the national governing body for group exercise

SOCIAL VALUE OF GROUP EXERCISE
- LITERATURE REVIEW -

FULL REPORT

SPORT+ RECREATION ALLIANCE

Estimates, information and forecasts contained within this report are based on the data obtained at that time and the accuracy of resultant findings and recommendations is dependent on the quality of that data.

The author(s) will not be held liable for any data or information provided within this document. While the data and recommendations have been continuously reviewed throughout the process, it has not been possible for the author to independently review and verify every element of data provided by third parties.

Authors:
Emma Birch, Research and Development Officer, Sport and Recreation Alliance
Ricky Boardman, Head of Research and Development, Sport and Recreation Alliance

TABLE OF CONTENTS

1 Introduction

1.1 Purpose Of This Document

1.1.1 This document, along with an accompanying database, provides an overview of the methodology, and interim results of a literature review into the social value of group exercise.

1.1.2 Note, the document presents the initial findings of the excerise from a 'process' perspective (e.g. the breakdown of relevant articles by year of publication), and includes a summary of the literature pertaining to the four social value outcomes.

1.1.3 A full analysis of the key findings will be presented in a subsequent document.

1.2 Outcomes

1.2.1 The literature review exercise summarised in this document, and the accompanying database, details the strength and spread of evidence regarding the social value of group exercise.

1.2.2 A primary reason for undertaking the literatary review was to identify any evidence of sufficient strength and specificity that would support an update to the National Model used to calculate the social value of group exercise. The review confirms that evidence available does not support an update to the national model.

1.3 Summary Of Initial Findings from The Literature Review

1.3.1 The literature review was conducted between October and November 2024 using a series of search protocols signed off by EMD UK.

1.3.2 The databases trawled as part of the review were Cochrane, Scopus, Web of Science and Google Scholar. These databases were used as they tend to contain a high volume of articles relevant to the social value of sport and physical activity.

1.3.3 Google Scholar is the only database that is free for public access and is used to capture any notable studies that may have been published in the public domain or via a database that wasn't trawled as part of this review.

1.3.4 In total, 304 sources were captured during the initial review. Of these, 255 were appropriate for inclusion in the final report. This may reduce slightly after a final evaluation.

1.3.5 The principal reasons for excluding 49 sources were because they were either irrelevant to the social value of group exercise, didn't meet the inclusion criteria agreed with EMD or didn't meet the minimum threshold in the hierarchy of research or were inaccessible. The reason for exclusion is documented in the database.

1.3.6 All sources in the database have the year of publication, name of database and breakdown of source type, regardless of whether they were to be excluded or included from the final report.

1.3.7 Across the four databases, 88 sources were identified through Cochrane, 129 from Web of Science, 16 from Scopus and 71 from Google Scholar.

1.3.8 Articles published from 2010 onwards were part of the review's scope. 3 articles were found and are in the database but on later review were excluded as they were prior to 2010. There is a general upward trend towards more relevant articles over recent years, with 42 published in 2024, 32 in 2020, 32 in 2017, 24 in 2015 and only 36 over a four-year period spanning 2010-2014.

1.3.9 The breakdown of the sources in the database is 286 from 'Academic Sources', 16 from 'Grey Literature' and 2 from 'Other' sources.

1.3.10 From the papers that are to be included in the final report, most research was quantitative, with 184 articles falling into this category compared to 32 qualitative and 34 mixed.

1.3.11 A strength of this literature review is the proportion of sources that are considered more reliable/robust in the hierarchy of research. The papers that are to be included in the final report comprise of systematic reviews (25 sources) and randomised controlled trials (86 sources) which are considered most reliable/robust, and they account for 45.5% of the overall type of research included in the database.

1.3.12 The social value outcome area that was most prevalent in the literature review was Physical and Mental Health with 246 sources covering this topic. This was followed by Subjective Wellbeing with 82 sources referencing this area and Social and Community Development with 53. The area of social value with the least coverage was Individual Development, being picked up in 25 of the 304 total number of sources.

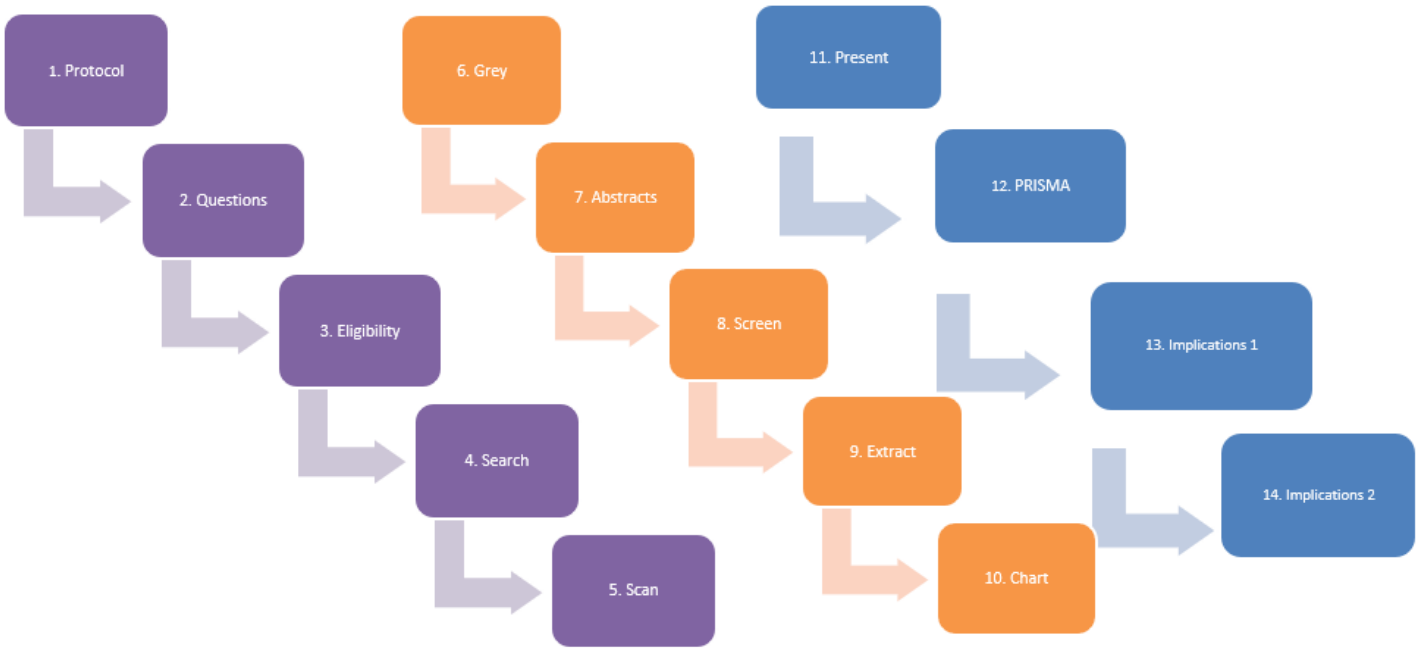
1.3.13 Most sources are from the US (24.3%), the UK (10.7%) and Australia (9.9%) although this is likely to be somewhat skewed by the fact that articles published in a language other than English were excluded.

1.3.14 A summary of each of the overarching social value outcome areas can be found in section 4 of the report (page 13).

2 Methodology

2.1.1 The methodology used for the review of literature was a 'Quick Scoping Review' (as described by Collins et al., 2015), in which the aim is to identify the evidence available, summarise the findings, and provide an informed conclusion on completion. The specific aims of the literature review were to review evidence on the relationship between group exercise and social outcomes. The following figure shows the steps of a scoping review.

Figure 1: Steps of a Scoping Review



2.1.2 The literature review includes material from both published academic papers and non-academic unpublished 'grey literature'. The search involved the use of a range of online academic databases, including Scopus (Elsevier); Cochrane (Wiley); Web of Science (Clarivate), and Google Scholar. The terms outlined in Table 1 (overleaf) were used in various combinations, in order to conduct the collection of evidence. 481 searches took place yielding 711,090 search results.

2.1.3 All literature found from these searches was then screened by reading either the abstract, executive summary or introduction, and those papers deemed relevant to the review aims were included in the database. The papers were downloaded, read in full and the data from them (including reference details, research methodologies, demographic groups, key themes and findings), was extracted and stored in a specially designed database. Upon more detailed review, the papers that did not meet the review aims were colour coded in red in the database and marked as excluded from the final report.

2.1.4 The full exclusion criteria can be found in Table 2.

Table 1: Full exclusion criteria for removing papers during the screening process.

Exclusion Criteria
Full article not in English
Published before 2010
Less than 3 pages
Study Protocol (no results published)
News article / Press Release / Magazine / Opinion piece
Low standard of paper e.g. does not state methodology used or has little context to findings
Not relevant - some papers slipped through the initial sifting and are not relevant to the study

Table 1. Summary of Search Terms

Engagement	Type	Social outcome areas	Sub social outcome areas
Therapeutic	Social impact	Physical and mental health	**Physical and mental health:**
Social	Social value	Subjective wellbeing	Hospital visits
Instructing	Social benefit	Individual development	Readmission Rates
Fitness		Social & community development	Length of Stay (Hospital)
Mind-body			CHD and Stroke
Pilates			Type 2 Diabetes
Yoga			Breast Cancer
Zumba			Colon Cancer
Cardio			Dementia
Aqua*			Clinical Depression
Aerobics			Sports Injuries
Outdoor fitness			Back Pain
Circuits			Hip Fractures
Indoor cycling			Joint replacement
Chair based			Reduced GP visits
HIIT			Reduced Psychotherapy Services
Combat Fitness			Reduced Physiotherapy Services
Barre			Visits to Orthopaedics
Spinning			Obesity
			Disability
			Balance
			Strength
			Subjective wellbeing:
			Subjective wellbeing
			Life satisfaction
			Anxiety/stress
			Quality of life
			Emotional health
			Individual development:
			Pro-social behaviour
			Anti-social behaviour
			Educational attainment/achievement
			Employability
			Confidence
			Rehabilitation
			Self-efficacy
			Human capital
			Self-esteem
			Social and community development:
			Social capital
			Social connections
			Communities
			Friendship
			Crime reduction
			Offenders/Prison sentences
			Care homes
			Pre and post-natal

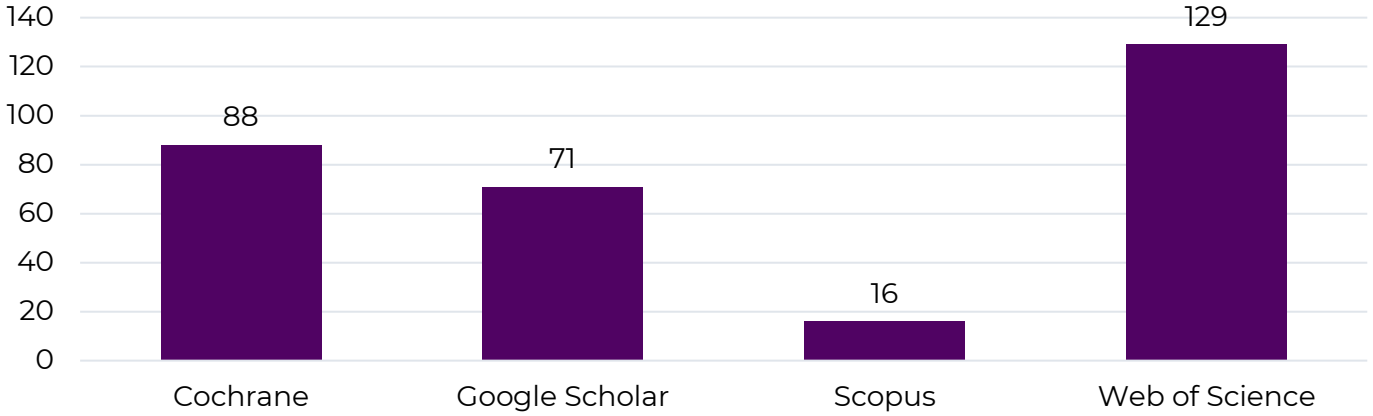
3 Breakdown of Results from the Literature Review

3.1.1 This section of the report summarises the profile of the literature produced by the methodology outlined in the previous section.

3.2 Breakdown by Database Sources

3.2.1 Four databases were used to search for sources, these were: Web of Science, Cochrane, Google Scholar and Scopus.

Figure 2: Breakdown of Database Source



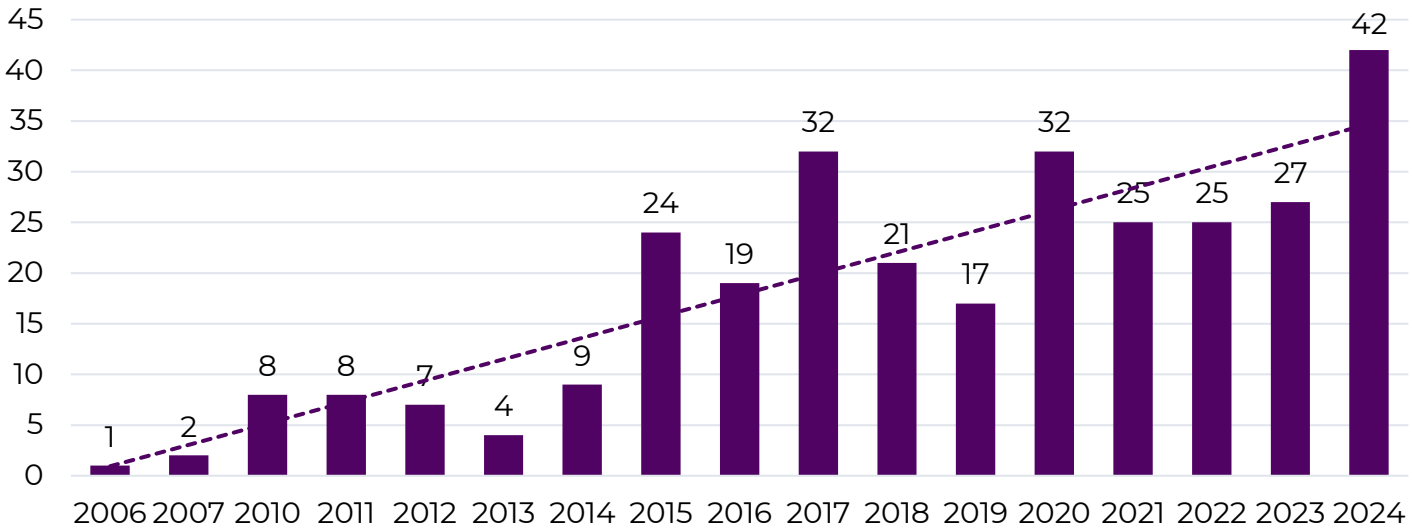
3.2.2 The highest number of sources were downloaded from Web of Science (129 sources), followed by Cochrane (88 sources), Google Scholar (71 sources) and Scopus with just 16 sources. Web of Science was the most useful database in terms of collecting a large number of data sources.

3.3 Breakdown by Year

3.3.1 Only sources from post-2010 were included in this review. This was necessary in ensuring the research collected was relevant and relatable to group classes in 2024. As shown in the search tracker alongside the database, huge numbers of results were produced when filtering for sources post-2010.

3.3.2 When searching for sources, some sources that were pre-2010 did come up and had relevance in the outcome of individual development. These 3 sources (1 from 2006 and 2 from 2007) were included in the database but are excluded from the final report because all outcome areas were covered sufficiently by the number of papers that are marked as 'included' for the final report.

Figure 2: Breakdown of source by year

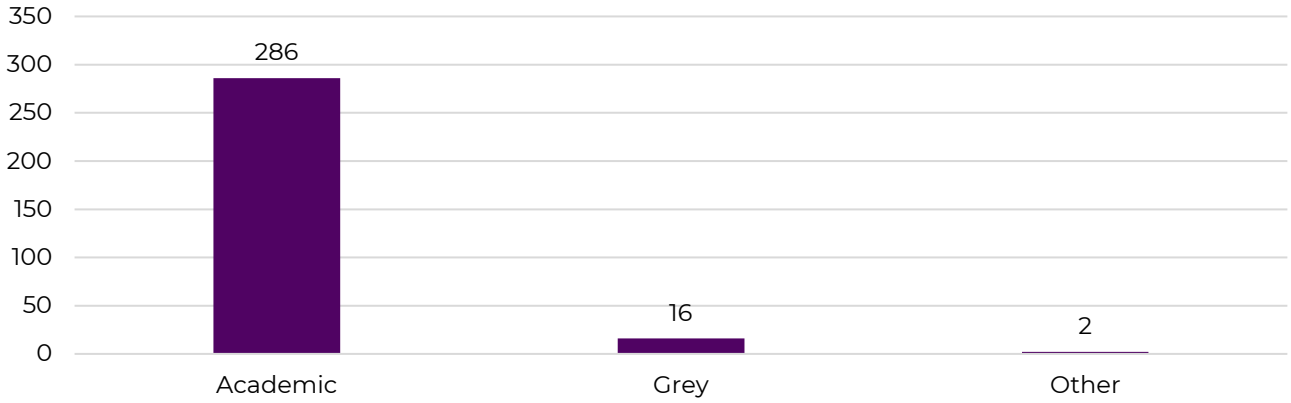


3.3.3 The breakdown of articles by year shows a positive trend towards an overall increase in articles over the past 14 years, with the highest number of sources (42) being published in 2024, followed by 32 sources in both 2020 and 2017 and just 27 sources from 2010-2013. This tells us that the sources used in this review are relevant to the current landscape with many of them being published within the last 10 years.

3.4 Breakdown by Source Type

3.4.1 'Source Type' refers to the provinence of the study identified during the literature review. Typeologies include 'academic', meaning an article produced via a higher education institution and published in a peer reviewed journal. 'Grey' literature refers to research produced by recognised and credible institutions or individuals, including individuals in higher education institutions, but which has not been published in peer reviewed journals. 'Other' sources refers to studies that fit in neither of the above classifications.

Figure 3: Breakdown of Source Type

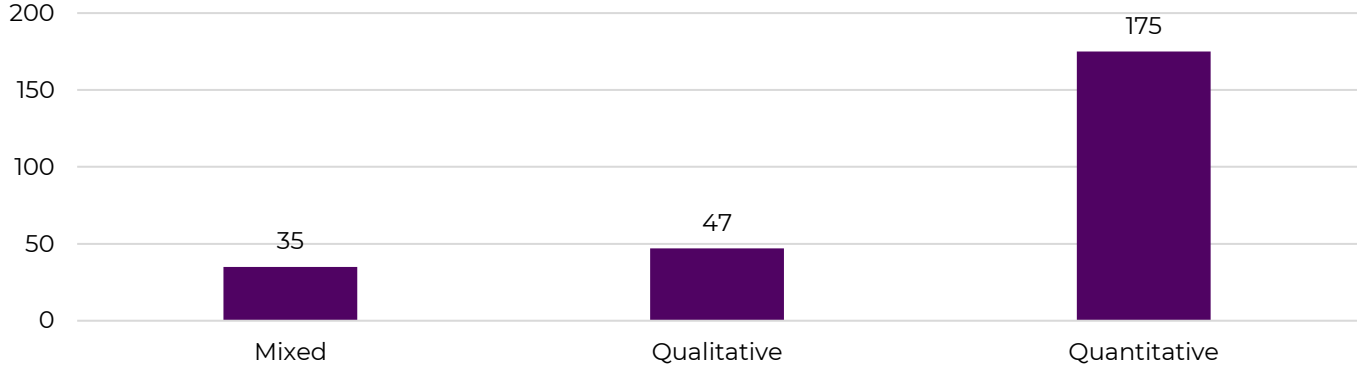


3.4.2 The majority of sources found were academic articles. 286 sources out of the 304 sources downloaded were academic articles. 16 sources from 'grey' literature were included in the database. These sources were dissertations, thesis' and conference papers. 2 sources were categorised as 'other', these involved one opinion piece and one book.

3.5 Breakdown by Research Methodology

3.5.1 The following breakdowns were only inputted in the database for the sources that have been classified as relevant to be included in the final report. The research methodologies applied include studies using 'quantitative' methodologies, meaning the data and findings produced in these sources was numerical and suitable for statistical analysis. Many sources used the quantitative methods of physical fitness tests and mental health scales and tests. 'Qualitative' methods, by contrast, use interviews and observations by the researcher, meaning findings and data are not expressed numerically. 'Mixed' methodology studies utilise both quantitative and qualitative approaches to produce data and evidence their findings. A breakdown of the research sources included in the literature review by methodology is provided below.

Figure 4: Breakdown of Method Type

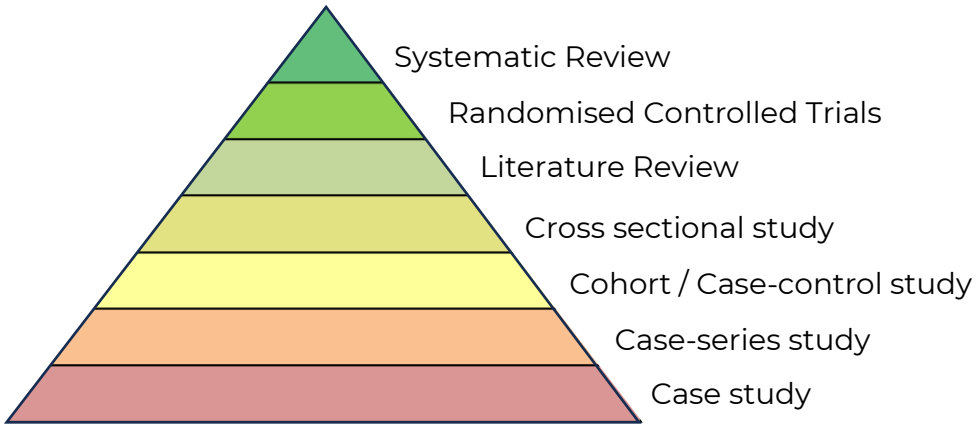


3.5.2 From the review, the most prevalent method type is quantitative, at 175 sources, followed by qualitative, with 45 sources, and mixed with 35 sources. This links to the high number of sources that focus on physical and mental health as many of these studies use structured health tests and questionnaires to assess the impact of group exercise on participants.

3.6 Breakdown by Study Type

3.6.1 Figure 5a shows the typical hierarchy of evidence applied during literature reviews.

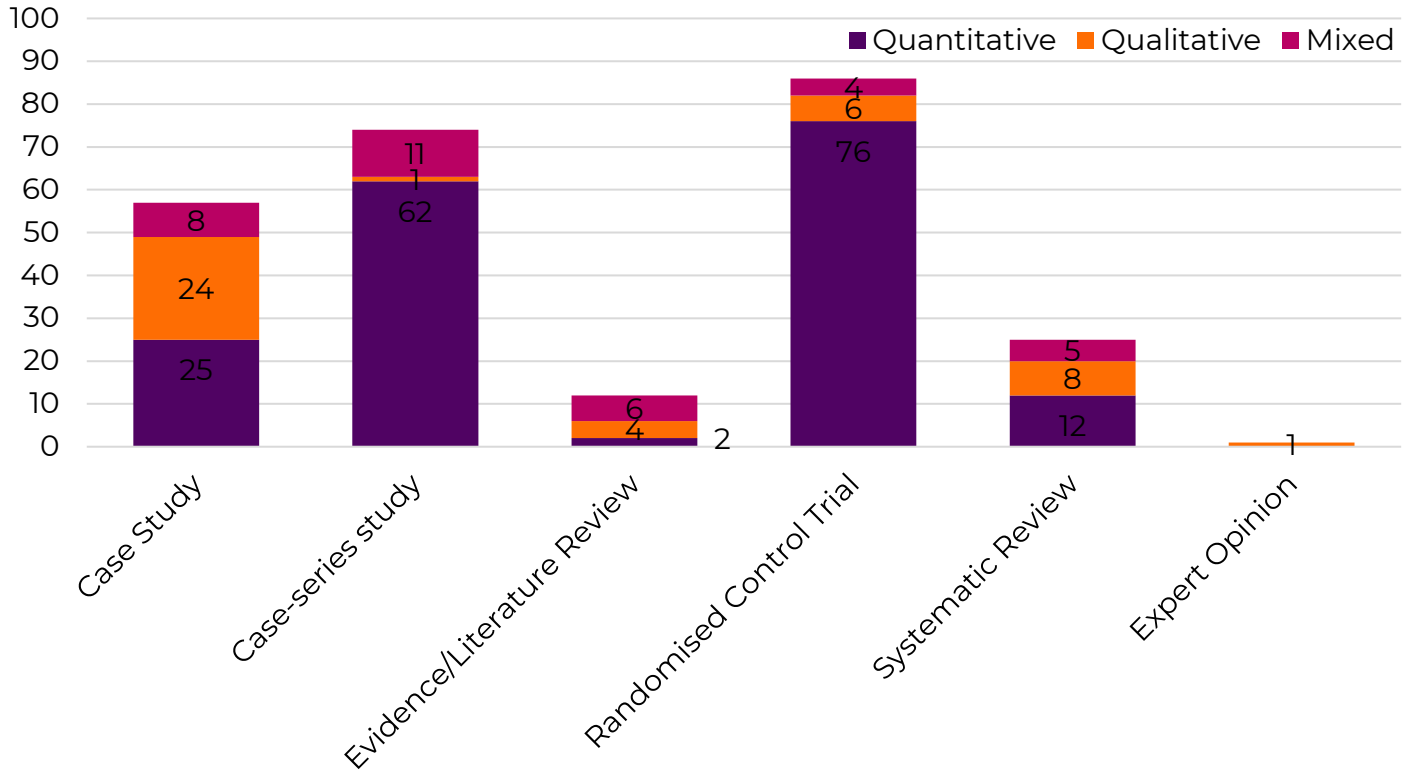
Figure 5a: Hierarchy of Evidence



3.6.2 The hierarchy of evidence reflects the quality and strength of the body of research identified during the literature review. Systematic reviews and randomised controlled trials are identified as the highest quality and strength of study, and case-series and case studies considered the weakest. For this review, it is important to note that case-series studies was the term also given to classify case-control studies.

3.6.3 The spread of studies identified by this literature review is provided in figure 5b below.

Figure 5b: Breakdown of Research Type by Method

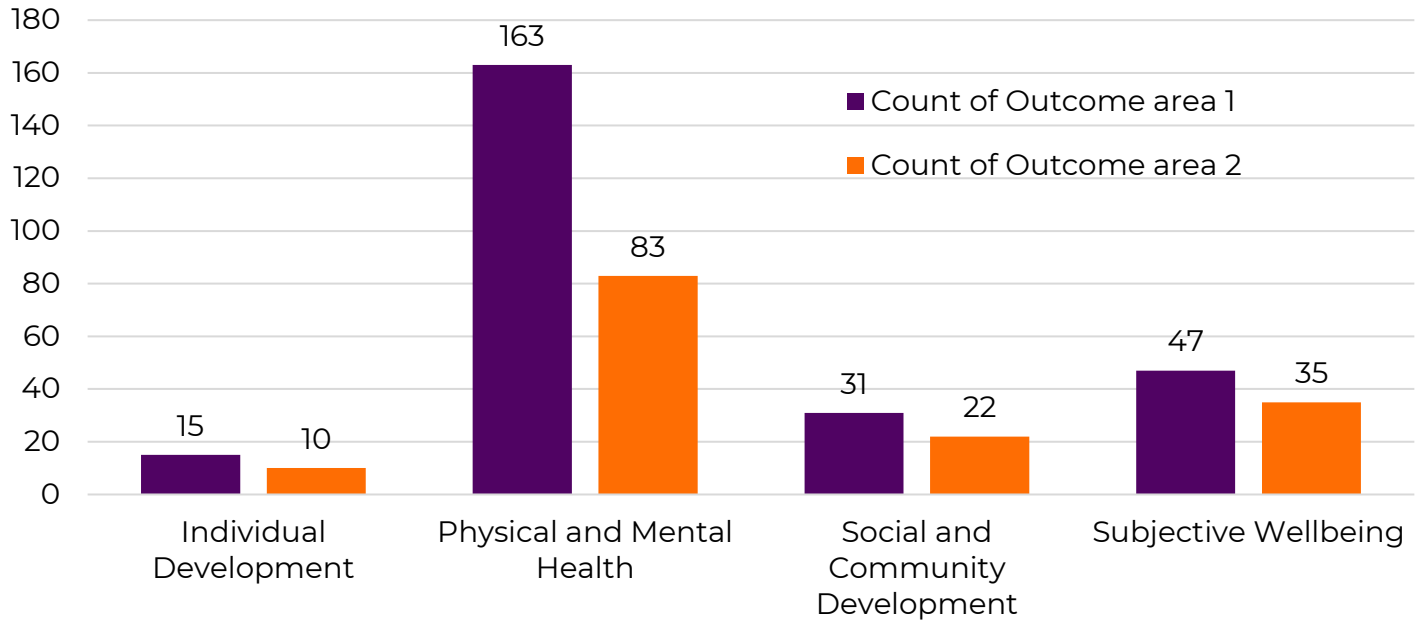


3.6.4 The most prominent research type were randomised control trials. This research type is second in the hierarchy of research and thus this shows the strength of the data sources collected. 88% of the sources that were randomised control trials produced quantitative data. The second most present research type in the literature was the case-series studies with 74 sources. Sources were categorised as 'case-series studies' if the study involved a control group but participants in the study were not randomly assigned to groups. 84% of case-series studies produced quantitative data. There was high variance in the numbers for each research type, with the least present research type being expert opinion followed by evidence/literature reviews with only 1 and 12 sources respectively.

3.7 Breakdown by Social Value Outcome Area

3.7.1 For each source, the most prevalent outcome of group exercise was listed in the database as 'outcome 1' and the second most prevalent outcome listed as 'outcome 2'. Data was collected on all four of the social value outcome areas. The findings are summarised in figure 7, below.

Figure 6: Breakdown of Social Value Outcome Areas

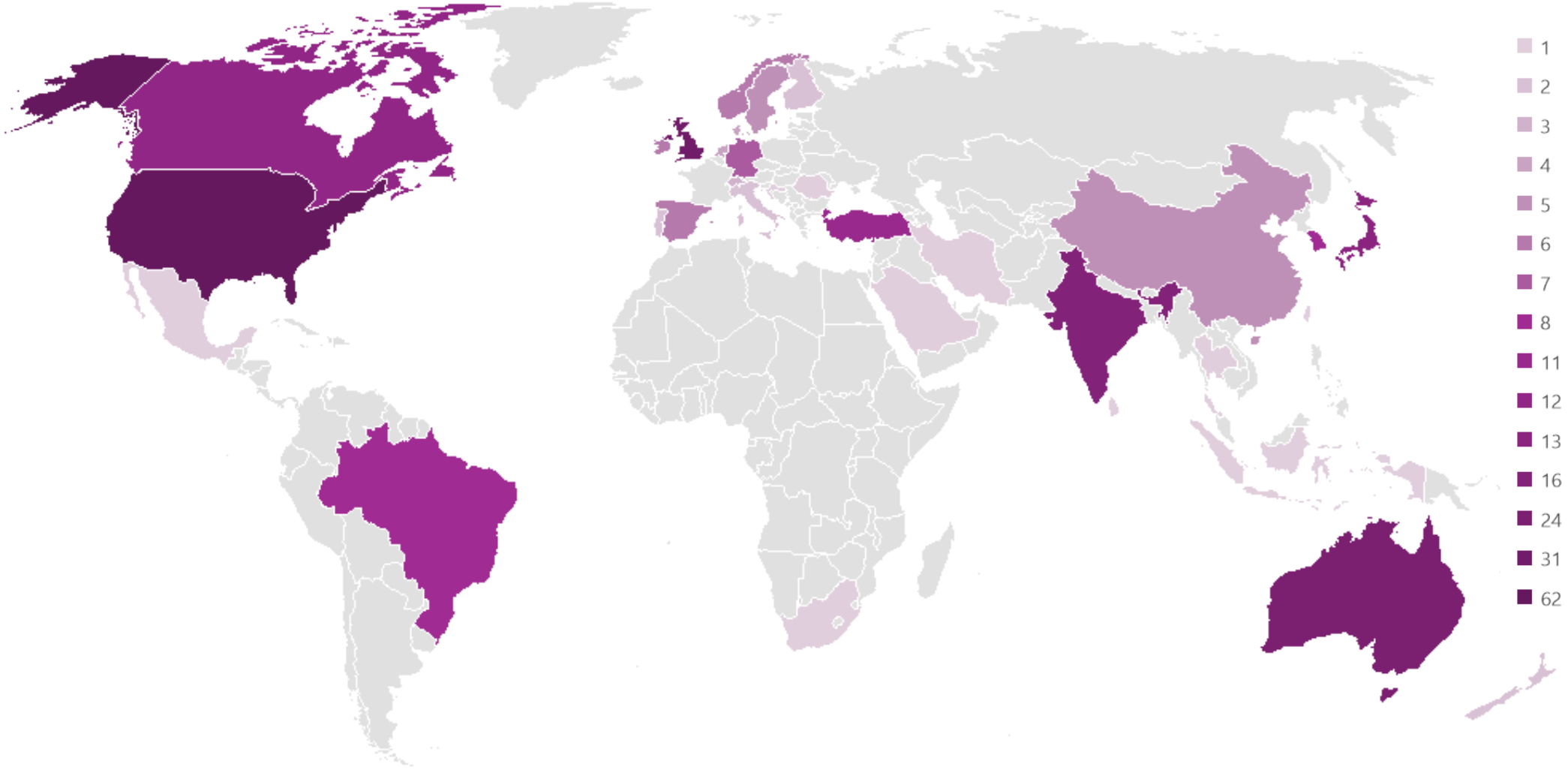


3.7.2 Physical and Mental Health was the most prevalent outcome of the review with 246 sources showing how the impact of group exercise impacts on physical and mental health. The least prevalent outcome was individual development, with 25 sources covering this outcome.

3.8 Breakdown by Country of Origin

3.8.1 There were sources found from 15 different countries. The most sources came from the United States (62 sources), the United Kingdom (31 sources). There was 1 source from Saudia Arabia and under 10 sources from 7 other countries. See the map on Figure 8 below.

Figure 7: Breakdown of Geographical Location of Study



4 Summary of Initial Findings by Outcome Area

4.1.1 This section of the report provides a summary of the key themes and areas to have emerged from an initial review of the literature. Please note, this section should not be considered to be the final version of the summary of findings from the literature review, rather it is indended to give an indication of the direction of travel for these findings. Full findings from the review will be made available in separate document in due course.

4.2 Physical And Mental Health

4.2.1 Physical and Mental Health was the most prevalent social outcome found in the database searches. The literature indicates that group exercise significantly improves physical functions such as strength, flexibility, balance, and endurance. Thirty-two sources found that group exercise in women enhanced body strength, flexibility, and balance. Similarly, four sources found that moderate-to-high intensity group exercise for stroke survivors led to significant gains in muscle strength, balance, and motor function.

4.2.2 Community-based group exercise interventions for older adults also show improvements to standing balance and lower extremity strength for participants, while specific programs like the Otago Group Exercise Programme have been effective in reducing falls and thereby reducing admissions to hospitals (Albornos-munoz, 2024).

4.2.3 Mental health benefits are equally a consistent finding in the literature. In a randomised-control trial by Zeibig (2021) Group exercise interventions for mental health outpatients in Germany demonstrated reduced global symptom severity, effectively addressing conditions such as clinical depression, insomnia, PTSD, panic disorder and schizophrenia.

4.2.4 Group exercise was also found to play a crucial role in Programs for Parkinson's disease patients, stroke and cancer survivors, highlighting the importance of group exercise in rehabilitation.

4.2.5 Furthermore, group exercise has been linked to broader health outcomes such as reduced hospital stays and healthcare costs. In one study, inpatient exercise therapy for colon cancer patients was found to reduce hospital stays and improve bowel motility and physical function.

4.3 Subjective Wellbeing

4.3.1 Subjective wellbeing was the second most prevalent outcome area found in this literature review. There is consistent finding that group exercise programs enhance subjective wellbeing across various populations. 'Quality of life' was one of the most common sub-outcomes found in this Literature Review with sixty-five sources found. Two randomised control trials by Albornos-Munoz (2024) and Aminirakan (2024) highlight the effectiveness of group exercise in improving quality of life and life satisfaction among older adults, particularly through structured and supportive environments.

4.3.2 Studies by Dennis (2024) and Fernandez-Sanchez (2024) further emphasise the health wellbeing benefits, noting significant reductions in stress, anxiety, and depression, as well as improvements in overall life satisfaction for individuals with chronic conditions and cancer patients. Supporting these findings, Yang (2022) demonstrated that group exercise programs not only improve physical health but also enhance cognitive function and improve mood.

4.3.3 Overall, the integration of physical and cognitive elements in group exercise interventions amplifies their benefits, making them a valuable component of holistic health management strategies. The literature shows how group exercise programmes effectively improve life satisfaction, play a part in tackling mental and emotional health issues, and foster a sense of community, thereby significantly enhancing subjective wellbeing for many different populations.

4.4 Individual Development

4.4.1 Individual Development was the outcome area with the least sources found. However, the literature does show positive links between participating in group exercise and the improvement of self-esteem, confidence, resilience, motivation and overall personal growth. The Literature also demonstrated the impact of group exercise on positive and pro-social behaviour change and group exercise as a strategy to reduce aggression and anger.

4.4.2 The literature includes six case and case-series studies and one randomised control trial that show that participants in group exercise felt more confident and capable due to the encouragement and camaraderie experienced during group sessions. This boost in confidence was particularly evident in programs that included goal-setting and self-monitoring components, which helped participants track their progress and celebrate their achievements.

4.4.3 Six sources explored the impact of group exercise on self-esteem. Participants reported feeling better about themselves and their abilities, which was reflected in their increased willingness to engage in other activities. The positive emotional effects of exercise, such as improved mood and reduced anxiety, also contributed to higher self-esteem. For example, Martin (2015)'s case study on cancer survivors found that group exercise, combined with supportive group psychotherapy, provided significant physical and psychological benefits, enhancing overall quality of life and self-esteem.

4.4.4 Seven studies looked at pro-social behaviour and behaviour change as a result of participation in group exercise. The positive behaviour changes found included healthier eating habits, increased physical activity outside of the group sessions, and a greater commitment to maintaining an active lifestyle. The structured and supportive environment of group exercise classes encouraged consistent participation and long-term adherence to physical activity.

4.5 Social And Community Development

4.5.1 The literature also found that Group exercise programs contribute to social and community development, fostering a sense of community, enhancing social support, and promoting social interactions among participants. These programs create environments where individuals can connect, support each other, and build meaningful relationships, which are crucial for overall wellbeing.

4.5.2 An article by Humphrey (2020) quoted the following from a regular group exercise participant with Parkinson's disease: "The people I've met here and spent time with will be my friends forever". The literature shows that the social interactions that group exercise provide are key to community development and long-term adherence to exercise. This is supported by a case-study by Cleary (2020), which highlighted that social support, structured programs, and instructor presence are key factors in maintaining attendance and enhancing motivation. Participants valued the social interactions and the sense of community that the group exercise sessions provided, which helped them stay engaged and committed to the programme.

4.5.3 Another case-study by Ferrusola-Pastrana (2024) assessed the impact of group exercise classes on relationships. The study examined the perceptions of participants and their partners in a group exercise class for Parkinson's disease delivered through a community-university collaboration. Ferrusola-Pastrana found that the support from the group, including instructors and student volunteers, empowered participants to proactively manage their health. The exercise sessions fostered strong social connections within the local Parkinson's community, highlighting the importance of community-based programs in promoting social cohesion and support. Other studies explored the social connections formed by a variety of populations, including culturally diverse older adults and at-risk adolescents.

4.5.4 Further, the literature also examines the impact of community-level group sports participation. A case-series study by Tsuji (2017) found that higher community-level participation in group sports was significantly associated with lower all-cause and cancer mortality rates. Promoting group sports within communities was found to be an effective strategy for extending life expectancy and enhancing social capital, regardless of individual participation levels.

4.6 Limitations

4.6.1 The main limitation of this review is the limited availability of literature focusing on individual development, particularly in areas such as reducing anti-social behaviour, lowering crime rates, reducing prison sentences, and improving educational attainment and employability skills. While these topics are relevant to understanding broader developmental outcomes, the scarcity of available literature in these areas results in a lack of findings for these social outcomes. This gap in research means this review does not capture these aspects of individual development and societal impact. Further research in this area is therefore recommended. That being said, we acknowledge that these areas no longer form part of the General Model 2024.

4.6.2 Another limitation is that it is possible that the search terms used did not capture every type of group exercise. The search terms aimed to capture many types of group exercise, including yoga, Pilates, boxing, aquatic exercise, spin exercises, etc. However, the review results were limited to the findings identified through the search terms used, and so other types of group exercise that weren't included as a search term may not have been captured by this review.

4.7 In Summary

4.7.1 The initial findings show a wide range of recently published papers covering all four of the social outcome areas. There is significant weighting towards sources focussing on the impact of group exercise on physical and mental health. There is a substantial amount of literature on strength, balance and improving physical health. Another heavily reported topic is the impact of group exercise on quality of life. This sub-outcome has the second highest number of sources following the outcome of physical and mental health. There is also substantial evidence in the literature for group exercise producing strong community connections, support networks, and long-term adherence to healthy habits.

4.7.2 These findings will be supplimented with a final report which will detail each social outcome thoroughly to assess the social impact of group exercise.

5 Results

5.1 Physical and Mental Health

5.1.1 Physical and Mental Health was found to be the most prevalent social outcome. 246 sources focus on physical and mental health which equates to 80% of total sources. The impact of group exercise on supporting individuals with Cancer is most common sub-outcome.

5.2 Reduction in Hospital Visits, Falls and Healthcare costs

5.2.1 A total of 35 articles were reviewed in this area, including six focused on reducing hospital visits, 12 on reducing falls, and 12 on reducing healthcare costs. Some studies covered multiple outcomes. The research included 10 randomised controlled trials, two literature reviews, one systematic review, and five case-series studies.

5.2.2 A randomised control trial examined the effects of a post-surgical inpatient exercise program on colon cancer patients (Ahn, 2013). The study found that patients in the exercise group had an average hospital stay of 7.82 days, compared to 9.86 days in the usual care group. The findings suggest that low-to-moderate intensity post-surgical exercise can reduce hospital stays and improve recovery. Additionally, a case-series study found that group circuit therapy significantly reduced hospital stays (English, 2012). The study also highlighted the efficiency of group settings in optimising therapist-to-patient ratios, potentially lowering healthcare costs.

5.2.3 A case study by Oestergard (2018) focused on 303 acutely hospitalised geriatric patients. Those in the exercise intervention group had significantly shorter hospital stays (9.8 days) compared to the control group (12.2 days). Coyle et al (2020) evaluated the effectiveness of the 'On The Move' (OTM) community-based group exercise program through a randomized controlled trial. Results indicated a decreased incidence rate of hospitalization for participants compared to usual care (IRR = 0.88; 95% CI = 0.59–1.32), with stronger estimates when controlling for attendance (adjusted IRR = 0.82; 95% CI = 0.56–).

5.2.4 These studies provide strong evidence that group exercise programs contribute to shorter hospital stays and reduced healthcare costs, supporting their role in improving public health outcomes.

5.2.5 Examining further into the impact of group exercise on fall risk, several recent studies provide evidence in support of group exercise reducing fall risk. In their randomised control trial, Aranda-Reneo (2021) found that the fall risk was 10% lower when exercises were delivered in a group setting. The study assessed the cost-effectiveness of the Otago Exercise Program (OEP) for reducing fall risk in 498 healthy, non-institutionalised older people.

5.2.6 In their case study of 82 older adults, Wells (2024) reported that participation in group exercise increased confidence and reduced the fear of falling. Skinner et al (2016)'s case study also found that the proportion of community-dwelling adults defined as high fall risk reduced from 38% to 21% after participating in a group Aqua balance program. In their case-series study Hinman (2020) showed that participants in the group exercise class experienced significantly fewer falls compared to those following a home exercise program (HEP), with an 80% reduction in fall risk for the group exercise group. The study also found that participants who participated in the group exercise program had an average increase of 5% in their balance confidence scores, while HEP participants saw a 6% decrease. Iliffe (2014) observed a statistically significant reduction in fall rates in the Falls Management Exercise program, which involved weekly group classes, compared to the usual-care arm in elderly care residents.

5.2.7 These studies collectively highlight the positive impact of group exercise programs on reducing fall risk and improving balance confidence among older adults. The findings suggest that group exercise can be a cost-effective way to provide ongoing support and supervision, this finding will be further examined in the following paragraphs.

5.2.8 Aranda-Reneo (2021) highlighted the financial savings of running a group exercise class compared to individual sessions. They found that the cost per patient was 51.28 US dollars lower for the group sessions compared to individual sessions in the control group. This is further supported by Dennis (2024) who, in their systematic review, highlighted that group formats make interventions more accessible and cost-effective by allowing multiple participants to receive support simultaneously, reducing healthcare costs and demands on the health system. Additionally, a case-series study emphasised that regular participation in group exercise can maintain health and independence in older adults, potentially lowering healthcare costs and the burden on the healthcare system (Hamar, 2013).

5.2.9 In their randomised control trial, May (2017) conducted a cost-effectiveness analysis for colon cancer patients. The benefits to the patients' health and wellbeing through participating in a group exercise intervention was calculated to amount to incremental cost savings of €4321. Researching the costs saved on hip fractures specifically, Scheckel (2021) conducted a case-series study evaluating the cost-effectiveness of a group-based program for independently living people aged 75 and above. The study found that the costs per hip fracture avoided were €52,864 for women and €169,805 for men, indicating that group-based exercise may not be a cost-effective option for preventing fall-related hip fractures in this population.

5.2.10 These studies collectively demonstrate that group exercise programs can reduce healthcare costs and alleviate pressure on national health systems, by making interventions more accessible, maintaining health and independence in older adults, and providing economic benefits through cost savings and improved health outcomes.

5.3 Improvements in Physical Health Functioning and Mobility

5.3.1 Recent studies have highlighted the significant benefits of group exercise programs for improving mobility, functional performance, and overall health. A total of 8 sources were reviewed in this area. The sources consisted of 2 randomised control trials, 5 case-series studies and 1 case study.

5.3.2 In their case-series study, Oestergard (2018) found that patients who fully complied with the group exercise program showed significant improvements in mobility, as measured by the De Morton Mobility Index (DEMMI). Additionally, older adults in the case-series study demonstrated better functional performance, indicating enhanced mobility and reduced fall risk. Participants also reported improved nutritional habits, including increased consumption of fruits and vegetables and higher daily water intake following completion of the exercise program.

5.3.3 In their case-series study and randomised control trial, Brach et al (2024) evaluated the On the Move (OTM) group exercise program and found significant improvements in gait speed, a critical measure correlated with functional ability, mobility and balance confidence. The benefits of the OTM program persisted even after the intervention ended, indicating long-term positive effects on mobility. The study also emphasized the importance of maintaining high intervention fidelity to ensure the program's success in real-world settings.

5.3.4 Further evidence of the positive impact group exercise can have on mobility was found by Powell-Cope (2014) in their randomised control trial, which found that participants with peripheral neuropathy who participated in Functional Balance Training (FBT) and Tai Chi group exercise programs reported significant improvements in mobility and stability. These improvements were maintained at the 6-month follow-up, with participants continuing to use "balance tricks" learned during the classes.

5.3.5 Looking more specifically into the impact on general cardiovascular health, Verrusio's (2016) randomised control trial with patients with metabolic syndrome found a significant reduction in blood pressure through participation in spin classes. The study provided preliminary evidence that spinning training may be a useful and safe intervention for middle-aged and older adults with multiple cardiovascular risk factors.

5.3.6 The findings of these studies demonstrate that group exercise programs can significantly improve mobility, functional performance, and overall health in older adults. The implications for healthcare are substantial, as these programs can reduce healthcare costs and alleviate pressure on the NHS by promoting better health and reducing the need for long-term care.

5.4 Chronic Heart Disease and Stroke

5.4.1 There was a total of 11 sources in this area, 7 sources looking at the impact of group exercise on stroke patients and their symptoms and 4 looking at the impact on patients with chronic heart disease (CHD) The sources on stroke patients/survivors consisted of 2 randomised control trials, 2 systematic reviews and 3 case-series studies. Whilst the sources on CHD had consisted of 4 sources being randomised control trials.

5.4.2 The studies that highlight the significant benefits of group exercise programs for stroke patients/survivors, particularly focus on improved mobility, physical health, and the cost-effectiveness of group exercise.

5.4.3 In their case-series study, English (2012) found that stroke survivors participating in group exercise therapy showed improved walking speed and walking economy compared to those receiving traditional one-on-one therapy. Additionally, group exercise therapy participants experienced significant gains in cardiorespiratory fitness and leg muscle strength.

5.4.4 Kim (2014) conducted a randomised control trial with 28 hospitalised stroke patients, focusing on task-oriented gross motor group exercise. The experimental group showed significant improvements in neuromusculoskeletal and motor-related functions, including joint and bone mobility, muscle power, muscle tone, muscle endurance, and overall motor function. In contrast, the control group did not show significant changes in any of these functions. Additionally, Jung (2024) studied 30 stroke survivors and found that after 8 weeks of moderate-to-high intensity group exercise, participants showed significant improvements in isometric muscle strength of hip extensors, knee flexors, grip strength in both affected and unaffected limbs, and cognitive function.

5.4.5 Mental health benefits were also found through participation in group exercise. In their case-series study, McDonnell (2014) reported that levels of stress and depression were significantly higher in stroke survivors who did not engage in regular exercise compared to those who exercise regularly.

5.4.6 These findings suggest that group exercise programs can significantly enhance mobility, physical health, and mental well-being in stroke survivors. The implications for healthcare are substantial, as these programs can reduce healthcare costs and improve the quality of life for stroke patients by promoting better physical and mental health outcomes.

5.4.7 Looking into the impacts of patients with chronic heart disease, Gurunathrao (2024) conducted a randomised control trial with 110 CHD patients, of which 82 completed the study. The Yoga-CaRe program significantly improved endothelial function by reducing ET-1 and modulating adhesion molecules, and it enhanced antioxidant capacity. Participants experienced notable physical health benefits, including significant improvements in flexibility and muscle strength, as well as a reduction in chronic pain and inflammation. Mental health improvements were also observed, with decreases in stress and anxiety levels, and enhanced mood and emotional well-being. Cardiovascular health benefits included lowered blood pressure and heart rate, improved circulation, and cardiovascular endurance. Overall quality of life was enhanced, with participants reporting better sleep quality, increased energy levels, and a greater sense of mindfulness and relaxation.

5.4.8 The randomised control trial involving 60 patients by Christle (2024) found slightly contradictory evidence. They found stronger evidence for a positive impact on CHD patients when they participated in individualized combined exercise (ICE) in addition to group exercise programs. The findings suggest that rehabilitation programs should not be limited to only group exercise, as ICE proved to be an effective method in improving physical activity and overall health in those with cardiac disease. The study also indicated that relatively low volumes and intensities of exercise could lead to substantial improvements in both physical activity levels and health-related quality of life. Additionally, supplemental resistance exercise may enhance health-related quality of life and increase physical activity levels in patients with low exercise capacity.

5.5 Type 2 Diabetes

5.5.1 There were 9 sources on Type 2 Diabetes, 5 of these being randomised control trials, 1 being a systematic review and another being an evidence/literature review. This means the data evidence is of a strong research type. For conditions such as Type 2 diabetes, group interventions involving exercise and lifestyle education were particularly effective in managing blood glucose levels and improving overall health. Similar benefits were seen in cardiovascular fitness and reduced hospital admissions for heart-related conditions (Dennis, 2024).

5.5.2 A case series study into the effect of Pilates on anxiety, depression and anthropometric indices of women with Type 2 diabetes found significant improvements across all three areas following participation in group exercise. Furthermore, waist circumference and waist to hip ratio also reduced notably. The study concluded that exercise is a crucial non-pharmacological intervention in the management of diabetes and recommended that Pilates be used method to reduce anxiety and depression and enhance anthropometric indicators in this population (Alizadeh, 2023).

5.5.3 Remaining with the topic of Pilates, a randomised control trial found that an exercise protocol based on the Pilates method produced a reduction in glycated haemoglobin and oxidative stress on people with type 2 diabetes (Gouveia, 2021). Another separate randomised control trial observed improvements in various dimensions of quality of life, including physical functioning, general health, and vitality, among the participants who engaged in Pilates exercises. In this study, there were no significant change in the body mass index of participants (Yucel, 2016).

5.5.4 Vendramin et al (2019) found that Zumba and walking are both effective in reducing blood glucose levels and improving the quality of life in subjects with type 2 diabetes, but Zumba shows better results as compared to Walking. Finally, a case-series study in 2016 found that a long-term community-based combined exercise programme, developed with low-cost exercise strategies, produced significant benefits in physical fitness in middle-aged and older patients with type 2 diabetes. This supervised group exercise programme significantly improved aerobic fitness, muscle strength, agility/balance and flexibility, assessed with field tests in community settings (Mendes, 2016).

5.6 Cancer

5.6.1 There were 30 papers on cancer, this included colon and breast cancer.

5.6.2 Looking at breast cancer specifically, a randomised control trial exploring a yoga intervention into 69 women (98 prior to dropouts post-surgery) with breast cancer concluded that yoga could be used as a psychotherapeutic intervention in breast cancer patients undergoing conventional treatment due to its measurable benefits around supportive therapy counselling on mood states, treatment-related symptoms, toxicity, and quality of life in Stage II and III (Rao, 2017). Another randomised control trial concluded that interventions based on the Pilates method may bring positive results in quality of life, fatigue, and sleep quality in patients undergoing adjuvant treatment for breast cancer (Lawrence, 2017). A lot of women aren't aware of the benefits that group exercise can have post cancer recovery. Therefore, oncology nurses may play a unique role in informing and stimulating female breast cancer survivors to partake in breast cancer-specific exercise programs (Jones, 2020). This case study also concluded that shaping a route to adherence to such exercise programs is essential for breast cancer survivors to become and stay sufficiently active.

5.6.3 A study in Australia evaluating the short-term impact of YWCA Encore, a mixed-modality group exercise and information support program for breast cancer patients situated in the community setting found that participants showed significant improvements in quality of life compared to the control group. This was particularly evident in the Trial Outcome Index (TOI), which measures physical, functional, and breast cancer-specific well-being. The program significantly enhanced participants' satisfaction with social support. The study found that improvements in self-efficacy (confidence in performing exercises) and familiarity with exercise were significant mediators of the positive impact on quality of life. This means that the program helped participants feel more capable and knowledgeable about exercise, which in turn improved their overall quality of life. Participants reported significant increases in functional ability and energy levels after completing the program. Distress levels decreased over the eight-week period for all participants, regardless of group assignment (Sherman, 2010). Similar findings were found in a systematic review of literature pertaining to children with cancer (Doi, 2024).

5.6.4 A systematic review of available literature found that group exercise programs, typically prescribed and supervised by allied health professionals, were effective for improving health outcomes in adults with chronic conditions. These outcomes included better physical function, reduced symptoms, and improved quality of life across conditions like cancer and more (Dennis, 2024).

5.6.5 As well as improving health outcomes, group exercise improves life satisfaction in cancer patients. A meta-analysis found that exercise intervention improved satisfaction in people with cancer when compared to the control group. The analysis concluded that exercise could be considered an effective tool to improve life satisfaction in patients with cancer. Hence, professionals might consider the possibility of integrating physical exercise into strategies aimed at enhancing the low life satisfaction often experienced by patients. This could be associated with a better prognosis and self-esteem and with less stress, anxiety, depression and frustration (Fernandez-sanchez, 2024).

5.6.6 A seven-year longitudinal study into community-level group sports participation and all-cause, cardiovascular disease, and cancer mortality produced some extraordinary findings. Among the participants, 5,711 (13.3%) deaths were identified, with 1,311 related to cardiovascular disease and 2,349 to cancer. The average group sports participation rate was 28.3%. After adjusting for individual-level group sports participation and potential confounders, a higher community-level group sports participation rate was found to be significantly associated with a lower risk of both all-cause mortality and cancer mortality for every 10% point increase in the participation rate. The findings support the existence of a preventive relationship between community-level group sports participation and the occurrence of all-cause and cancer mortality among older individuals. Promoting group sports within communities holds promise as an effective population-based strategy for extending life expectancy, regardless of individual participation in these groups (Tsuji, 2024).

5.6.7 Group exercise has been shown to reduce the length of stay in hospital for people with colon cancer (stages I, II and III) by ~two days on average in a randomised control trial that took place in 2013 (Ahn, 2013).

5.6.8 Group exercise instructors play a key role in fostering a positive environment for people with cancer. In a qualitive case study conducted in 2015, the overarching findings were that instructors play an essential role in creating a supportive climate and fostering positive experiences in group-based exercise programmes for breast cancer survivors. Therefore, hiring caring and knowledgeable instructors who are able to create a supportive climate may enhance breast cancer survivors' experiences in group-based exercise programmes and promote sustained participation (Brunet, 2015).

5.6.9 When considering the effect of a pre and post operative exercise program versus standard care on physical fitness of patients with oesophageal and gastric cancer undergoing neoadjuvant treatment prior to surgery, a randomised control trial concluded that community exercise prehabilitation program significantly improves physical fitness for surgery, is feasible and provides a standardised framework for the prescription of exercise in esophagogastric cancer patients undergoing neoadjuvant chemotherapy. A community-based exercise program can have a meaningful impact on physical fitness in patients undergoing neoadjuvant therapy for oesophago-gastric cancer (Loughney, 2024).

5.6.10 Community-based exercise programmes have also been used for men that have prostate cancer. A study that looked at the impact of a nationwide community exercise and support programme for men with prostate cancer in Australia produced promising findings. The programme consisted of supervised moderate to vigorous-intensity aerobic and resistance training group exercise sessions conducted weekly or bi-weekly over 10-18 weeks and investigated the impact on body weight, cardiovascular health, and physical function outcomes. The study found that the group exercise and support program was effective in preventing weight gain, reducing blood pressure, and improving physical function in patients with prostate cancer treated with androgen-deprivation therapy. Moreover, patients presenting with the poorest outcome measures at baseline benefited the most from participating in the structured and supervised exercise sessions (Schaumacher, 2022).

5.7 Dementia

5.7.1 No peer reviewed studies have explored the role of group exercise in protecting participants from the on-set of dementia. There has been more research into group exercise therapy as means of supporting those with cognitive impairments; the outcomes of these maybe impacted by type and style of group exercise used. There were 4 sources on the impact of group exercise on supporting persons with dementia.

5.7.2 Although there is currently no cure for dementia, group exercise has been shown to reduce anxiety and depression significantly while also improving the mood of older adults in care homes (Frampton, 2024) (Long, 2020).

5.7.3 Older people living with dementia or a mild cognitive impairment are more vulnerable to experiencing social isolation and loneliness due to their cognitive and physical impairments. Integrating technology (e.g. exergames, virtual cycling or online classes) into group exercises contributes to improved resilience and well-being of older adults living with dementia and mild cognitive impairments (Long, 2020). A literature review conducted in 2024 found that across 379 participants living with dementia, those who participate in group exercise see improved cardiovascular fitness and muscle strength alongside enhancements in both mental wellbeing and social interaction (Hung, 2024). Furthermore, the review observed improvements in lifestyle choices, such as healthier eating habits and increased physical activity outside of the group sessions.

5.8 Clinical Mental Health

5.8.1 There was a total of 44 sources that looked at clinical mental health issues/disorders. 39 sources looked at clinical depression and anxiety, 3 sources looked at PTSD and 2 sources looked at impact of group exercise on Schizophrenia.

5.8.2 There is a growing prevalence of prolonged antidepressant use globally. Social group interventions may be an effective way to manage mild to moderate depression, especially with patients seeking to discontinue antidepressant use. A systematic review has found that group exercise reduces mild to moderate depression symptoms effectively, with some studies reporting large effect sizes in symptom reduction. Furthermore, participants in group exercise programs often benefited from the social support and interaction that come from exercising in a group, which is a crucial element in depression management. These findings indicate that social group interventions are an effective way to manage mild to moderate depression symptoms in a variety of populations and the approach may also help to prevent relapse among patients tapering off antidepressant medication (Dingle, 2021).

5.8.3 People participating in group exercise often report significant mental health benefits and group exercise has been shown to significantly improve physical and psychological quality of life domains for people with depression (Schuch, 2016). This is especially true for older adults with mild cognitive impairments where randomised control trials have evidenced statistically significant improvements in depression scores (Sanchez-alcala, 2024) which have contributed to quality-of-life improvements across the board. Other studies have also noted enhanced cognitive function, increased life satisfaction and a reduction in depression (Sok, 2021).

5.8.4 Additionally, evidence suggests that group exercise participation helps to reduce the likelihood of elderly people experiencing a trip/fall or living a sedentary lifestyle, which contributes to decreased anxiety and depression and improved subjective wellbeing (Yang, 2022)

5.8.5 Rates of clinical anxiety in postpartum women are higher than those in women from the general population. An eight-week outdoor group exercise intervention on postpartum mental health, exercise self-efficacy, and exercise motivation found a significant reduction in anxiety after the intervention. There were also non-significant improvements in depression, perceived stress, and trait anxiety. In addition, the randomised control trial found a significant improvement in meeting basic psychological needs (competence), and a significant improvement in autonomous regulation (intrinsic motivation) (Hatfield, 2022).

5.8.6 The 'group' environment plays a key role in preventing cases of depression, but the type of activity is also a factor. In 2014 a study segmented sedentary women into two groups who participated in different group exercise classes and compared the changes in depression scores after eight weeks. Depression level measured before the start of the two-month exercise did not show meaningful difference between two groups but when the values after two months were compared, it was found that the depression level of the group doing aerobic-step exercise was statistically lower than that of the group doing aerobic-core exercise (Atan, 2014). That being said, there is limited research that compares the impact of different group exercises classes on depression, and it is particularly challenging to control for other influential variables.

5.8.7 The 'group' environment plays a key role in preventing cases of depression, but the type of activity is also a factor. In 2014 a study segmented sedentary women into two groups who participated in different group exercise classes and compared the changes in depression scores after eight weeks. Depression level measured before the start of the two-month exercise did not show meaningful difference between two groups but when the values after two months were compared, it was found that the depression level of the group doing aerobic-step exercise was statistically lower than that of the group doing aerobic-core exercise (Atan, 2014). That being said, there is limited research that compares the impact of different group exercises classes on depression, and it is particularly challenging to control for other influential variables.

5.8.8 Recent studies have assessed the impact of group exercise on people with PTSD, highlighting significant benefits for both physical and mental health.

5.8.9 Telles (2012) conducted an evidence review on various trauma-affected populations, including children who have experienced trauma, war veterans, and survivors of natural disasters and terrorism. The review found that yoga and meditation practices significantly reduced PTSD symptoms in these groups. The randomised control trial included 47 veterans and involved three 1-hour group exercise sessions per week for 12 weeks, combining aerobic and resistance exercise. The group-based Integrative Exercise (IE) program led to greater improvements in psychological quality of life (d = .53) and smaller relative improvements in physical quality of life.

5.8.10 In Wolf's (2024) randomised control trial ten outpatient rehabilitative and medical care facilities participated in a study involving outpatients aged 18-65 diagnosed with moderate or severe depression, primary insomnia, PTSD, panic disorder, or agoraphobia. The randomized control trial suggested that exercise therapy should be implemented in outpatient mental health care as an adjunctive transdiagnostic treatment for these mental disorders. The findings indicate that transdiagnostic group exercise interventions could help bridge the gap between the many individuals in need of evidence-based treatment and the few who receive it.

5.8.11 These studies underscore the importance of incorporating group exercise programs into mental health care for individuals with PTSD and other mental health disorders. The implications for healthcare are substantial, as these programs can improve psychological and physical quality of life, reduce symptoms, and provide accessible and effective treatment options for a wide range of mental health conditions.

5.8.12 There is also evidence that group exercise can have an impact on schizophrenia symptoms. Arasappa (2024) conducted a case-series study to assess feedback from patients attending yoga sessions at a tertiary neuropsychiatric hospital. Improvements in overall health and sleep were noted. A minority reported adverse effects, but these did not lead to discontinuation. The study concluded that most patients with major mental disorders could practice yoga under supervision and experienced significant symptom improvement with minimal adverse effects.

5.9 Chronic Pain

5.9.1 This section looks specifically at chronic back pain but also delves into the evidence found for the impact of group exercise on disability and general chronic pain.

5.9.2 9 sources assessed the impact of group exercise on chronic pain and disability whilst 6 sources focused on chronic back pain specifically. However, these sources found little convincing evidence on the impact of group exercise on people that suffer from lower back pain. More research is required in this area.

5.9.3 From the research that has been conducted, mixed results have been reported, particularly where group exercise has been used to supplement other treatment plans for lower back pain. When comparing two groups of people with chronic lower back pain who received pain biology education, a 2010 study found that while pain biology education was effective in reducing pain and improving self-efficacy by reshaping beliefs about pain, the group that participated in group exercise classes alongside this education saw no added benefits (Ryan, 2010). Furthermore, there is evidence to suggest that there is no significant difference in the perception of pain for those participating in group exercise classes compared to those receiving physiotherapy for their lower back pain (Daulat, 2016).

5.9.4 One study found that yoga leads to slight improvements in back function and pain compared to non-exercise controls, though these differences were generally considered small and clinically unimportant (Wieland, 2022). Another looked at the impact of a virtual group exercise intervention on the lower back pain of eldercare workers and concluded that those in the exercise group lowered their low back pain intensity. Improvements in additional low back and hand/wrist pain outcomes were also observed, as well as on upper limb muscle performance improvements (Espin, 2024).

5.9.5 Group exercise is often lauded as a terrific way to keep active because of the positive impacts derived through exercising as part of a group. When comparing the impact of group exercise on participants with lower back pain to those who follow individual exercise programmes, limited differences have been found in lower back pain, physical function and activities of daily living. That being said, significant quality of life improvements were observed in group exercise participants compared with those who exercised individually (Takeuchi, 2011).

5.9.6 While there is conflicting evidence as to the impact of group exercise on lower back pain, there is some strong evidence around its ability to improve the disabilities and chronic pain exhibited by regular participants. One study explored the impact of group exercise on (predominantly) female participants. It found that pain intensity improved markedly during the first six months of the programme with further minimal reductions noted up to the 12-month mark. An interesting finding from the study was that the disability of participants improved to a greater degree than their self-reported pain improvements (Steffens, 2012).

5.9.7 A randomised control trial by Caputo (2017) assessed the impact of group-based neck-shoulder resistance exercises in workers with chronic pain. They found strong evidence that these exercises were effective in reducing pain and disability among video display unit workers with chronic neck pain.

5.9.8 Furthermore, a key study by Kempert (2019) also found that group exercise did have a positive impact on chronic pain levels in children. Paediatric chronic pain patients identified many benefits after a single group yoga session. Yoga was found to combine the physical and cognitive aspects of interdisciplinary pain rehabilitation for continued use after discharge.

5.9.9 Further evidence support was found in the case-series study by Hamar (2013). They found that participants in a group exercise program experienced less impairment in activities of daily living (ADLs) like bathing, dressing, eating, and walking. The treatment group had a higher percentage of members with no ADL impairments and a lower disability index compared to the comparison group.

5.10 Other Diseases

5.10.1 Whilst the Literature Review did not initially focus on these outcomes in the searches, strong evidence for the impact of group exercise on people with Parkinson's and Multiple Sclerosis (MS) was found. 9 sources were found on the impact on MS and 9 on Parkinson's.

5.10.2 In their case study, Domingos (2022) found that group exercise programs for Parkinson's disease patients significantly improved motor functions, balance, gait, and overall physical activity levels. Similarly, Rosenfeldt's (2022) case study reported notable improvements in Movement Disorders Society-Unified Parkinson's Disease Rating Scale Motor III (MDS-UPDRS III) scores and cognitive function, particularly in immediate recall. These findings are also supported by States (2011) who observed that long-term participants in a community-based group exercise program showed significant improvements in grip strength and a trend toward better 6MWT performance, with no significant changes in gait speed or Timed Up and Go test results. These findings suggest that group exercise programs are not only safe and feasible but also effective in enhancing physical and cognitive functions in individuals with Parkinson's disease, making them a promising option for managing progressive neurological disorders.

5.10.3 Research highlights the positive impact of group exercise programs on individuals with multiple sclerosis (MS). Horton (2015) found that participation in exercise programs led to improvements in physical function, psychological well-being, independence, and social relationships, counteracting the typical decline associated with MS. Similarly, Garg (2024) demonstrated significant post-training functional gains ($P < 0.05$) from a 13-week virtual group exercise program, proving its feasibility, safety, and effectiveness. In their randomised control trial, Taracki (2018) further supported these findings, showing that supervised group exercise improves balance, functional status, spasticity, fatigue, and overall quality of life in individuals with moderate MS, with no clinical deterioration.

5.11 Subjective Wellbeing

5.11.1 Subjective wellbeing was the second most prevalent outcome area found in this literature review with 82 sources found on this topic, equating to 27% of total sources. There is a consistent finding that group exercise programs enhance subjective wellbeing across various populations. 'Quality of life' was the most common sub-outcome under subjective wellbeing and also one of the most common sub-outcomes found in this Literature Review with sixty-five sources found.

5.12 Emotional and Cognitive Health

5.12.1 In this section, there are 7 sources on emotional health and 11 on cognitive health.

5.12.2 Group exercise significantly contributes to emotional health, which encompasses one's ability to understand, express, and manage emotions, fostering resilience and overall well-being. Case-series studies show group exercise programs that include dance or Tai Chi address psychological needs, reduce stress, improve mood, and enhance cognitive engagement (Domingos, 2022). Case studies also find that group exercise can promote greater acceptance of one's condition, foster a positive outlook and resilience in participants with Parkinson's disease (Strassheim, 2021). The literature also shows that group exercise can be a tool for maintaining sobriety in participants recovering from drug abuse (Nowakowski-Sims, 2018). This case study found that participants often experience empowerment, regain control, establish healthy habits, and benefit from the supportive community of group exercise that reduces isolation, increases motivation, and leads to improvements in physical and emotional health, stress management, and overall well-being.

5.12.3 Cognitive health encompasses various mental functions, including memory, attention, and processing speed, all crucial for maintaining independence and quality of life, especially in older adults and those recovering from brain injuries.

5.12.4 The literature indicates that specific exercise programs can significantly improve cognitive function. In their systematic review, Yang (2022) shows that the Otago Exercise Programme (OEP) has been shown to enhance cognitive abilities in older adults, improve lower limb strength and balance, and promote gait stability, ultimately reducing the risk of falls. This systematic review also highlights that OEP helps overcome the fear of falling, fostering a positive attitude towards exercise, reducing sedentary behaviour and depression, and improving overall well-being.

5.12.5 Furthermore, case-series studies such as Sok (2021) and Van Camp (2015) show that incorporating cognitive tasks into exercise routines, such as memory games and coordination with music, provides mental stimulation and enhances cognitive function, particularly attention and executive function. This dual-tasking aspect is particularly beneficial for older adults, as it closely mimics the cognitive demands encountered in daily life. Additionally, In a 2020 systematic review, Wang et al. found that multicomponent exercise programs, particularly those lasting 12 months, significantly improved global cognitive function, attention, and executive function. However, the review did not find significant improvements in memory.

5.12.6 For individuals with traumatic brain injury, case studies such as Quilico (2020) show that regular physical activity can also positively impact cognitive abilities, improving memory, concentration, and processing speed, while also promoting alertness and mental sharpness.

5.13 Life Satisfaction

5.13.1 There is substantial evidence highlighting the multifaceted impact of group exercise on various aspects of well-being, including life satisfaction, mood, and sleep quality. There are 17 sources in this area, 9 on life satifaction and improving mood and 8 on improving sleep quality.

5.13.2 The literature finds several studies that indicate that group exercise contributes to enhanced mood, reduced loneliness, and greater overall life satisfaction (Wells, 2024). In a randomised controlled trial, Aminirakan (2024) demonstrated that group resistance training improves muscle strength and function, with a combined cognitive-resistance intervention linked to higher life satisfaction due to increased physical independence and cognitive engagement. Similarly, a randomised controlled trial by Curi (2018) found significant improvements in life satisfaction scores among healthy elderly women who participated in a Matt Pilates program compared to a control group, suggesting its positive effects on healthy aging. Case-series studies, such as Sok (2021), reinforce these findings, indicating that regular group-based cognitive and physical exercise enhances well-being by fostering positive social interaction and elevating mood.

5.13.3 The implications of these findings suggest that group exercise can be a powerful tool for promoting well-being across various populations, with potential benefits for physical health, cognitive function, and social connectedness. Furthermore, a systematic review by Fernandez-Sanchez (2024) found that exercise interventions improved life satisfaction in people with cancer, and a literature review by Hsueh (2021) found that patients with breast cancer practicing yoga exhibited significant improvements in physical and mental well-being and sleep quality, along with reductions in anxiety, depression, stress, fatigue, and pain severity.

5.13.4 Another randomised controlled trial by Leite (2024) suggested that interventions based on the Pilates may bring positive results in quality of life, fatigue, and sleep quality in patients undergoing adjuvant treatment for breast cancer.

5.13.5 The identifcation of strategies to improve life satisfaction in patients with cancer is of great interest to health practitioners since it may be associated with a better prognosis of cancer higher survival rates. The literature finds significant evidence concludes that group exercise should be considered an effective tool to improve life satisfaction in patients with cancer and therefore should be implimented in strategies by health practioners.

5.14 Stress

5.14.1 There are 9 sources that look at the impact of group exercise on stress levels. These studies include cases of anxiety and stress that aren't clinically diagnosed.

5.14.2 The literature shows evidence for the positive impact of group exercise on stress management. In a randomised controlled trial, Frith (2011) found that aerobics, circuit training, and Tai Chi classes all led to significant reductions in anxiety, anger, tension, and stress, while also increasing overall pleasant feelings. Similarly, a randomised controlled trial by Khalsa (2011) highlighted group yoga's potential for stress management and mental health maintenance among adolescents, suggesting its possible integration into school curriculums.

5.14.3 The implications of these findings support the integration of diverse group exercise modalities into various settings to promote mental well-being. Additionally, case studies like Yorks (2017) show a relationship between fitness classes and decreased perceived stress in medical students, and Kinser (2015) emphasises the potential of prenatal yoga for managing stress and depressive symptoms in pregnant women, underscoring the need for targeted interventions that address the unique needs of specific populations.

5.15 Quality of Life

5.15.1 Quality of life' was one of the most common sub-outcomes found in this Literature Review with sixty-five sources found.

5.15.2 The literature provides in-depth data support for group exercise improving quality of life in participants. Numerous sources showcase the often-significant improvement in quality of life (QOL) through participation in group exercise, highlighting its multifaceted benefits for physical, mental, and social well-being.

5.15.3 Several case-series studies demonstrate the positive impact of group exercise on various populations. Abasiyanik (2021) evaluated group Yoga and Pilates, finding the Pilates exercise classes effective in improving walking speed, quality of life, and balance confidence in people with multiple sclerosis. No significant improvement here was found for yoga. A case study by Levy (2012) indicates that FEPA (Functional Exercise Program for Arthritis) shows promise for improving health-related outcomes in those with arthritis, with potential for sustainability in community settings.

5.15.4 The findings of Hinman (2020)'s case study further reinforce these positive findings. Looking at a group exercise program called GroupHab, participants reported significant improvements in physical function, walking ability, pain reduction, and overall well-being. A systematic review conducted by Dennis (2024) also highlighted the effectiveness of group exercise programs, typically prescribed by allied health professionals, for improving health outcomes in adults with chronic conditions, leading to better physical function, reduced symptoms, and improved quality of life across conditions like cancer, cardiovascular disease, and diabetes.

5.15.5 These findings are further supported by randomised controlled trials showcasing the diverse benefits of group exercise. For example, Karaborklu (2024)'s randomised controlled trial found that group exercise was superior to platelet-rich plasma injections for improving pain, physical function, and quality of life in knee osteoarthritis patients. Similarly, McGregor (2023)'s randomised controlled trial demonstrated the clinical effectiveness of an online, home-based, supervised, group physical and mental health rehabilitation program in improving health-related quality of life at three and 12 months in adults with post-COVID-19 condition.

5.15.6 Moreover, a systematic review by Doi (2024) noted improvements in emotional well-being, physical functioning, and psychological symptoms in three of the five studies reviewed, with group dynamics helping reduce cancer-related fatigue, anxiety, and procedural pain, contributing to better overall QOL. Finally, Taracki (2018) finds Improvements in the QOL subscales related to pain, nausea, and anxiety through participation in exercise routines that are completed with others.

5.15.7 The implications of these findings support the integration of group exercise programs into various healthcare and community settings to enhance the quality of life for individuals with chronic conditions, post-COVID-19 condition, and other health challenges. The studies suggest that group exercise can provide a holistic approach to well-being by addressing physical, mental, and social needs, ultimately leading to improved health outcomes and a higher quality of life.

5.16 Individual Development

5.16.1 Individual Development was the outcome area with the least sources found with 25 sources, making up 8% of the total sources. However, the literature does show positive links between participating in group exercise and the improvement of self-esteem, self-efficacy, confidence, anger management, motivation and overall personal growth.

5.17 Anger/Aggression

5.17.1 There is little evidential support on the impact of group exercise on anger and aggression. There were only 3 sources found in this literature review on this topic. However, the 2 sources that have been included here have found positive findings in this area.

5.17.2 The case study by Kanchibhotla (2019) demonstrated significant reductions in aggression, improved quality of life, and enhanced life satisfaction through yoga techniques such as Sudarshan Kriya, Yoga, and Meditation, as evidenced by paired t-test results. These practices were particularly beneficial for individuals seeking rehabilitation after incarceration or militant experiences, aiming to lower the risk of future criminality among those convicted of violent extremist offenses. This approach not only protects public safety but also fosters individual and community well-being. Similarly, the randomised control trial by Khalsa (2011) highlighted the mental health benefits of yoga for secondary school adolescents, showing significant improvements in anger control among yoga participants compared to a control group.

5.18 Confidence and Motivation

5.18.1 There were 16 sources found on motivation and 7 sources found on confidence.

5.18.2 This literature review finds that group exercise programs enhance motivation and adherence to physical activity by fostering a structured, supervised, and socially engaging environment.

5.18.3 The Hinman (2020) case-series study found that participants in GroupHab classes demonstrated greater exercise adherence, with higher frequency and duration of exercise compared to those in a home exercise program (HEP). This highlights the role of structured group settings in promoting consistent participation. Similarly, the case-series study by Arkkukangas (2022) study showed that high-challenge group exercise programs effectively encouraged long-term physical activity habits among older adults, with the structured and socially interactive nature of these programs playing a key role in sustaining engagement.

5.18.4 The case-series study by Wayment (2017) further emphasised that group fitness environments foster intrinsic motivations, such as enjoyment and personal achievement, rather than extrinsic factors like appearance. These findings suggest that group exercise not only improves adherence but also supports long-term health benefits by enhancing intrinsic motivation and creating a sense of community. This has broad implications for designing fitness programs aimed at improving public health across various age groups.

5.18.5 The Hancox (2015) case-series study highlights that whilst group exercise increases motivation, the communication style of instructors significantly influences participants' engagement and adherence. A motivationally adaptive communication style—emphasizing autonomy support, clear structure, and interpersonal involvement—enhances motivation by encouraging choice, acknowledging feelings, and offering psychological support. Conversely, maladaptive styles, such as promoting a "no-pain, no-gain" culture or relying on extrinsic rewards, can reduce motivation and lead to higher dropout rates. These findings underscore the importance of instructor communication in creating a supportive environment that fosters sustained exercise participation.

5.18.6 Similarly, the Lohmann (2019) case-series study found that positive instructor interactions were strongly associated with increased intrinsic motivation among participants. This intrinsic motivation led to greater enjoyment and long-term engagement in group exercise activities. The structured and supportive environment also gave participants the confidence boost to engage in other activities outside the class, contributing to broader lifestyle improvements.

5.18.7 Together, these studies emphasise that effective communication not only enhances individual motivation but also supports long-term adherence to physical activity. These insights have implications for designing group fitness programs that prioritise adaptive communication techniques to improve public health outcomes and participant retention.

5.19 Self-efficacy and Self-esteem

5.19.1 There were 17 sources in this section, 6 on self-esteem and 11 on self-efficacy. This was found to be the most prevalent sub-outcome for individual development.

5.19.2 Group exercise interventions have shown positive outcomes in self-esteem for individuals with peripheral neuropathy and related conditions, as well as more serious diseases. The randomised control trial by Powell-Cope (2014) found that participants reported an improved outlook on life, increased self-esteem, and greater confidence in managing their balance and stability. They felt more in control of their condition and were motivated to continue improving their health. The findings suggest significant improvements in quality of life, self-esteem, and overall health management.

5.19.3 The case study by Martin (2015) found that interventions helped cancer survivors explore and redefine their self-identity, particularly in relation to their cancer survivor status. This led to participants feeling more in control of their health and well-being, which positively impacted their self-esteem and confidence. Similarly, Quilico's (2020) case study on traumatic brain injury patients reported that exercise contributed to improved mood, self-esteem, and emotional well-being. Participants felt more confident and capable, which helped them manage the emotional challenges associated with TBI.

5.19.4 Randomised control trials have also demonstrated the effectiveness of exercise interventions. Mir's (2023) study showed that yoga significantly improved quality of life, self-esteem, and reduced symptoms of depression, anxiety, and stress in patients with traumatic amputation. Powell-Cope's (2024) trial found that participants reported an improved outlook on life, increased self-esteem, and greater confidence in managing their balance and stability. Additionally, Sung's (2010) study on elderly women revealed that a 16-week group exercise program effectively improved body strength, flexibility, balance, and self-esteem, with older participants showing greater improvements in self-esteem.

5.19.5 Donnelly (2019) also reported positive qualitative findings through their case-study of a group yoga intervention for people with traumatic brain injury and their caregivers. The session named LoveYourBrain Yoga successfully promoted community integration for people with traumatic brain injury. It also facilitated diverse and meaningful physical, psychological, and social health benefits, specifically improvements in self-efficacy, self-esteem and resilience, which suggest that it may be an effective mode of community-based rehabilitation. Participants felt more confident in being able to move forward in their lives and reported continuing to use the tools they learnt to cope with negative emotions (for example, breathing exercises).

5.19.6 These findings have important implications for health management and well-being. They suggest that structured exercise interventions can significantly enhance physical and psychological well-being in individuals with various health conditions. The improvements in self-esteem, confidence, and health management skills indicate that such programs may lead to better long-term health outcomes and increased independence for participants.

5.20 Social and Community Development

5.20.1 The literature also found significant evidential support that Group exercise programs contribute to social and community development, fostering a sense of community, enhancing social support, and promoting social interactions among participants. Although this is not the most prominent social outcome, this is an important outcome that is unique to group exercise and there is considerable strong evidence to support the positive impact of group exercise on the social and community development of a wide range of individuals and communities.

5.20.2 Group exercise programs create environments where individuals can connect, support each other, and build meaningful relationships, which are crucial for overall wellbeing. There were 53 sources found on this topic, making up 17% of total sources.

5.21 Social Connections and Support

5.21.1 There were 30 sources on this sub-outcome. These sources delve into the social support participants receive through group exercise, the benefits of this support and the social connections and friendships made.

5.21.2 Group exercise programs offer significant benefits for individuals with chronic illnesses, disabilities, and various health conditions, fostering both physical and psychosocial well-being. Research consistently demonstrates that these programs create a supportive environment where participants make meaningful social connections that enhance motivation, adherence, and overall health outcomes.

5.21.3 Group settings encourage camaraderie and peer support, reducing isolation and enhancing participants' willingness to engage (Inoue, 2024). For people with chronic illnesses or disabilities, this creates a vital sense of community and belonging. Wayment's (2017) case-series study found that group settings fostered positive interactions among participants, promoting a sense of community and mutual encouragement. Wells' (2024) case study reported that participants experienced reduced feelings of isolation and increased motivation due to the sense of belonging within exercise groups. The study suggested incorporating peer mentors as a strategy to sustain engagement and support among participants.

5.21.4 The group environment of the classes also offers psychological and emotional benefits. Arkkukangas' (2022) case study highlighted the importance of social interaction and support for mental well-being, especially during periods of isolation like the COVID-19 pandemic. The structured and socially engaging nature of group exercise programs helped participants maintain their physical activity habits over the long term. Additionally, Strassheim's (2021) case study found that participants highly valued the program's group atmosphere, which provided a welcoming and compassionate environment. Many appreciated the opportunity to connect with others experiencing similar health issues, which helped reduce feelings of isolation and fostered social support.

5.21.5 This literature review also finds that the supportive environment of group exercise classes increases motivation and adherence to exercise. Cleary's (2020) case study observed that exercising in a group among peers in an enjoyable, varied, and challenging program that was structured, socially supportive, and supervised provided incentive for maintaining attendance. Golaszewski (2022) Case-series study found that group exercise membership is associated with various forms of social support, including emotional, validation, informational, instrumental, and companionship support. These forms of social support help strengthen exercise identity, which is the degree to which individuals identify as exercisers.

5.21.6 Golaszewski (2022) found gender differences in the benefits of group exercise. For women, group exercise membership was significantly associated with higher levels of physical activity and stronger exercise identity. Women perceived higher levels of emotional, validation, informational, instrumental, and companionship support from their exercise groups. For men, group exercise membership was not significantly associated with physical activity levels or exercise identity, but they still perceived emotional, validation, informational, and companionship support from their groups.

5.21.7 The literature review has found evidence for the benefits of group exercise for specific groups. Humphrey's (2020) case study studied the effects of non-contact boxing for individuals with Parkinson's Disease (PD). The study found that non-contact boxing facilitated the growth of supportive relationships and provided various physical, cognitive, and emotional benefits.

5.21.8 Taraldsen (2020) demonstrated that it is possible to involve home-dwelling persons with cognitive decline and dementia in group exercise sessions. The role of building relationships was the major factor for successful participation.

5.21.9 Doi (2024) conducted a systematic review of patients with childhood cancer participating in group exercise programs. The collaborative nature of group exercises likely provided psychological and emotional benefits through shared experiences, fostering a sense of community and support among participants.

5.21.10 In conclusion, group exercise programs offer a holistic approach to addressing both physical and emotional challenges faced by various populations. They provide a sustainable model for integrating physical activity into rehabilitation programs, with the added benefits of social interaction and peer support.

5.22 Communities

5.22.1 Research highlights the crucial role of community support in exercise programs, particularly for individuals managing health conditions. There were 9 sources found in this area.

5.22.2 Long (2020) found that carers valued the sense of community, shared experiences, and practical advice. Social opportunities, such as post-class coffee gatherings, extended the benefits beyond physical exercise by fostering meaningful connections.

5.22.3 Cruickshank (2024) examined stroke communities and found that participants benefited from peer information-sharing and learning opportunities led by stroke experts. Access to specialists and stroke-related resources provided valuable insights and widened their support network.

5.22.4 Ferrusola-Pastrana (2024) explored the experiences of individuals with Parkinson's disease (PwP) and found that group support, including instructors and student volunteers, empowered participants to self-manage their health. The inclusive group setting helped them enjoy exercise and develop strong social bonds. The study highlighted the role of healthcare professionals as both enablers and barriers to participation. It emphasised the importance of community-university partnerships in providing sustainable and inclusive exercise opportunities for PwP.

5.22.5 Humphrey (2020) conducted a case study on 10 participants with Parkinson's disease and found that non-contact boxing facilitated social engagement. Participants built strong relationships and felt supported by peers facing similar challenges, which encouraged continued participation. A recurring theme was the lasting friendships formed through the program.

5.22.6 Nowakowski-Sims (2018) studied the impact of group exercise on individuals recovering from substance use disorders. Participants found that being part of a supportive group helped them stay committed to both sobriety and exercise. The study suggested that social reinforcement and community support are key predictors of success in recovery. Integrating group exercise into recovery programs could enhance long-term treatment outcomes.

5.22.7 These studies highlight the importance of social interaction and community in exercise programs, demonstrating that group settings can enhance motivation, provide emotional support, and encourage long-term participation. Programs designed for individuals with chronic conditions or in recovery should consider structured social opportunities which become supportive communities for participants to foster engagement and well-being.

5.23 Group Exercise in Care Homes

5.23.1 There were 4 sources on the impact of group exercise programs on care home residents and the positive implications of these programs for care-homes.

5.23.2 This literature review highlights a key study on group exercise in care homes. Frampton's (2024) case-series study demonstrates that accessible chair yoga effectively engages older residents, including those with dementia, with strong attendance over an eight-week program. The study found significant reductions in anxiety and depression, as well as improved mood, although no major changes in balance confidence or health-related quality of life were observed.

5.23.3 These findings suggest that structured, accessible group exercise programs can enhance well-being in care home settings, supporting both mental and physical health. This finding has real-world implications for care homes. Through this finding, care homes can look to implement group exercise programmes such as chair yoga as a feasible method to improve the mental and physical health of their residents.

5.24 Conclusion and Implications

5.24.1 This report presented the findings from a literature review aimed at understanding the social value of group exercise. 304 papers were collated and then separated into four outcomes – physical and mental health, subjective wellbeing, individual development, and, social and community development.

5.24.2 The overall findings of the reviews can be summarised as follows:

5.24.3 The review found evidence of high volume and quality on the extent to which group exercise contributes to social outcomes with the most prevalent type of study being randomised control trials.

5.24.4 Of the papers found, the largest volume of literature was around the outcome area of physical and mental health. Individual development, subjective wellbeing, and social and community development had significantly smaller volume with individual development being the least prevalent outcome. This does not correspond to less importance but suggests a gap in existing empirical evidence.

5.24.5 The majority of papers examined the social value of equestrianism in treating people with existing disabilities or long-term health conditions, opposed to preventing the development of such conditions.

5.24.6 Group exercise classes have been found to contribute social value in all four outcomes. And the evidence suggests there is a unique value in group exercise not found in other activities. There is a need for further, and higher quality, research quantifying the social value of group exercise particularly in the area of individual development.

6 References

Abasiyanik. (2021). "A comparative study of the effects of yoga and clinical Pilates training on walking, cognition, respiratory functions, and quality of life in persons with multiple sclerosis: A quasi-experimental study". *Explore*.

Ahn. (2013). “The effects of inpatient exercise therapy on the length of hospital stay in stages I-III colon cancer patients: Randomized controlled trial”. *International Journal of Colorectal Disease 28(5)*.

Alizadeh. (2023). “Effect of Pilates on Anxiety, Depression, and Anthropometric Indices of Women with Type 2 Diabetes”. *Medical Surgery Nursing J. 2*.

Aminirakan. (2024). "Effects of combined cognitive and resistance training on physical and cognitive performance and psychosocial well--being of older adults ≥65: study protocol for a randomised controlled trial". *BMJ*.

Albornos-Munoz. (2024). "Efficacy of the Otago-Exercise-Programme to reduce falls in community-dwelling adults aged 65-80 when delivered as group or individual training: Non-inferiority-clinical-trial". *BMC Nursing 23:7*.

Aranda-Reneo. (2021). "Cost-Effectiveness of an Exercise Programme That Provided Group or Individual Training to Reduce the Fall Risk in Healthy Community-Dwelling People Aged 65–80: A Secondary Data Analysis". *Healthcare*.

Arasappa. (2024). "Perspective of patients referred to Yoga center in a tertiary neuropsychiatric hospital: A cross-sectional retrospective study". *Indian Journal of Psychiatry*.

Arkkukangas. (2022). "Short Multicomponent Group Exercise Intervention Promotes Long-Term Physical Activity Habits among Community-Dwelling Older Adults during COVID-19 Restrictions: A Cohort Study". *Int. Journal of Environmental Research and Public Health*.

Atan. (2014). “Effects of two different exercise on life satisfaction and beck depression level”. *British Journal of Sociology of Education 5(1):18-23*.

Brach, J.; VanSwearingen, J.; Freburger, J.; Weiner, B. (2024). "On the Move in the community: Protocol for a hybrid 1 trial examining effectiveness and fidelity of a community-based group exercise program for older adults". *Contemporary Clinical Trials*.

Brunet. (2015). Fostering positive experiences of group-based exercise classes after breast cancer: What do women have to say? *DISABILITY AND REHABILITATION*.

Caputo. (2017). "Group-based exercise at workplace: short-term effects of neck and shoulder resistance training in video display unit workers with work-related chronic neck pain—a pilot randomized trial". *Clin Rheumatol*.

Coyle, P.; Perera, S.; Albert, S.; Freburger.; J. (2020). "Potential long-term impact of “On The Move” group-exercise program on falls and healthcare utilization in older adults: an exploratory analysis of a randomized controlled trial". *BMC Geriatric*.

Christle. (2016). "Individualized vs. group exercise in improving quality of life and physical activity in patients with cardiac disease and low exercise capacity: results from the DOPPELHERZ trial". *Disability and Rehabilitation*.

Cleary. (2020). “Parkinson’s Disease: Exploring Motives for Long-Term Adherence to a Group Exercise Program”. *Rehabilitation Nursing*.

Cruickshank. (2024). "Group exercise membership is associated with forms of social support, exercise identity, and amount of physical activity". *International Journal of Sport Exercise Psychology*.

Curi. (2018). "Effects of 16-weeks of Pilates on functional autonomy and life satisfaction among elderly women". *Journal of Bodywork & Movement Therapies*.

Daulat. (2016). "A pragmatic randomized controlled trial to compare a novel group physiotherapy programme
with a standard group exercise programme for managing chronic low back pain in primary care". *International Musculoskeletal Medicine*.

Dingle. (2021). The effects of social group interventions for depression: Systematic review. *Journal of Affective Disorders*.

Dennis. (2024). "How efective are allied health group interventions for the management of adults with long-term conditions? An umbrella review of systematic reviews and its applicability . *BMC Primary Care*.

Doi. (2024). Effects of Group Exercise Intervention on Quality of Life and Physical Parameters in Patients with Childhood Cancer: A Systematic Review. *Current Oncology*.

Domingos. (2022). Community Exercise: A New Tool for Personalized Parkinson's Care or Just an Addition to Formal Care?. *Frontiers in Systems Neuroscience*.

Donnelly. 2019. "A qualitative study of LoveYourBrain Yoga: a group-based yoga with psychoeducation intervention to facilitate community integration for people with traumatic brain injury and their caregivers". *Disability and Rehabilitation*.

English. (2012). PHYSICAL THERAPY PERSPECTIVES IN THE 21ST CENTURY – CHALLENGES AND POSIBILITIES. In J. Bettany-Saltikov, *PHYSICAL THERAPY PERSPECTIVES IN THE 21ST CENTURY – CHALLENGES AND POSIBILITIES*. InTechOpen.

Espin. (2024). "Videoconference-Supervised Group Exercise Reduces Low Back Pain in Eldercare Workers: Results from the ReViEEW Randomised Controlled Trial". *Journal of Occupational Rehabilitation*.

Fernandez-sanchez. (2024). "Effects of exercise on life satisfaction of people diagnosed with cancer". *Supportive Care in Cancer*.

Ferrusola-Pastrana. (2024). "Group-based exercise for Parkinson's: a qualitative study of participants
and partners' perceptions of an exercise class delivered through a community-university collaboration". *BMC Geriatrics 24:488*.

Frampton. (2024). "Reduced Anxiety and Depression and Improved Mood in Older Adults Living in Care
Homes After Participating in Chair Yoga". *Journal of Applied Gerontology*.

Frith. (2011). "Effects of Pilates method on quality of life, fatigue and sleep quality among breast cancer women receiving hormone therapy – Two-arm randomized clinical trial". *Journal of Bodywork & Movement Therapies*.

Garg. (2024). "Feasibility, Outcomes, and Perceptions of a Virtual Group Exercise Program in Multiple Sclerosis". *Journal of Neurologic Physical Therapy 48:1*.

Golaszewski. (2022). "Group exercise membership is associated with forms of social support, exercise identity, and amount of physical activity". *International Journal of Sport Exercise Psychology*.

Gouveia, V. (2021). "The effect of pilates on metabolic control and oxidative stress of diabetics type 2 e A randomized controlled clinical trial. *Journal of Bodywork & Movement Therapies*.

Gurunathrao, S.; Sobitharaj, E C.; Singh, K.; Gupta, R.; Roy, A. (2024). "Effect of Yoga-Based Cardiac Rehabilitation Program on Endothelial Function, Oxidative Stress, and Inflammatory Markers in Acute Myocardial Infarction: A Randomized Controlled Trial". *International Journal of Yoga*.

Hancox. (2015). " An intervention to train group exercise class instructors to adopt a motivationally adaptive
communication style: a quasi-experimental study protocol". *Health Psychology and Behavioral Medicine*.

Hamar, B. (2013). "Impact of a Senior Fitness Program on Measures of Physical and Emotional Health and Functioning". *POPULATION HEALTH MANAGEMENT 16:6*.

Hatfield (2022). “Utility of an Outdoor Group Exercise Program for Improving Postpartum Mental Health”. *Health & Fitness Journal of Canada*.

Hinman, M. (2020). "Effectiveness of a Group Exercise Class vs. Home Exercise Program as a Follow-up to Physical Therapy for Older Adults with High Fall Risk”. *Journal of Geriatric Medicine*.

Horton. (2015). "A qualitative investigation of exercising with MS and the impact on the spousal relationship". *European Review of Aging and Physical Activity*.

Hsueh. (2021). "Effects of yoga on improving quality of life in patients with breast cancer: a meta-analysis of randomized controlled trials". *Breast Cancer*.

Humphrey. (2020). "Perceptions of the Impact of Non-contact Boxing on Social and Community Engagement for Individuals with Parkinson’s Disease: A qualitative study". *Internet Journal of Allied Health Sciences
and Practice*.

Hung. (2024). "Technology-based group exercise interventions for people living with dementia interventions for people living with dementia or mild cognitive impairment: A scoping review". *PLOS ONE*.

Iliffe, S. (2014). "Multicentre cluster randomised trial comparing a community group exercise programme and
home-based exercise with usual care for people aged 65 years and over in primary care". *HEALTH TECHNOLOGY ASSESSMENT*.

Inoue, Y. (2024). “What explains the well-being benefits of physical activity? A mixed-methods analysis of the roles of participation frequency and social identification”. *Social Science & Medicine*.

Jones. (2020). “Using the Integrative Model of Behavioral Prediction to Understand Female Breast Cancer Survivors’ Barriers and Facilitators for Adherence to a Community-Based Group-Exercise Program”. *Seminars in Oncology Nursing*.

Jung. (2024). “Moderate-to-high Intensity Group Exercise Improves Function of Stroke Survivors”. *Neurology* 100:17.

Kanchibhotla. (2019). "Effectiveness of a Comprehensive Yoga Program on Convicted Extremist Offender".

Karaborklu. (2024). "Does the Combination of Platelet-rich Plasma and Supervised Exercise Yield Better Pain Relief and Enhanced Function in Knee Osteoarthritis? A Randomized Controlled Trial". *Clinical Orthopaedics Related Research*.

Kempert. (2019). "The Use of Yoga as a Group Intervention for Pediatric Chronic Pain Rehabilitation: Exploring Qualitative and Quantitative Outcomes". *International Journal of Yoga*.

Khalsa. (2011). "Evaluation of the Mental Health Benefits of Yoga in a Secondary School: A Preliminary
Randomized Controlled Trial". *Journal of Behavioral Health Services & Research*.

Kim. (2014). “Effect of Gross Motor Group Exercise on Functional Status in Chronic Stroke: A Randomized Controlled Trial”. *Journal for Physical Therapy and Science*.

Kinser. (2015). "“Yoga Was My Saving Grace”: The Experience of Women Who Practice Prenatal Yoga". *Journal of the American Psychiatric Nurses Association*.

Lawrence. (2017). “Yoga for stroke rehabilitation”. *Cochrane Database of Systematic Reviews*.

Leite. (2024). "Effects of Pilates method on quality of life, fatigue and sleep quality among breast cancer women receiving hormone therapy – Two-arm randomized clinical trial". *Journal of Bodywork & Movement Therapies*.

Levy. (2012). "Evaluation of a multi-component group exercise program for adults with arthritis: Fitness and Exercise for People with Arthritis (FEPA)". *Disability and Health Journal*.

Lohmann. (2019). “Associations among instructor behaviors, psychological need satisfaction, motivation, and participation in group exercise classes”. *International Journal of Sport Psychology*.

Long. (2020). "The Impact of a Dementia-Friendly Exercise Class on People Living with Dementia: A Mixed-Methods Study". *International Journal of Environmental Research and Public Health*.

Loughney. (2024). "The effect of a pre- and post- operative exercise program versus standard care on physical fitness of patients with oesophageal and gastric cancer undergoing neoadjuvant treatment. *International Journal of Surgery*.

Martin. (2015). "Breast and Prostate Cancer Survivor Responses to Group Exercise and Supportive Group
Psychotherapy". *Journal of Psychosocial Oncology*.

May. (2017). "Cost-effectiveness analysis of an18-week exercise programme for patients with breast and colon cancer undergoing adjuvant chemotherapy: the randomised PACT study". *BMJ Open*

Mendes. (2016). “Impact of a community-based exercise programme on physical fitness in middle-aged and older patients with type 2 diabetes”. *Gac Sanit*.

Mcdonnell. (2014). "Regular group exercise is associated with improved mood but not quality of life following stroke". *PeerJ*.

Mir. (2023). “Associations among instructor behaviors, psychological need satisfaction, motivation, and participation in group exercise classes”. *International Journal of Sport Psychology*.

McGregor. (2023). "Clinical effectiveness of an online supervised group physical and mental health rehabilitation programme for adults with post-covid-19 condition (REGAIN study): multicentre randomised controlled trial". *The BMJ*.

Nowakowski-Sims. (2018). "Relearning to Live Life Without Substances: A Grounded Theory of the Impact of Group Physical Exercise on Sobriety". *Journal of Social Work Practice in the Addictions*.

Oestergard. (2018). "In acutely admitted geriatric patients offering increased physical activity during hospitalization decreases length of stay and can improve mobility". *Institute of Sports Medicine Copenhagen*.

Powell-Cope, (2014). "Perceived Benefits of Group Exercise Among Individuals With Peripheral Neuropathy". *Western Journal of Nursing Research*.

Quilico. (2020). "Interpretative Phenomenological Analysis of Community Exercise Experiences after Severe
Traumatic Brain Injury". *Qualitative Research in Sport, Exercise and Health*.

Rao, M. (2017). "Effects of a Yoga Program on Mood States, Quality of Life, and Toxicity in Breast Cancer Patients Receiving Conventional Trial. *Indian Journal of Palliative Care*.

Ryan. (2010). "Pain biology education and exercise classes compared to pain biology education
alone for individuals with chronic low back pain: A pilot randomised controlled trial". *Manual Therapy*.

Rosenfeldt. (2022). "Community-based high-intensity cycling improves disease symptoms in individuals with Parkinson's disease: A six-month pragmatic observational study". *Health Social Care Community*.

Sanchez-alcala. (2024). "Effects of Dance-Based Aerobic Training on Mental Health and Quality of Life in Older Adults with Mild Cognitive Impairment". *Journal of Personalized Medicine*.

Schaumacher. (2022). "Nationwide Industry-Led Community Exercise Program for Men With Locally Advanced, Relapsed, or Metastatic Prostate Cancer on Androgen-Deprivation Therapy. . *JCO Oncology Practice*.

Scheckel. (2021). "Cost-effectiveness of group-based exercise to prevent falls in elderly community dwelling people". *BMC Geriatrics*.

Schuch. (2016). "Exercise improves physical and psychological quality of life in people with depression: A meta analysis including the evaluation of control group response". *Psychiatry Research*.

Sherman. (2010). Psychological effects and mediators of a group multi-component program for breast cancer survivors. *Journal of Behavioural Medicine*.

Skinner, E.; Dinh, T.; Hewitt, M.; Piper, R.; Thwaites, C. (2016). "An Ai Chi-based aquatic group improves balance
and reduces falls in community-dwelling adults: A pilot observational cohort study". *Physiotherapy Theory and Practice*

Sok. (2021). "Effects of Cognitive/Exercise Dual-Task Program on the Cognitive Function, Health Status, Depression, and Life Satisfaction of the Elderly Living in the Community". *International Journal Environment Research and Public Health*.

States. (2011). "Long-term Group Exercise for People With Parkinson's Disease: A Feasibility Study". *JNPT*.

Strassheim. (2021). "Conceptualizing the benefits of a group exercise programme developed for those with chronic fatigue: a mixed methods clinical evaluation". *Northumbria University*.

Steffens. (2012). "Prognosis of chronic low back pain in patients presenting to a private community-based group exercise program". *European Spine Journal*.

Sung. (2010). "The Effects of 16-Week Group Exercise Program on Physical Function and Mental Health of Elderly Korean Women in Long-Term Assisted Living Facility". *The Journal of Cardiovascular Nursing 24:5*.

Takeuchi. (2011). Patients with non-specific chronic low back pain. *Journal of Physical Therapy*.

Taracki. (2018). "Group exercise training for balance, functional status, spasticity, fatigue and quality
of life in multiple sclerosis: a randomized controlled trial". *Clinical Rehabilitation*.

Taraldsen. (2020). "Group exercise membership is associated with forms of social support, exercise identity, and amount of physical activity". *International Journal of Sport Exercise Psychology*.

Telles. (2012). "Managing Mental Health Disorders Resulting from Trauma through Yoga: A Review". *Depression Research and Treatment*.

Tsuji. (2024). Community-level group sports participation and all-cause, cardiovascular disease, and cancer mortality: a 7-year longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity 21:44*.

Tsuji. (2017). "Reducing depressive symptoms after the Great East Japan Earthquake in older survivors through group exercise participation and regular walking: a prospective observational study". *BMJ Open*.

Van Camp. (2015). "A RATIONALE FOR A BALLET EXERCISE-BASED BALANCE TRAINING PROGRAMME FOR
OLDER ADULTS WITH BALANCE IMPAIRMENT". *Tampere University of Applied Sciences*.

Vendramin, B.; Bergamin, M.; Gobbo, S.; Cugusi, L.; Duregon, F.; Bullo, D.; Zaccaria, M.; Neunhaeuserer, D.; Ermolao, A. Health Benefits of Zumba Fitness Training: A Systematic Review. *PM&R*.

Verrusio. (2016). "Efficacy and safety of spinning exercise in middle-aged and older adults with metabolic syndrome: randomized control trial". *Ann Ist Super Sanità*.

Wayment. (2017). "SHARING A PERSONAL TRAINER: PERSONAL AND SOCIAL BENEFITS OF INDIVIDUALIZED, SMALL-GROUP TRAINING". *Journal of Strength and Conditioning Research*.

Wells, W. (2024). "Supporting Physical Activity Maintenance in Older Adults Following Supervised GroupExercise: A Mixed-Methods Study Among Culturally Diverse Older Adults". *Journal of Applied Gerontology*.

Wieland. (2022). Yoga for chronic non-specific low back pain. *Cochrane Database of Systematic Reviews*.

Wolf. (2024). A transdiagnostic group exercise intervention for mental health outpatients in Germany (ImPuls): results of a pragmatic, multisite, block-randomised, phase 3 controlled trial. *Lancet Psychiatry*.

Yang. (2022). The impact of Otago exercise programme on the prevention of falls in older adult: A systematic review. *Cochrane Database of Systematic Reviews*.

Yorks. (2017). "Effects of Group Fitness Classes on Stress and Quality of Life of Medical Students". *The Journal of the American Osteopathic Association*.

Yucel. (2016). Pilates-Based Mat Exercises and Parameters of Quality of Life in Women With Type 2 Diabetes. *Iranian Red Crescent Medical Journal*.

- **END -**

For further information of the information presented above, please contact:
RICKY BOARDMAN
Head of Research and Development, Sport, and Recreation Alliance