

Sport Participation and Subjective Outcomes of Health in Middle-Aged Men: A Scoping Review

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Abstract

Although sport participation is intrinsically motivating and improves the physical health of middle-aged men, its influence on subjective health measures, such as health-related quality of life, self-rated health, or well-being is unclear. The purpose of this scoping review was to describe the existing literature that has assessed male sport participants and their subjective health. MEDLINE, Embase, Emcare, PsycInfo, SPORTDiscus, Cochrane Library, and Web of Science were searched, and reference lists of included studies were pearled. Included were original peer-reviewed studies reporting a marker of subjective health in males, 35 to 54 years (average), who participated in sport. The search identified 21 eligible articles, 18 quantitative, 2 mixed-methods, and 1 qualitative, from 13 different countries. Eighteen studies were cross-sectional. A broad range of outcomes were assessed, with the most common being quality of life/health-related quality of life ($n = 6$) and self-rated health ($n = 6$). Most studies assessing quality of life, health-related quality of life, or self-rated health demonstrated a positive association with sport participation, while sport participation was not related to measures of life satisfaction, flourishing, happiness or global well-being; however, limited studies examined these latter outcomes. Sport participation appears to be related to better select subjective health outcomes in middle-aged men. However, most available data are cross-sectional and thus causation cannot be determined. Randomized intervention trials are required to determine whether sport participation improves the subjective health of middle-aged men.

Open Science Framework registration: <https://osf.io/zypps>

Keywords

health related quality-of-life, well-being, male, health, enjoyment, social

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Introduction

“Good health” is more than just the absence of disease or illness, it is multidimensional and encompasses physical, mental, and social well-being (World Health Organization [WHO], 2002). Measuring health can include objective physical measures of risk factors for disease as well as subjective measures that measure an individual's view of their health, such as self-rated health or life satisfaction. Considering one's own perception and experience regarding their health is important for a complete picture of health status (Clearly, 1997) and provides detail (e.g., pain, vitality, happiness) that cannot be obtained through biomedical outcomes alone (Au et al., 2010).

Physical activity (PA) is a modifiable lifestyle factor that is well known to improve subjective outcomes of health, such as health-related quality of life (HRQoL)

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(Pucci et al., 2012), self-rated health (Rosenkranz et al., 2013), and mental well-being (Kekäläinen et al., 2019). As PA participation rates steadily decline with age (Hallal et al., 2012), to try and maintain subjective health it is important to develop strategies to assist people to maintain PA as they age.

It is important to consider that not all domains of PA influence health equally, with leisure-based PA providing a stronger benefit for HRQoL (Jurakic et al., 2010; Päivärinne et al., 2018) and components of mental well-being (White et al., 2017) than occupational, domestic, and/or transport-related PA. One subset of leisure-based PA that could be exploited to maintain participation in PA as people age is participation in sport (Khan et al., 2012). The potential benefit of sport was recognized by the WHO's (2018) 12-year global action plan, which highlighted that engagement in sport was an underutilized modality for increasing PA. Sport is intrinsically motivating (Nielsen & Wikman, 2018; Pedersen et al., 2017) with objective physical health effects that have been reported to be similar, and at times superior, to traditional exercise modalities (Bellissimo et al., 2018; Milanović et al., 2015). Further, sport participation has been positively associated with the psychological and social health of adults (Andersen et al., 2018; Eime et al., 2013) and older adults (Gayman et al., 2017; A. Kim et al., 2019), such as improved well-being, life satisfaction, and social capital.

Middle-aged men are a sub-group of the population that experiences poor subjective health, presenting with elevated levels of stress (Steptoe et al., 2015), low life satisfaction (Steptoe et al., 2015), and low perceived social support (Beyond Blue, 2014). Despite PA's known positive impact on these health outcomes, only ~16% of men aged 35 to 54 years meet the Australian PA guidelines (Australian Bureau of Statistics, 2018) and only 24.2% of American males aged 45 to 54 years meet the American PA guidelines (National Center for Health Statistics [NCHS], 2019). Given this low PA level, sport participation may be particularly important for promoting health into older age given that sport participation in mid-life, compared to other forms of PA, is most strongly associated with being physically active 20-years later (Aggio et al., 2017). In addition, Omorou et al. (2013) and Knapik et al. (2009) identified that men participating in sport had superior HRQoL compared with those participating in non-sporting PA. Although, it is important to also consider that as sport has historically been contended as a venue for the promotion and reproduction of traditional masculinity, through a focus on competition, physical prowess, and pushing through pain (Ramaeker & Petrie, 2019; Stick, 2021), some individuals may not experience the positive benefits of sport participation. While the expression and affirmation of masculinity may be appealing

to some men and empower them to engage in health-related behaviors (Bottorff et al., 2015; Drummond, 2008), internalizing masculine ideologies can be detrimental to health seeking for some (Springer & Mouzon, 2011; Yousaf et al., 2015). Furthermore, sport-related injury can negatively influence life satisfaction and HRQoL (Moreira et al., 2014). While there is potential for sport to positively influence men's health, it may not be "inherently" good for all.

While previous reviews assessing sport and psychosocial health outcomes have assessed adults (i.e., 18–65 years, Eime et al., 2013; 18+ years, Andersen et al., 2018) and older adults (50–65+ years old) (Gayman et al., 2017; A. Kim et al., 2019), their findings are not necessarily relevant to middle-aged men. The broad inclusion of adults, combining males and females (Eime et al., 2013) or younger and older adults (Andersen et al., 2018), limits extrapolation to a middle-aged male population. Middle-aged and older adults have different preferences for exercise (Burton et al., 2012). For example, those aged 60 to 67 years were more likely to prefer to exercise with people of a similar age, and were less likely to prefer team-based, competitive, and/or vigorous activities with a fixed schedule when compared to 42 to 49 year old's (Burton et al., 2012). Furthermore, increasing sport participation has shown a negative impact on the self-reported health of younger adult men (26–44 years), but a positive impact on a more middle-aged male group (45–64 years) (Downward et al., 2016). A recent meta-analysis identified a small association between sport participation and psychosocial outcomes in middle-aged and older adults, and further identified age (when considering males and females together) and gender (when considering middle-aged and older adults together) not to moderate the overall effect size (Sivaramakrishnan et al., 2021). However, older adult studies ($n = 20$) outweighed middle-aged studies ($n = 6$) and of the studies assessing middle-aged adults, females constituted most of the sample. While this review (Sivaramakrishnan et al., 2021) advances our understanding of the relationship between sport and psychosocial health, the meta-analytic approach required a strict inclusion criterion (e.g., quantitative research only, requirement of a comparator group) and was not able to investigate the effects in middle-aged men specifically.

The current state of literature relating to the effects of sport participation on subjective outcomes of health in middle-aged men is unclear but there appears to be emerging evidence of benefit. The current study aimed to explore the research methodologies, the types of sports, and what outcomes have been investigated in research exploring sport participation and subjective health outcomes in middle-aged men, while also identifying knowledge gaps and recommendations for future research. A

Table 1. Inclusion/Exclusion Criteria.

Inclusion criteria	Exclusion criteria
Studies were included within this review if they met all the following criteria: ○ Available in English (due to available resources and time required for translation) ○ Peer-reviewed original research ○ Participant average age was within 35 and 54 years (or data were separated by age with available data for this range) ○ Sample included male participants only or provided data separated by gender ○ Focused on participation in sport; defined as “a subset of exercise that can be undertaken individually or as a part of a team. . . participants adhere to a common set of rules or expectations, and a defined goal exists” Khan et al. (2012, p. 59) ○ Included an outcome measure that addressed the individuals and/or groups’ evaluated health, well-being, and/or quality of life from the perspective of the individual/group in question	Studies were excluded from the review if they met any of the following criteria: ○ Focused solely on physical activity or exercise, or in combination with sport so that the independent influence of sport was not clear (‘physical activity’ = “any bodily movement produced by skeletal muscles that results in energy expenditure”, ‘Exercise’ = “planned, structured and repetitive bodily movement, the objective of which to improve or maintain physical fitness” Khan et al. (2012, p. 59) ○ Focused solely on ‘adapted’ sports (designed to meet the needs of individuals with physical/intellectual disabilities) ○ Focused solely on a clinical population, elite/professional sporting athletes, sport injuries and/or return to sport following injury, or individuals not directly participating in sport (e.g. spectators, coaches) ○ Studies focusing on experienced/symptom specific outcomes of psychological health (e.g. stress or mood). The focus for this review was on more evaluative measures, such as life satisfaction and quality of life, as research has identified measures of evaluative well-being being a better predictor of health than experienced well-being (e.g. mood) Miret et al. (2017) ○ Solely report physiological and/or biomedical outcome measures

scoping review methodology was therefore deemed most appropriate (Munn et al., 2018).

Methods

Protocol and Registration

The protocol for this scoping review was developed according to the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021) in combination with the PRISMA guidelines extension for scoping reviews (PRISMA-ScR) (Tricco et al., 2018). The final protocol was registered with the Open Science Framework on 08/07/2020 (<https://osf.io/zyyps>). This study was exempt from ethics approval given the exclusive use of published literature.

Information Sources

A search of MEDLINE, Embase, Emcare, PsycInfo, SPORTDiscus, Cochrane Library, and Web of Science was completed in July 2020. The final search strategies are presented in Supplemental Additional file 1. In brief, search terms composed three groups: Group 1: men; Group 2: sport (including 100 individual sports names); and Group 3: outcomes of evaluated health, well-being, and/or quality of life.

Eligibility Criteria

Inclusion and exclusion criteria is presented in Table 1.

Selection of Sources of Evidence

Duplicate articles were removed in Endnote (Version 9, Clarivate Analytics, Philadelphia, PA) before being uploaded to Covidence (Veritus Health Innovation, Melbourne, Australia). All titles, abstracts, and full text were screened in duplicate using Covidence by two authors (H. T. B. and E. J. O. or S. A. B.). Discrepancies were resolved by the two authors between which the disagreement existed. Discrepancies unable to be agreed on were resolved by a third reviewer (J. D. B., B. J. S., or A. J. C.). Reference lists of included studies were pearled for potentially relevant articles.

Data Charting Process

The data-charting form was developed by H. T. B. and reviewed by J. D. B., B. J. S., and A. J. C. Studies were extracted in duplicate by two authors (H. T. B. and E. J. O. or S. A. B.). The variables extracted were author, year of publication, study country, study design, sample size, sport, primary research aim, outcome, outcome measure, and findings.

Results

Study Selection and Characteristics

The processing of articles from identification to inclusion is presented in Figure 1. The characteristics of the included studies are presented in Table 2. Of the 21

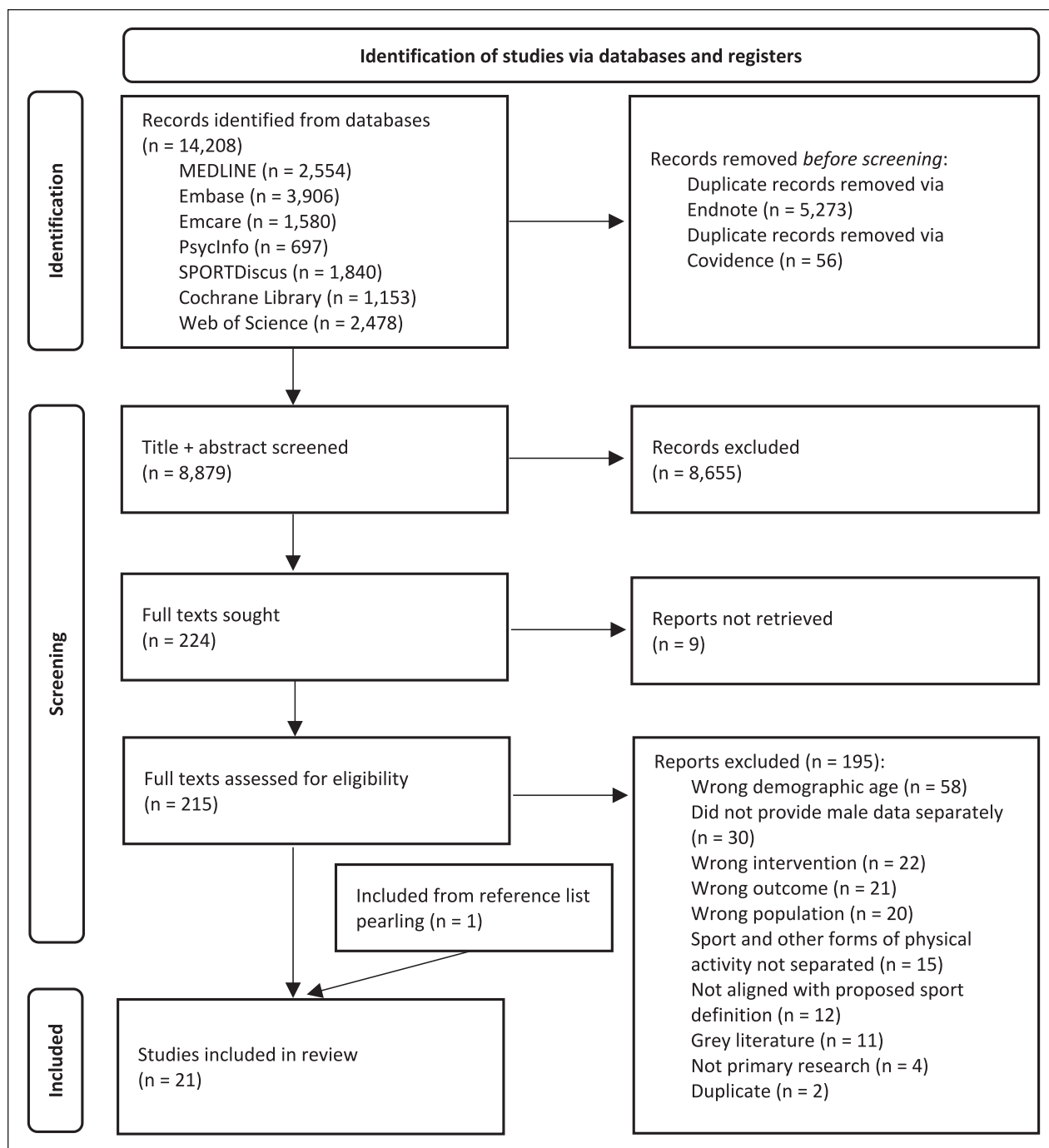


Figure 1. PRISMA Flow Diagram

Note. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

included studies, 12 were published from 2016 onwards, 6 between 2009 and 2015, and 3 prior to 2005. Eighteen studies used quantitative methods and three used qualitative or mixed methods. Most ($n = 18$) of the studies were cross-sectional in nature, while two were longitudinal and one used cross-sectional data collection with a

time-series analysis. The included studies varied widely in country of origin, covering 13 different countries, with 3 being conducted in the United Kingdom, Australia, and United States, two in both Spain and Poland, and one conducted in Austria, Brazil, Belgium, Canada, France, Germany, Israel, and Slovenia.

Table 2. Study Characteristics.

Author, country, methodology	Sport	Study: N, % men/male, and age $\pm$ SD (range)	Sample Included in Review: N, age $\pm$ SD	Primary aim	Outcome and outcome measures	Narrative summary of findings
Quantitative						
Boldt et al. (2018), Germany, cross-sectional	Endurance runners (completed marathon-based running event in previous 2 years)	281, 43.4%, 40.0 $\pm$ 11.0 (18+)	122, NS ^d	Investigate QOL in endurance runners adhering to a vegetarian or vegan diet and compare them to endurance runners following a mixed diet	QoL: WHOQOL-BREF	Male runners had higher physical and psychological QoL domains compared to female runners, but similar social and environmental QoL domains.
Bullock et al. (2020), United Kingdom, cross-sectional	Recreational and elite cricket	2280, 97.1%, 51.7 $\pm$ 14.7 (18+)	2211, 51.9 $\pm$ 14.7	Evaluate HRQoL (PCS and MCS) and flourishing in recreational and elite, and current and former cricketers	HRQoL: SF-8 Flourishing: The Flourishing Scale	Compared to former cricket participants, current recreational and elite cricket participation was associated with superior PCS, a near significant difference in flourishing but no difference in MCS.
Crouton et al. (2019), United States, cross-sectional	United States Masters Field Hockey	122, 40.9%, 50.1 $\pm$ 8.3 (35–71 years)	50, 52.74 $\pm$ 7.97 ^a	Examine the health status, lifestyle behaviors, and well-being in United States Masters field hockey athletes	Health Status: "How would you rate your current health?" Flourishing: The Flourishing Scale	No difference between male and female players for health status nor flourishing.
Downward et al. (2016), United Kingdom, cross-sectional / time-series	Self-report on 68 sports activities: occurrence and duration over last 4 weeks	~14,000, NS, NS (16+)	NS, 36 ^a	Evaluate the relationship between 'sport' participation and subjective, self-reported health across time	Subjective Health: 'How is your health in general?'	Increases in sport participation had a depreciative influence on self-reported health for males
Froom et al. (2004), Israel, longitudinal	Regular leisure sports activity (yes/no) at baseline	2518, 100%, 44.0 $\pm$ 11.5 (18–64)	2518, 44.0 $\pm$ 11.5	Determine the predictive value of behavioral and biomedical risk factors for self-evaluated health 7.7– 11.5 years later	Self-evaluated Health: 10 = excellent health, and 1 = poor health	26–45 years old (36 years avg.), but accelerated sports participation had a positive influence in males 46–65 years old (56 years avg.). Leisure sport participation predicted superior self-rated health 7.7 to 11.5 years later.
Grunseit et al. (2017), Australia, cross-sectional	Weekly community running event (Parkrun)	865, 39%, NS (18+)	337, 46.0 $\pm$ 12.7 ^a	To compare overall and domain specific subjective well-being of adult parkrun participants to the general population	Well-being: Personal Well-being Index (Including: satisfaction with health).	Global wellbeing for runners was within two standard deviations of population normative data. Satisfaction with life was two standard deviations below population normative data.
Kitchen & Chowhan (2016), Canada, cross-sectional	Recreational ice hockey	1910, 100%, 37.0 ^a (35+)	1910, 37.0 ^a	Examine the characteristics of adults who play ice hockey in Canada	Self-assessed Health: Likert scale Self-assessed Mental Health: Likert scale	Regular hockey participants had better perception of their health than physically active non-regular participants (<once/week or not at all). No difference in self-assessed mental health was found.

(continued)

Table 2. (continued)

Author, country, methodology	Sport	Study: N, % men/male, and age $\pm$ SD (range)	Sample Included in Review: N, age $\pm$ SD	Primary aim	Outcome and outcome measures	Narrative summary of findings
Quantitative						
Knapik et al. (2009), Poland, cross-sectional	Self-assessment of sporting activity: kind and duration of sporting activities	154, 100%, NS (30–60)	154, NS (only 30–60 years)	To define the relations (effect) between various kinds of activity with the specific indicators and components of the self-assessment of health	HRQoL: SF-36	Significant correlation between sport participation and PCS, MCS and overall HRQoL, however no such correlation between work or free time (excluding sport) based activity.
Luschen et al. (1997), Germany, cross-sectional	Intensity one engaged in sport ("O" not participating in any sport, "4" those engaging with "high intensity")	2574, 46.8%, 47.2 $\pm$ 17.7 (18+)	1204, 46.4 $\pm$ 16.9	Compare the subjective health status of West and East Germans following unification in relation to a number of variables	Subjective Health Status: 5-point-scale	Sport participation positively influenced the subjective health status of West German men, but not East German, likely due to cultural differences.
Marlier et al. (2015), Belgium, cross-sectional	Sport participation assessed using the sport index of the Flemish Physical Activity Questionnaire	414, 45.7%, 38.8 $\pm$ 10.6 (18–56)	189, 37.0 $\pm$ 11.4 ^c	Examine how sport participation, total physical activity, social capital and mental health are interrelated	Well-being: Goldberg's General Health Questionnaire	No significant relationship between sport and wellbeing was found.
Mayolas-Pi et al. (2017), Spain, cross-sectional	Competitive Amateur Endurance Cyclists (road/MTB)	1577, 67.1%, 38.1 $\pm$ 8.4 (NS)	1058, 38.2 $\pm$ 8.5 ^b	To compare parameters associated with the physical and mental health of cyclists with risk of exercise addiction, those with a low risk of exercise addiction and inactive subjects.	HRQoL: SF-12v2	Regardless of exercise addiction risk, PCS and MCS was superior for cyclists compared to age-matched inactive individuals. Male cyclists with high exercise addiction risk had worse MCS than those with low exercise addiction risk.
Moreira et al. (2016), Brazil, cross-sectional	Masters Basketball	5665, 100%, 53.3 $\pm$ 11.8 (35–85)	5665, 53.3 $\pm$ 11.8	Verify the prevalence and characteristics of sports injury and to determine the association between the PA level and injury with HRQoL perception domains in Brazilian basketball Master athletes	HRQoL: SF-36	Basketball athletes presented with better PCS and MCS than the male general population of Brazil. Regarding individual scales, all were lower among the athlete group apart from physical function and mental health.
Munguia-Izquierdo et al. (2017), Spain, cross-sectional	Competitive Amateur Endurance Cyclists (road/MTB)	1577, 67.1%, 38.0 $\pm$ 10.0 (NS)	1058, 38.2 $\pm$ 9.6	Evaluate the effects of adolescent sport practice on the training, performance, and health outcomes of adult amateur endurance cyclists	HRQoL: SF-12v2	Regardless of participation in sport during adolescence, PCS and MCS were superior for amateur cyclists compared to age-matched inactive individuals.
Omorou et al. (2013), France, cross-sectional	Participation in sport over the last 7 days	4909, 41.8%, 41.9 $\pm$ 14.6 (15–69)	2054, 41.3 $\pm$ 14.7	Investigate the contribution of sport to the association between PA and QoL	QoL: WHOQOL-BREF	Sport participation was associated with increased physical, psychological, and social QoL independent of PA level.
Pori et al. (2013), Slovenia, cross-sectional	Participants of the 2010 Ljubljana Marathon	1323, 49.7%, 37.8 $\pm$ 10.9 (NS)	657, 38.0 $\pm$ 10.9 ^a	Investigate the relationship between recreational sport participation and satisfaction with life among adult Slovenian participants of the Ljubljana Marathon	Life Satisfaction: Satisfaction with Life Scale	Male runners had a weaker relationship between running and life satisfaction than females.

(continued)

Table 2. (continued)

Author, country, methodology	Sport	Study: N, % men/male, and age $\pm$ SD (range)	Sample Included in Review: N, age $\pm$ SD	Primary aim	Outcome and outcome measures	Narrative summary of findings
Quantitative						
Snyder & Spreitzer (1974), United States, cross-sectional	Questionnaire measured the extent to which respondents participated in sports	510, 51%, 42 (NS)	260, NS ^d	To use involvement in sport as an independent variable in analyzing variations in perceived life satisfaction and avowed happiness.	Life Satisfaction: In general, how satisfying do you find the way you are spending your life these days? Avowed Happiness: Taking all things together, how would you say things are these days? HRQoL: SF-36v2	No relationship between participating in sport and life satisfaction or happiness was found.
Swain et al. (2016), Australia, longitudinal	Amateur Rugby Union	125, 100%, 24.3 $\pm$ 9.8 (18–24, 25–34, 35+)	4, 46.3 $\pm$ 12.3 ^a	Describe HRQoL and physical characteristics of a cohort of amateur rugby players		HRQoL scales for rugby players were within one standard deviation of age-matched Australian males.
Wojtas-Ślubowska & Skarpanska-Stejnborn (2010), Poland, cross-sectional	LTPA forms practiced on the day preceding the survey. ("In the form of sport activity" or "in sport-related forms of LTPA")	731, 30.8%, NS (18–34 and 35–51)	225, NS (only 35–51 years)	Does past participation in competitive sports differentiate between SRH declared by younger and older respondents or between males and females?	Self-rated Health: #1 (non-comparative): How do you rate your health in general? #2 (age-comparative): What do you think of your own health condition compared to that of other men/women of your age?	Males with past competitive sport experience showed a significant positive relationship between self-rated health #1 and current participation in sport-related forms of LTPA. Males with and without past competitive sport experience showed a significant positive relationship between self-rated health #2 and current participation in sport-related forms of LTPA.
Qualitative/Mixed-Methods (of those mixed-methods, only qualitative data met inclusion)						
Abotsie et al. (2020), United Kingdom, cross-sectional	Participation in recreational soccer as a part of a men's health program.	142, 100%, ~30 ^a (18–44)	2, 42 and 43	Develop and implement community-based support to increase awareness of and access to men's mental health support networks and groups	Mixed-methods surveys and qualitative content analysis	Two participant excerpts met inclusion: The soccer program provided opportunities to improve social confidence, opportunities to meet new people, and left feeling more relaxed in life.
Hall & Houlbrook (2019), Australia, cross-sectional	Over 35 soccer players (one club)	71, 100%, 45.7 $\pm$ 6.3 ^a (35–65)	8, NS	Aim of gaining insight into the motivations for and experiences of playing, as well as the impact of participation on their health and wellbeing	Mixed-methods survey and qualitative thematic, line-by-line analysis Social Determinants of Health framework	Identified club soccer participation improving and/or sustaining wellbeing, primarily through enjoyment and social connection.
J. Kim et al. (2014), United States, cross-sectional	Players at Korean Recreational tennis or badminton clubs	13, 61.5%, NS (34–65)	1, 37	Examine the benefits of physical activity involvement with members of the same ethnic group	Constructive grounded theory methodology	Single qualitative extract met inclusion: Participant stated that he felt that playing badminton provided an opportunity to develop friendships, which helped deal with feelings of loneliness and depression.

Note. HRQoL = Health Related Quality of Life; LTPA = leisure time physical activity; MCS = mental component summary; N = study sample size; NS = not stated; PCS = physical component summary; QoL = quality of life; WHOQOL-RBEEF = World-Health Organization Quality of Life Assessment—brief.

^aMale age not provided in-text but obtained through direct communication from author/s. ^b Age reflects sporting group, not provided for comparative group. ^c Age not provided in-text but calculated based on raw data provided

^dIncluded based on study average age.

Of the 21 studies included, only 2 included both an exclusively middle-aged male cohort and a primary focus on assessing the relationship between sport participation and a subjective health outcome (Hall & Houlbrook, 2019; Kitchen & Chowhan, 2016). The remaining 19 studies, whose primary aims were not to specifically assess the relationship between middle-aged male sport participation and subjective health (e.g., investigate and compare the quality of life (QoL) in endurance runners of differing diets (Boldt et al., 2018)), provided data on male sport participants' subjective health. Six studies compared a sporting sample to a non-sporting/general population sample (Bullock et al., 2020; Grunseit et al., 2017; Kitchen & Chowhan, 2016; Mayolas-Pi et al., 2017; Moreira et al., 2016; Munguia-Izquierdo et al., 2017; Swain et al., 2016), 9 studies compared individuals who reported sport participation versus those that indicated no sport participation via a questionnaire (Downward et al., 2016; Froom et al., 2004; Knapik et al., 2009; Luschen et al., 1997; Marlier et al., 2015; Omorou et al., 2013; Snyder & Spreitzer, 1974; Woitas-Ślubowska & Skarpanska-Stejnborn, 2010), while six studies had no non-sporting comparator group (Abotsie et al., 2020; Boldt et al., 2018; Croteau et al., 2019; Hall & Houlbrook, 2019; J. Kim et al., 2014; Pori et al., 2013).

Two thirds ($n = 14$) of the studies included both males and females in their sample, but reported separate data for males, with seven studies that included only male participants. Despite the average population age falling between 35 and 54 years, the included age ranges varied widely. Studies ranged from close-fitting middle-aged populations (e.g., 30–60 years (Knapik et al., 2009)) to broader adult populations (e.g., 18–64 years (Swain et al., 2016)), while 4 studies did not define the included age range.

Sports

The studies included a diverse range of sports, including organized running, competitive cycling, hockey, soccer, basketball, cricket, rugby, and badminton/tennis. The remaining eight studies did not specify the sports included but identified sport as an activity in which participants engaged.

Outcome Measures and Findings

Quality of Life and Health-Related Quality of Life. Eight studies explored the QoL or HRQoL of sport participants. Six assessed HRQoL using different versions of the Short Form (SF) Health Survey, SF-36 ($n = 2$), SF-36V2 ($n = 1$), SF-12V2 ($n = 2$), SF-8 ($n = 1$), while two studies assessing QoL used the World Health Organization QoL Brief Version.

Overall, participation in select sports (competitive cycling (Mayolas-Pi et al., 2017; Munguia-Izquierdo et al., 2017), Masters basketball (Moreira et al., 2016), endurance running (Boldt et al., 2018)) and broadly defined sport (Knapik et al., 2009; Omorou et al., 2013) demonstrated a positive relationship with physical and psychological domains of QoL or HRQoL. Another study identified current cricket participants to have higher physical HRQoL than former cricket participants, while psychological HRQoL was equal between the two groups (Bullock et al., 2020). Finally, the HRQoL of amateur rugby players was identified to be within one standard deviation of an age-matched Australian population (Swain et al., 2016).

Self-Rated Health. Six studies assessed overall health using one to two single self-reported questions, while one also assessed self-reported mental health. Two studies focused on specific sports (field hockey (Croteau et al., 2019), ice hockey (Kitchen & Chowhan, 2016)), while the others considered sport participation more broadly. Participation in sport was identified to have a positive influence on self-rated health in three studies (Froom et al., 2004; Kitchen & Chowhan, 2016; Woitas-Ślubowska & Skarpanska-Stejnborn, 2010) while no association was reported for self-assessed mental health (Kitchen & Chowhan, 2016). Three studies provided mixed results, with one identifying a positive influence for men living in West-Germany but not East-Germany (Luschen et al., 1997), another identified decreasing self-rated health with increased self-reported sport participation in 26 to 45 year old's (mean age 36 years) but a positive influence in 46 to 65 year old's (mean age 56 years) (Downward et al., 2016), while the third did not find any difference between male and female players of the 2018 United States Masters field hockey team (Croteau et al., 2019).

Life Satisfaction. Three studies considered the relationship between sport participation and life satisfaction. One study did not find a significant association between sport participation and life satisfaction in males (Snyder & Spreitzer, 1974), one identified a stronger relationship for female runners compared to male runners (Pori et al., 2013), and another identified that satisfaction with life of male participants of a weekly community running event to be below that of a male normative population group (Grunseit et al., 2017).

Flourishing. Two studies assessed sport participation and flourishing. One identified a near significant ($p = .053$) difference between current and former cricket participants (Bullock et al., 2020), while the second reported no difference between male and female Masters field hockey players (Croteau et al., 2019).

Happiness and Wellbeing. Three studies assessed relationships between sport participation and happiness or wellbeing. One study reported no influence of sport participation on avowed happiness (Snyder & Spreitzer, 1974), another reported no association with mental wellbeing (Marlier et al., 2015), while a third identified the global wellbeing of male participants of a weekly community running event to be within two standard deviations of an age-matched population (Grunseit et al., 2017).

Qualitative Data. Three studies employed a qualitative approach and assessed sports participation on subjective health. Two of these studies used mixed methods (Abotsie et al., 2020; Hall & Houlbrook, 2019); however, only the qualitative outcomes were applicable for this review. In general, participation in sport was identified to positively influence the well-being of middle-aged men through enjoyment and social connections (Abotsie et al., 2020; Hall & Houlbrook, 2019; J. Kim et al., 2014).

Discussion

This scoping review examined the characteristics (methodology, sports, outcomes), extent, and variety of peer-reviewed journal articles exploring sport participation and the health of men in their middle years. Of the 21 studies included within this review, no overlap was identified with the six middle-aged studies included in a recent meta-analysis on the psychosocial health of middle-aged and older adult sport participants (Sivaramakrishnan et al., 2021). This was due to differences in the inclusion criteria required for the meta-analysis (e.g., quantitative data, presence of comparator group) and analysis of mixed gender studies. The lack of cross-over highlights the appropriateness of the scoping methodology used here to specifically explore the male literature in detail. In general, results identified that the HRQoL and self-rated health of middle-aged men appear to be positively influenced by sport participation. The impact of sport on other outcomes, such as life satisfaction and flourishing, is unclear.

Synthesis of Findings

This review identified that middle-aged male sport participants presented with superior HRQoL compared to age-matched inactive controls (Mayolas-Pi et al., 2017; Munguia-Izquierdo et al., 2017), which is consistent with the previously established relationship between PA and HRQoL (Pucci et al., 2012). Within the current review, Kitchen and Chowman (2016) identified greater self-rated health when comparing male recreational ice hockey players to an age-matched active demographic that did not play hockey, and Omorou et al. (2013) identified increased QoL among male sport participants, compared to

non-sport participants, regardless of PA level. Further, Knapik et al. (2009) identified sport to be positively correlated with QoL among men aged 30 to 60 years, but no such correlation appeared between work and free time (excluding sport) based activity. One possible explanation for sports positive influence on different facets of health, such as QoL, may be intention. Asztalos et al. (2009) proposed that an observed positive relationship between sport and mental health may have been due to sport participation generally being undertaken for recreation and enjoyment, attributes that are associated with greater psychological well-being, but not characteristic of other forms of PA (e.g., active transportation, work-related PA). It is also worth considering that setbacks and challenges (e.g., losing, negotiating/learning new skills) players face through sport assist in developing resilience, a trait shown to promote greater QoL and flourishing scores among male sport participants (Bullock et al., 2020). Finally, sports influence on men's health may be influenced by past participation, as early life sport participation is associated with lower occurrence of physical chronic diseases in adulthood (Fernandes & Zanesco, 2015; Yang et al., 2009). Identified within this review, HRQoL (Munguia-Izquierdo et al., 2017) and age-comparative self-rated health (what do you think of your own health condition compared to that of other men of your age?) (Woitas-Ślubowska & Skarpanska-Stejnborn, 2010) were positively influenced by current sport participation, regardless of previous sport participation. However, the influence of early sport participation can't be concluded, as Woitas-Ślubowska and Skarpanska-Stejnborn (2010) also identified only men with past competitive sport experience to have a positive association between current participation in sport-related forms of PA and positive non-comparative self-rated health (how do you rate your health in general?).

Participation in team-based sport has previously shown a positive influence on social and psychological health. Research has reported that social variables, which encompassed factors such as positive social norms, peers participating in PA, and social support to perform PA, are significant in explaining PA variance in men aged 35 to 65 years (De Bourdeaudhuij & Sallis, 2002), while the social aspect of sport has been identified to be a major attractor among men (Robertson, 2003). Across the identified literature, six of eight studies of team-sport participants reported positive effects on physical HRQoL (Bullock et al., 2020; Moreira et al., 2016), mental HRQoL (Moreira et al., 2016), self-rated health (Kitchen & Chowman, 2016), or outlined themes of improved well-being, in part through developing social connections (Abotsie et al., 2020; Hall & Houlbrook, 2019; J. Kim et al., 2014). Of the two that did not follow this pattern, one only provided data to compare males and females and

did not identify a difference in self-rated health or flourishing (Croteau et al., 2019), while the other identified no difference in HRQoL between amateur rugby players and age-matched males (Swain et al., 2016). Given most team-sport studies demonstrated a positive influence, the inclusion of sporting companions may be particularly important for men, which is supported by further literature identified in this review. In particular, Grunseit et al. (2017) identified male participants of a community running event to have a similar global well-being to the general population, although the male runner's global well-being scores increased significantly as their perceived benefit of community connection from the events increased. This positive influence of social connection was consistent with the finding of Marlier et al. (2015) included in this review who identified those participating in sport (both males and females) with friends and colleagues demonstrated higher levels of individual and community social capital.

Despite several positive implications of sport participation, the included literature has highlighted factors that may impair the impact of sport participation on male subjective health, such as exercise addiction and/or injury. Mayolas-Pi et al. (2017) identified that male endurance cyclists with a high risk of exercise addiction, compared to those at low risk, had lower mental QoL scores. The development of a dependence and obsession with sport can lead to negative social health impacts as one may prioritize sport over family, friends and/or career (Griffiths et al., 2005). There is also evidence, while limited, that males may be at higher risk of exercise addiction than females (Dumitru & Dumitru, 2018) and that endurance-based sports, compared to team-based sports or health and fitness activities, are associated with higher exercise addiction risk (Di Lodovico et al., 2019). It is also important to consider that sport can lead to injury. From the identified literature, male Master's athletes who suffered a sport-related injury reported significantly lower physical and mental HRQoL, including reductions in their social function and mental health, likely due to their inability to participate in normal activities (Moreira et al., 2016). Similarly, Bullock et al. (2020) identified that 36% of former cricketers who stopped playing due to injury or chronic pain, had worse physical function and pain compared with current cricketers, but there was no difference in mental QoL.

Study Characteristics

A primary finding of this review was that there was a lack of peer-reviewed literature that had directly investigated how sport influenced the subjective health of men in their middle years. Of the 21 included studies, only two studies included a male only sample that was 35 years or older and

provided a clear indication of the sport assessed (Hall & Houlbrook, 2019; Kitchen & Chowhan, 2016). It was more common for the inclusion of a wider age range (e.g., 15–69 years (Omorou et al., 2013)) or both males and females to be included with only select data available for males. The lack of male only studies that fit the age range of interest limits the ability to identify discrete associations of sport participation and health in middle-aged males. For example, in Swain et al. (2016), of the entire sample ($n = 125$), only four were over 35 years of age, resulting in a very small sample of applicable data for this review. Similarly, two of the three qualitative studies featured males and females (J. Kim et al., 2014) or a young overall sample (Abotsie et al., 2020) which yielded no more than two qualitative excerpts from each study being applicable to middle-aged males and subjective health. It is inappropriate to draw generalizations from younger or older demographics given exercise context preferences can differ with age (Burton et al., 2012), and self-reported health (Downward et al., 2016) and social health (Marlier et al., 2015) have shown more positive influence among more middle-aged demographics compared to younger adults.

This review also identified a lack of diversity in research methodology. Eighteen of the 21 studies were cross-sectional, which is consistent with previous reviews on sport participation and psychosocial health of adults (Eime et al., 2013) and older adults (Gayman et al., 2017; A. Kim et al., 2019). Although cross-sectional research can provide evidence of an association, it does not provide evidence of causation for a specific intervention. To overcome this shortcoming recent research has begun to implement interventional methodologies to explore the causative effect of sport participation on QoL; however, this has been limited to older adults (Pedersen et al., 2017) and females (Hornstrup et al., 2018). Future researchers are encouraged to apply more robust research methodologies, through pre-post designs and/or randomized controlled trials, to provide causal inferences between sport participation and the subjective health of middle-aged men.

The included studies were published between 1974 and 2020. Over half ($n = 12$) were published from 2016 onwards, indicating increased interest in examining the relationship between sport participation and health in recent years. This recent increase follows the rise in literature on adult sport participation and objective physical health outcomes (Bellissimo et al., 2018; Luo et al., 2018; Milanović et al., 2019). Many factors could be driving this increase, one being the increase in the number of middle-aged adults among an aging population, many of whom (over 30%) present with multiple morbidities (Gondek et al., 2021). Furthermore, improving physical and psychological health, an opportunity for socialization, and enjoyment are motivators for middle-aged

adults to participate in sports (Sport Australia, 2020). Based on this motivation, researchers would be driven to provide evidence of sport's influence on these factors to aid effective health promotion and to increase participation rates. Finally, it is important to highlight that the drive in research is also likely influenced by increased Governmental promotion and funding of sport as a vehicle to improve health and increase PA levels (Sport Australia, 2018; Sport England, 2016).

Sports

Thirteen studies focused on participants of specific sports, while the remaining eight had a broader definition of sport. The more recent the publication, the more likely it was to include a clearer depiction of sport participation, with 11 of the 12 publications since 2016 assessing a specific sport. These sports (e.g., soccer, cricket, cycling) align with those commonly participated in by middle-aged males (Sport Australia, 2020). However, the depth of research into specific sports, for example, football/soccer, and subjective health outcomes are scant in comparison to the depth of research that has assessed the physiological outcomes of recreational football/soccer (Milanović et al., 2015, 2019). Many international sports, such as golf, or national sports high in middle-age male fanship, such as Australian Rules Football (Australia) or Handball (Germany), have also not been studied within this demographic. The lack of research into golf in the middle-aged demographic is particularly noteworthy, given that in Australia and the United Kingdom for example, unlike most sports which see a decline in participation with age, golf participation and membership increases from 35 years of age (England Golf, 2018; Sport Australia, 2019).

Among studies that assessed participation in sport more broadly ($n = 8$), only one (Marlier et al., 2015) provided an explicit definition of sport. The lack of definition and uniformity is consistent with adult sport research (Eime et al., 2013) and is a large limitation when trying to draw conclusions on population-based sport participation (Khan et al., 2012). The absence of a definition of sport brings about uncertainty as to whether the results truly represent sport, or may more broadly include exercise, such as yoga, gym, walking, or recreational running/cycling, as studies have been found to do when discussing "sport" (e.g., Oliveira-Brochado et al., 2017; Skrok et al., 2019). It is important for future research to clearly distinguish their classification of sport/s and utilize well established and objective definitions, such as that proposed by Khan et al. (2012).

Outcomes

Across the included studies, the outcome measures used demonstrated some consistency. HRQoL was only

assessed using versions of the SF Health Survey, while the World Health Organization QoL Brief Survey was used to assess QoL. Furthermore, all 6 studies assessing self-rated health as an outcome aligned with the definition of self-rated health (Wu et al., 2013), and the remaining outcome measures that were used less frequently have been considered valid (Diener et al., 2009; International Wellbeing Group, 2013; Pavot et al., 1991; Schmitz et al., 1999). The consistent use of a valid measure within the literature enables researchers to undertake comparisons between study findings and practitioners to attempt to emulate positive findings in practice. This is a strength of the identified research. However, the number of studies looking at outcomes beyond HRQoL and self-rated health is lacking. Given that measures such as flourishing and life satisfaction presented mixed results across only a few studies, and data provided prevented conclusions to be drawn (e.g., male versus female athletes Croteau et al., 2019), it is worth considering a more thorough exploration of these measures alone, or in conjunction with a measure such as HRQoL.

From two of three qualitative studies, only one (J. Kim et al., 2014) and two (Abotsie et al., 2020) excerpts that related directly to middle-aged males and their wellbeing could be obtained, as the overall conclusions and discussion included males and females (J. Kim et al., 2014) or an inappropriate age group (Abotsie et al., 2020). Qualitative research preserves the individuality and perspective of participants and upholds meanings attributed to experiences (Lockwood et al., 2015). Future qualitative research with middle-aged males could be valuable in providing insight into how men experience sport and identify what contextual factors of sport (e.g., competitiveness) (Draper, 2009) lead to improved health and wellbeing. Of the included studies within this review, the phenomenological approach by Hall & Houlbrook (2019) enabled the authors to uncover what practices, such as team awards and match reports, helped sustain the team and contribute to overall wellbeing within an over 35s soccer club; data that would likely not be captured through quantitative outcomes. A qualitative approach, similar to that of Hall & Houlbrook (2019), should be applied within future research to provide insight into the experience of other individual and/or team-based sports. Data on the participants perception of positive characteristics of certain sports, teams, and/or clubs would be useful in influencing the design of sport-based programs for the promotion of middle-aged male health.

Limitations

There are limitations within this review that need to be considered when interpreting the results. Only peer-reviewed articles were included which may have resulted

in the exclusion of relevant studies within the gray literature. Further, studies were included based on the average participant age, resulting in the inclusion of studies with individuals outside of the 35- to 54-year age range. This is highlighted by the provided age-ranges and large standard deviations. The use of average age was purposeful to ensure the full extent and range of potential literature was identified, as including studies that provided explicit results only for individuals directly falling within this age bracket (35–54 years) would have resulted in only a single study being included (Woitas-Ślubowska & Skarpanska-Stejnborn, 2010). Second, to capture all relevant literature and prevent the exclusion of articles based on the lack of detailed sport definitions provided in some studies, this review included articles in which sport participation was assessed, but the definition provided (or lack thereof) did not directly oppose the review's inclusion criteria. It is also important to highlight that the optional step of study critical appraisal was not undertaken as the aim of this review was to investigate the characteristics of published literature and not the quality.

Conclusion and Future Directions

This review provides several insights relating to the current state of peer-reviewed literature on the health of middle-aged male sport participants. While several studies provide data on males that participate in sport, very few researchers have designed their methodology with the specific aim of identifying how participation in sport influences the subjective health of middle-aged males. Drawing conclusions is restricted by methodological limitation (e.g., broad age-range, male and female sample) and therefore future research should address this directly through the inclusion of a male sample that closely aligns with the middle-aged demographic. Current literature, particularly population-based studies, have also been vague in the description of sport which brings about some uncertainty regarding the form of sport and/or exercise being assessed, and therefore the sport/s being studied within future research must be clearly detailed and ideally align with a well-accepted definition of sport (e.g., Khan et al., 2012). Future research implementing an interventional or experimental methodology will build on previously identified correlations and provide evidence of the causative effect/s, or lack thereof, that participation in sport has on the subjective health of men in their middle years. This study design recommendation was also passed down by Eime et al. (2013) across the broader adult literature almost a decade ago. Experimental research, be it quantitative, qualitative, or mixed, would also provide opportunity to disentangle the components of sport that most effectively promote the health of middle-aged men which could inform future sport for health programs.

Contributors

H. T. B. contributed to the conception, design and formulation of the review protocol and conducted the search strategy, completed screening, data extraction and the initial manuscript draft. J. D. B., A. J. C., and B. J. S. contributed to the conception, design and formulation of the review protocol and revised the original manuscript. E. J. O. and S. A. B. completed screening, data extraction and revised the original manuscript. All authors have read and approved the final version of the manuscript and agree with the order of presentation of the authors.

Data Availability Statement

The dataset that includes the extracted data from included studies analyzed during the current study is not publicly available but is available from the corresponding author on reasonable request.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: H. T. B., J. D. B., B. J. S., and A. J. C. are currently undertaking a clinical trial on team-sport participation and men's health which has been funded by a grant provided by the Norwood Football Club, South Australia, Australia. This grant has not been directly utilized for this review study and no affiliates of the funding organization had influence or contribution to this review.

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Supplemental Material

Supplemental material for this article is available online.

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