Phoenix & Orr, 2014).

Amongst the findings of the most used synonyms, a host of other less frequent terms were also identified (Table 6). In comparison to the most common synonyms, which (apart from tranquility) were broad and more general, these less frequent terms were more specific, however, they could also be represented by those most frequent general descriptors for pleasure. For example, in one study ($n= 1/35$, 2.9%), a participant had used the term “proud” to describe how they felt after they walked for a certain duration of time (Jallinoja et al., 2010, p. 123). The term “proud” as a specific expression is also represented by general descriptors of pleasure such as “positive affect” or “pleasant feeling”. Other more specific terms such as “calm” ($n= 4/35$, 11.4%) (Humberstone & Stuart, 2016; Hyodo et al., 2021; Parkington et al., 2022; Richardson et al., 2020), “tranquility” ($n= 5/35$, 14.2%) (Chipperfield & Bissell, 2023; Focht et al., 2007; Parkington et al., 2022; Phoenix & Orr, 2014; Richardson et al., 2020), and “peaceful” or “inner peace” ($n= 2/35$, 5.7%) (Parkington et al., 2022; Silva et al., 2022) were represented and encapsulated by more general terms, such as “positive feelings”.

However, in addition to general and specific terms that were used to represent pleasure, it was found that authors also described pleasure by what it was not (Table 6). Through tools that were used to assess pleasure by the authors, antonyms such as “negative affect” (n= 3/35, 8.6%) (Parkington et al., 2022; Richardson et al., 2020; Szabo et al., 2021), “fatigue” (n= 2/35, 5.7%) (Parkington et al., 2022; Richardson et al., 2020), “frustration” (n= 1/35, 2.9%) (Parkington et al., 2022), and “boredom” (n= 2/35, 5.7%) (Richardson et al., 2020; Rodriguez Cayetano et al., 2020) were also used to portray the opposing feelings that were present in the PA experiences of participants.

Pleasure as a Motivator for Physical Activity

The second aim of this review was to describe the different ways in which older adults’ pleasure is achieved through PA. To support this, this review first describes how pleasure is conceptualized across the included studies and then describes the results regarding the measured outcome of pleasure (Table 7). One noticeable finding in the conceptualization of pleasure across the 35 studies was the idea of pleasure as an intrinsic motivator for PA behaviour. This was evident through direct discussions regarding how pleasure served as a motivator or through the implementation of tools and scales by authors to assess motivators for PA. Some studies (n= 4/35, 11.4%) conceptualized pleasure as an intrinsic motivator for engagement in physical activity behaviour (Cabrita et al., 2017; Colon Semenza et al., 2021; Elsangedy et al., 2021; Hancock et al., 2021).

For example, Hancock et al. (2021) stated that, “Sense of purpose and pleasure are sources of intrinsic motivation identified in self-determination theory... Moreover, it has been argued that people try to balance feelings of purpose and pleasure from moment to moment in

everyday life... which suggests studying momentary (experiential) feelings relating to older people's activities could help to identify physically active and less sedentary activities that are more intrinsically motivating because they appeal to feelings of pleasure and purpose." (p. 670).

Table 7. Findings of Quantitative Designs

Author	Study Design	Objectives	Intervention/PA Characteristics	Outcome	Findings
Alves et al., 2015	Quantitative, nonrandomized pre-experimental	Examine differences in affective responses across different weight training intensities among older women	Mode: resistance training (bench press, leg extension, front pull-up, leg flexion, and lateral (side) dumbbell raises). Duration: not reported Intensity: 1) self-selected, 2) 35% of 1RM (one-repetition maximum), and 3) 70% of 1RM Frequency: 3 sets of 10 repetitions	1. Affective response - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Across all three groups, 35% of 1RM intensity presented a higher positive response for all exercises when compared to 35% of 1RM and self-selected 1RM ($p<0.05$) - However, all exercises performed at 70% of 1RM showed significant difference in affect in comparison to when performed at 35% of 1RM ($p<0.05$), not when compared to self-selected intensity
Benites et al., 2016	Quantitative, repeated measures design (pre/post intervention)	Examine effects of 8-week strength training on feelings of pleasure/displeasure in older women	Mode: Strength/resistance training (bench press, leg curl, pulldown, and leg extension) Duration: 8 weeks Intensity: 70% of 1RM Frequency: 3 sets of 10 repetitions	1. Affective response - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Subjects reported feelings of pleasure across all four exercises - Feelings of pleasure in leg extension, pulldown, and leg curl increased over time - Leg curl and leg extension pleasure scores at week 5 were statistically different from week 1 ($p<0.05$) and leg curl and pulldown pleasures scores at week 8 were statistically different from week 1 ($p<0.05$) - Feelings of pleasure scores for bench press were not statistically different over time

Beraud-Peigne et al., 2023	Quantitative, randomized single-center interventional study (pre/post intervention)	Compare effects of immersive and interactive wall exergames (I2WE) and walking and muscle strengthening (WMS) on perceived pleasure (secondary outcome)	Mode: I2WE or WMS group Duration: 12 weeks Intensity: moderate (both groups) Frequency: bi-weekly one-hour sessions	1. Perceived pleasure - Physical Activity Enjoyment Scale (French version): 7-point scale (absolutely disagree (1) to completely agree (7)) with scores between 7-70	- Perceived pleasure was significantly higher ($p=0.03$) for I2WE group (score= 63.74 ± 6.04) compared to WMS group (score= 59.57 ± 4.82)
Cabrita et al., 2017	Quantitative, cross-sectional design	To determine: 1) how do daily activities relate to physical activity, 2) how do daily activities relate to the experience of pleasure, and 3) how do daily activities influence the relation between physical activity and pleasure in the daily lives of the older adults.	Mode: not reported Duration: 320 days Intensity: not mentioned Frequency: not mentioned	1. Pleasure - Visual Analogue Scale (not at all (0) to totally (10)) - Participants were asked how pleasurable the activity was	- Social companionship was a predictor for pleasure when doing an activity where with another person was reported to provide 6% more pleasure compared to when doing an activity alone ($p<0.001$) - When compared to doing activities at home, outdoor activities were also reported to increase pleasure ($p<0.05$) - Of all predictors, activity type was the strongest where leisure activities increased pleasure in comparison to basic activities of daily living ($p<0.001$) - Amount of PA when doing an activity (leisure or bADL) was a weak but statistically significant predictor of pleasure. When doing leisure, more physical activity resulted in increased pleasure in comparison to bADL where more physical activity resulted in decreased pleasure
Cassol and Pereira, 2020	Quantitative, cross-sectional design	Determine the motivational factors for practicing street running in amateur athletes from Caxias do Sul-RS	Mode: street running Duration: not reported Intensity: not reported Frequency: not reported	1. Pleasure - Inventário de Motivação a Prática de Atividades Físicas ou Esportivas (IMPRAFE-132) or the Motivation	- Pleasure represented the second biggest motivation for running in the 45+ group (80.56 ± 8.53) after health (83.47 ± 8.87)

				Inventory Practice of Physical or Sports Activities (English): self-administered questionnaire with 132 items - Contains six dimensions associated with motivation for PA: stress management, health, sociability, competitiveness, aesthetics, and pleasure	- No statistical difference for pleasure as a motivational factor across age groups 18-35, 36-45, and 45+ ($p=0.207$)
Chao et al., 2014	Quantitative, cross-sectional design	Describe the rate of perceived exertion and affective responses during a Wu Tai Chi Chaun intervention Hypothesis: Wu Tai Chi Chuan will generate a light-to-moderate RPE and feelings of pleasure during its practice	Mode: classical Wu Tai Chi Chuan Duration: 7 weeks Intensity: low-moderate Frequency: 3 times per week	1. Affective responses - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Significant difference in increased affective responses at 30-minute ($p<0.05$) and 45-minute timepoints ($p<0.05$) when compared to the initial assessment at the 15-minute timepoint. However, no statistical difference in affective responses between 30- and 45-minute timepoint were observed ($p>0.05$) - Affective responses ranged from $+3.2 \pm 0.9$ to $+4.7 \pm 0.5$ and thus all sessions were perceived as “good” to “very good”
Colon Semenza et al., 2021	Quantitative, cross-sectional design	Determine if 1) effort-based decision-making related to exercise was different in people with Parkinson's Disease (PwPD) compared to healthy age-matched controls (HC); 2) if components of motivation (apathy and the anticipation of pleasure) predict decision making for physical effort in PwPD, controlling for the physical measures of age, walking capacity, and motor disease	Mode: stationary cycling Duration: 15 minutes total (5 minutes at each level) Intensity: 1) low effort 2) medium effort 3) high effort Frequency: once	Temporal Experience of Pleasure Scale-Anticipatory Pleasure (TEPS-ANT): 10-item self-report scale with scores between 10-60 - Measures trait tendencies for the anticipatory experience of pleasure	- The anticipation of pleasure was a significant predictor of decisions in PwPD to respond "accept" and engage in cycling ($p<0.001$) - Additionally: age, reward, effort, and trial were also significant predictors of decisions for cycling in this population when holding all other factors constant (age:

		severity; and 3) if effort-based decision-making for a discrete motor task was correlated to effort-based decision-making for exercise in PwPD			$p < 0.01$; reward, effort, trial: $p < 0.001$) - The anticipation of pleasure did not explain choices for the HC group ($p = 0.569$). Instead, choices for cycling were explained by reward, effort, and trial ($p < 0.001$)
Elsangedy et al., 2021	Quantitative, randomized control trial	To examine effects of self-selected resistance training (SSRT) program on the fitness and psychophysiological responses of physically inactive older women	Mode: SSRT (bench press, leg press, lateral pulldown, knee extension, lateral shoulder raise, knee curl, biceps curl, and triceps pushdown) or control group Duration: 12 weeks long Intensity: self-select exercise load to perform 3 sets of 15 repetitions Frequency: 3 times per week, 3 sets of 15 repetitions	1. Affective response - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Resistance training was perceived to be pleasant across all exercises with mean values of 2–3 indicating participants felt “fairly good” or “good” - Mean perception of pleasure was higher in all exercises (except for triceps pushdown and leg press) in the last 4 weeks (i.e., weeks 9-12) - Bench press, knee extension, lateral shoulder raise, biceps curl, and triceps pushdown showed significant changes in mean affect during the final four weeks (i.e., weeks 9-12) in comparison to weeks 1-4 ($p < 0.05$) - Bench press, lateral shoulder raise, biceps curl, and triceps pushdown showed significant changes in mean affect during weeks 9-12 in comparison to weeks 5-8 ($p < 0.05$)
Focht et al., 2007	Quantitative, nonrandomized and uncontrolled design (pre/post intervention)	Main objective was to examine affective and self-efficacy responses to an acute bout of aerobic exercise among both sedentary older and younger adults. Secondary purpose was to	Mode: cycling Duration: 8 weeks Intensity: 65% of VO₂ peak Frequency: 4 times per week	1. Affective response - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Affective response based on Feeling Scale (FS) had a main effect for time ($p = 0.05$) - Age group main effect ($p < 0.59$) and age x time

		examine the relationship between affect and self-efficacy responses to acute exercise		- Felt Arousal Scale: 6-point scale (low arousal (1) to high arousal (6)) - Exercise-Induced Feeling Inventory (EFI): 5-point scale (do not feel (0) to feel very strongly (4)) - 12-item multidimensional scale measuring degree of experiencing four feeling states: revitalization, positive engagement, tranquility, and physical exhaustion	interaction ($p < 0.24$) were not significant on the FS - Felt Arousal Scale showed that older adults had a significant increase in felt arousal during exercise ($d = 0.58$) compared to baseline, however, this felt arousal was not statistically different at post-exercise when compared to baseline - For revitalization (EFI), the main effect for age was not significant ($p < 0.72$). However, for older adults' revitalization from baseline to during ($d = -0.96$) and after exercise ($d = -0.90$) decreased significantly -Positive engagement (EFI) for older adults at baseline compared to during ($d = -0.53$) and post-exercise ($d = -0.44$) was not statistically different, and this was a similar case for tranquility (EFI) where baseline score was not statistically different compared to during ($d = -0.63$) and post-exercise ($d = -0.60$). Main effect for age ($p < 0.57$) was also not significant for assessed positive engagement
Follador et al., 2019	Quantitative, nonrandomized	To compare perceived exertion and affective responses of older	Mode: Tai Chi, yoga, or stretching classes Duration: 60 minutes	1. Affective response	Affect:

	and ex-post facto design	women doing either Tai Chi, yoga, or stretching classes	Intensity: low intensity Frequency: 2 times per week	- Feeling Scale: 11-point scale (very good (+5) to very bad (-5)) - Circumplex model of affect (quadrants based on arousal and pleasure/displeasure) 2. Arousal or perceived activation (i.e., emotional excitement) - Felt Arousal Scale: 6-point scale (low arousal (1) to high arousal (6))	- Affective responses were similar across the three groups ($p=0.41$) - Affective responses across time within respective groups differed over time for the yoga ($p<0.001$) and stretching groups ($p=0.02$) - For yoga group, affective responses were more pleasant at 60-minute mark (90% CI (-.63, -.25)), 15-minute mark (90% CI (-.64, -.26)), and 30-minute mark (90% CI (-.60, -.22)) in comparison to pre-exercise ($p<0.001$) - For stretching group, affective responses were more pleasant at the 60-minute mark in comparison to pre-exercise (90% CI (-.64, -.19)) ($p=0.004$) Arousal: - Arousal responses across time within respective groups different over time for the yoga ($p<0.001$) and stretching groups ($p=0.002$) - For yoga group, arousal levels were significantly higher at 60-minute mark (90% CI (-.67, -.32)), 45-minute mark (90% CI (-.62, -.24), and 30-minute mark (90% CI (-.59, -.19) in comparison to pre-exercise ($p<0.002$) - For stretching group, arousal responses were significantly
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					higher at 60-minute mark (90% CI (-.64, -.20) in comparison to 30-minute mark (p=0.005) - Circumplex model of affect showed that majority of changes for all three groups occurred in the high-activation pleasure quadrant (i.e., energy quadrant). Thus, positive affect increased, and arousal moved from the low-activation pleasure quadrant (calm) to the high-activation quadrant (energy) throughout the exercise classes
Hancock et al., 2021	Quantitative cross-sectional observational design	To determine how the contexts of activities (i.e., the type, social, environment) relate to momentary feelings of pleasure and purpose among retired or semi-retired older adults	Mode: light, moderate, vigorous sport or exercise, and DIY/gardening Duration: Not reported Intensity: 1) light sport or exercise 2) moderate 3) vigorous 4) DIY/gardening Frequency: Not reported	1. Momentary happiness - Ecological Momentary Assessment application: self-report app for cellphones	- Light sport/exercise was positively related to assessed happiness (beta coefficient= 0.257, 95% CI = [-0.233, 0.804]) whereas moderate-vigorous sport/exercise (in comparison to light sport/exercise) was not associated with assessed happiness (beta coefficient= -0.409, 95% CI = [-0.854, 0.028]) - DIY/gardening was also demonstrated to be positively related to happiness (beta coefficient= 0.404, 95% CI = [-0.172, 1.110]) moderate-vigorous sport/exercise - Both engagement in light sport/exercise that was social and outdoors (beta = 1.768,

					95% CI = [0.822, 2.713] and DIY/gardening that was social and outdoors (beta = 1.748, 95% CI = [0.995, 2.501] were statistically positively associated with happiness (p<0.05)
Hyodo et al., 2019	Quantitative, nonrandomized design (pre/post intervention)	To determine if acute slow aerobic dance exercise (ADE) increases mood and executive function more strongly in comparison to cycling exercise (CE) among older adults	Mode: CE or ADE Duration: 10 minutes Intensity: CE = intensity of 60% of their ventilatory threshold (VT); ADE = light-intensity, slow-tempo Frequency: once	1. Mood - Two-Dimensional Mood Scale (TDMS): 6-point scale (not at all (0) to extremely (5)). - Contains 8 mood-expressing words related to pleasure and arousal	- Pleasure was significantly higher in ADE group than CE group (p=0.027) - ADE group had significant interaction effects between time and pleasure levels (p=0.005) where pleasure levels significantly increased post-exercise in comparison to pre-exercise time point (p=0.007) while the CE group did not have any significant interaction effects between time and pleasure - Arousal levels had a significant time effect (p=0.009), however, there were no significant differences of arousal levels between the two conditions - Arousal levels were higher post-exercise in comparison to pre-exercise (p<0.007)
Hyodo et al., 2021	Quantitative, nonrandomized and counterbalanced within-subject design	To examine the effects of intermittent light-intensity aerobic dance (I-LADE) to the effects of continuous LADE (C-LADE) on mood and executive functions of older adults	Mode: I-LADE or C-LADE Duration: 10 minutes Intensity: light-low intensity Frequency: once	1. Enjoyment levels - Japanese version of Physical Activity Enjoyment Scale (PACES): 7-point scale with 18 items 2. Mood during exercise	- Enjoyment levels via PACES were significantly higher in I-LADE than C-LADE after exercise (p<0.01) - Change in mood during exercise via FS was significantly higher in I-

				- Feeling Scale (FS): 11-point scale (very good (+5) to very bad (-5)) 3. Mood after exercise - Two-Dimensional Mood Scale (TDMS): 6-point scale (not at all (0) to extremely (5))	LADE group than C-LADE ($p=0.049$) - While time was found to have a significant effect on FS score ($p<0.01$) and a significant interaction effect ($p<0.01$), the exercise condition did not have a significant main effect ($p=0.66$) - Pleasure levels after exercise via TDMS showed a significant main effect of time ($p<0.001$) while the exercise condition did not present significant interactions ($p=0.86$) or main effects ($p=0.79$) - Arousal levels were found to have a significant main effect of time ($p<0.01$), however, there was no significant interaction ($p=0.7$) and no significant main effect of the exercise condition ($p=0.56$)
Lamoth and Caljouw, 2011	Quantitative repeated measures design (pre/post intervention)	To appraise effects of a balance-based exergame training program on the balance of community-dwelling older adults	Mode: exergame on Sensbalance fitness board Duration: 6 weeks Intensity: not reported Frequency: 3 times per week	1. Pleasure as motivation - Self-Regulation Questionnaire for Exercising (SRQ-E)	- With average score of 55.6 on SRQ-E, participants were reported to be very motivated to exercise due to finding exergames enjoyable and challenging - No significant changes in motivation at 3- or 6-week mark
McAuley et al., 2003a	Quantitative randomized control trial	To examine the effects of walking and stretching/toning PA on self-efficacy to overcome barriers and	Mode: walking or stretching/toning program Duration: 6 months	1. Affective response	- Affective experience of exercise influenced self-efficacy patterns over the

		engage in increased periods of PA as well as to determine how affective, social, and behavioural factors contributed to self-efficacy at the end of the program	Intensity: 1. Walking group = began at light levels (50-55% VO2 peak) and increased gradually to moderate levels (65% VO2 peak) at program half point 2. Stretching/toning group = not reported Frequency: 3 times per week (both groups)	- Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	course of the 6 months (confidence overcoming barriers to PA increased from baseline to 2 months and then decreased at the 4th and 6th month mark) - Reported exercise frequency significantly influenced exercise affect and that positive affect during exercise had a stronger effect on self-efficacy in both exercise conditions than in the relationship between barriers and self-efficacy - Concluded that having increased positive affect and increased social support lead to higher self efficacy at the end of the program
McAuley et al., 2003b	Quantitative randomized control trial	Examined factors of exercise-induced affect, social support, and value judgements in influencing long-term adherence to an exercise program	Mode: walking or stretching and toning program Duration: 6 months with 18-month follow-up Intensity: not reported Frequency: 3 times per week	1. Affective response - Feeling Scale: 11-point scale (very good (+5) to very bad (-5)) 2. Social support - The Social Provisions Scale assessed social relations in the exercise groups	- There was a significant relationship between affect and social support - Model suggested participants who exercised more frequently over the 6 months had greater levels of social support and more positive exercise experience - Concluded as a result, affect (as well as social and behavioural) components enhanced self efficacy at the end of the program which led to greater levels of exercise participation at both follow-up points (i.e., months 6 and 18)

Orsano et al., 2018	Quantitative randomized control trial	To compare effects of traditional resistance training (RT) and high velocity resistance training (HVRT) on psychophysiological, metabolic, and cardiovascular responses in older women with hypertension	Mode: RT or HVRT (10 exercises performed with 3 sets of 10 repetitions) Duration: not reported Intensity: 70% of 10 RM Frequency: 2 sessions	1. Affective response - Sensation Scale: 11-point scale (very well (+5) to very bad (-5))	- Comparing the two groups, affective response after exercise was only significantly different for leg extension ($p=0.027$) where RT scored higher than the HVRT group in affective response
Parkington et al., 2022	Quantitative randomized crossover design	To compare effects of low-load resistance exercise with blood flow restriction (LLRE-BFR) on affective, cardiovascular, and perceptual responses during two different resistance exercises in comparison to moderate-low resistance exercise (MLRE) and LLRE in older adults	Mode: Participants all completed 1) LLRE-BFR, 2) LLRE and 3) MLRE (4 sets of leg press and knee extension completed in all 3 conditions) Duration: not reported Intensity: one repetition maximum (1RM) for each exercise Frequency: once	1. Affect after each set of exercise - Feeling Scale (FS): 11-point scale (very good (+5) to very bad (-5)) 2. Levels of enjoyment 15 min after exercise - Physical Activity Enjoyment Scale (PACES) 3. Affect at arrival and 15 min after exercise - Physical Activity Affect Scale (PAAS) 4. Enjoyment 15 min after exercise - Three separate visual analogue scales (VAS)	Affect via FS: - For leg press, there was a significant condition main effect for affect ($p=0.031$) and there was a significant difference in affect via FS where affect was lower during LLRE-BFR when compared to LLRE and MLRE conditions ($p=0.0048$) - For knee extension, both significant condition ($p<0.001$) and time ($p<0.001$) main effects for affect were present. There was also a significant difference in affect between set 1 and set 4 where affect had decreased for all three conditions ($p<0.001$) - When comparing mean affect across sets 1-4 for all three conditions, affect was lower for LLRE-BFR condition compared to LLRE ($p<0.001$) and MLRE ($p<0.001$). Mean affect was also lower for knee extension in comparison to leg press ($p<0.001$)

					Enjoyment via PACES: - Significant condition main effect ($p=0.004$) for PACES. Level of enjoyment measured 15-minutes post-exercise in the LLRE-BFR condition was significantly lower in comparison to the LLRE condition Affect via PAAS: - For all 3 conditions, there was significant increase in positive affect ($p = 0.006$) and tranquility ($p<0.001$) from pre to post assessment Enjoyment via VAS - VAS of enjoyment 15-minutes post-exercise was high in all 3 conditions with no significant condition main effect present
Pereira et al., 2022	Quantitative, randomized counterbalanced, crossover design	To examine acute effects various resistance training loads on perceived session exertion and feelings of pleasure/displeasure (sFPD) in older women	Mode: resistance training (3 sets of chest press, horizontal leg press, seated row, knee extension, preacher curl (using free-weight barbell), seated-leg curl, triceps pushdown, and seated calf raise) Duration: not reported Intensity: all participants completed 1) light 2) moderate and 3) heavy loads Frequency: 3 sessions (sessions 4-6)	1. Feelings of Pleasure/Displeasure (sFPD) - Feeling Scale: 11-point scale (very good (+5) to very bad (-5))	- Significant condition effect ($p<0.001$) for sFPD. Differences between 3 conditions were observed ($p<0.001$) - Moderate load produced greater sFPD scores (i.e., greater feelings of pleasure) in comparison to light ($p<0.05$) and heavy loads ($p<0.05$) - Heavy load demonstrated lower scores of sFPD (i.e., greater feelings of displeasure) in comparison to light load ($p<0.05$)

Ribeiro et al., 2021	Quantitative, nonrandomized design	To examine effects of four exercise orders (EO) on affectivity during a resistance training program for older women	Mode: resistance training (8 exercises: biceps preacher curl (BC), triceps pushdown (TP), seated row (SR), chest press (CP), seated calf raises (SC), leg curl (LC), knee extension (KE), horizontal leg-press) - Group 1 = SJ-MJ-UB (single joint to multi-joint order starting with upper body exercise) - Group 2 = SJ-MJ-LB (single joint to multi-joint order starting with lower body exercise) - Group 3 = MJ-SJ-UB (multi-joint to single joint order starting with upper body exercise) - Group 4 = MJ-SJ-LB (multi-joint to single joint order starting with lower body) Duration: 12 weeks Intensity: not reported Frequency: 3 times per week	1. Affective valence (positive/pleasant and negative/unpleasant) - Feeling Scale (FS): 11-point scale (very good (+5) to very bad (-5)) - Felt Arousal Scale (FAS): 6-point scale (very low arousal (1) to very high arousal (6))	- Compared to pre-exercise values, affect (via FS and FAS) at 12-week time point was unchanged ($p>0.05$) - Affect values were not statistically different between the four groups ($p>0.05$), therefore, positive affect was achieved through resistance training regardless of the exercise order - Based on circumplex model of affectivity, all four exercise order groups experienced positive affect at week 1 and week 12 (located in activated pleasant quadrant)
Richardson et al., 2020	Quantitative, randomized multi-armed and parallel design	To compare affective responses of older adults when doing a high-velocity low-load (HVLL) or low-velocity high-load (LVHL) training either once weekly or twice weekly	Mode: resistance exercise (8 exercises: leg press, seated row, chest press, leg extension, leg curl, calf raise, triceps extension, and bicep curl) - Group 1 = HVLL once weekly (HVLL1) - Group 2 = LVHL once weekly (LVHL1)	1. Affective valence - Physical Activity Affect Scale (PAAS): 5-point scale (do not feel (0) to feel very strongly (4)) - Feeling Scale (FS): 11-point scale (very good (+5) to very bad (-5)) - Visual Analog Scale (VAS)	- All four exercise conditions resulted in similar affective responses across the FS, FAS, and the 4 PAAS subscales ($p=0.773$) - Positive affect on the PAAS was demonstrated to increase when comparing post-exercise sessions to pre-exercise sessions ($p<0.001$). However,

			- Group 3 = HVLL twice weekly (HVLL2) - Group 4 = LVHL twice weekly (LVHL2) Duration: 10 weeks Intensity: 3 sets of 14 repetitions at 40% 1-RM (one repetition maximum) Frequency: either once or twice weekly	- Physical Activity Enjoyment Scale (PACES): 7-point Likert scale 2. Arousal - Felt Arousal Scale (FAS): 6-point scale (very low arousal (1) to very high arousal (6))	- no significant differences observed when comparing all four exercise conditions ($p=0.534$) - Tranquility on PAAS showed no significant changes when comparing pre- and post- exercise sessions ($p=0.534$)
Rodriguez Cayetano et al., 2020	Quantitative, cross-sectional design	To understand the intrinsic satisfaction and reasons why paddle players participate in sport	Mode: paddle tennis (players <25, players 26-46, players >46)	1. Motivation for sport - Motives for Sports Participation Questionnaire (PMQ) (Spanish version): 5-point Likert-type scale (nothing important (1) to very important (5)) with 35 items - 8 factors (social status, health/physical fitness, fun/socialization, cooperation/teamwork, competition, release energy/catharsis, friendship/group, equals and self-improvement) 2. Intrinsic satisfaction (fun and boredom) - Spanish version of Intrinsic Satisfaction in Sports Questionnaire: 5-point Likert scale (strongly disagree (1) to strongly agree (5)) with 8 items, 5 of which measure fun	- Reasons for participation based on age showed significant differences ($p=0.026$) in the fun/socialization factor - When comparing players in the 46+ group to players <25 for fun/socialization as a motivator, a significant difference in scores was found ($p=0.029$) with a higher motivational score for players 46+, however, no significant difference was found in comparison to players 26-45 ($p=0.282$) - Based on age, all three age groups based their intrinsic satisfaction on fun, however, there were no significant differences between the three groups ($p=0.789$)
Shigematsu et al., 2008	Quantitative parallel group-randomized trial	To compare effects of square-stepping exercise (SSE) with effects of strength and balance (SB) training	Mode: SSE or SB Duration: 12 weeks Intensity: self-selected pace	1. Pleasure - Self-reported line scale (left edge = not pleasant (0), right edge = very pleasant (100))	- No significant group by time effect for pleasure (between baseline and post-exercise) ($p<0.50$), however, SSE group demonstrated a significant

			Frequency: 70-minute session twice per week		within-group improvement for pleasure in exercise (between baseline and post-regimen scores, 75.5 ± 6.6 and 93.5 ± 5.6 , respectively)
Szabo et al., 2021	Quantitative, cross-sectional design	Study 2 examined effects of laughter yoga in older women	Mode: laughter yoga class Duration: not reported Intensity: low-moderate intensity Frequency: single session	1. Affect - The Positive and Negative Affect Schedule (PANAS): 5-point Likert scale (very slightly (1) to very much (5)) with 10-items (5 positive adjectives and 5 negative adjectives) 2. Momentary well-being - Feeling Scale (FS): 11-point scale (very good (+5) to very bad (-5)) 3. Perceived arousal - Felt Arousal Scale (FAS): 6-point scale (very low arousal (1) to very high arousal (6)) 4. Expectation about Effects of Laughter - Prior to yoga, assessed with single item 6-point Likert scale (very negative (1) to very positive (6)). A similar scale, ranging from 1 (not at all)) - After yoga, assessed with similar 6-point Likert scale (not at all (1) to totally (6))	- All three psychological measures showed statistically different changes between pre- and post- laughter yoga intervention where positive affect via PANAS increased ($p < 0.001$), momentary well-being via FS increased ($p < 0.001$), and perceived arousal also increased ($p < 0.001$) - There was also a statistically significant positive correlation between perceived effect of laughter yoga and change in the reported positive affect via PANAS ($\rho = 0.53$, $p = 0.013$)
Van Roie et al., 2015	Quantitative randomized design	To compare effect of low- and high-resistance exercise on long-term exercise adherence and motivation	Mode: resistance training (leg press, leg extension, and seated row) Duration: 12 weeks	1. Positive feelings related to exercise - Positive Feelings Related to Exercise Scale: 5 questions	- No significant differences were found in mean scores of positive feelings related to exercise between groups at

			Intensity: High (2 sets of 10-15 repetitions at 80% of 1RM), Low (1 set of 80-100 repetitions at 20% of 1RM), and Low+ (60 repetitions at initial resistance of 20% of 1RM followed by 10-20 repetitions at initial resistance of 40% of 1RM) Frequency: 3 times per week	were answered on 11-point scale (not at all... (0) to very... (10))	any of the 12 time points and there were no significant time effects found within groups (all $p>0.05$)
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In the same vein, Cabrita et al. (2017) denoted that "Pleasure is an important concept within health promotion research as, according to the Self-Determination Theory, previous experience of pleasure while performing an activity is an intrinsic motivator to repeat that activity." (p. 4) Therefore, pleasure in relation to PA can also be understood through established theories of motivation. These studies have also operationalized pleasure as a motivator for PA through the applied tools in their studies. For example, four studies ($n = 4/35$, 11.4%) (Cassol & Pereira, 2020; Lamothe & Caljouw, 2011; Rodriguez Cayetano et al., 2020; Silva et al., 2022) also implemented various tools that assessed motivational factors for the uptake and practice of PA, and within these tools, the component of pleasure was assessed as a motivational component for PA. This included tools such as the Inventário de Motivação a Prática de Atividades Físicas ou Esportivas (IMPRAFE-132) or the Motivation Inventory Practice of Physical or Sports Activities (in English). The IMPRAFE-132 was a self-administered questionnaire that assessed the six potential dimensions associated with motivation for regular PA (i.e., stress management, health, sociability, competitiveness, aesthetics, and pleasure) (Cassol & Pereira, 2020).

Similarly, the Spanish version of the Participation Motivation Questionnaire (PMQ) was used to assess reasons for sport participation among older adult padel players ($n = 1/35$, 2.9%) (Rodriguez Cayetano et al., 2020). This questionnaire consisted of 35 items that represented reasons for partaking in sports (Rodriguez Cayetano et al., 2020). Therefore, based on the adopted tools of these studies and their implied representation of pleasure, pleasure can also be understood as a motivational force for PA participation.

In one study examining the effects of an exergame with a balance board over the course of 6 weeks on the balance of older adults had also measured the motivation for exergame participation through the Self Regulation Questionnaire for Exercising (QRS-E) in which a

higher score (out of 72) indicated that the individual was more driven by intrinsic motivation and identified regulation (Lamoth & Caljouw, 2011). The findings of this study had demonstrated an average QRS-E score of 55.6. While there were no significant changes in motivation at the 3- or 6-week mark, based on this average score, the authors had reported that participants had been highly motivated to engage in the activities as they found the exergame to be both enjoyable and challenging (Lamoth & Caljouw, 2011).

On another note, when comparing the differences in motivation for amateur street running participation among three different age groups (i.e., ages 18-35, 36-45, and 45+) one study (Cassol & Pereira, 2020) demonstrated that when comparing the motivational factor of pleasure for this form of running, there was no statistical difference found between the three age groups ($p=0.207$). Therefore, as per the IMPRAFE-132, pleasure was an important aspect for PA motivation no matter the age group of the participants. However, in comparison, Rodriguez Cayetano et al. (2020) who had examined the reasons for sport participation among paddle players from three different age groups (i.e., players under 25, players between 26-46, and players 46+) had found that in respect to the age of the participants, there was a significant difference ($p<0.026$) in the fun/socialization factor. In comparison to Cassol and Pereira (2020), Rodriguez Cayetano et al. (2020) had found that fun/socialization was more important to certain age groups. More specifically, the findings showed there was a significant difference ($p=0.029$) in the fun/socialization factor with a higher motivational score for players 46+ in comparison to players in the under 25 group (Rodriguez Cayetano et al., 2020). However, when comparing the scores between those 46+ to participants in the 26-45 age group, no significant difference was found ($p=0.282$) (Rodriguez Cayetano et al., 2020). Lastly, all three age groups were reported to

base their intrinsic satisfaction in paddle tennis on fun, however, there were no significant differences in this score across the three groups ($p=0.789$).

Lastly, one study by Silva et al. (2022) used the Motivation Inventory for Regular Physical Activity Practice (IMPRAF-54), in addition to qualitative open-questions, to assess the motivation for participation and adherence to a guided PA workshop. As per the findings, pleasure was observed to have the third highest score amongst the motivational factors for joining and staying in the PA workshop, following after factors such as health and sociability (Silva et al., 2022) (Table 8). However, when comparing the two groups (i.e., participants who had taken part in the workshop for over a year and participants who had taken part in the workshop for less than a year), the authors denoted no significant differences in the length of stay of participants being motivated by the factor of pleasure ($p=0.161$).

Table 8. Findings of Mixed Method Designs

Author	Study Design	Study Objectives	Intervention/PA Type	Identified Typologies	Outcome	Quantitative Findings	Qualitative Findings
Paxton et al., 1997	Mixed method: Quantitative cross-sectional design and qualitative open-ended interviews	To determine predictors of exercise in older women	Mode: Organized exercise program by community/health centre or no exercise (not an intervention)		1. Degree of exercise enjoyment - Degree of Exercise Enjoyment Scale: 5-point scale (not at all (1) to extremely (5))	- Between group differences present where exercise group scored significantly higher on exercise enjoyment when compared to non-exercise group ($p < 0.001$) - When examining predictor variables for exercise group membership for the non-exercise group, exercise enjoyment was not statistically significant ($p = 0.87$)	- Findings showed responses of women who exercise in comparison to the non-exercise group differed in their beliefs - For open ended questions, enjoyment was the third most cited reason for why the women exercised (18%) in comparison to physical health benefits (36%) and social contact (33%) - Reasons for not exercising among the non-exercise group included belief they attained enough exercise during daily activities (most common), having no interest in exercise, feeling lazy, too busy, transport difficulties, a lack

							of confidence, and belief that it was not important for their health
Silva et al., 2022	Mixed method: Quantitative cross sectional design with qualitative interviews (descriptive approach)	To examine the intrinsic and extrinsic factors that influence older women to start and also adhere to a community PA program	Mode: >1 year or <1 year of participation in guided and structured PA program (exercises on strength, flexibility, and aerobics) Duration: 60 minute session Intensity: not reported Frequency: twice per week		1. Motivation for adherence and permanence in PA program - Motivation Inventory for Regular Physical Activity Practice (IMPRAF-54): 5-point Likert scale (this motivates me very little (1) to this motivates me very much (5)) - Open ended questions	- Pleasure was the third highest score of motivation for participation in PA program after health and sociability for both women who were in the program for >1 year and <1 year	- Pleasure as a motivation to join the PA program was the second most cited response (n=4) after health (n=10) - Motivations for permanence in PA program were health (n=3), sociability (n=5), and pleasure (n=7) - Sociability was also reported to have intrinsic motivation
Vargemidis et al., 2023	Mixed method. Online survey (n=27) and interviews (n=17)	To understand the PA data visualization preferences of older adults and how do they perceive those visualizations when pleasure and performance are emphasized	Walking and hiking, outdoor cycling, indoor cycling, swimming, yoga, dance, jogging or running, gardening, aquagym, housework, going shopping, cooking	- Pleasures of Experiencing the Body Perform (extended) - Documented Pleasures, Pleasures of Habitual Action, Pleasures of Immersion, Sensual Pleasures (directly reinforced)	1. Pleasure - Statements from the survey were rated on a 5-point Likert Scale (strongly disagree (1) to strongly agree (5))	- According to the surveys, participants had varying personal preferences about data visualizations - When asked about how pleasing survey participants found the visualizations to look at, participants rated the UbiFit the	- Visualizations offered through PA tracking devices evoked feelings of enjoyment through the ability to looking back on recorded data from a PA session or in comparing the data over time - Pleasure was also derived from the performance of the physical body itself

						highest (mean = 4.0, SD = 1.1), followed by the Fitbit (mean = 3.9, SD = 0.9), Circles (mean = 3.7, SD = 1.0), Coupon (mean = 3.3, SD = 1.0), Map (mean = 3.3, SD = 1.1), and Rings (mean = 2.5, SD = 1.3) - When asked how excited they would be to use a device based on the type of data visualization, participants rated the Fitbit the highest (mean = 3.6, SD = 1.2), followed by the UbiFit (mean = 2.8, SD = 1.3), Circles (mean = 2.8, SD = 1.4), Map (mean = 2.7, SD = 1.4), Coupon (mean = 2.7, SD = 1.4), and Rings (mean = 2.1, SD = 1.2) - When asked to rate whether	and the movement of the body - In terms of comparing the six data visualizations, perspectives of participants on the devices varied across individuals in terms of the aesthetics and functionality of the devices - For visual appeal of the devices, participants participants rated the UbiFit Garden with a higher rating and rated the ring-based object the lowest - Participants who liked gardening enjoyed the UbiFit Garden as it had a flower theme in its data visualization - It would motivate them to engage in more PA as it was pleasant to look at, being motivated to get more flowers if some were missing on the visualizer
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						visualizations should focus on performance or focus on supporting PA as a pleasurable experience (ex: making visual art from the activity status or tracking memorable moments), it was found that participants more so strongly agreed that visualizations should focus on performance (mean = 4.0, SD = 1.0) and agreed that visualizations should primarily focus on supporting PA as a pleasurable experience (mean = 3.7, SD = 1.1) - When asked to rate each visualization based on its ability to increase enjoyment in PA, it was found that the FitBit was rated the highest	- However, other participants reported to find this visualizer to be simplistic or feared being infantilized with it, viewing it to be a childish display for older adults - In the same realm of aesthetics, some participants found the rings to be too big or unappealing - Some participants also denoted that they did not want to be supervised or give up a sense of agency through their PA data (i.e., as some data visualizations display how “good” or “bad” their PA performance is through the visualizations)
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						(mean = 3.5, SD = 1.2), followed by Coupon, Circles, UbiFit, Map, and Rings - Lastly, when asked about whether each visualization highlighted that PA was enjoyable or pleasant, it was found that participants rated the UbiFit the highest (mean = 3.5, SD = 1.1), followed by Circles, Coupon, FitBit, Map, and Rings	
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Results of Measured Pleasure in PA

An observed finding across eligible studies with quantitative measures in place to assess pleasure was the presence of pleasure during PA interventions (Table 8) ($n = 23/35$, 65.7%) (Alves et al., 2015; Benites et al., 2016; Beraud-Peigne et al., 2023; Cabrita et al., 2017; Chao et al., 2014; Colon Semenza et al., 2021; Elsangedy et al., 2021; Focht et al., 2007; Follador et al., 2019; Hancock et al., 2021; Hyodo et al., 2019; Hyodo et al., 2021; Lamothe & Caljouw, 2011; McAuley et al., 2003a; McAuley et al., 2003b; Orsano et al., 2018; Parkington et al., 2022; Pereira et al., 2022; Ribeiro et al., 2021; Richardson et al., 2020; Shigematsu et al., 2008; Szabo et al., 2021; Van Roie et al., 2015). One study (Chao et al., 2014) examined how Tai Chi Chuan, a form of low-moderate PA, influenced the rate of perceived exertion (RPE) and affective responses of 16 older women over the course of 7 weeks. The authors had hypothesized that this form of PA would produce feelings of pleasure among the older women. During the Tai Chi classes, the Feeling Scale was presented every 15 mins (i.e., at the 15-, 30-, and 45-minute mark of the Tai Chi class) to measure feelings of pleasure. Significant differences between the affective responses at the 15-minute mark and the 30-minute mark was reported ($p < 0.05$) and similarly between the 15 minute and 45-minute mark (both $p < 0.05$) where pleasure had increased at both times in comparison to the initial 15-minute mark (Chao et al., 2014). No significant differences in the affective responses were reported between the 30-minute and the 45-minute mark ($p > 0.05$). Overall, affective responses varied from "good" to "very good" across all the analyzed sessions of the participants. This had confirmed the authors' hypothesis that feelings of pleasure would be produced during Tai Chi Chaun classes (Chao et al., 2014).

Another study by Szabo et al. (2021) found that participation in a single session of laughter yoga class increased positive affect ($p < 0.001$), momentary well-being ($p < 0.001$), as well

as perceived arousal ($p < 0.001$). The study has also reported that for the older women, there was an observed positive correlation between the assessed perceived effect of laughter yoga and change in the reported positive affect ($p = 0.53$, $p = 0.013$).

However, the presence of pleasure in PA is not only limited to low-intensity PA such as Tai Chi and yoga. Assessed pleasure was reported in other activities such as cycling ($n = 1/35$, 2.9%) (Focht et al., 2007) and across a variety of resistance training studies for older adults (9/35, 26%) (Alves et al., 2015; Benites et al., 2016; Elsangedy et al., 2021; Orsano et al., 2018; Parkington et al., 2022; Pereira et al., 2022; Ribeiro et al., 2021; Richardson et al., 2020; Van Roie et al., 2015). One study that examined the acute effects of various resistance training loads on feelings of pleasure/displeasure (sFPD) in older women found that when all the women completed light, moderate, and heavy loads of resistance training for 8 exercises, significant differences between the three conditions were observed ($p < 0.001$). More specifically, this study found that sFPD scores were greater when doing moderate load resistance training in comparison to light load ($p < 0.05$) and heavy load resistance training ($p < 0.05$) (Pereira et al., 2022). However, when comparing sFPD between heavy load and light load resistance training, heavy load demonstrated lower scores of sFPD (i.e., greater feelings of displeasure) in comparison to when the light load was completed ($p < 0.05$) (Pereira et al., 2022). Similarly, in a study by Parkington et al. (2022) that compared effects of low-load resistance exercise with blood flow restriction on affective responses to moderate-low resistance exercise and low-load resistance exercise (without any adjustments to blood flow restriction), it was found that there was a significant increase in positive affect ($p = 0.006$) and tranquility ($p < 0.001$) from pre to post-exercise across all three load-resistance conditions.

However, while assessed pleasure was present in resistance training, not all individual resistance training exercises and exercise velocities induced the same level of pleasure ($n = 3/35$, 8.6%) (Benites et al., 2016; Elsangedy et al., 2021; Orsano et al., 2018). One study (Elsangedy et al., 2021) denoted that mean values of affective responses increased over time during a resistance training intervention. Through the course of 12 weeks, mean affect across various forms of resistance training activities had increased. The findings showed that the measured perception of pleasure was higher in all exercises in the last four weeks of the study (weeks 9-12), except for two of strength training activities, which consisted of leg press and triceps pushdown. More specifically, of the resistance exercises that showed significant changes in the mean values of affect during the final four weeks of the program (weeks 9-12) in comparison to the previous eight weeks, this included bench press, knee extension, lateral shoulder raise, biceps curl, and triceps pushdown (where $p < 0.05$) in comparison to weeks 1-4 as well as significant changes in the mean values of affect for bench press, lateral shoulder raise, biceps curl, and triceps pushdown in comparison to weeks 5-8 ($p < 0.05$).

Similarly, a second study (Benites et al., 2016) reported a similar finding in which measured pleasure in a strength training intervention had increased over time. The objective of this study was to examine the effects of a strength training program over the course of 8 weeks on sedentary, older women's rate of perceived exertion and feelings of pleasure and displeasure. Participants had reported feelings of pleasure across all four exercises (i.e., bench press, leg extension, pulldown, and leg curl), however, the study reported a statistically significant increase in feelings of pleasure for only three of the four exercises when compared to their initial measured pleasure at week 1. This included leg extension ($p < 0.05$) at week 5, pulldown ($p < 0.05$)

at week 8, and leg curl ($p < 0.05$) at week 5 and 8. The bench press exercise did not produce a statistically significant increase in pleasure across weeks 1, 5, or 8 (Benites et al., 2016).

Pleasure and Exercise Order

Only one study ($n = 1/35$, 2.9%) examined the effects of exercise order (EO) on affective responses in a form of PA. Ribeiro et al. (2021) aimed to investigate whether there would be any effects of EO with four groups performing the same resistance training exercises in different orders. The eight resistance training exercises consisted of biceps preacher curl, triceps pushdown, seated row, chest press, seated calf raise, leg curl, knee extension, and horizontal leg press. It was found that affective responses were not statistically different across the four EOs ($p > 0.05$) and that positive affect was achieved through participation in resistance training regardless of the EO (Ribeiro et al., 2021).

Differences in Pleasure Across Intervention Groups

Findings across various studies also examined potential differences in pleasure between intervention groups (Beraud-Peigne et al., 2023; Parkington et al., 2022; Shigematsu et al., 2008) (Table 7). For example, pleasure was assessed between varying intervention groups to understand how exergames might impact perceived pleasure in comparison to walking and muscle strengthening. One study observed the changes in affect by comparing the effects of two different interventions, immersive and interactive wall exergames (I2WE) and walking and muscle strengthening (WMS) on cognitive functions, dual task effects, as well as physical parameters and perceived pleasure of participants (Beraud-Peigne et al., 2023). The French version of the Physical Activity Enjoyment Scale (which provided a score between 7 and 70.2) was employed to assess the perceived pleasure of participants across both groups. Through the implementation of a t-test, the findings showed that pleasure in the I2WE group was significantly

higher ($p=0.03$) in which they scored 63.74 ± 6.04 on the PACES tool. This was in comparison to the WMS group who was reported to present a score of 59.57 ± 4.82 (Beraud-Peigne et al., 2023). It was concluded that I2WE was an enjoyable alternative to other conventional forms of PA, such as walking or muscle strengthening (Beraud-Peigne et al., 2023).

Another study that examined new forms of PA for older adults was conducted by Shigematsu et al. (2008) which compared the effects of square-stepping exercise (SSE) to the effects of strength and balance (SB) training among older adults. It was found that both forms of PA were pleasurable with no significant pre- to post-regiment improvements reported in self-assessed pleasure, however, the SSE group did demonstrate within-group improvements for pleasure when comparing post-regimen scores to baseline at 93.5 ± 5.6 and 75.5 ± 6.6 , respectively (Shigematsu et al., 2008).

PA Intensity and Pleasure Over Time

When examining the effects of low-intensity PA on pleasure over time, affect demonstrated increases when comparing post-exercise to baseline measures (Chao et al., 2014; Follador et al., 2019; Hyodo et al., 2019; Hyodo et al., 2020; Pereira et al., 2022; Shigematsu et al., 2008). Other studies, such as Hyodo et al. (2019), examined the effects of light-low intensity exercise on pleasure, demonstrating between group effects, as well as within time effects. More specifically, Hyodo et al. (2019) demonstrated the effects of acute slow aerobic dance exercise (ADE) on mood in comparison to cycling exercise (CE). When comparing pleasure between the two groups, it was reported to be significantly higher in the ADE group ($p=0.027$). Within-group effects had also shown that participants in the ADE group reported increased levels of pleasure post-exercise in comparison to pre-exercise, while the CE group reported no significant interaction between time and pleasure (Hyodo et al., 2019). In another study by Hyodo et al.

(2021) which examined the effects of intermittent light-intensity aerobic dance (I-LADE) in comparison to continuous LADE (C-LADE) on mood, it was reported that mood during exercise was significantly higher in the I-LADE group ($p=0.049$). However, it was reported that the exercise condition did not have a significant main effect ($p=0.66$) and instead, it was the time ($p<0.01$) which had a significant interaction effect.

Similarly, other low intensity forms of PA, such as Tai Chi, yoga, and stretching classes were also compared to one another and significant within-time increases in affect were also observed for two groups post-exercise (Follador et al., 2019). When comparing affective responses of participants across all three classes, it was found that measured affect was similar across the three groups ($p=0.41$), however, when compared across time within the respective groups, it was found that affective responses were significantly different over time for yoga ($p<0.001$) and stretching ($p=0.02$) (Follador et al., 2019). Over the course of 60 minutes, yoga was most pleasant at the 60-minute mark, the 30-minute mark, and the 15-minute mark when compared to affect levels at baseline (all $p<0.001$) while for the stretching group, affective responses were most pleasant at the 60-minute mark in comparison to baseline ($p=0.004$) (Follador et al., 2019).

Contexts Related to Pleasure in PA

Only two studies had assessed pleasure using correlational statistics (Hancock et al., 2021; Szabo et al., 2021). In a study examining how the contexts of activities (i.e., the type, its social factor, the environment) related to momentary feelings of happiness, it was found that both engagement in light sport/exercise that was social and outdoors ($b = 1.768$, 95% CI = [0.822, 2.713] and DIY/gardening that was social and outdoors ($b = 1.748$, 95% CI = [0.995, 2.501]) were statistically positively associated with happiness ($p<0.05$) (Hancock et al., 2021). When

examining laughter yoga among older women, Szabo et al. (2021) had found a statistically significant positive correlation between the women's perceived effect of laughter yoga and change in their reported level of positive affect ($\rho=0.53$, $p=0.013$).

Predictors for Pleasure and Adherence to PA

Very few studies examined pleasure in relation to long-term PA adherence ($n= 3/35$, 8.6%) (McAuley et al., 2003a; McAuley et al., 2003b; Silva et al., 2022). According to a study by Silva et al. (2022) which aimed to examine the intrinsic and extrinsic factors that both influenced older women to start and adhere to a form of community PA, pleasure was one of the motivations for permanence in attending a PA program ($n= 7$), followed by sociability ($n= 5$) and health ($n= 3$). McAuley et al. (2003a) reported that exercise frequency was significantly influenced by exercise affect and found that both increased positive affect and social support lead to higher self efficacy at the end of the two compared programs (i.e., a walking or stretching/toning program). Similar findings around the role of pleasure for long-term PA adherence in walking or stretching/toning was found in McAuley et al. (2003b) as it was reported that affect (in addition to social and behavioural factors) enhanced self efficacy for exercise, resulting in greater levels of exercise participation when following up with participants at the 6-month mark and the 18-month mark (McAuley et al., 2003b).

In terms of factors that were reported to be predictor for pleasure, it was found that having social companionship was a predictor for pleasure where in which one study reported that doing an activity with another individual provided 6% more pleasure compared to when doing an activity alone ($p<0.001$) (Cabrita et al., 2017). In the same study by Cabrita et al. (2017), it was also found that outdoor activities were also reported to increase pleasure ($p<0.001$) when compared to doing activities at home. Lastly, when considering pleasure as a predictor for PA,

one study found that the anticipation of pleasure among individuals with Parkinson's Disease was one significant predictor for the decision of individuals in this group to continue in a cycling trial ($p < 0.001$) alongside age ($p < 0.01$), reward, effort, and trial ($p < 0.001$) (Colon Semenza et al., 2021). In comparison, the anticipation of pleasure did not explain the choices of individuals in the healthy control group ($p = 0.569$).

PA Data Visualization and Pleasure

Only one study conducted by Vargemidis et al. (2023) examined how different types of wearable activity trackers that displayed PA data on a screen (with the exception of one data visualizer which was displayed through a physical object that does not require any smart device screens to present the data) were perceived and valued by older adults. The authors found that when participants were asked to rate six different PA data visualizations (i.e., data visualizations presented by the Fitbit, Coupon, Circles, UbiFit, Map, and Rings), it was denoted that preferences for data visualizations varied across participants and were individualized (Vargemidis et al., 2023) (Table 8). The Fitbit provided numerical values to indicate the number of steps or distance walked. The Coupon visualization focused on attaining a pre-set goal set by the individual where the individual's progress was tracked and rewarded for attaining the pre-set goal. The Circles visualization provided several circles to portray how physically active the individual was. The UbiFit visualization consisted of a garden and displayed more flowers whenever the individual was more active. The Maps visualization made use of symbols on a map where in which it displayed check marks to highlight where the individual had visited during their PA and displayed question marks to highlight areas that have yet to be visited. Lastly, the Rings visualization was a physical object with eight rings. One ring represented a pre-set goal,

and the others represented the step count of the individual in a day of PA (Vargemidis et al., 2023).

Overall, based on the findings, visualizations by the Fitbit and UbiFit were typically rated the highest in regard to pleasure, while the Rings visualization was typically rated the lowest. Regarding how pleasing the visualizations were for participants to look at, the UbiFit was rated the highest by participants in comparison to other five visualizations, with Rings rated the lowest (Vargemidis et al., 2023). Regarding how excited participants would be to use a visualizer based on how it displayed the PA data, the Fitbit was rated the highest in comparison to the other five visualizations, with the Rings visualization rated the lowest (Vargemidis et al., 2023). Moreover, participants were also asked to rate if visualizations should focus on performance and if they should focus on supporting PA as a pleasurable experience. It was found that participants strongly agreed that visualizations should focus on displaying PA performance (mean = 4.0, SD = 1.0) and agreed that visualizations should focus on supporting and displaying PA as a pleasurable experience (mean = 3.7, SD = 1.1) (Vargemidis et al., 2023). Lastly, regarding findings on how participants rated each visualization based on its ability to increase enjoyment in PA, Vargemidis et al. (2023) found that the Fitbit was rated the highest (mean = 3.5, SD = 1.2) while the Rings visualization was rated the lowest. And when participants were asked about whether each visualization highlighted that PA was enjoyable or pleasant, it was found that participants rated the UbiFit the highest (mean = 3.5, SD = 1.1) with the Rings visualization being rated the lowest (Vargemidis et al., 2023).

Reinforced Typologies of Pleasure

Across literature that has examined pleasure in the PA experiences of older adults, typologies of pleasure have been identified as ways in which those pleasurable experiences are

felt and evoked during PA (Table 9 and Appendix A). A study by Phoenix and Orr (2014) identified four typologies of pleasure through life history interviews which explained how pleasure was elicited among their 51 participants. The first typology of pleasure was identified as documented pleasure. According to Phoenix and Orr (2014), this referred to a form of pleasure that was present after the PA took place and arose from the process of documenting the activity. This included written entries of walking routes, diary entries of sailing or trekking experiences, and the creation of items for community magazines (Phoenix & Orr, 2014).

Table 9. Qualitative Design Findings

Author	Study Design	Study Objectives	PA Type	Identified Typologies	Findings
Allain, 2020	Qualitative, semi structured interviews	To investigate how older adult hockey players view pleasure and risk in hockey, as well as how the materials and spaces associated with the sport influence their experiences of PA in later life	Recreational hockey	- Pleasures of Emplacement (extended) - Pleasures of Nostalgia and Connections to Youth (extended) - Pleasures of Immersion, Sensual Pleasures (directly reinforced)	- Pleasure in hockey was evoked through the materials (such as the sweat drenched jerseys, the skates, and puck) and spaces associated (such as the ice rink and the dressing rooms) with the sport that shaped the pleasurable PA experiences of the participants - Pleasure in hockey was also derived from connections to vitality, nostalgic memories from youth hockey experiences, and feeling younger when engaging in sport
Batt-Rawden and Tellnes, 2011	Qualitative longitudinal study with an exploratory approach	To examine the role of music in the lives of individuals with long-term illnesses	Walking and dance	- Sensual Pleasures (implied)	- Some participants living with long-term illnesses used music to accompany their PA experiences - When PA is supported with music, it provided opportunities for those participants to participate in PA and recover
Chipperfield and Bissell, 2023	Qualitative, semi-structured interviews	To examine the experiences of community-dwelling older adults doing ballroom dancing	Ballroom dancing	- Pleasures of Community and Pleasures of Practice (extended) - Pleasures of Immersion, Sensual Pleasures, Pleasures of Habitual Action (directly reinforced)	- Pleasure was derived from sensual experiences of pleasure that were present in ballroom dancing (joy from music, from touch in partnered dances, visual aesthetics of dance, from proprioceptive factors such as posture and body awareness), pleasures of habitual action (new sense of structure evoked through the uptake of dance), and pleasures of immersion (transformative experience allowing individuals to forget any pain or troubles in the moment of the activity) - Pleasure was also evoked through the community aspect (joy from forming new connections and socializing through a PA experience) and from practicing dance

					itself (joy from gaining new skills and a sense of physical competence through PA)
Humberstone and Stuart, 2016	Qualitative focus groups, semi structured ethnographic interviews, and participant observation	To uncover the experiences of older women in yoga and Exercise-to-Music (ETM) classes and the factors that are important to them in those classes	Yoga and Exercise-to-Music classes	- Pleasures of Spatial and Social Contexts (extended) - Documented Pleasures, Pleasures of Habitual Action, Sensual Pleasures (directly reinforced)	- Pleasure was derived from the spatial and social contexts of yoga and ETM classes. Factors such as the instructor's ability to adjust movements to meet the varying needs of participants and physical spaces of where the movement takes place - Also evoked through pleasures of habitual action (i.e., through developed physical literacy when engaging in yoga or through the act of rehearsing a dance routine)
Jallinoja et al., 2010	Qualitative focus groups	To examine the descriptions of pleasure that came from food and physical activity in a group-based counseling intervention	Swimming, walking, water jogging, pole walking, and stationary bike riding	- Sensual Pleasures (implied) - Pleasures of Physical Activity Accomplishments (extended)	- Pleasure in PA was derived from sensual pleasures (evoked by the environmental surroundings of an activity for example when outdoors) and from the ability to accomplish PA-related commitments (such as walking a certain distance in a period of time)
Krekula, 2022	Ethnographic and explorative methodological approach with qualitative interviews and participatory observations	To understand the pleasurable components of dance in the experiences of older adults	Dance	- Pleasures of Unbroken Temporality in Physical Activity (extended) - Sensual Pleasures (implied)	- Pleasure was elicited through connections to the senses such as hearing (where in which the type of music was important to illicit feelings of joy and allowed participants to become one with the rhythm, further producing joy) - Also evoked through PA's ability to make individuals feel younger than their chronological age and reinforce an unbroken temporality to a past version of the self
Phoenix and Orr, 2014	Qualitative life history interviews	To uncover knowledge on pleasure in the physical activity experiences of older adults and understand pleasure in relation to health	Golf, swimming, running, dance, fitness class or gym, cycling,	Documented Pleasure, Pleasure of Habitual Action, Pleasure of Immersion, Sensual Pleasures	- Pleasure was described to be experienced through a range of ways, including through the documentation of a PA (such as written diary entries), through becoming immersed in the

			rowing, bowls, Tai Chi or yoga, sea swimming or surfing, and tennis or badminton		experience of an activity and momentarily escaping from other life demands, through connections to one's senses via various sounds, touch, and smells associated with a PA, and from the habit of performing a routine PA behaviour
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The second typology of pleasure that was observed was referred to as pleasure of habitual action. According to Phoenix and Orr (2014), this typology represented pleasure that arose from adhering to routine behaviour in which pleasure was evoked through the habit of performing the activity. The third typology of pleasure that was present in the experiences of older adults was identified as pleasure of immersion. This referred to a felt pleasure that occurred during an activity, one that the authors described to provide an escape from the demands of everyday life (Phoenix & Orr, 2014). Finally, the fourth typology of pleasure was categorized as sensual pleasures. This referred to how the senses of participants were connected to pleasurable feelings during PA and was described to be typically tied to the specific time and space where the activity had taken place (Phoenix & Orr, 2014). According to the findings, sensual pleasure was observed through various sounds, touch, and smells that were present during a range of PA experiences.

Some studies following Phoenix and Orr (2014) ($n = 4/35$, 11.4%) (Allain, 2020; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Vargemidis et al., 2023) were found to directly reinforce the identified typologies of pleasure through findings present in their own research. For example, one study by Vargemidis et al. (2023) denoted how their participants described experiences of documented pleasure when examining how visualizations of PA trackers could appeal to older adults engaging in PA. More specifically, participants were reported to have found enjoyment in looking back on recorded PA data and in comparing their data over the course of months (Vargemidis et al., 2023). Based on the findings, the authors denoted that participants used wearable PA trackers to keep note of their PA goals and gained a sense of enjoyment from being able to track their PA data at their leisure (Vargemidis et al., 2023). According to the authors, this demonstrated the ways in which data visualizations for PA

can be rewarding for individuals. Therefore, as per Phoenix and Orr (2014), enjoyment in PA is not only limited to the movement of an activity, but the ways in which participants can track, document, and revisit the progress of their chosen activity.

Pleasure of habitual action in the PA of older adults was also observed across two studies ($n=2/35$, 5.7%) (Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016). In a study examining the experiences of older adults doing ballroom dancing, Chipperfield and Bissell (2023) found that the pleasure of habitual action was evoked through dance classes as it allowed for a novel sense of structure in their lives. Chipperfield and Bissell (2023) described that some participants organized their lives and schedules around dancing. This included attending social events for dance, going on “dance holidays” and attempting to avoid any conflicts between their scheduled dance classes and other life responsibilities (such as caring for grandchildren) or social engagements (p. 282). Similarly, in another study looking at the experiences of older women taking part in either a weekly yoga class or weekly exercise to music (ETM) class (Humberstone & Stuart, 2016), the authors found that pleasure of habitual was evoked through the ongoing rehearsal of ETM routines, as well as through the development of physical literacy that was honed through the attendance of weekly yoga classes. For some of the women in the ETM classes, their scheduled Monday morning dance classes were also said to be the way they started off their week, reinforcing the pleasure of habitual action (Humberstone & Stuart, 2016).

Moreover, in the same study conducted by Humberstone and Stuart (2016), pleasure of immersion was also apparent across both groups. For participants attending the ETM classes, this typology was experienced through engagement in dance performances. Participants had discussed becoming immersed in the dance movements and the pride they felt in being able to perform the dance routines without any faults (Humberstone & Stuart, 2016). Additionally, the

authors observed that the concentration required for engagement in this form of PA allowed participants to both forgo their worries and boost their mood, reinforcing the pleasure of being immersed in PA (Humberstone & Stuart, 2016). For participants attending the yoga classes, pleasurable immersion in PA was evoked through gaining a moment to relax while concentration is shifted to the poses at hand. Therefore, as per Humberstone and Stuart (2016), pleasure of immersion brought forth a transformative effect. This positive effect was evident through the ability to reduce stress and increase a sense of wellbeing among the yoga attendees (Humberstone & Stuart, 2016). Similarly, findings by Chipperfield and Bissell (2023) had also reinforced the pleasure of immersion. Overall, participants had expressed a sense of enjoyment that was associated with their ability to “forget everything” while dancing (Chipperfield & Bissell, 2023, p. 282). This transformative experience applied to both physical pain and anxiety. For example, Chipperfield and Bissell (2023) denoted how one participant expressed that ballroom dancing allowed them to manage anxiety that was related to family trouble. Likewise, for another participant, being immersed in ballroom dancing brought forth a transformative experience by allowing her to forget about her back pain when engaged in dance.

Furthermore, evidence of sensual pleasure was echoed in Chipperfield and Bissell’s (2023) study as pleasure in ballroom dancing also came from the visual esthetics associated with dance or the stimulation of being watched during a performance (Chipperfield & Bissell, 2023). In terms of the other senses, the sense of touch through dance was described to evoke a sense of instant gratification when alongside a dance partner. For example, having the ability to follow a partner's lead through touch allowed for a sense of pleasure as partners highlighted that this was a shared experience, one where individuals were aware of one another (Chipperfield & Bissell, 2023). Therefore, as per Phoenix and Orr (2014), pleasure in later life PA is also achieved

through the connection to one's senses. Lastly, Chipperfield and Bissell (2023) had suggested that the typology of sensual pleasure could be extended to include proprioception system as participants had described how over the course of their classes, they noticed improvements in factors such as their balance, posture, and body awareness (Chipperfield & Bissell, 2023). Thus, the authors denoted that a sense of pleasure was also evoked from the sensory proprioceptive system of individuals.

Implied Connections to the Typologies of Pleasure

While some studies in this review do not explicitly draw on Phoenix and Orr's (2014) typologies to examine how pleasure is experienced during later-life PA, their results indirectly reinforced the various ways pleasure was elicited during PA as per Phoenix and Orr's (2014) four typologies of pleasure. Experiences related to sensual pleasure were most commonly identified indirectly across several studies that had not drawn on Phoenix and Orr (2014) ($n=3/35$, 8.6%) (Batt-Rawden & Tellnes, 2011; Jallinoja et al., 2010; Krekula, 2022). Batt-Rawden and Tellnes (2011), who aimed to examine the role that music played in the lives of participants with long-term illnesses, found that music in conjunction with PA provided opportunities for participants to recover and heal. For example, one participant reflected on how he would not go on walks without his favourite music. Therefore, in accordance with Phoenix and Orr (2014), PA can elicit joy through associations to sounds or music that is employed alongside the activity of choice. Similarly, in a study conducted by Krekula (2022), the author denoted an interaction between music and the older adults partaking in dance. This was evident as participants expressed that the pleasure associated with dancing came from the experience of becoming one with the music through the rhythms of dance. Another study conducted by Jallinoja et al (2010), which aimed to examine descriptions of pleasure that came from food and physical activity

through a group-based counseling intervention, found that negotiation in partaking in PA was influenced by the presence of sensory pleasure that was felt immediately during or after an activity. Based on participant interviews, Jallinoja et al (2010) highlighted that enjoyment arose in the moment of the activity due to the environmental surroundings that the activity took place in and required no further external motivation.

Extended Typologies of Pleasure

Finally, in addition to the four typologies of pleasure identified by Phoenix and Orr (2014), several studies have also offered extended categorizations of pleasure through their findings that demonstrate how enjoyment is experienced in later life PA (n= 8/35, 22.9%) (Allain, 2020; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Jallinoja et al., 2010; Krekula, 2022; Paxton et al., 1997; Silva et al., 2022; Vargemidis et al., 2023). Vargemidis et al. (2023) proposed the addition of a fifth typology which was constructed as “the pleasure of experiencing the body perform” (p. 21:23). This referred to the pleasure of being “bodily capable” of participating in PA, a type of pleasure that centered around the immediate satisfaction of bodily movement itself and its promotion of a healthy lifestyle (Vargemidis et al., 2023, p. 21:23). Additional extended typologies of pleasure included pleasure of community and pleasure of practice (Chipperfield & Bissell, 2023). Firstly, Chipperfield and Bissell (2023) found that pleasure in ballroom dancing resulted from the social connections that individuals made through PA participation. Participants described joining ballroom dancing post-retirement to have an activity that they could enjoy alongside their partners, as well as acquire new social connections after the loss of other work or life companions (Chipperfield & Bissell, 2023). Moreover, the authors observed participants meet in the social area prior to their classes to talk or spend time together after class over refreshments (Chipperfield & Bissell, 2023).

Secondly, pleasure of practice referred to a type of pleasure in which participants gained a sense of enjoyment when their regular dance engagement resulted in feelings of “physical competence” (Chipperfield & Bissell, 2023, p. 283). Somewhat similar to Chipperfield and Bissell’s (2023) extended typology of pleasure of practice, Jallinoja et al. (2010) found that the negotiation between activity and inactivity among individuals in the group-based counseling program was rooted in the satisfaction of attaining goals. This was observed as participants cited feeling proud after walking for a certain amount of time (Jallinoja et al., 2010). Therefore, as per Jallinoja et al. (2010), enjoyment in PA was not necessarily about corporeal pleasure, instead, it was rooted in other positive feelings, such as pride or contentment, which were a result of accomplishing a PA-commitment.

Another extended typology that was found was related to the objects and spaces of the PA. A study by Allain (2020), which examined the pleasures and risks associated with later life hockey, highlighted the pleasures of emplacement in the experiences of the older men who played recreational hockey. This form of pleasure referred to how materials and physical spaces associated with hockey facilitate enjoyment (Allain, 2020). Participants expressed how materials used to play hockey, such as the skates that allowed them to speed and glide across the ice, or the effect of an increased heart rate that resulted from chasing the puck, provided a sense of joy (Allain, 2020). The second component to the pleasure of emplacement was the material spaces associated with the sport (such as the hockey arena or the dressing rooms) which were also found to be integral to the experience of pleasure (Allain, 2020). For the older men, it was found that the dressing rooms were just as important as being on the ice as social connections and locker room friendships were formed within that common space where experiences or identities as “aging hockey players” were shared among participants (Allain, 2020, p. 6).

Similarly, within the realm of spaces and environments, Humberstone and Stuart (2016) had also identified the importance of spatial and social contexts in influencing older adults' pleasurable PA experiences. Humberstone and Stuart (2016) found that environmental aspects (i.e., locations and spaces in which PA occurs) and the social contexts of the yoga and ETM classes were important to how pleasure was fostered and experienced during PA. For the older women in the ETM group, it was found that the spot in the room that the women picked was important to them (Humberstone & Stuart, 2016). The authors denoted that such positioning (such as standing in an exercise circle where participants could face one another) provided a stronger sense of belonging for participants, regardless of their varied abilities to perform the activity. Within this theme, it was also found that the PA instructor, and their level of experience and knowledge to promote a sense of safety and confidence in the activity, also played an important role in fostering pleasure within the spaces where PA took place. For example, across both groups, the instructor's approach to the classes held much importance by offering alternative poses (during the yoga class) or modified dance movements (during the ETM class) to fit the needs of participants and take on PA challenges that participants were comfortable with (Humberstone & Stuart, 2016).

Lastly, pleasure from PA experiences was found to also be related to nostalgia of a type of PA (Allain, 2020) as well as related to appearing or feeling younger than one's chronological age when engaging in PA as PA provided conditions for individuals to combat age norms (Krekula, 2022). Based on findings by Krekula (2022), through practicing dance, preconceived notions around one's age identity were no longer apparent or existent, allowing both older men and women to feel "younger" or "cooler" while partaking in dance (p. 441). Overall, Krekula (2022) highlighted that the experience of an unbroken temporality (where in which the individual

viewed themselves to be similar to a past version of themselves) led to a positive experience for older adults who were engaging in dance.

Social Locations and Intersectionality

The reported social locations across all 35 studies were depicted in a graph (Figure 2). All 35 studies reported on the factor of age ($n = 35/35$, 100%) (Table 10). Almost all studies reported a numerical distribution of gender/sex ($n = 33/35$, 94.3%) and across those studies, this factor was constructed on a binary basis (i.e., male and female). One study ($n = 1/35$, 2.9%) had only stated that participants were predominantly female and another study ($n = 1/35$, 2.9%) had not reported or identified the gender/sex distribution of their participants at all. The third most reported social location was health conditions ($n = 22/35$, 62.9%). This social location consisted of factors such as assessed Body Mass Index (BMI), general health status or health history, mental state status, depression, diagnosis of Parkinson's Disease (based on established criteria), general frailty, and physical limitations. Following was place of residence ($n = 17/35$, 48.6%), education ($n = 10/35$, 28.6%), race/ethnicity ($n = 6/35$, 17.1%), occupation ($n = 6/35$, 17.1%), socioeconomic status ($n = 5/35$, 14.3%), and social capital ($n = 4/35$, 11.4%).

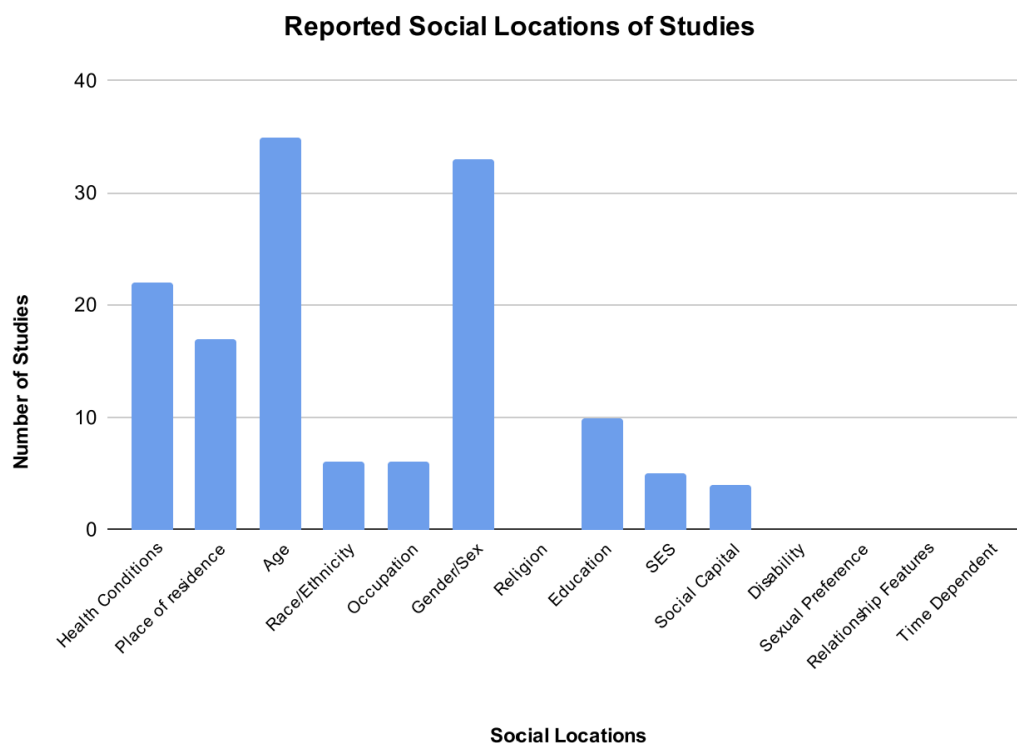
Figure 2. PROGRESS-PLUS Social Locations Bar Graph

Figure 2. Note: Missing bars indicate “0” as the number of studies.

Across the 35 publications, intersectional approaches regarding the outcome of pleasure were neither mentioned nor performed ($n = 0/35$, 0%) (Table 10). In terms of the inclusion of social locations, all 35 studies considered the social location of chronological age ($n = 35/35$, 100%). Of the articles in this review, three studies included a between-group assessment of results across age groups ($n = 3/35$, 8.6%) (Cassol & Pereira, 2020; Focht et al., 2007; Rodriguez Cayetano et al., 2020). Additionally, one study examined between-group differences across two groups categorized by health conditions (i.e., individuals diagnosed with Parkinson’s Disease and individuals without Parkinson’s Disease) ($n = 1/35$, 2.9%) (Colon Semenza et al., 2021). Therefore, overall, an intersectional analysis was not applied across these articles to determine how two or more social locations may have interacted to influence the outcome of pleasure in PA.

Table 10. Inclusion of Social Locations

Study	PROGRESS Descriptors	How factors were measured	Inclusion of Social Locations	Findings
Allain, 2020	Place of residence; Race/ethnicity; Gender, sex; Education; Socioeconomic status; Age	Semi-structured, qualitative interviews	- Age: Included to describe sample, included in participant quotation identifiers - Other factors: Included to describe sample	
Alves et al., 2015	Health conditions; Place of residence; Gender, sex; Age	BMI were recorded according to the World Health Organization	- Included to describe sample	
Batt-Rawden and Tellnes, 2011	Health conditions; Place of residence; Race/ethnicity; Gender, sex; Age	Semi-structured, ethnographic interviews	- Age: Included to describe sample, included in participant quotation identifiers - Other factors: included to describe sample	
Benites et al., 2016	Health conditions; Gender, sex; Age	Health conditions were determined via the Physical Activity Readiness Questionnaire (PAR-Q)	- Included to describe sample	
Beraud-Peigne et al., 2023	Health conditions; Place of residence; Occupation; Gender, sex; Education; Age	Health conditions were assessed via a self-rated health scale (1 = very poor to 5 = very good)	- Included to describe sample	
Cabrita et al., 2017	Health conditions; Place of residence; Gender, sex; Age	Health conditions were based on frailty across three domains (i.e., physical, cognitive, and nutritional). General frailty was measured via the Groningen Frailty Indicator (a score higher than four indicated 'frailty'). Physical limitations were measured via a) the Katz Index (a score higher than four was labeled as robust) and b) the physical functioning scale of the Short Form-36 Health Survey (a	- Included to describe sample	

		score higher than 60 was labeled as robust)		
Cassol and Pereira, 2020	Place of residence; Gender, sex; Education; Social capital; Age	Sociodemographic information was collected via a standardized questionnaire	- Gender and age: Included to describe sample, included in statistics to test for differences - Other factors: included to describe sample	- No statistical difference for pleasure as a motivational factor across age groups 18-35, 36-45, and 45+ ($p=0.207$) - Across all ages (not stratified by age groups): no statistical difference for factor of pleasure as a motivational factor between males and females
Chao et al., 2014	Health conditions; Gender, sex; Age	Participant BMIs were recorded	- Included to describe sample	
Chipperfield and Bissell, 2023	Health conditions; Gender, sex; Socioeconomic status; Age	Semi-structured qualitative interviews: Socioeconomic groups were categorized using the postcodes of participants as per the Index of Multiple Deprivation (IMD). IMD score ranges consist of quintile group 1 = ≤ 8.49 (least deprived), up to quintile group 5 = ≥ 34.18 (most deprived)	- Included to describe sample	
Colon Semenza et al., 2021	Health conditions; Gender, sex; Education; Age	Parkinson's Disease diagnosis as per the UK Brain Bank Criteria. Participants diagnosed with Parkinson's Disease were in Hoehn and Yahr (H&Y) stages 2 and 3. Depression was assessed via the Geriatric Depression Scale-Short form	- Health conditions: Included to describe sample, included in statistics to test for differences - Age: Included to describe sample, included in statistics but controlled for - Other factors: included to describe sample	- No significant differences present in anticipation of pleasure between PwPD and HC groups - The anticipation of pleasure (as well as age, reward, effort, and trial when all other factors were constant) was a significant predictor of decisions in PwPD to respond "accept" and engage in cycling (all $p<0.001$)

				- The anticipation of pleasure did not explain choices for the HC group ($p=0.569$). Instead, choices for cycling were explained by reward, effort, and trial ($p<0.001$)
Elsangedy et al., 2021	Health conditions; Gender, sex; Age	Participants' BMIs were recorded	- Included to describe sample	
Focht et al., 2007	Health conditions; Place of residence; Race/ethnicity; Gender, sex; Education; Social Capital; Ages	Participants completed a medical-history questionnaire	- Age: included to describe sample, included in statistics to test for differences - Other factors: Included to describe sample	- For affective responses assessed by the feeling scale, no age-group main effect reported ($p<0.59$) - For felt arousal scale, age main effect was not statistically significant ($p<0.83$) - For revitalization, no age-group main effect reported ($p<0.72$) - For positive engagement, no age-group main effect reported ($p<0.57$) - For tranquility, no age-group main effect reported ($p<0.17$)
Follador et al., 2019	Health conditions; Gender, sex; Age	Participants' BMIs were recorded	- Included to describe sample	
Hancock et al., 2021	Health conditions; Place of residence; Race/ethnicity; Occupation; Gender, sex; Education; Social capital; Age	Participants completed a survey via the Ethica app which collected sociodemographic information as well as, overall life satisfaction and worthwhileness of life	- Included to describe sample	
Humberstone and Stuart, 2016	Place of residence; Race/ethnicity; Occupation; Gender, sex; Socioeconomic status; Age	Semi-structured ethnographic interviews, focus groups, and participant observation	- Included to describe sample	
Hyodo et al., 2019	Health conditions; Gender, sex; Education; Age	Depression was assessed on the	- Included to describe sample	

		Geriatric Depression Scale where a score > 7 indicated depression		
Hyodo et al., 2021	Health conditions; Gender, sex; Education; Age	Healthy cognitive abilities were assessed via the Mini-Mental State Examination with a score > 28. The absence of depression was measured via the Geriatric Depression Scale with a score < 7	- Included to describe sample	
Jallinoja et al., 2010	Place of residence; Occupation; Gender, sex; Age	Focus group interviews	- Included to describe sample	
Krekula et al., 2022	Gender, sex; Age	Qualitative interviews	- Age and gender: Included to describe sample, included in participant quotation identifiers - Other factors: Included to describe sample	
Lamoth and Caljouw, 2011	Place of residence; Age		- Included to describe sample	
McAuley et al., 2003a	Health conditions; Race/ethnicity; Gender, sex; Age	Mental status assessed via the Pfeiffer Mental Status Questionnaire	- Included to describe sample	
McAuley et al., 2003b	Health conditions; Gender, sex; Age	Mental status was assessed via the Pfeiffer Mental Status Questionnaire. A questionnaire packet assessing demographic information, physical activity, and general medical history was completed	- Included to describe sample	
Orsano et al., 2018	Health conditions; Gender, sex; Age	Participant BMIs were assessed. Participants were assessed to have hypertension stage 1 or 2 as per the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. They were also	- Included to describe sample	

		evaluated by a physician		
Parkington et al., 2022	Health conditions; Place of residence; Gender, sex; Age	Anthropometric data and physiological data at rest were collected	- Included to describe sample	
Paxton et al., 1997	Place of residence; Gender, sex; Socioeconomic status; Age	Participants' health was assessed using the Health Status Measure	- Included to describe sample	
Pereira et al., 2022	Health conditions; Gender, sex; Age	Participants completed a health history questionnaire	- Included to describe sample	
Phoenix and Orr, 2014	Health conditions; Gender, sex; Age	Qualitative life history interviews	- Age: Included to describe sample, included in participant quotation identifiers - Other factors: Included to describe sample	
Ribeiro et al., 2021	Health conditions; Gender, sex; Age		- Included to describe sample	
Richardson et al., 2020	Health conditions; Place of residence; Gender, sex; Age	Participants' BMIs were recorded	- Included to describe sample	
Rodriguez Cayetano et al., 2020	Gender, sex; Age		- Age: included to describe sample, included in statistics to test for differences - Other factors: Included to describe sample	- Significant difference in scores found between players in the 46+ group to players <25 for fun/socialization as a motivator ($p=0.029$) with a higher motivational score for players 46+ - No significant difference was found when comparing players 46+ to players 26-45 ($p=0.282$) or when comparing players 26-45 to players >25 ($p=0.299$) - Based on age, all three age groups based their intrinsic satisfaction on fun, however, there were no significant differences between the three groups ($p=0.789$)

Shigematsu et al., 2008	Health conditions; Place of residence; Gender, sex; Education; Age	Medical conditions were recorded out of 21 possible common medical conditions (e.g., cerebrovascular disease, hypertension, heart disease)	- Included to describe sample	
Silva et al., 2022	Occupation; Gender, sex; Education; Socioeconomic status; Social capital; Age	Qualitative interviews with questions regarding sociodemographic data	- Included to describe sample	
Szabo et al., 2021	Gender, sex; Age		- Included to describe sample	
Van Roie et al., 2015	Health conditions; Place of residence; Gender, sex; Age	Participants' BMIs were recorded	- Included to describe sample	
Vargemidis et al., 2023	Health conditions; Place of residence; Occupation; Gender, sex; Age	27/44 (61.4%) participants completed an online survey, and 17/44 (38.6%) participants took part in semi-structured interviews	- Included to describe sample	

For the social location of age, three studies ($n = 3/35$, 8.6%) examined between-group differences across stratified age groups. Cassol and Pereira (2020) had stratified participants by three age groups and compared motivational factors for amateur street running across groups (18-35, 36-45, and 45+). For the motivational factor of pleasure, all three groups reported being motivated by pleasure for PA participation, however, there was no reported statistical difference between the scores of the three groups ($p=0.207$) (Cassol & Pereira, 2020). The study had also applied an analysis to examine statistical differences in motivational factors for PA (including pleasure) across gender categories (male and female), however, an intersectional analysis of age and gender was not included in this analysis. Similarly, Rodriguez Cayetano et al. (2020) also compared PA motivational scores for fun/socialization between three age groups (<25, 26-45, 46+), however, they had found a significant difference across the three groups ($p<0.026$). Across the three age groups, participants 46+ were most motivated by the factor of fun/socialization to engage in padel tennis. It was also found that there was a significant difference in this motivational score between participants 46+ compared to players <25 ($p=0.029$) with a higher motivational score for fun/socialization among the 46+ group. No significant difference in scores was found between players 46+ and players 26-45 for the motivational factor of fun/socialization (Rodriguez Cayetano et al., 2020). Lastly, when assessing intrinsic satisfaction on the component of fun, it was found that there were no significant differences between the three age groups ($p=0.789$). All three age groups based their intrinsic satisfaction on fun (Rodriguez Cayetano et al., 2020).

Focht et al. (2007) compared the affective responses between older adults (60-76) and younger adults (19-30), denoting no age-group main effect for affective responses assessed by the feeling scale ($p<0.59$), and no age-group main effect for affective responses assessed by the

Exercise-Induced Feeling Inventory (EFI) for revitalization ($p<0.72$), positive engagement ($p<0.57$), or tranquility ($p<0.17$). The age-group main effect on the Felt Arousal Scale was also not statistically significant ($p<0.83$) (Focht et al., 2007). When examining interactions of age and time, there were no significant interactions between age and time ($p<0.24$) for affective responses on the Feeling Scale. For the Felt Arousal Scale, there was a significant age by time interaction ($p<0.01$) where older adults had reported a significant increase in their felt arousal during exercise, however, felt arousal at the post-exercise time mark was not significantly different from the initial baseline arousal (Focht et al., 2007). For the component of revitalization of the EFI, a significant interaction between age and time was also observed. It was found that for older adults, revitalization significantly decreased when comparing post-exercise revitalization scores to baseline (Focht et al., 2007). Finally, for components of positive engagement and tranquility on the EFI, no significant interaction between age and time were detected for either group (Focht et al., 2007).

Lastly, one study considered the influence of the social location of health conditions when analyzing the data ($n= 1/35$, 2.9%) (Colon Semenza et al., 2021). When comparing participants diagnosed with Parkinson's Disease to the study's healthy control group, it was determined that the anticipation of pleasure (as well as age, reward, effort and trial when all other factors were constant) was a significant predictor for individuals in this group to cycle (all $p<0.001$) (Colon Semenza et al., 2021). In comparison, anticipation of pleasure did not explain choices for the control group ($p=0.569$) and instead, engagement in cycling among this group was explained by reward, effort, and trial (all $p<0.001$) (Colon Semenza et al., 2021).

CHAPTER 4

Discussion

Summary

Overall, the objectives of this systematized-scoping review were to 1) identify and synthesize the existing definitions and synonyms used to describe pleasure in primary research examining later life PA and 2) describe the ways in which older adults' pleasure is achieved in PA. To achieve the outlined objectives, a systematic search was performed in which 35 primary studies of either quantitative, qualitative, or mixed method designs were identified to address the aforementioned objectives. Findings demonstrated that studies predominantly did not conceptualize pleasure through a definition, however, they provided a large host of synonyms (used by authors, participants, and provided by the tools that authors used to assess pleasure) to represent or discuss pleasure in PA. Overall, the findings demonstrated that the description of pleasure and the felt experiences of pleasure during PA are subjective and specific to the individual. However, across those experiences, several commonalities were identified between the type of intensity of PA that elicited pleasure (i.e., low-moderate intensity activities), and the diverse typologies of pleasure that were identified across PA experiences of older adults engaging in various forms of PA. Overall, pleasure was present during the PA experiences of older adults.

Definitions and Synonyms of Pleasure

Regarding the first outlined objective, when identifying definitions of pleasure across the texts, the overall findings have suggested that there is a lack of definitions to conceptualize pleasure as most studies had not provided any of their own or conceptualized pleasure through

other past research. Of the five studies that did provide a conceptualization for pleasure, a definition offered by Smith (1980) was most common among three studies ($n= 3/35$, 8.6%) (Chipperfield & Bissell, 2023; Phoenix & Orr, 2014; Vargemidis et al., 2023) where pleasure was defined as “being the diverse emotions that make a person ‘feel good,’ including, happiness, joy, fun, sensuality, amusement, mirth, tranquility” (p. 75; Phoenix & Orr, 2014, p. 96; Chipperfield & Bissell, 2023; Vargemidis et al., 2023). The deficit of definitions offered by studies on this topic area might suggest and fall in line with the broader literature where pleasure is at times considered to be “ineffable” (Frijda, 2010, p. 99). However, the results of synonyms suggest that it is not necessarily that pleasure is undefinable or too great to be expressed, rather, it is expressed but across a large variety of ways that might be specific to the individual and the experience. Across all the terms, there was more consensus for the term “enjoyment” (which included variations of “enjoy” and “enjoyable”) ($n= 22/35$, 62.9%) which was used across authors, the tools that authors implemented, as well as used by participants themselves through direct quotes.

Notably, the synonym of “enjoyment” is not captured within the offered definition by Smith (1980). While the definition highlights the aspect of joy in relation to pleasurable experiences, the “feel good” emotion of joy differs from the experience of enjoyment which in comparison, seems to encapsulate more long-term experiences of pleasure rather than represent a “feel good” emotion as the definition offered by Smith (1980) seems to do with the feeling of joy and other emotion-based terms, such as sensuality or happiness that make an individual “feel good” in an immediate moment. The term enjoyment, in comparison, may be broader and not limited to emotions as its essence might capture a long-term effect of pleasure, rather than an emotion that is felt or expressed in a specific moment of time when it is elicited. Across the studies that did

define pleasure, two of them were represented through conceptualizations regarding affect (Elsangedy et al., 2021; Follador et al., 2019). To support this, the second most common synonym for pleasure was “positive affect” ($n = 11/35$, 31.4%) (Alves et al., 2015; Chao et al., 2014; Elsangedy et al., 2021; Follador et al., 2019; McAuley et al., 2003a; McAuley et al., 2003b; Orsano et al., 2018; Parkington et al., 2022; Ribeiro et al., 2021; Richardson et al., 2020; Szabo et al., 2021). When comparing this conceptualization to the definition offered by Smith (1980), both definitions fail to capture elements of pleasure that are uniquely identified by the other. Definitions that conceptualize pleasure around affective response, while broader in comparison by encapsulating the spectrum of arousal through tools of assessment, does not necessarily reflect the emotions that are associated with the experience of pleasure. Thus, in this case, this conceptualization and the one offered by Smith (1980), when considered in tandem, provide a more general and overall encompassing understanding of pleasure. One that captures both the emotional aspect of pleasure, as well as the arousal and valences that exist within the experience of pleasure which would not be fully captured through one definition over the other.

However, the findings had also demonstrated that participants were more likely to offer more unique or uncommon synonyms to represent or portray their felt experiences of pleasure relative to the terms offered by the authors and the tools (Table 6). This included terms such as “peace,” “relaxed-chilled out,” or “buzz” ($n = 1/35$, 2.9%) (Humberstone & Stuart, 2016), “proud” ($n = 1/35$, 2.9%) (Jallinoja et al., 2010), “wonderful” ($n = 2/35$, 5.7%) (Jallinoja et al., 2010; Phoenix & Orr, 2014), and “Inner peace” or “freedom” ($n = 1/35$, 2.9%) (Silva et al., 2022). Such terms, such as peace and inner peace, relaxed and chilled out, buzz, or freedom, do not represent emotions, but rather the opposite of a stressed state of being. Therefore, pleasure not only encapsulated “feel good” emotions based on the synonyms used by participants across the

studies, but it also captured pleasant or positive experiences that were absent of negative or unpleasant moments of being (which were also represented and depicted by the observed antonyms for pleasure across the findings, Table 6). However, it is important to note that based on the synthesis of the definitions and synonyms, there is limited knowledge on whether the presented synonyms and the two definitions are accepted by older adults today. Further primary research with older adults is necessary to understand whether these synonyms and definitions can provide an appropriate representation of pleasurable experience in PA based on the sentiments of older adults themselves.

Heterogeneity of Older Adults and Pleasurable PA

Regarding the second objective of this review, the findings of this review have demonstrated that the older adult population is heterogeneous and as such, the various components of PA that were found to be pleasurable in PA behaviour were also diverse across individuals. Based on the findings, one component that can be considered for evoking pleasure in PA behaviour is the intensity of the activity. More generally, it was found that low-moderate intensity PA resulted in increased pleasure overtime (Chao et al., 2014; Szabo et al., 2021). This finding of increased pleasure in low-intensity interventions was also reinforced when comparing affective responses between intervention groups where low-moderate intensity PA elicited more pleasure in comparison to heavy or high-intensity PA (Hancock et al., 2021; Hyodo et al., 2019; Pereira et al., 2022). When comparing the assessed feelings of pleasure and displeasure (sFPD) of older women engaging in resistance training, Pereira et al. (2022) observed that sFPD was greater when completing the moderate-load resistance training in comparison to both light ($p<0.05$) and heavy load conditions ($p<0.05$). Similarly, Hyodo et al. (2019) found that when comparing a high intensity cycling exercise to a light-intensity, slow tempo aerobic dance exercise, pleasure

was found to be significantly higher in the ADE group ($p=0.027$) with an observed interaction with time for only the ADE group where pleasure levels increased significantly post-exercise in comparison to baseline levels ($p=0.007$).

However, there were also some variances present in the findings in regard to the level of pleasure and the influence of PA intensity. When comparing pleasure across different intensity levels of resistance training (Parkington et al., 2022; Van Roie et al., 2015), it was found that pleasure did not significantly differ across different intensity conditions. In addition, another study by Follador et al. (2019) which compared three low intensity activities (i.e., Tai Chi, stretching, and yoga classes) found that while affective responses differed over time for the yoga group ($p<0.001$) and the stretching group ($p=0.02$), overall, affective responses were similar across the three groups with no significant differences ($p=0.41$). Similarly, studies that had examined affective responses in resistance training interventions comprised of multiple exercises had also demonstrated somewhat similar findings where in which some exercises attained a higher perception of pleasure in comparison to others which did not ($n= 3/35$, 8.6%) (Benites et al., 2016; Elsangedy et al., 2021; Orsano et al., 2018). Therefore, to assume that high resistance PA on its own is “unpleasurable” for older adults is too dismissive of a statement and too general of a conclusion. In this case, an examination of intensity (i.e., high, moderate, or low) in conjunction with the type of PA (for example, resistance training or an intervention program such as square-stepping exercise, cycling, or strength and balance training) might provide further insight on how pleasure can be enhanced and whether there is a relationship between intensity and activity type.

Lastly, the heterogeneity of older adults was also demonstrated in the findings when considering the various typologies of pleasure that were identified across studies (Table 9 and

Appendix A). Based on the findings, pleasure is a subjective experience, and one typology of pleasure will not be identically experienced across individuals, as demonstrated through the various ways the same typology of pleasure can be experienced. Of the typologies of pleasure, sensual pleasures was the most commonly identified typology ($n= 7/35$, 20%) (Allain, 2020; Batt-Rawden & Tellnes, 2011; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Jallinoja et al., 2010; Krekula, 2022; Vargemidis et al., 2023). Within experiences of sensual pleasures, studies identified various ways that participants recounted sensual pleasures, ranging across the senses of smell, sounds associated with music and rhythm, or feelings of touch, or even pleasures associated with visual aesthetics (Table 9).

Even across PA groups, a shared typology of pleasure was experienced differently as demonstrated by Humberstone and Stuart (2016) where participants in the yoga class had referenced pleasure from the developed physical literacy of attending yoga classes while the women in the ETM classes referenced pleasures of habitual action that were rooted in the act of rehearsing their dances (Humberstone & Stuart, 2016). Similarly, across studies that had identified documented pleasures among the experiences of their participants (Phoenix & Orr, 2014; Vargemidis et al., 2023) this might have been through written diary entries where participants can recount their PA experience (Phoenix & Orr, 2014) or it could have been evoked through the use of virtual PA tracking devices that allowed participants to track their recorded data afterwards (Vargemidis et al., 2023). Thus, the overall findings have highlighted the nuances that exist within pleasure at the individual level.

Lastly, findings demonstrated the heterogeneity in the preferences of PA visualizations, highlighting the variances within a typology such as documented pleasure. Based on the findings presented by Vargemidis et al. (2023), preferences for the type of visualization of PA data varied

across participants. As visualizations provided by the Fitbit and UbiFit were rated higher in regard to pleasure while the Rings visualizer was rated the lowest from all the data visualizers, it suggests that the way in which collected PA data is presented to the individual is important in evoking pleasure and not all data visualizers are viewed or valued in the same way despite having the same overall function of displaying PA data. This is an important consideration as the findings also found that participants agreed that visualizations should focus on displaying PA performance and focus on displaying PA as a pleasurable experience (Vargemidis et al., 2023). Therefore, older adults are not only interested in the ability to track their personal PA performances, but value a visualizer that showcases the pleasurable aspects of the PA that they are engaging in. Thus, the findings demonstrate that the component of pleasure is also central to data visualizers used for PA and the type of visualizers can elicit more or less pleasure from an individual based on the way in which the data is presented.

Intersectionality in Later Life Physical Activity

Regarding intersectionality across publications examining pleasure in later life PA, the results demonstrated that there was limited consideration around intersectionality within the analysis approaches of studies. Of the 35 studies, none of the studies ($n = 0/35$, 0%) had implemented an intersectional approach to the collected data of pleasure in PA (Table 10). Despite the absence of intersectional analyses, all studies ($n = 35/35$, 100%) had considered the social location of age and some studies ($n = 4/35$, 11.4%) (Cassol & Pereira, 2020; Colon Semenza et al., 2021; Focht et al., 2007; Rodriguez Cayetano et al., 2020) had either examined between group differences based on the social location of age ($n = 3/35$, 8.6%) (Cassol & Pereira, 2020; Focht et al., 2007; Rodriguez Cayetano et al., 2020) or assessed the influence of health

conditions ($n= 1/35$, 2.9%) (Colon Semenza et al., 2021) when analyzing the data regarding pleasure and PA.

More generally, it was found that when comparing pleasure as a motivator to engage in PA, all age groups were motivated by pleasure. While Cassol and Pereira (2020) had denoted no statistical difference between motivational scores for pleasure ($p=0.207$) among participants who did amateur running, Rodriguez Cayetano et al. (2020) found that participants 46+ were most motivated by the factor of fun/socialization to engage in padel tennis with a significant difference between participants 46+ who had a higher motivational score in compared to those <25 ($p=0.029$). The one study ($n= 1/35$, 2.9%) that examined differences between health conditions (i.e., participants diagnosed with Parkinson's Disease with participants who were considered healthy controls) also found that the anticipation of pleasure was a significant predictor of decisions for this group to cycle ($p<0.001$) while it was not for those in the control group ($p=0.569$) (Colon Semenza et al., 2021).

While the current findings provide some insight on assessed PA pleasure in relation to social locations such as age or health conditions, it is important to also consider how these findings might be limited as they do not capture the wide scope of differences across social locations that may exist among older adults. As there were no intersectional analyses applied across the studies within this review, there is a critical need for intersectional analyses in future research on this topic to consider how various social locations may interact and influence experiences of pleasure in PA, as well as to ensure that findings are representative of individuals within this age group. This is an important consideration as social locations are not exclusive from the experience of PA or from the experience of aging. For example, both PA and aging are gendered experiences, and it is important to consider how one's gender may shape an individual's PA status or the aging

process. PA status and aging are also influenced by a host of other factors and contexts, such as one's place of residence and socioeconomic status which may either afford them opportunities to PA or potentially limit them from regular PA engagement. Therefore, in recognizing the influence of these social locations on PA- and aging-related experiences, these factors would also play a role in influencing whether an individual experiences pleasure during PA. As a result, it is important to consider through research how certain social locations present in the lives of older adults may serve as determinants to pleasurable PA. Lastly, the inclusion of intersectional analyses in primary studies on this topic would provide opportunities to further reflect on how to address the presence of any limiting social locations in the lives of individuals to promote pleasurable PA across the wider older adult population.

Pleasure and Current Physical Activity Guidelines

Regarding the intersectional analysis of the studies, the few findings have shown that when comparing motivation for pleasure across age groups, pleasure was an important motivator across ages (Cassol & Pereira, 2020; Focht et al., 2007; Rodriguez Cayetano et al., 2020). This was demonstrated by Cassol and Pereira (2020) who had examined the motivations for amateur street running across ages 18-35, 36-45, and 45+ and found that motivational scores for pleasure were not statistically different between the three groups. In fact, when comparing the values of pleasure as a motivator for running, individuals in the 45+ group had the second highest score for pleasure as a motivator after the 36-45 age group (Cassol & Pereira, 2020). This demonstrated that the importance of pleasure to engage in a type of PA (such as running) was not only specific to one age group, such as younger adults. When comparing pleasure across age groups in an intervention, findings by Focht et al. (2007) showed that between older and younger adults, there were no age group main effects for affective response based on the Feeling Scale ($p < 0.59$),

revitalization (on the Exercise-Induced Feeling Inventory) ($p < 0.72$) and positive engagement ($p < 0.57$). However, older adults did demonstrate a significant decrease in revitalization during ($d = -0.96$) and after exercise ($d = -0.90$) while this was not the case for the younger adults who did not showcase a significant change in revitalization at these time points (Focht et al., 2007). These findings are important as they provide some potential insight into the level of importance that might be placed on enjoyment as a motivational factor for PA engagement among older adults and when considering current PA guidelines that are circulating in the present moment.

While the experience of pleasure is considered within current PA guidelines, it is not consistent across the lifespan. Instead, the emphasis on movement for pleasurable experiences shifts away as the guidelines proceed into later life. The WHO (2020) Guidelines on Physical Activity and Sedentary Behaviour has provided a substantial list of activities that can present active engagement for both older adults (individuals 65 years and older) and children and adolescents (5-17 years), including PA under forms of leisure and recreation (such as play, games, sports, and exercise) (WHO, 2020). Despite the inclusion of a variety of activities that can be taken up across the lifespan, regardless of age, the grounds for PA in later life was focused on circumventing “all-cause mortality” (WHO, 2020, p. 43). The guidelines’ good practice statement for older adults prompts individuals to gradually work toward increasing the duration, intensity, and frequency of activity and that older individuals should be as physically active as their abilities allow (WHO, 2020). While the statements for children and adolescents address the importance of frequency and intensity, they also make an additional point to highlight the importance of pleasure within such engagements, encouraging PA opportunities that are safe, equitable, enjoyable, and appropriate for one’s capabilities and age (WHO, 2020). Thus, while the guidelines provided valuable information on ways to promote health benefits

across the lifespan, the component of pleasure as a way to attain such benefits, or to simply encourage enjoyable movement in later life, was absent for older adults.

Moreover, when considering pleasurable PA within the Canadian context, other guidelines have espoused a similar health-focused narrative regarding the physiological benefits of PA for older adults. *The Canadian 24-Hour Movement Guidelines*, which aimed to provide insight on what a healthy 24 hours looks like across age groups, promoted that adherence for children and youth (ages 5-17) was associated with a range of benefits, including factors such as musculoskeletal health, regulation of emotions, social behaviours, cognition and academic achievement, and quality of life (CSEP, 2016). For this group, participation in PA was presented as a worthwhile experience that yields overall positive biopsychosocial outcomes. However, for older adults, PA was presented as an intervention for potential disease and the prevention of premature death.

More specifically, benefits of engagement addressed factors such as lowering risk of mortality and cardiovascular disease, reducing risk of falls, depression, or dimension, and improving bone health, cognition, physical function, and quality of life (CSEP, 2020). Thus, the basis for being physically active in later life presented more of a biomedical focus, one that has been implicitly rooted in mitigating physiological risks or decline. Therefore, this is an absence of also highlighting other potential motives (in addition to the aforementioned health benefits) that older adults may personally identify with to participate in PA, such as moving for the sake of personal enjoyment. This is important as the limited consideration for the pleasure and enjoyment of older adults (relative to the other age groups addressed) within these guidelines might unintentionally promote a specific message on what PA is and should be for different age groups. More specifically, one where PA is portrayed as a mitigator of illness, rather than both a

healthy behaviour and a potentially enjoyable experience in later life for older adults who may or may not be considering the uptake of PA in their lives.

Pleasure and the Biopsychosocial Model of Health

The findings of this review also give insight to potentially promoting the biopsychosocial model of health within the health of older adults. More specifically, ways in which pleasure in PA can potentially emphasize or encourage the domains of psychological and social health. The biopsychosocial model of health is a model that extends the biomedical model of health to a multidimensional and interacting model that considers the importance of the psychological and social domains in addition to the model when considering the spectrum of health, disease, and the lived/living experiences of the individual (Havelka et al., 2009). The findings within this review demonstrated that pleasurable PA has the potential to provide opportunities for the psychological and social domains of health to be addressed during PA experiences. Chipperfield and Bissell's (2023) identified typology of community demonstrated that some older adults value and find enjoyment in PA experiences with an integrated social component to the activity, ones that provide opportunities to socialize and form new social connections with other individuals. As such, types of PA that emphasize moments for socialization among participating older adults may hold potential for addressing the social domain of an older adult's wellbeing.

Similarly, the pleasures of immersion as demonstrated by some studies (Chipperfield & Bissell, 2023; Phoenix & Orr, 2014) where participants were described to gain enjoyment from the ability to forget about factors ranging from anxiety and family struggles to physical pains, demonstrating that pleasurable PA experiences can potentially provide older adults with opportunities to address their psychological well being. Additionally, typologies such as the pleasures of practice (Chipperfield & Bissell, 2023; Jallinoja et al., 2010) and pleasures of

experiencing the body perform (Vargemidis et al., 2023) which highlighted a common experience of gaining enjoyment from gaining a sense of physical competence through skills acquired during PA or from the sense of achievement of attaining PA-related goals, highlighted the opportunities that pleasurable PA might provide to address the connection between the biological and psychological domains and their influence on an individual's wellbeing. However, while these findings might suggest the potential of pleasure in PA experiences to enhance these domains in regard to the overall wellbeing of older adults, further practical research that examines the effects of pleasurable PA on psychological and/or social benefits is needed to consider the role of pleasure and the potential benefits on one's well being.

The Broader Role of Pleasure and the Social Ecological Model

The findings from this review that addressed the objective of how pleasure is achieved within the PA experiences of older adults also extend beyond the biopsychosocial model and allow for consideration in relation to the social ecological model (SEM). More specifically, when considering the identified typologies of pleasure, some of the typologies go beyond the individual themselves and also extend to addressing wellbeing at the community level. Findings regarding the pleasures of community highlighted the value that some older adults placed on forming novel social connections with others and having opportunities to acquire connections after the potential loss of other life connections (Chipperfield & Bissell, 2023). Similarly, Allain (2020) found that within the typology of pleasures of emplacement, the physical space in which PA occurs holds a level of importance to evoking experiences of pleasure among the older men who played hockey, including the ice rinks and the dressing rooms where they had opportunities to connect within a common space. When analyzing the findings within the context of the community level of the SEM, the findings can be contextualized through the *Pathways to*

Wellbeing framework by the Canadian Parks and Recreation Association (CPRA) (2015). The objective of this framework is to guide policies or practices concerning recreation in Canada that aim to promote the wellbeing of individuals, communities, and environments (CPRA, 2015). Within this framework, five goals are outlined, including fostering active aging through recreation, addressing and providing access to recreation for populations with constraints, help connect individuals to nature through recreation, support physical and social environments through the construction of caring communities, and to support the ongoing growth of recreation (CPRA, 2015).

Thus, beyond the individual benefits that pleasurable PA brings forth, the typologies of pleasure can help understand how engagement in pleasurable PA might support one of the key goals of the CPRA framework by supporting the construction of strong and caring communities through participation in recreation. Within the CPRA's (2015) fourth goal (i.e., to ensure supportive environments), it is highlighted that both supportive physical and social environments help individuals to adopt healthy choices, as well as foster community connectedness and a mutual sense of care for others, the community, and the environment (CPRA, 2015). Through shared PA experiences, as demonstrated by Allain (2020) where the older men were able to connect based on a shared aging identity and enjoyment in hockey and as demonstrated by Chipperfield and Bissell (2023) through having opportunities to form new connections with other individuals through ballroom dancing, wellbeing at the level of the community is enhanced. Pleasure is no longer an individual experience, but one that can also be shared between participants engaging in the same PA within a specific time and a shared place. It is then through these social connections that are fostered during an activity that allow for individuals to support the ongoing growth and wellbeing of one another in virtue of engaging in a shared PA together.

Therefore, not only are participants reaping benefits at the individual level, but wellbeing is extended to the wider community through the social connections that are fostered during a shared and pleasurable PA experience that might motivate ongoing participation in PA and thus allow older Canadians to meet PA guidelines, such as the recommended 150 minutes of PA per week, as per the Canadian 24-Hour Movement Guidelines (2020). As such, overall wellbeing is also cultivated at the wider community level through PA and recreation, which in turn will continue to develop supportive environments across communities.

The typology of the pleasures of the spatial and social contexts which was identified in the study by Humberstone and Stuart (2016) found that in addition spaces, environments, and social contexts of associated PAs were important components to influencing the pleasure experienced by older adults engaging in PA. Within this typology, PA instructors played an important role in shaping the space and social contexts for PA and thus shaping the experience of pleasure in the PA of participants attending the yoga and Exercise-to-Music (ETM) classes (Humberstone & Stuart, 2016). More specifically, pleasure was elicited through an instructor's ability to promote safety and confidence within an activity by offering alternative movements or poses that would meet the varying needs and abilities of participants within those two classes (Humberstone & Stuart, 2016). The fifth goal within the framework by the CPRA (also known as recreation capacity) brings attention to the need to continue the growth and support sustainability of the recreation field in Canada (CPRA, 2015). Within this aim, institutions for recreation need to be addressed. Thus, Humberstone and Stuart's (2016) findings have highlighted the valuable role that instructors play as facilitators of pleasure in later PA and recreation opportunities that currently exist for older adults and when considering the growth of future opportunities. Not only are institutions required to support the physical spaces of PA and recreation for older adults, but

knowledgeable instructors who can meet the wants and needs of the heterogeneous older adult population is just as important, as per the Humberstone and Stuart's (2016) findings on the pleasures of spatial and social contexts. Therefore, to support the growth of recreation opportunities in Canada, it should not only be addressed at the level of the physical institutions across Canadian communities that would facilitate PA, but also the individuals (i.e., the leaders of recreation, as per the CPRA (2015)) within those institutions/spaces that can help support and enhance the pleasure of older adults in PA, and thus potentially promote motivation for on-going PA behaviour among this age group.

Limitations

This review had potential limitations. First, eligible studies were limited to those indexing key terms that were included in the established search strategy. As a result, potentially eligible reports may have been unintentionally excluded from the final review. Second, despite the inclusion of non-English articles in the two-phase screening process, the search strategy was limited to English only. Thus, there was a possibility that other eligible studies may have been missed. Third, as this systematized-scoping review incorporated data from other primary literature, any limitations within those studies would also be a limitation for this review. Fourth, the interventions of the studies included in this review were predominantly assessing pleasure as an outcome of PA. Thus, based on the findings of the included studies, this review was not able to provide generalized findings based around the influence of pleasure on adherence to PA or how the factor of pleasure may or may not affect regular adherence to PA behaviours among older adults.

In addition to the limitations of the review itself, it was important to also consider the limitations of the studies that were included within the review. First, only two studies ($n = 2/35$,

5.7%) (Hancock et al., 2021; Szabo et al., 2021) had used correlational methods of analyses to consider pleasure in relation to PA contexts. As a result, findings in this review were unable to provide insight on the direction or strength of the relationship when considering the relationship between variables such as assessed pleasure and PA. Second, when considering the risk of bias assessments, it was found that all studies assessed by either the ROBINS-I tool (for studies that included non-randomized designs) ($n = 6/35$, 17.1%) or the ROB-2 tool (for studies that included a randomized design) ($n = 10/35$, 28.6%) were judged to be at serious risk of bias or at high risk of bias, respectively. Therefore, this might suggest that while there are studies examining the experiences of pleasure in later life PA, more studies need to be conducted with robust methodology in place. More specifically, studies that clearly discuss and address strategies to mitigate risk of bias relating to confounding variables and potential risk of bias related to measurements of the examined outcome. Lastly, none of the publications in this review ($n = 0/35$, 0%) provided intersectional analyses in regard to the variables of interest (i.e., pleasure and PA).

Strengths

Despite the study's limitations, this review also presented several strengths. The first being that this review adhered to both PRISMA and the PRISMA extension for Scoping Reviews, ensuring appropriate and robust methodology was in place to ensure transparent reporting of findings within this systematized-scoping review. Secondly, a comprehensive search was conducted across 8 databases to identify eligible research. This allowed for the breadth of literature existing on this topic area to be explored and considered based on the established inclusion criteria of this review. Third, the inclusion of articles in any language (i.e., not only limited to English publications) was another strength as it widened the scope of research that we were able to reach to explore this topic. Lastly, this review was the first to formally synthesize or

organize the existing categorizations of pleasure that were present in later life PA experiences. In terms of the primary literature, qualitative studies were predominantly found to be of low concern and performed well on quality assessment as most studies scored above 7 or higher out on the qualitative assessment tool (Table 2). Most of the included quantitative studies were also at low risk for the domain missing outcome data, with the exclusion of one study (Table 5).

CHAPTER 5

Implications

Future Implications and Future Directions

In terms of the future implications of this systematized-scoping review, findings from this review may be of interest or beneficial for applied practice. More specifically, for healthcare practitioners, policy makers, or future researchers interested in addressing and supporting the PA behaviours of older adults. The provided synthesis of the varying findings in regard to the ways in which pleasure was evoked across the included primary studies has highlighted how some of the PA contexts or features (i.e., PA intensity, activity type, or typologies) provide spaces for pleasure to be experienced among older adults. When considering the low PA level among this age group, healthcare practitioners working with the older adult population may want to consider other facilitators for PA behaviour, such as the factor of pleasure, to aid in the promotion and uptake of PA among their older adult patients or clients. When considering the design of prospective PA interventions, the findings of this systematized-scoping review may help inform future interventions. Researchers may want to consider the inclusion of identified typologies of pleasure as an additional component to help support or enhance designed PA programs and interventions that are attempting to address regular PA behaviour among older adults. Moreover, the inclusion of the typologies of pleasure might also be beneficial when attempting to motivate new groups of older individuals who may or may not be already inclined to partake in PA.

In terms of future studies, researchers may want to do a conceptual map to understand what the core and fundamental aspects of pleasure are, as well as to determine what specific examples of PA experiences older adults might have and how might those experiences be categorized or fall within the general domains of the conceptual map on pleasure. In doing so, this might

provide further insight into the spectrum of pleasure that the findings of this systematic-scoping review have synthesized. Future studies on the topic of pleasure in later life PA may also want to consider examining how the synonyms and definitions of pleasure identified within this review may or may not resonate with older adults. In doing so, future studies on this topic can offer a more current definition to conceptualize pleasure in later life PA.

Lastly, based on the findings of this review, existing or future guidelines addressing the PA and overall wellbeing of older adults may want to consider the meaningful inclusion of pleasure within those recommendations. The inclusion of pleasure, in addition to other health-focused motivators for PA engagement that are often emphasized for this age group (CSEP, 2020), may help promote the uptake of PA among older adults who are considering partaking in PA, but are not necessarily motivated by or do not resonate with reasonings solely related to health. Thus, engagement in PA in later life does not need to be solely associated with the goal of reducing health risks, but rather can also be understood as a way to engage in enjoyable activities that are both pleasurable and beneficial for one's overall biopsychosocial wellbeing. This would also reinforce the idea that pleasure in PA is not only restricted or important during youth and younger adulthood, but pertinent to being sustained throughout the lifespan. Therefore, through the inclusion of pleasure, PA guidelines can help shape the way later life PA is understood and further promote regular participation across the entire lifespan.

Conclusion

This systematized-scoping review aimed to synthesize the existing definitions and synonyms of pleasure, as well as to identify the ways in which pleasure may be achieved when older adults engage in PA. This study would be the first to synthesize the existing synonyms and definitions of pleasure that are present within primary research examining pleasure in later life

PA. While pleasure in later life PA does not have a consensus on how to conceptualize pleasure, an analysis of the synonyms both support terms that relate to emotions and affect. Future studies may potentially want to consider exploring the appropriateness of the definitions and synonyms in relation to capturing the experience of pleasure to potentially offer an update or more current definition based on the current state of the pleasurable later life PA literature.

Furthermore, based on the findings of the primary studies assessing pleasure, pleasure was found present in PA experiences, and predominantly achieved through low-moderate intensity forms of PA. However, some studies also demonstrated that not all individual forms of exercise elicited the same level of pleasure when performed at the same intensity, suggesting that pleasure might be more subjective on the account of both intensity and the exercise of choice. Finally, the identified typologies of pleasure from across studies demonstrated the diverse ways in which pleasure could be evoked in later life PA. Future interventions focusing on addressing the PA behaviours of older adults may want to consider addressing these typologies when curating PA programs or interventions geared towards this population. Lastly, PA guidelines focused on increasing PA participation among the older adult population may want to include the component of pleasure as an additional motivator for the uptake of PA among this age group.

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Appendices

Appendix A: Tables

Table 11. Identified Typologies of Pleasure

Typology (and Categorization)	Study	Studies that Reinforced the Typology	Definition	Participant Quote
Pleasures of Emplacement (Extended)	Allain, 2020		Refers to how the objects and spaces associated with the sport bring forth a sense of pleasure. For example, the pleasure that is derived from sweat-drenched jerseys or the hockey change room.	“It's strange, but this you know this-this little black disk, it's forcing me to skate hard and to get my heart pumping and to start sweating, just you know just chasing that thing, and that part of the game, that part of that activity.” He then concluded, “You know, if that wasn't there, I wouldn't get my heart rate up. I wouldn't.” (Allain, 2020, p. 6). “I can't tell you how many times I've heard guys say, ‘If it wasn't for the half hour before and the hour afterward, I wouldn't be playing hockey.’” (Allain, 2020, p. 6).
Pleasures of Community (Extended)	Chipperfield and Bissell, 2023		Refers to the pleasure that is derived from the social component of physical activity. For example, participants gained pleasure from the sense of community that ballroom dancing brought them.	One couple who attended ballroom dancing together noted that while they were limited by their physical health conditions, “We don't do much dancing but the social aspect of it is lovely.” (Chipperfield & Bissell, 2023, p. 283).
Pleasures of Practice (Extended)	Chipperfield and Bissell, 2023		Refers to a form of pleasure that is derived through the practice of ballroom dancing. For example, participants	One participant had stated that despite his health limitations, ballroom dancing was, “Something I <i>can</i> do!” (Chipperfield & Bissell, 2023, p. 283).

			described feeling a sense of “physical competence” through their regular engagement in physical activity (Chipperfield & Bissell, 2023, p. 283) as well as a sense of motivation to continue with the development of their skills.	
Documented Pleasures	Phoenix and Orr, 2014	Humberstone & Stuart, 2016; Vargemidis et al., 2023	Refers to a type of pleasure that arises from the process of documenting an activity and is typically experienced after the occurrence of the activity. For example, keeping written entries or written diaries of the activity.	“...I've been keeping this log since 1996. It's an enjoyable part of things, to see what I've been doing and what's happened over the years.” (Phoenix & Orr, 2014, p. 97).
Pleasures of Habitual Action	Phoenix and Orr, 2014	Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Vargemidis et al., 2023	Refers to a source of pleasure that arises when implementing and adhering to habitual behaviour. For example, gaining a sense of pleasure in balancing everyday life with a routine in physical activity.	“[Physical activity] it's just a part of life. It's just what I do, like some people get up and clean their teeth and it's part of a routine. I'm not one for routines but I think when you finish work you've got to get some sort of routine otherwise I imagine you get very depressed and go downhill. So physical activity gives me a structure and I know exactly what happens through the week, which I like.” (Phoenix & Orr, 2014, p. 98).
Pleasures of Immersion	Phoenix and Orr, 2014	Allain, 2020; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Vargemidis et al., 2023	Refers to pleasure that occurs in the moment of an activity, one that provides “escape from, consideration of and perspective to be gained upon everyday life demands” (Phoenix & Orr, 2014, p.100). For example,	“What is it like to do Zumba [a form of dance exercise class]? Great! It makes you feel happy, if you are worried about anything, or if anything is on your mind, you forget about it for an hour and just get sucked into the music...” (Phoenix & Orr, 2014, p. 99).

			through immersion of an activity, individuals gain enjoyment in the ability to detach themselves from daily concerns and/or other people.	
Sensual Pleasures	Phoenix and Orr, 2014	Allain, 2020; Batt-Rawden & Tellnes, 2011; Chipperfield & Bissell, 2023; Humberstone & Stuart, 2016; Jallinoja et al., 2010; Krekula, 2022; Vargemidis et al., 2023	Refers to sensory experiences felt in the moment of an activity. Participants described the pleasure of feeling the wind against one's skin or smelling a freshly mowed golf course.	"I love to feel the water as I glide through it, cold at first then pleasantly cool as my body heats up from the exercise. There is a great sense of freedom and buoyancy when you can just float lazily in the deeper end and a sense of achievement when I reach the goals I set myself, for example number of lengths, different strokes, and trying to breathe properly..." (Phoenix & Orr, 2014, p. 97).
Pleasures of Experiencing the Body Perform (Extended)	Vargemidis et al., 2023		Refers to the pleasure associated with being physically capable to partake in a type of PA and gain a sense of satisfaction from the movement itself, as well as a sense of satisfaction that the movement contributes to general fitness and health.	
Pleasures of Spatial and Social Contexts (Extended)	Humberstone and Stuart, 2016		Refers to how spatial aspects and social contexts (i.e., the spaces and locations of where physical activity takes place) are important to how physical activity is experienced by the individual.	"I like the exercise in a ring because it makes you feel part of something bigger than yourself...a community thing like the coffee afterwards. There is no one in front of you that makes you go wrong if you are following them and you can keep out of the way of anyone who can't keep the beat because that's off-putting." (Humberstone & Stuart, 2016, p. 415).

Pleasures of Unbroken Temporality in Physical Activity (Extended)	Krekula, 2022		Refers to how physical activity contexts provide conditions for individuals to feel younger than their chronological age and lead to positive experiences while engaging in physical activity.	“It gives more in the way that you get to experience an inner, let’s call it, sensuality or something. You feel sort of younger, fresher, cooler and that feeling cancels out all existing taboos. Preconceived ideas that ladies of my age shouldn’t be doing such things are not around there, no one sniffs at you.” (Krekula, 2022, p. 441).
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Extended= refers to a new identified typology of pleasure that was not one of the four typologies (i.e., Documented Pleasures, Pleasures of Immersion, Habitual Action, and Sensual Pleasures) identified by Phoenix and Orr (2014).