BMJ Open

Lived experiences of disabled individuals in sport: a systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038214
Article Type:	Protocol
Date Submitted by the Author:	02-Mar-2020
Complete List of Authors:	Aitchison, Beth; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences Rushton, Alison; University of Birmingham, Centre of Precision Rehabilitation for Spinal Pain Martin, Paul; English Institute of Sport Heneghan, Nicola; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences
Keywords:	SPORTS MEDICINE, REHABILITATION MEDICINE, PUBLIC HEALTH

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Lived experiences of disabled individuals in sport: a systematic review protocol

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Prospero registration number: CRD42020169224

Word count: 2,411

ARTICLE SUMMARY

Strengths and Limitations of this Study

- First systematic review of the experiences of individuals with disabilities in sport and will help to provide a basis for future research and inform practice
- The protocol is written in accordance with the PRISMA-P guidelines and registered with PROSPERO
- This protocol states our *a priori* methods to enable data synthesis from qualitative and quantitative research, with the overall quality of evidence reported using GRADE
- One limitation is that only articles written in English will be included in the analysis.

ABSTRACT

Introduction: Sports participation has many physical and psychosocial benefits for individuals with disabilities. The increase in awareness of and participation in disability sport has led to a growth in research in this area; however there is no insight into the lived experiences of individuals with disabilities in sport across different sub-populations and ages. This systematic review will provide a basis for future research and add to the literature to help inform practices.

Methods and PRISMA-P: The phenomenon of interest is the lived experiences of individuals with disabilities in sport. Studies with participants from any background with a physical, visual or mental impairment who participate in sport will be included. There will be no participant age limit and all study designs, except systematic reviews, will be included. Non-English language studies will be excluded. Two independent reviewers will be involved at each stage. The online databases MEDLINE, EMBASE, PsychINFO, CINAHL Plus, Web of Science and SportDiscus will be electronically searched. Grey literature will be searched and relevant sport-related journals will be hand-searched. The Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) will be used for quality assessment of qualitative studies and the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used if both qualitative and quantitative studies are included. Thematic synthesis will be used to analyse the qualitative studies. If quantitative studies are included, a narrative synthesis will be used to analyse the data and an integration matrix created to juxtapose the data and determine themes. The strength of the overall body of evidence will be assessed and reported using a modified Grading of Recommendations, Assessment, Development and Evaluation (GRADE).

Ethics and dissemination: This systematic review raises no ethical issues. Results will be published in a peer reviewed journal and disseminated to key stakeholders to inform practice.

PROSPERO registration number: CRD42020169224

Keywords: sport, lived experience, disabled, systematic review

INTRODUCTION

Rationale

Disability sport provides individuals with different impairments the opportunity to experience the many physical and psychosocial benefits associated with physical activity.[1] However, over 40% of disabled adults are inactive in the UK and those with a higher number of impairments are most inactive; nearly half of those with 3 or more impairments reported being inactive.[2] These individuals also experience higher rates of chronic disease, with 46% of disabled individuals in the United States experiencing heart disease, cancer, diabetes or a stroke.[3] Research into physical activity in disabled individuals has demonstrated many benefits to wellbeing including improvements in mental health and activities of daily living, and increased socialisation, employment opportunities and self-worth across a wide range of disabilities and age groups.[4-6]

Awareness and participation in disability sport has grown in recent years, with Sport England reporting that approximately 30% of disabled individuals in the UK have an active sports club membership.[7] The International Paralympic committee, established in 1989,[8] has been credited with the 'Paralympic movement' which is responsible for an increase in sporting opportunities, inclusion of disabled individuals in sport and raising the profile of elite disability sport.[9-11] At the elite level, there has been a steady growth in participation at the Paralympic Games, from 3000 athletes and 83 countries at Barcelona in 1992 to 4300 athletes and 160 countries at Rio 2016.[12] Paralympic sport funding has also grown, with UK Sport investing almost £73 million ahead of the Rio Paralympics compared to just £10 million for the Sydney Paralympic cycle (2000).[13] Research has suggested that sports participation is influenced by age and the type of disability, and also that finding the most appropriate sport for each individual increases and maintains participation.[14]

This greater awareness and investment has prompted research into para-sport, where the beliefs, identities and self-perceptions of disabled athletes have been explored. [15-17] Sport has been found to promote self and social acceptance and enable a sense of competence and pride in a population of Paralympic swimmers, however these findings are not transferrable to other sports.[15] Another study has reported that sport promotes independence and empowerment in para-athletes, giving them an opportunity to reinvent themselves.[17] However due to the participants' nationality, the results obtained may be Singaporean phenomena and therefore not transferrable to other countries and cultures. This review will synthesise the data on the disability athlete experience across sports in order to determine areas for future research and inform practice in this population. In disabled veterans, sports participation has been shown to improve quality of life, increasing confidence and

motivation whilst also providing an opportunity for camaraderie.[18] Additionally, one systematic review has reported that sport and physical activity play a role in improving the wellbeing and rehabilitation of veterans after physical and psychological trauma, facilitating personal growth and development.[19] This study proposed a potentially essential difference between 'sport' and 'physical activity' and the impact on the veterans' wellbeing, and suggested that future research should take this into account. Therefore this systematic review will look specifically at the sport experiences of veterans in order to provide more specific recommendations for research and practice.

To the best of the authors' knowledge, this review will be the first to synthesise the literature on the perceived health benefits of sport across different disabled populations and age ranges. Furthermore, as sports participation is influenced by age, [14] it is possible that the sport experiences also differ, so this will be explored in children, adolescent and adults. The synthesis of literature on the disability sport experience in different populations and age groups will provide a basis for future research and offer evidence that can help to inform practice.

Objectives

Aim: To explore the lived experiences of disabled individuals in sport.

1. To examine the perceived health benefits of sport in disabled populations.
2. To explore the lived experiences of children and adolescents in sport.
3. To explore the lived experiences of elite disability athletes and disabled veterans in sport.

METHODS

This systematic review protocol follows the Preferred Reporting Items of Systematic Review and Meta-analysis Protocols (PRISMA-P) 2015 statement (See Supplementary file 1). [20] This protocol and search has been designed involving subject-specific expertise in the form of leading experts in the field of elite disability sport (PM, NH) and methodological expertise in the form of extensive systematic review publications (AR, NH). The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD42020169224).

Eligibility criteria:

Eligibility criteria are informed using the Sample, Phenomenon of Interest, Design, Evaluation and Research (SPIDER) concept which is designed for qualitative evidence synthesis. [21] Studies will be eligible for inclusion in this review if they meet the following criteria:

Sample: Individuals with a physical, visual or mental impairment from any background who participate in sport, either competitively or recreationally. Individuals who are classed as disabled through old age or a medical condition (e.g. kidney disease, diabetes) will be excluded. There is no age limit on participants.

Phenomenon of Interest: The lived experiences of disabled individuals in sport.

Designs: All types of study designs will be considered. Systematic reviews will be excluded.

Evaluation: The lived experiences of disabled individuals in sport will be explored, which refers to the experiences of participating in sport as an impaired individual. The perceived health benefits of sport participation will be explored.

Research type: Qualitative research if just qualitative studies are included. Mixed-methods research both qualitative and quantitative studies are included.

Additionally studies written in languages other than English will be excluded.

Information sources

The databases Medline (Ovid interface), EMBASE (Ovid interface), PyschINFO (Ovid interface), Web of Science (Clarivate Analytics interface), CINAHL Plus (EBSCO interface) and SportDiscus (EBSCO interface) will be searched from database inception to February 2020. Grey literature sources, including OpenGrey, will be searched. Hand searching of the following journals will be conducted to complement the search strategy: *Qualitative Research in Sport, Exercise and Health*, *Psychology of Sport and Exercise, Disability and Rehabilitation, British Journal of Sports Medicine, European Journal of Sports Science* and *International Journal of Sports Science*. The screening of the references of included studies will also take place. Active researchers who have published literature in this field will be contacted.

Search strategy

The search will be conducted by the lead author (BA) in discussion with a second reviewer. Initial scoping searches have refined the search terms which will be kept broad to ensure a sensitive search strategy. Free text searches and subject heading searches will be carried out to ensure completeness of the search. The search strategy will be consistent however specific search terms will be adjusted for each database to reflect syntax differences (See Supplementary file 2 for MEDLINE search strategy).

Study records

Data management

The results of the literature search will be imported into EndNote X9 [22] which will be used for data management and reference storage. The citation, abstract and full text for all potentially eligible studies will be stored to allow effective screening. Any duplicates will be removed prior to the selection process.

Selection process

Two reviewers will independently screen titles and abstracts of studies to determine inclusion using the pre-determined eligibility criteria. The eligibility criterion of eligible/not eligible/might be eligible will be used to assess the studies. Studies will be excluded if it is clear from the title and abstract that the content is not relevant to the objectives. When a study cannot be excluded based on the title and abstract it will be graded as 'might be eligible'. After title and abstract screening, full-text copies of the potentially relevant studies will be obtained and eligibility determined. Studies published in languages other than English will be excluded. Studies will be also removed if the information available is insufficient for assessment and synthesis, such as full-text copies not being available. These studies will not be included in the synthesis but may be referenced in the discussion. Consensus between the reviewers regarding study selection will be reached through a discussion and in the case where an agreement is not reached a third reviewer will be consulted. Cohen's kappa will be used to assess the chance-corrected agreement, inter-rater reliability, between the two reviewers in assessing the eligibility of articles at the title/abstract stage and the full-text screening stage. [23] The study selection process will be carried out according to the PRISMA flow diagram and reported visually. [24]

Data collection process

Data will be extracted from included studies using the standardised qualitative data extraction tool from the Joanna Briggs Institute (See Supplementary file 3). [25] The form will be piloted first to ensure completeness and suitability on five studies and amended if necessary. Data will be extracted independently by two reviewers. In the event of a disagreement, a third reviewer will be consulted. If data are missing or ambiguous, the authors of the study will be contacted via email for the required additional information or any necessary clarification. The authors will receive a follow up email after 10 days and if they fail to respond within another 10 days, the study will be excluded.

Data items

Data will be presented in a table and data items will include: participant characteristics, context, study methods, phenomenon of interest and findings of each included study.

Outcomes and prioritisation

The experiences of children, adolescents, adults, elite athletes and veterans participating in disability sport constitute the phenomenon of interest. All experiences reported by these individuals, including experiences of the benefits, barriers and facilitators to sports participation, will be explored provided that there is sufficient evidence.

Risk of bias in individual studies

If only qualitative studies are included in the review, the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) will be used to provide a quality assessment (see supplementary file 4).[26] This tool is appropriate for and coherent in assessing qualitative studies due to its focus on congruity.[27] Alternatively, if both qualitative and quantitative studies are included the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used to create a quality rating score for all included studies (See Supplementary file 4).[28] This tool is suitable for quality assessment in mixed-methods designs as good validity, inter-rater reliability and test-retest reliability have been established.[28] A summary of the quality score for each study will be reported in a table. Two reviewers will independently carry out the quality assessment and if there is a lack of consensus between the reviewers after a discussion, the third reviewer will be consulted.

Data synthesis

Thematic synthesis is an appropriate method for the synthesis of qualitative evidence [29] and is based on thematic analysis, which is used for the analysis of primary research. [30] It will be conducted following the stages suggested by Thomas et al. [29] for qualitative evidence synthesis in systematic reviews. One reviewer (BA) will undertake line-by-line coding of the studies. Descriptive and analytical themes will be generated and two reviewers will review the themes and re-read the studies to ensure all relevant themes are identified. Should quantitative studies be eligible, a narrative synthesis of the quantitative studies will be undertaken independent of the qualitative analysis. This will involve a preliminary synthesis of the results of included studies and an exploration of the relationships within and between studies. [31] An integration matrix will be used to juxtapose the qualitative and

quantitative data to determine agreement or disagreement within identified themes.[32-34] The synthesis will be conducted by BA and checked by two other reviewers with experience in thematic synthesis and narrative synthesis.

Confidence in cumulative evidence

To assess the overall quality and strength of evidence, modified Grading of Recommendations, Assessment, Development and Evaluation (GRADE) will be used.[35] GRADE is used rate the body of evidence at the outcome level, [36] and will be modified so that it is suitable for the study designs included in this review. This tool is appropriate as it has been widely adopted to grade the quality of evidence, make recommendations and present summarises of evidence.[36-37] Two reviewers will independently apply this approach and quality will be rated as 'high', 'moderate', 'low' or 'very low'.[35]

DISCUSSION

This systematic review will be the first to synthesise the literature on the lived experiences of disabled individuals in sport. It will explore the experiences in different age groups, including children/adolescents and adults, as well as in different disabled populations including elite disability athletes and disabled veterans. The paucity of research in this area provides rationale for synthesising the literature on the lived experiences of disabled individuals in sport, and will provide a clear basis to guide further research and information to help inform practice. This protocol serves to provide a detailed account of the rationale and methods to be used in the proposed systematic review to ensure full transparency of the process. This study raises no ethical issues and any potential biases in the review process will be reported in the discussion section of the final review paper. Any required amendments to this protocol will be reported in the final systematic review and on PROSPERO along with the date, description and rationale for amendment.

Patient and public involvement

This study and protocol have been informed through extensive contact with disabled individuals and key stakeholders in the field in both a professional physiotherapy and clinical capacity, and in an athletic capacity through contact with disabled athletes. Since no individual data is needed, disabled

individuals will not be involved in data collection or analysis. Key stakeholders may be contacted for their input to the synthesis and interpretation of findings to inform results.

Implications

It is anticipated that the findings from this systematic review will provide an insight into the lived experiences of disabled individuals in sport, providing a basis for future research and helping to inform practice.

DECLARATIONS

Ethics and Dissemination

No ethical approval is required for this systematic review. The findings from this systematic review will be published in peer reviewed journals and disseminated to key stakeholders in disability sport.

Author Contributions

BA is an MSc by Research student at the University of Birmingham. AR and NH are supervisors. PM and NH are experts in the field of disability sport. BA, AR, PM and NH contributed to the systematic review topic. BA drafted the protocol with guidance and feedback from AR and NH. AR, PM and NH reviewed the manuscript and commented on the protocol. All authors have approved and contributed to the final manuscript.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

Competing interests

None declared.

Provenance and peer review

Not commissioned; externally peer reviewed.

Patient consent for publication

Not required.

REFERENCES

1. Slater D, Meade MA. Participation in recreation and sports for persons with spinal cord injury: review and recommendations. NeuroRehabilitation. 2004 Jan 1;19(2):121-9.
2. Sport England. *Active Lives Adult Survey May 18/19 Report.* Available from: https://www.sportengland.org/media/14239/active-lives-adult-may-18-19-report.pdf [Accessed 27th November 2019].
3. Carroll DD, Courtney-Long EA, Stevens AC, Sloan ML, Lullo C, Visser SN, Fox MH, Armour BS, Campbell VA, Brown DR, Dorn JM. Vital signs: disability and physical activity—United States, 2009–2012. MMWR. Morbidity and mortality weekly report. 2014 May 9;63(18):407.
4. Shephard RJ. Benefits of sport and physical activity for the disabled: implications for the individual and for society. Scandinavian journal of rehabilitation medicine. 1991;23(2):51-9.
5. Barfield JP, Malone LA. Perceived exercise benefits and barriers among power wheelchair soccer players. Journal of rehabilitation research and development. 2013 Feb 10;50(2):231.
6. Johnson CC. The benefits of physical activity for youth with developmental disabilities: a systematic review. American Journal of Health Promotion. 2009 Jan;23(3):157-67.
7. Sport England. *Active Lives Survey Nov 17/18.* Available from: https://activelives.sportengland.org/Result?queryId=27860 [Accessed 27th November 2019].
8. International Paralympic Committee. *About the International Paralympic Committee.* Available from: https://www.paralympic.org/ipc/who-we-are [Accessed 29th November 2019].
9. International Paralympic Committee. *History of the Paralympic Movement.* Available from: https://www.paralympic.org/ipc/history [Accessed 29th November 2019].
10. Blauwet C, Willick SE. The Paralympic Movement: using sports to promote health, disability rights, and social integration for athletes with disabilities. PM&R. 2012 Nov 1;4(11):851-6.
11. Thomas N, Smith A. Disability, sport and society: An introduction. Routledge; 2008 Dec 5.
12. International Paralympic Committee. *Summer Paralympic Games Overview.* Available from: https://www.paralympic.org/paralympic-games/summer-overview [Accessed 29th November 2019].
13. UK Sport. *Historical Funding Figures.* Available from: https://www.uksport.gov.uk/our-work/investing-in-sport/historical-funding-figures [Accessed 29th November 2019].

14. Jaarsma EA, Dijkstra PU, Geertzen JH, Dekker R. Barriers to and facilitators of sports participation for people with physical disabilities: A systematic review. Scandinavian journal of medicine & science in sports. 2014 Dec;24(6):871-81.
15. Pack S, Kelly S, Arvinen-Barrow M. "I think I became a swimmer rather than just someone with a disability swimming up and down:" paralympic athletes perceptions of self and identity development. Disability and rehabilitation. 2017 Sep 25;39(20):2063-70.
16. Kasum G, Mladenović M. The self-perception of athletes with disability. Fizička kultura. 2017;71(1):43-54.
17. De Cruz NP, Spray CM, Smith B. Implicit beliefs of disability and elite sport: the para-athlete experience. Qualitative Research in Sport, Exercise and Health. 2019 Jan 1;11(1):69-91.
18. Sporner ML, Fitzgerald SG, Dicianno BE, Collins D, Teodorski E, Pasquina PF, Cooper RA. Psychosocial impact of participation in the national veterans wheelchair games and winter sports clinic. Disability and rehabilitation. 2009 Jan 1;31(5):410-8.
19. Caddick N, Smith B. The impact of sport and physical activity on the well-being of combat veterans: A systematic review. Psychology of sport and exercise. 2014 Jan 1;15(1):9-18.
20. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic reviews. 2015 Dec;4(1):1.
21. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. Qualitative health research. 2012 Oct;22(10):1435-43.
22. Clarivate. *EndNote X9.* Available from: https://endnote.com/ [Accessed: 2nd December 2019].
23. McHugh ML. Interrater reliability: the kappa statistic. Biochemia medica: Biochemia medica. 2012 Oct 15;22(3):276-82.
24. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Annals of internal medicine. 2009 Aug 18;151(4):264-9.
25. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. *Joanna Briggs Institute Qualitative data extraction tool.* Available from: https://wiki.joannabriggs.org/display/MANUAL/Appendix+2.3%3A+JBI+Qualitative+data+extraction+tool [Accessed 2nd December 2019].
26. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. *Joanna Briggs Institute Critical Appraisal Checklist for Qualitative Research.* Available from:https://wiki.joannabriggs.org/display/MANUAL/Appendix+2.1%3A+JBI+Critical+Appraisal+Checklist+for+Qualitative+Research [Accessed 2nd December 2019].

27. Hannes K, Lockwood C, Pearson A. A comparative analysis of three online appraisal instruments' ability to assess validity in qualitative research. Qualitative health research. 2010 Dec;20(12):1736-43.

28. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. Journal of evaluation in clinical practice. 2012 Aug;18(4):746-52.

29. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. BMC medical research methodology. 2008 Dec;8(1):45.

30. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006 Jan 1;3(2):77-101.

31. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, Britten N, Roen K, Duffy S. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version. 2006 Apr 1;1:b92.

32. Thomas J, Harden A, Oakley A, Oliver S, Sutcliffe K, Rees R, Brunton G, Kavanagh J. Integrating qualitative research with trials in systematic reviews. Bmj. 2004 Apr 22;328(7446):1010-2.

33. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. Research in the schools: a nationally refereed journal sponsored by the Mid-South Educational Research Association and the University of Alabama. 2006;13(1):29.

34. Caracelli VJ, Greene JC. Data analysis strategies for mixed-method evaluation designs. Educational evaluation and policy analysis. 1993 Jun;15(2):195-207.

35. Guyatt G, Oxman AD, Akl EA, Kunz R, Vist G, Brozek J, Norris S, Falck-Ytter Y, Glasziou P, Debeer H, Jaeschke R. GRADE guidelines: 1. Introduction—GRADE evidence profiles and summary of findings tables. Journal of clinical epidemiology. 2011 Apr 1;64(4):383-94.

36. Siemieniuk R, Guyatt G. *What is GRADE?* Available from: https://bestpractice.bmj.com/info/toolkit/learn-ebm/what-is-grade/ [Accessed 5th February 2020].

37. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, Schünemann HJ. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. Bmj. 2008 Apr 24;336(7650):924-6.

Supplementary file 1.

PRISMA-P 2015 Checklist

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol

Section and topic	Item No	Checklist item	Signpost
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	P1. Lived experiences of disabled individuals in sport: a systematic review protocol
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not applicable
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	P1. PROSPERO: CRD42020169224
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	P1. Beth Aitchison University of Birmingham Email: bla923@student.bham.ac.uk Dr Nicola Heneghan Lecturer in Physiotherapy School of Sport, Exercise and Rehabilitation Sciences College of Life and Environmental Sciences University of Birmingham Edgbaston, Birmingham, B15 2TT, UK Tel: 0121 415 8367 Email: n.heneghan@bham.ac.uk Dr Alison Rushton University of Birmingham

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Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	P9. BA developed the protocol with guidance and feedback from NH and AR. BA is first reviewer and second reviewer is Marc Barr (MB). NH is third reviewer. All authors have contributed to the development of the protocol and will contribute to the data interpretation. All authors have approved the final manuscript.
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:			
Sources	5a	Indicate sources of financial or other support for the review	P9. 'This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.'
Sponsor	5b	Provide name for the review funder and/or sponsor	Not applicable
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	Not applicable
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	P4 and P5. Introduction (rationale)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	P5. Introduction (objectives)
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	P5 and P6. Eligibility criteria.
Information sources	9	Describe all intended information sources (such as electronic	P6. Information sources.

		databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	P6 and P7 and supplementary file 2.
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	P7. Data management.
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	P7. Selection process
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	P7 and P8. Data collection process.
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	P8. Data items.
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	P8. Outcomes and prioritisation.
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	P8. Risk of bias in individual studies.
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	P8 and P9. Data synthesis.
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	P8 and P9. Data synthesis
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Not applicable.
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	P8 and P9. Data synthesis.
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	P9. Discussion.

Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	P9. Confidence in cumulative evidence.

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g764

Supplementary file 2.

Search strategy for MEDLINE database.

1	Experience*.ti,ab.
2	Benefit*.ti,ab.
3	Involve*.ti,ab.
4	Participa*.ti,ab.
5	1 or 2 or 3 or 4
6	Disab*.ti,ab.
7	Impair*.ti,ab.
8	Wheelchair*.ti,ab.
9	Exp Disabled Persons/
10	(disab* ad5 veteran*).ti,ab.
11	(disab* adj3 athlete*).ti,ab.
12	(para* adj3 athlete*).ti,ab.
13	Paralympi*.ti,ab.
14	6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15	Sports for Persons with Disabilities/
16	Sports/
17	15 or 16
18	5 and 14 and 17

Supplementary file 3.

Joanna Briggs Institute data extraction tool for qualitative research.

JBI QARI Data Extraction Tool for Qualitative Research

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Description

Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors conclusions

Comments

Complete Yes ☐ No ☐

Findings	Illustration form Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete Yes ☐ No ☐

Supplementary file 4.

Joanna Briggs Insitute Critical Appraisal Checklist for Qualitative Research

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer_____Date_____

Author _____Year_____Record Number_____

		Yes	No	Unclear	Not applicable
1.	Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐	☐
2.	Is there congruity between the research methodology and the research question or objectives?	☐	☐	☐	☐
3.	Is there congruity between the research methodology and the methods used to collect data?	☐	☐	☐	☐
4.	Is there congruity between the research methodology and the representation and analysis of data?	☐	☐	☐	☐
5.	Is there congruity between the research methodology and the interpretation of results?	☐	☐	☐	☐
6.	Is there a statement locating the researcher culturally or theoretically?	☐	☐	☐	☐
7.	Is the influence of the researcher on the research, and vice- versa, addressed?	☐	☐	☐	☐
8.	Are participants, and their voices, adequately represented?	☐	☐	☐	☐
9.	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	☐	☐	☐	☐
10.	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

Quality Assessment Tool for Studies with Diverse Designs

Criteria	0 = Not at all	1 = Very slightly	2 = Moderately	3 = Complete
Explicit theoretical framework	No mention at all.	Reference to broad theoretical basis.	Reference to a specific theoretical basis.	Explicit statement of theoretical framework and/or constructs applied to the research.
Statement of aims/objectives in main body of report	No mention at all.	General reference to aim/objective at some point in the report including abstract.	Reference to broad aims/objectives in main body of report.	Explicit statement of aims/objectives in main body of report.
Clear description of research setting	No mention at all.	General description of research area and background, e.g. 'in primary care'.	General description of research problem in the target population, e.g. 'among GPs in primary care'.	Specific description of the research problem and target population in the context of the study, e.g. nurses and doctors from GP practices in the east midlands.
Evidence of sample size considered in terms of analysis	No mention at all.	Basic explanation for choice of sample size. Evidence that size of the sample has been considered in study design.	Evidence of consideration of sample size in terms of saturation/information redundancy or to fit generic analytical requirements.	Explicit statement of data being gathered until information redundancy/saturation was reached or to fit exact calculations for analytical requirements.
Representative sample of target group of a reasonable size	No statement of target group.	Sample is limited but represents some of the target group or representative but very small.	Sample is somewhat diverse but not entirely representative, e.g. inclusive of all age groups, experience but only one workplace. Requires discussion of target population to determine what sample is required to be representative.	Sample includes individuals to represent a cross section of the target population, considering factors such as experience, age and workplace.
Description of procedure for data collection	No mention at all.	Very basic and brief outline of data collection procedure, e.g. 'using a questionnaire distributed to staff'.	States each stage of data collection procedure but with limited detail, or states some stages in details but omits others.	Detailed description of each stage of the data collection procedure, including when, where and how data were gathered.
Rationale for choice of data collection tool(s)	No mention at all.	Very limited explanation for choice of data collection tool(s).	Basic explanation of rationale for choice of data collection tool(s), e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool(s), e.g. relevance to the study aims and assessments of tool quality either statistically, e.g. for reliability & validity, or relevant qualitative assessment.
Detailed recruitment data	No mention at all.	Minimal recruitment data, e.g. no. of questionnaire sent and no. returned.	Some recruitment information but not complete account of the recruitment process, e.g. recruitment figures but no information on strategy used.	Complete data regarding no. approached, no. recruited, attrition data where relevant, method of recruitment.
Statistical assessment of reliability and validity of measurement tool(s) (Quantitative only)	No mention at all.	Reliability and validity of measurement tool(s) discussed, but not statistically assessed.	Some attempt to assess reliability and validity of measurement tool(s) but insufficient, e.g. attempt to establish test–retest reliability is unsuccessful but no action is taken.	Suitable and thorough statistical assessment of reliability and validity of measurement tool(s) with reference to the quality of evidence as a result of the measures used.
Fit between stated research question and method of data collection (Quantitative)	No research question stated.	Method of data collection can only address some aspects of the research question.	Method of data collection can address the research question but there is a more suitable alternative that could have been used or used in addition.	Method of data collection selected is the most suitable approach to attempt answer the research question
Fit between stated research question and format and content of data collection tool e.g. interview schedule (Qualitative)	No research question stated.	Structure and/or content only suitable to address the research question in some aspects or superficially.	Structure & content allows for data to be gathered broadly addressing the stated research question(s) but could benefit from greater detail.	Structure & content allows for detailed data to be gathered around all relevant issues required to address the stated research question(s).
Fit between research question and method of analysis	No mention at all.	Method of analysis can only address the research question basically or broadly.	Method of analysis can address the research question but there is a more suitable alternative that could have been used or used in addition to offer greater detail.	Method of analysis selected is the most suitable approach to attempt answer the research question in detail, e.g. for qualitative IPA preferable for experiences vs. content analysis to elicit frequency of occurrence of events, etc.
Good justification for analytical method selected	No mention at all.	Basic explanation for choice of analytical method	Fairly detailed explanation of choice of analytical method.	Detailed explanation for choice of analytical method based on nature of research question(s).
Assessment of reliability of analytical process (Qualitative only)	No mention at all.	More than one researcher involved in the analytical process but no further reliability assessment.	Limited attempt to assess reliability, e.g. reliance on one method.	Use of a range of methods to assess reliability, e.g. triangulation, multiple researchers, varying research backgrounds.
Evidence of user involvement in design	No mention at all.	Use of pilot study but no involvement in planning stages of study design.	Pilot study with feedback from users informing changes to the design.	Explicit consultation with steering group or statement or formal consultation with users in planning of study design.
Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues.	Discussion of some of the key strengths and weaknesses of the study but not complete.	Discussion of strengths and limitations of all aspects of study including design, measures, procedure, sample & analysis.

BMJ Open

The experiences and perceived health benefits of individuals with a disability participating in sport: a systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038214.R1
Article Type:	Protocol
Date Submitted by the Author:	05-Jun-2020
Complete List of Authors:	Aitchison, Beth; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences Rushton, Alison; University of Birmingham, Centre of Precision Rehabilitation for Spinal Pain Martin, Paul; English Institute of Sport Soundy, Andrew; University of Birmingham, Heneghan, Nicola; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences
Primary Subject Heading:	Public health
Secondary Subject Heading:	Evidence based practice, Public health, Rehabilitation medicine
Keywords:	REHABILITATION MEDICINE, PUBLIC HEALTH, SOCIAL MEDICINE

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The experiences and perceived health benefits of individuals with a disability participating in sport: a systematic review protocol

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Prospero registration number: CRD42020169224

Word count: 2,441

ABSTRACT

Introduction: Sports participation has many physical and psychosocial benefits for individuals with a disability. The increase in awareness of and participation in disability sport has led to a growth in research in this area; however there is little insight into the experiences of children and adolescents, adults, elite athletes and veterans with a disability participating in sport. This systematic review will provide a basis for future research and add to the literature to help inform practice.

Methods and PRISMA-P: The phenomenon of interest is the experiences and perceived health benefits of individuals with a disability participating in sport. There will be no age limit on participants and all study designs, besides systematic reviews, will be included. Studies in languages other than English will be excluded. Two independent reviewers will be involved at each stage. The online databases MEDLINE, EMBASE, PsychINFO, CINAHL Plus, Web of Science and SportDiscus will be electronically searched from database inception to February 2020. Grey literature will be searched and several sport-related journals will be hand-searched. The Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) will be used for quality assessment of qualitative studies and if both qualitative and quantitative studies are included, the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used instead. Thematic synthesis will be used to analyse the qualitative studies. If quantitative studies are included, a narrative synthesis will be used to analyse the data and an integration matrix created to juxtapose the data and determine themes. The strength of the overall body of evidence will be reported using modified Grading of Recommendations, Assessment, Development and Evaluation (GRADE).

Ethics and dissemination: This systematic review raises no ethical issues. Results will be published in a peer reviewed journal and disseminated to key stakeholders to inform practice.

PROSPERO registration number: CRD42020169224

Keywords: sport, experience, disabled, systematic review

ARTICLE SUMMARY

Strengths and Limitations of this Study

- This is the first systematic review to synthesise evidence on the experiences and perceived health benefits of individuals with a disability participating in sport.
- Rigorous methods will be applied at all stages of the review to inform levels of evidence for individual outcomes.
- Only articles written in English will be included in the analysis.

INTRODUCTION

Rationale

Disability sport provides individuals with different impairments the opportunity to experience the many physical and psychosocial benefits associated with physical activity.[1] These benefits include improvements in mental health, activities of daily living, socialisation, employment opportunities and perceived self-worth across a wide range of disabilities and age-groups.[2-4] However, over 40% of disabled adults are inactive in the UK.[5] Almost half of those with 3 or more impairments, including a physical disability, chronic health condition or mental health condition, are inactive.[5] Individuals with a vision, cognitive or mobility disability also experience higher rates of chronic disease. In the United States, over 40% of disabled individuals experience heart disease, cancer, diabetes or a stroke compared to just 13.7% of those without a disability.[6]

Awareness and participation in disability sport has grown in recent years, with Sport England reporting that approximately 30% of individuals with a disability in the UK have an active sports club membership and had participated at least twice in the last month.[7] This is consistent with the findings of Krane and Orkis [8] who reported that 30% of American adults with disabilities were regularly participating in sports or physical activity. The International Paralympic committee, established in 1989,[9] has been credited with the 'Paralympic Movement' which is responsible for an increase in sporting opportunities, inclusion of individuals with a disability in sport and raising the profile of elite disability sport.[10-12] At the elite level, there has been a steady growth in participation at the Paralympic Games, from 2999 athletes and 83 countries at Barcelona in 1992 to 4328 athletes and 160 countries at Rio 2016.[13] Paralympic sport funding has also grown, with UK Sport investing almost £73 million in the four year cycle before Rio Paralympics Games compared to just £10 million for the Sydney Paralympic Games cycle (2000).[14]

This greater awareness and investment has prompted research into para-sport, where the beliefs, identities and self-perceptions of athletes with a disability have been explored. [15-17] At the elite-level, sport has been found to promote both self-acceptance and social acceptance and enables a sense of competence and pride. .[15] Another study has reported that sport promotes independence and empowerment in elite para-athletes, giving them an opportunity to reinvent themselves.[17] These studies were conducted specifically in Paralympic swimmers [15], and in elite Singaporean para-athletes [17], therefore further investigation may be needed into other sports and countries.

In veterans with a disability, sports participation has been shown to improve quality of life, increasing confidence and motivation whilst also providing an opportunity for camaraderie.[18] Additionally, one systematic review has reported that sport and physical activity play a role in improving the wellbeing and rehabilitation of veterans after physical and psychological trauma, facilitating personal growth and development.[19] This study proposed a potentially essential difference between 'sport' and 'physical activity' and the impact on the veterans' wellbeing, and suggested that future research should take this into account.

In the general population, the personal and environmental barriers and facilitators to sports participation have been reported to be different in children and adolescents with a disability compared to adults with a disability.[20] For instance, enjoyment and relaxation were the main facilitators to sport in the younger population, whereas health, fitness and goal setting were important to adults.[20] These differences suggest that other aspects of the sport experiences may differ between these populations, such as participant perceived benefits.

Therefore the aim of this review is to synthesise the literature on the disability sport experience and participant perceived health benefits of sport in children and adolescents, adults, elite athletes and veterans with a disability. To the best of the authors' knowledge, this review will be the first to synthesise the evidence on the disability sport experience in these different populations and will provide a basis for future research and offer evidence that can help to inform practice.

Objectives

Aim: To explore the experiences and perceived health benefit of individuals with a disability participating in sport.

1. To examine the perceived health benefits of participating in disability sport for children and adolescents, adults, elite athletes and veterans with a disability.
2. To explore the experiences of children and adolescents, adults, elite athletes and veterans with a disability participating in disability sport.

METHODS

This systematic review protocol follows the Preferred Reporting Items of Systematic Review and Meta-analysis Protocols (PRISMA-P) 2015 statement (supplementary file 1).[21] This protocol and search has been designed involving subject-specific expertise in the form of leading experts in the field of elite disability sport (PM, NH) and methodological expertise in the form of extensive systematic review

publications (AR, NH). The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO registration number: CRD42020169224).

Eligibility criteria:

Eligibility criteria are informed using the Sample, Phenomenon of Interest, Design, Evaluation and Research (SPIDER) concept which is designed for qualitative evidence synthesis.[22] Studies will be eligible for inclusion in this review if they meet the following criteria:

Sample: Individuals with a physical, visual or mental impairment from any background who regularly (≥ once per week) participate in sport, either competitively or recreationally. Individuals who are classed as disabled through old age (eg. >60 years old) or a medical condition (eg. Kidney disease, diabetes) will be excluded. There is no age limit on participants.

Phenomenon of Interest: The experiences of individuals with a disability participating in sport and the perceived health benefits of sport.

Designs: All types of study designs will be considered including phenomenology, grounded theory, discourse analysis, narrative analysis and cross-sectional research. Systematic reviews will be excluded. Studies written in languages other than English will be excluded.

Evaluation: Any reported experiences by individuals with a disability in sport will be explored. The perceived health benefits of sport participation will be explored via studies which have reported participant perceived health benefits

Research type: Research including qualitative methods or where combined with quantitative methods results from both (mixed methods) will be included.

This systematic review will be qualitative research should the studies retrieved are be qualitative in nature. Should both qualitative and quantitative studies be included in the analysis, the systematic review will be mixed methods.

Information sources

The databases Medline (Ovid interface), EMBASE (Ovid interface), PyschINFO (Ovid interface), Web of Science (Clarivate Analytics interface), CINAHL Plus (EBSCO interface) and SportDiscus (EBSCO interface) will be searched from database inception to February 2020. Grey literature sources, including OpenGrey, will be searched. Hand searching of the following journals will be conducted to complement the search strategy: *Qualitative Research in Sport, Exercise and Health*, *Psychology of Sport and Exercise, Disability and Rehabilitation, British Journal of Sports Medicine, European Journal of Sports Science* and *International Journal of Sports Science*. The screening of the references of

included studies will also take place. Active researchers who have published literature in this field will be contacted.

Search strategy

The search will be conducted independently by the lead author (BA) and a second reviewer. Initial scoping searches have refined the search terms for the databases which will be kept broad to ensure a sensitive search strategy. Free text searches and subject heading searches will be carried out to ensure completeness of the search. The search strategy will be consistent however specific search terms will be adjusted for each database to reflect syntax differences (see supplementary file 2 for MEDLINE search strategy).

Study records

Data management

The results of the literature search will be imported into EndNote X9 [23] which will be used for data management and reference storage. The citation, abstract and full text for all potentially eligible studies will be stored to allow effective screening. Any duplicates will be removed prior to the selection process.

Selection process

The lead author (BA) and a second reviewer will independently screen titles and abstracts of studies to determine inclusion using the pre-determined eligibility criteria. The eligibility criterion of eligible/not eligible/might be eligible will be used to assess the studies. Studies will be excluded if it is clear from the title and abstract that the content is not relevant to the objectives. When a study cannot be excluded based on the information provided in the title and abstract it will be graded as 'might be eligible'. After title and abstract screening, full-text copies of the potentially relevant studies will be obtained and eligibility determined. Studies published in languages other than English will be excluded. Studies will also be removed if the information available is insufficient for assessment and synthesis, such as full-text copies not being available. These studies will not be included in the synthesis but may be referenced in the discussion section. Consensus between the reviewers regarding study selection will be reached through a discussion and in the case where an agreement is not reached a third reviewer will be consulted. Cohen's kappa will be used to assess the chance-corrected agreement, inter-rater reliability, between the two reviewers in assessing the eligibility of articles at the title/abstract stage and the full-text screening stage.[24] The study selection process will be carried out according to the PRISMA flow diagram and reported visually.[25]

Data collection process

Data will be extracted independently by the lead author and second reviewer from included studies using the standardised qualitative data extraction tool from the Joanna Briggs Institute (see supplementary file 3).[26] The form will piloted first to ensure completeness and suitability on five studies and amended if necessary to include criteria such as study design should the systematic review be mixed-methods in design. In the event of a disagreement between the two reviewers in data extracted, a third reviewer will be consulted. .

Data items

Data will be presented in a table and data items will include: participant information, context, study methods, phenomenon of interest and findings of each included study.

Outcomes and prioritisation

The experiences and perceived health benefits of children and adolescents, adults, elite athletes and veterans with a disability participating in disability sport constitute the phenomenon of interest. All experiences reported by these individuals, including experiences of the benefits, barriers and facilitators to sports participation, will be explored provided that there is sufficient evidence.

Risk of bias in individual studies

If only qualitative studies are included in the review, the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) will be used to provide a quality assessment (see supplementary file 4).[27] This tool is appropriate for and coherent in assessing qualitative studies due to its focus on congruity and has been extensively peer reviewed[28, 29] Alternatively, if both qualitative and quantitative studies are included the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used to create a quality rating score for all included studies (see supplementary file 4).[30] This tool is suitable for quality assessment in mixed-methods designs as good validity, inter-rater reliability and test-retest reliability have been established and it allows an in-depth understanding of the included review papers.[30, 31] A summary of the quality score, and converted percentage score, for each study will be reported in a table. Two reviewers will independently carry out the quality assessment and if there is a lack of consensus between the reviewers after a discussion, the third reviewer will be consulted. If additional information is required

from authors, such as an interview topic guide, the authors will be contacted for this information to facilitate quality assessment.

Data synthesis

Thematic synthesis is an appropriate method for the synthesis of qualitative evidence [32] and is based on thematic analysis, which is used for the analysis of primary research.[33] It will be conducted following the stages suggested by Thomas et al.[32] for qualitative evidence synthesis in systematic reviews. The lead author (BA) will undertake line-by-line coding of the studies and generate descriptive and analytical themes. The themes generated will be reviewed by a further two reviewers (NH/AS). Should quantitative studies be eligible, a narrative synthesis of the quantitative studies will be undertaken independent of the qualitative analysis. This will involve a preliminary synthesis of the results of included studies and an exploration of the relationships within and between studies.[34] An integration matrix will be used to juxtapose the qualitative and quantitative data to determine agreement or disagreement within identified themes.[35-37]The synthesis will be conducted by BA and checked by two other reviewers with experience in thematic synthesis and narrative synthesis.

Confidence in cumulative evidence

To assess the overall quality and strength of evidence, modified Grading of Recommendations, Assessment, Development and Evaluation (GRADE) will be used.[38] GRADE is used rate the body of evidence at the outcome level,[39] and is appropriate as it has been widely adopted to grade the quality of evidence, make recommendations and present summarises of evidence.[39-40] Observational data is usually regarded as low quality, however these studies may be upgraded in quality when there is a 'large magnitude of effect' for instance.[39] Two reviewers will independently assess the overall body of evidence which will be rated as 'high', 'medium', 'low' or 'very low'. A high rating would conclude that further research is not likely to greatly impact on confidence of findings and a low rating would suggest an uncertainty of effect and the need for further research.

DISCUSSION

This systematic review will be the first to synthesise the literature on the experiences of individuals with a disability participating in sport. It will explore the sport experiences in different populations including children and adolescents, adults, elite athletes and veterans with a disability. The paucity of

research in this area provides rationale for synthesising the evidence, and will provide a clear basis to guide further research in this area and provide information to help inform practice surrounding participation in disability sport. This protocol serves to provide a detailed account of the rationale and methods to be used in the proposed systematic review to ensure full transparency of the process. This study raises no ethical issues and any potential biases in the review process will be reported in the discussion section of the final review paper. Any required amendments to this protocol will be reported in the final systematic review and on PROSPERO along with the date, description and rationale for amendment.

Patient and public involvement

This study and protocol have been informed through extensive contact with key stakeholders in the field in both a professional physiotherapy and clinical capacity, and in an athletic capacity through contact with disabled athletes. Since no individual data is needed, disabled individuals will not be involved in data collection or analysis. Key stakeholders may be contacted for their input to the synthesis and interpretation of findings to inform results.

Implications

It is anticipated that the findings from this systematic review will provide an insight into the lived experiences of disabled individuals in sport, providing a basis for future research and helping to inform practice.

DECLARATIONS

Ethics and Dissemination

No ethical approval is required for this systematic review. The findings from this systematic review will be published in peer reviewed journals and disseminated to key stakeholders in disability sport.

Author Contributions

BA is an MSc by Research student at the University of Birmingham. AR, AS and NH are supervisors. PM and NH are experts in the field of disability sport. BA, AR, AS, PM and NH contributed to the systematic

review topic. BA drafted the protocol with guidance and feedback from AR, AS and NH. AR, PM, AS and NH reviewed the manuscript and commented on the protocol. All authors have approved and contributed to the final manuscript.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

Competing interests

None declared.

Provenance and peer review

Not commissioned; externally peer reviewed.

Patient consent for publication

Not required.

REFERENCES

1. Slater D, Meade MA. Participation in recreation and sports for persons with spinal cord injury: review and recommendations. NeuroRehabilitation. 2004 Jan 1;19(2):121-9.
2. Shephard RJ. Benefits of sport and physical activity for the disabled: implications for the individual and for society. Scandinavian journal of rehabilitation medicine. 1991;23(2):51-9.

3. Barfield JP, Malone LA. Perceived exercise benefits and barriers among power wheelchair soccer players. Journal of rehabilitation research and development. 2013 Feb 10;50(2):231.
4. Johnson CC. The benefits of physical activity for youth with developmental disabilities: a systematic review. American Journal of Health Promotion. 2009 Jan;23(3):157-67.
5. Sport England. *Active Lives Adult Survey May 18/19 Report.* Available from: https://www.sportengland.org/media/14239/active-lives-adult-may-18-19-report.pdf [Accessed 27th November 2019].
6. Carroll DD, Courtney-Long EA, Stevens AC, Sloan ML, Lullo C, Visser SN, Fox MH, Armour BS, Campbell VA, Brown DR, Dorn JM. Vital signs: disability and physical activity—United States, 2009–2012. MMWR. Morbidity and mortality weekly report. 2014 May 9;63(18):407.
7. Sport England. *Active Lives Survey Nov 17/18.* Available from: https://activelives.sportengland.org/Result?queryId=27860 [Accessed 27th November 2019].
8. Krane D., Orkis, K. *Sports and employment among Americans with disabilities.* [Presentation] Harris Interactive. 12th February 2009.
9. International Paralympic Committee. *About the International Paralympic Committee.* Available from: https://www.paralympic.org/ipc/who-we-are [Accessed 29th November 2019].
10. International Paralympic Committee. *History of the Paralympic Movement.* Available from: https://www.paralympic.org/ipc/history [Accessed 29th November 2019].
11. Blauwet C, Willick SE. The Paralympic Movement: using sports to promote health, disability rights, and social integration for athletes with disabilities. PM&R. 2012 Nov 1;4(11):851-6.
12. Thomas N, Smith A. Disability, sport and society: An introduction. Routledge; 2008 Dec 5.
13. International Paralympic Committee. *Summer Paralympic Games Overview.* Available from: https://www.paralympic.org/paralympic-games/summer-overview [Accessed 29th November 2019].
14. UK Sport. *Historical Funding Figures.* Available from: https://www.uksport.gov.uk/our-work/investing-in-sport/historical-funding-figures [Accessed 29th November 2019].
15. Pack S, Kelly S, Arvinen-Barrow M. "I think I became a swimmer rather than just someone with a disability swimming up and down:" paralympic athletes perceptions of self and identity development. Disability and rehabilitation. 2017 Sep 25;39(20):2063-70.
16. Kasum G, Mladenović M. The self-perception of athletes with disability. Fizička kultura. 2017;71(1):43-54.
17. De Cruz NP, Spray CM, Smith B. Implicit beliefs of disability and elite sport: the para-athlete experience. Qualitative Research in Sport, Exercise and Health. 2019 Jan 1;11(1):69-91.

18. Sporner ML, Fitzgerald SG, Dicianno BE, Collins D, Teodorski E, Pasquina PF, Cooper RA. Psychosocial impact of participation in the national veterans wheelchair games and winter sports clinic. Disability and rehabilitation. 2009 Jan 1;31(5):410-8.
19. Caddick N, Smith B. The impact of sport and physical activity on the well-being of combat veterans: A systematic review. Psychology of sport and exercise. 2014 Jan 1;15(1):9-18.
20. Jaarsma EA, Dijkstra PU, Geertzen JH, Dekker R. Barriers to and facilitators of sports participation for people with physical disabilities: A systematic review. Scandinavian journal of medicine & science in sports. 2014 Dec;24(6):871-81.
21. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic reviews. 2015 Dec;4(1):1.
22. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. Qualitative health research. 2012 Oct;22(10):1435-43.
23. Clarivate. *EndNote X9.* Available from: https://endnote.com/ [Accessed: 2nd December 2019].
24. McHugh ML. Interrater reliability: the kappa statistic. Biochemia medica: Biochemia medica. 2012 Oct 15;22(3):276-82.
25. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Annals of internal medicine. 2009 Aug 18;151(4):264-9.
26. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. *Joanna Briggs Institute Qualitative data extraction tool.* Available from: https://wiki.joannabriggs.org/display/MANUAL/Appendix+2.3%3A+JBI+Qualitative+data+extraction+tool [Accessed 2nd December 2019].
27. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. *Joanna Briggs Institute Critical Appraisal Checklist for Qualitative Research.* Available from:https://wiki.joannabriggs.org/display/MANUAL/Appendix+2.1%3A+JBI+Critical+Appraisal+Checklist+for+Qualitative+Research [Accessed 2nd December 2019].
28. Hannes K, Lockwood C, Pearson A. A comparative analysis of three online appraisal instruments' ability to assess validity in qualitative research. Qualitative health research. 2010 Dec;20(12):1736-43.
29. Joanna Briggs Institute. *Checklist for systematic reviews and research syntheses.* Available from: https://joannabriggs.org/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Systematic_Reviews2017_0.pdf [Accessed 22/05/20].

30. Sirriyeh R, Lawton R, Gardner P, Armitage G. Reviewing studies with diverse designs: the development and evaluation of a new tool. Journal of evaluation in clinical practice. 2012 Aug;18(4):746-52.
31. Fenton L, Lauckner H, Gilbert R. The QATSDD critical appraisal tool: comments and critiques. Journal of evaluation in clinical practice. 2015 Dec;21(6):1125-8.
32. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. BMC medical research methodology. 2008 Dec;8(1):45.
33. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006 Jan 1;3(2):77-101.
34. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, Britten N, Roen K, Duffy S. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version. 2006 Apr 1;1:b92.
35. Thomas J, Harden A, Oakley A, Oliver S, Sutcliffe K, Rees R, Brunton G, Kavanagh J. Integrating qualitative research with trials in systematic reviews. Bmj. 2004 Apr 22;328(7446):1010-2.
36. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. Research in the schools: a nationally refereed journal sponsored by the Mid-South Educational Research Association and the University of Alabama. 2006;13(1):29.
37. Caracelli VJ, Greene JC. Data analysis strategies for mixed-method evaluation designs. Educational evaluation and policy analysis. 1993 Jun;15(2):195-207.
38. Guyatt G, Oxman AD, Akl EA, Kunz R, Vist G, Brozek J, Norris S, Falck-Ytter Y, Glasziou P, Debeer H, Jaeschke R. GRADE guidelines: 1. Introduction—GRADE evidence profiles and summary of findings tables. Journal of clinical epidemiology. 2011 Apr 1;64(4):383-94.
39. Siemieniuk R, Guyatt G. *What is GRADE?* Available from: https://bestpractice.bmj.com/info/toolkit/learn-ebm/what-is-grade/ [Accessed 5th February 2020].
40. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, Schünemann HJ. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. Bmj. 2008 Apr 24;336(7650):924-6.

Supplementary file 1.

PRISMA-P 2015 Checklist

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol

Section and topic	Item No	Checklist item	Signpost
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	P1. The experiences and perceived health benefits of individuals with a disability participating in sport: a systematic review protocol
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not applicable
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	P1. PROSPERO: CRD42020169224
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	P1. Beth Aitchison University of Birmingham Email: bla923@student.bham.ac.uk Dr Nicola Heneghan Lecturer in Physiotherapy School of Sport, Exercise and Rehabilitation Sciences College of Life and Environmental Sciences University of Birmingham Edgbaston, Birmingham, B15 2TT, UK Tel: 0121 415 8367 Email: n.heneghan@bham.ac.uk Dr Alison Rushton University of Birmingham

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Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	P11. BA developed the protocol with guidance and feedback from NH, AR and AS. BA is first reviewer and second reviewer is Marc Barr (MB). NH and AS are third and fourth reviewers. All authors have contributed to the development of the protocol and will contribute to the data interpretation. All authors have approved the final manuscript.
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:			
Sources	5a	Indicate sources of financial or other support for the review	P11. 'This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.'
Sponsor	5b	Provide name for the review funder and/or sponsor	Not applicable
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	Not applicable
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	P4 and P5. Introduction (rationale)
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	P5. Introduction (objectives)
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting,	P6. Eligibility criteria.

		time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	P6 and P7. Information sources.
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	P7 and supplementary file 2.
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	P7. Data management.
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	P7 and P8. Selection process.
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	P8. Data collection process.
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	P8. Data items.
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	P8. Outcomes and prioritisation.
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	P8 and P9. Risk of bias in individual studies.
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	P9. Data synthesis.
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	P9. Data synthesis
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Not applicable.
	15d	If quantitative synthesis is not appropriate, describe the type of	P9. Data synthesis.

		summary planned	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	P10. Discussion.
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	P9. Confidence in cumulative evidence.

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g764

Supplementary file 2.

Search strategy for MEDLINE database.

1	Experience*.ti,ab.
2	Benefit*.ti,ab.
3	Involve*.ti,ab.
4	Participa*.ti,ab.
5	1 or 2 or 3 or 4
6	Disab*.ti,ab.
7	Impair*.ti,ab.
8	Wheelchair*.ti,ab.
9	Exp Disabled Persons/
10	(disab* ad5 veteran*).ti,ab.
11	(disab* adj3 athlete*).ti,ab.
12	(para* adj3 athlete*).ti,ab.
13	Paralympi*.ti,ab.
14	6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15	Sports for Persons with Disabilities/
16	Sports/
17	15 or 16
18	5 and 14 and 17

Ti = title

Ab = abstract

Supplemenatary file 3.

Joanna Briggs Institute data extraction tool for qualitative research.

JBI QARI Data Extraction Tool for Qualitative Research

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Description

Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors conclusions

Comments

Complete Yes ☐ No ☐

Findings	Illustration form Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete Yes ☐ No ☐

Supplementary file 4.

Joanna Briggs Insitute Critical Appraisal Checklist for Qualitative Research

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer_____Date_____

Author _____Year_____Record Number_____

	Yes	No	Unclear	Not applicable
1. Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐	☐
2. Is there congruity between the research methodology and the research question or objectives?	☐	☐	☐	☐
3. Is there congruity between the research methodology and the methods used to collect data?	☐	☐	☐	☐
4. Is there congruity between the research methodology and the representation and analysis of data?	☐	☐	☐	☐
5. Is there congruity between the research methodology and the interpretation of results?	☐	☐	☐	☐
6. Is there a statement locating the researcher culturally or theoretically?	☐	☐	☐	☐
7. Is the influence of the researcher on the research, and vice- versa, addressed?	☐	☐	☐	☐
8. Are participants, and their voices, adequately represented?	☐	☐	☐	☐
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	☐	☐	☐	☐
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

Quality Assessment Tool for Studies with Diverse Designs

Criteria	0 = Not at all	1 = Very slightly	2 = Moderately	3 = Complete
Explicit theoretical framework	No mention at all.	Reference to broad theoretical basis.	Reference to a specific theoretical basis.	Explicit statement of theoretical framework and/or constructs applied to the research.
Statement of aims/objectives in main body of report	No mention at all.	General reference to aim/objective at some point in the report including abstract.	Reference to broad aims/objectives in main body of report.	Explicit statement of aims/objectives in main body of report.
Clear description of research setting	No mention at all.	General description of research area and background, e.g. 'in primary care'.	General description of research problem in the target population, e.g. 'among GPs in primary care'.	Specific description of the research problem and target population in the context of the study, e.g. nurses and doctors from GP practices in the east midlands.
Evidence of sample size considered in terms of analysis	No mention at all.	Basic explanation for choice of sample size. Evidence that size of the sample has been considered in study design.	Evidence of consideration of sample size in terms of saturation/information redundancy or to fit generic analytical requirements.	Explicit statement of data being gathered until information redundancy/saturation was reached or to fit exact calculations for analytical requirements.
Representative sample of target group of a reasonable size	No statement of target group.	Sample is limited but represents some of the target group or representative but very small.	Sample is somewhat diverse but not entirely representative, e.g. inclusive of all age groups, experience but only one workplace. Requires discussion of target population to determine what sample is required to be representative.	Sample includes individuals to represent a cross section of the target population, considering factors such as experience, age and workplace.
Description of procedure for data collection	No mention at all.	Very basic and brief outline of data collection procedure, e.g. 'using a questionnaire distributed to staff'.	States each stage of data collection procedure but with limited detail, or states some stages in details but omits others.	Detailed description of each stage of the data collection procedure, including when, where and how data were gathered.
Rationale for choice of data collection tool(s)	No mention at all.	Very limited explanation for choice of data collection tool(s).	Basic explanation of rationale for choice of data collection tool(s), e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool(s), e.g. relevance to the study aims and assessments of tool quality either statistically, e.g. for reliability & validity, or relevant qualitative assessment.
Detailed recruitment data	No mention at all.	Minimal recruitment data, e.g. no. of questionnaire sent and no. returned.	Some recruitment information but not complete account of the recruitment process, e.g. recruitment figures but no information on strategy used.	Complete data regarding no. approached, no. recruited, attrition data where relevant, method of recruitment.
Statistical assessment of reliability and validity of measurement tool(s) (Quantitative only)	No mention at all.	Reliability and validity of measurement tool(s) discussed, but not statistically assessed.	Some attempt to assess reliability and validity of measurement tool(s) but insufficient, e.g. attempt to establish test–retest reliability is unsuccessful but no action is taken.	Suitable and thorough statistical assessment of reliability and validity of measurement tool(s) with reference to the quality of evidence as a result of the measures used.
Fit between stated research question and method of data collection (Quantitative)	No research question stated.	Method of data collection can only address some aspects of the research question.	Method of data collection can address the research question but there is a more suitable alternative that could have been used or used in addition.	Method of data collection selected is the most suitable approach to attempt answer the research question
Fit between stated research question and format and content of data collection tool e.g. interview schedule (Qualitative)	No research question stated.	Structure and/or content only suitable to address the research question in some aspects or superficially.	Structure & content allows for data to be gathered broadly addressing the stated research question(s) but could benefit from greater detail.	Structure & content allows for detailed data to be gathered around all relevant issues required to address the stated research question(s).
Fit between research question and method of analysis	No mention at all.	Method of analysis can only address the research question basically or broadly.	Method of analysis can address the research question but there is a more suitable alternative that could have been used or used in addition to offer greater detail.	Method of analysis selected is the most suitable approach to attempt answer the research question in detail, e.g. for qualitative IPA preferable for experiences vs. content analysis to elicit frequency of occurrence of events, etc.
Good justification for analytical method selected	No mention at all.	Basic explanation for choice of analytical method	Fairly detailed explanation of choice of analytical method.	Detailed explanation for choice of analytical method based on nature of research question(s).
Assessment of reliability of analytical process (Qualitative only)	No mention at all.	More than one researcher involved in the analytical process but no further reliability assessment.	Limited attempt to assess reliability, e.g. reliance on one method.	Use of a range of methods to assess reliability, e.g. triangulation, multiple researchers, varying research backgrounds.
Evidence of user involvement in design	No mention at all.	Use of pilot study but no involvement in planning stages of study design.	Pilot study with feedback from users informing changes to the design.	Explicit consultation with steering group or statement or formal consultation with users in planning of study design.
Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues.	Discussion of some of the key strengths and weaknesses of the study but not complete.	Discussion of strengths and limitations of all aspects of study including design, measures, procedure, sample & analysis.

BMJ Open

The experiences and perceived health benefits of individuals with a disability participating in sport: A systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038214.R2
Article Type:	Protocol
Date Submitted by the Author:	13-Aug-2020
Complete List of Authors:	Aitchison, Beth; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences Rushton, Alison; University of Birmingham, Centre of Precision Rehabilitation for Spinal Pain Martin, Paul; English Institute of Sport Soundy, Andrew; University of Birmingham, Heneghan, Nicola; University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences
Primary Subject Heading:	Public health
Secondary Subject Heading:	Evidence based practice, Public health, Rehabilitation medicine
Keywords:	REHABILITATION MEDICINE, PUBLIC HEALTH, SOCIAL MEDICINE

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The experiences and perceived health benefits of individuals with a disability participating in sport: A systematic review protocol

Authors

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Prospero registration number: CRD42020169224

Word count: 3,217

ABSTRACT

Introduction: Sports participation has many physical and mental health benefits for individuals with a disability including improved functionality and reduced anxiety. Despite this, a large proportion of individuals with a disability are inactive. This review will be the first to synthesise the literature on the experiences and perceived health benefits of sport participation for children, adolescents, adults, elite athletes and veterans with a disability. Investigation of these phenomena will enable an understanding of the positive aspects and benefits of sport participation specific to each population, which may help to improve participation rates and ultimately improve health through promotion of these benefits.

Methods and PRISMA-P: The phenomena of interest are the experiences and perceived health benefits of individuals with a disability participating in sport. There will be no age limit on participants and all study designs, besides reviews, will be included. Studies in languages other than English will be excluded. Two independent reviewers will conduct the searches, study selection, data collection and quality assessment independently. The online databases MEDLINE, EMBASE, PsychINFO, CINAHL Plus, Web of Science and SportDiscus will be electronically searched from database inception to February 2020. Grey literature will be searched and several sport-related journals will be hand-searched. The Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used for quality assessment of included studies. Thematic synthesis will be used to analyse the qualitative studies, narrative synthesis will be used to analyse the quantitative studies and the perceived health benefits will be analysed using content analysis. The strength of the overall body of evidence will be assessed and reported using GRADE-CERQual (Grading of Recommendations, Assessment, Development and Evaluation – Confidence in the Evidence from Reviews of Qualitative research) for qualitative studies and GRADE for quantitative studies. These approaches will be applied to mixed-methods studies respectively where necessary.

Ethics and dissemination: This systematic review raises no ethical issues. Results will be published in a peer reviewed journal and disseminated to key stakeholders to inform practice.

PROSPERO registration number: CRD42020169224

Keywords: sport, experience, disability, systematic review

ARTICLE SUMMARY

Strengths and Limitations of this Study

- This is the first systematic review to synthesise evidence on the experiences and perceived health benefits of individuals with a disability participating in sport
- The research team includes researchers and practitioners with methodological and subject specific expertise.
- Only articles written in English will be included in the analysis.

INTRODUCTION

Sport provides individuals with a disability with the opportunity to experience the many physical and mental health benefits associated with being physically active.[1] These benefits include improved functionality, endurance and muscle tone, increased socialisation opportunities and a reduction in anxiety and depression across a range of disabilities and age-groups.[2-4] Despite the positive factors associated with sport participation, over 40% of adults with a disability are inactive in the UK, with similar figures reported in the USA (44.3%).[5-7] Furthermore, individuals with a disability also have higher rates of chronic disease: >40% of Americans with a disability develop heart disease, cancer, diabetes or have experienced a stroke compared to <14% of those without a disability.[6]

The awareness of and participation in sport for individuals with a disability has grown in recent years as a result of the 'Paralympic Movement', which has been responsible for an increase in sporting opportunities, inclusion of individuals with a disability in sport and raising the profile of elite disability sport.[7-9]. This review will focus solely on sport participation, which will be defined as an activity involving physical exertion with or without a game or competition element, where skills and physical endurance are either required or to be improved.[10].

Adults

Over the past three years the activity levels of adults with a disability have increased.[11] Those completing ≥150 minutes per week have increased from 43.6% to 47.3%, and those completing <30 minutes per week have decreased from 42.4% to 39.8%.[11] Similarly, in the USA approximately 30% of adults with a disability have been found to regularly participate in sports or physical activity.[12]. Despite these positive trends in activity levels, surprisingly the proportion of adults with an active sports club membership has decreased from 29.4% in 2017-2018 to 21.4% in 2018-2019.[11]

Children

Children with a disability are more likely to be less active than their non-disabled peers, with one third taking part in less than 30 minutes of physical activity per day.[13-14] (Sport England, 2019b; Activity Alliance, 2020). Additionally, several studies in a range of countries have reported low physical activity levels and high sedentary levels in children with a disability, suggesting that more needs to be done to promote their participation in sporting activities to improve overall health.[15-19] However, statistics published in the UK in 2019 have shown that the inactivity levels of children with a disability aged 11-16 years have decreased compared to 12 months ago, from 38.1% to 34%, suggesting an increase in participation.[13]

Elite athletes

At the elite level of sport there has been a steady growth in participation at the Paralympic Games, increasing from around 3000 athletes and 83 countries at Barcelona in 1992 to over 4300 athletes and 160 countries in Rio 2016.[20] The funding for Paralympic sport has also grown, with UK Sport investing almost £73 million in the four year cycle leading up to the Rio Paralympic Games compared to just £10 million for the Sydney Paralympic Games cycle (2000).[21] This greater awareness of and investment into elite disability sport has prompted research in this area, with studies exploring the beliefs, identities and self-perceptions of elite disability athletes.[22-24] Despite this, there is still a relatively small body of research in elite sport, with limited research exploring the experiences of elite athletes with a disability.

Veterans

Sport participation has been shown to improve quality of life, increase confidence and provide a source of motivation for veterans with a disability.[25] A systematic review has reported that sport and physical activity play a role in improving the wellbeing and rehabilitation of veterans after trauma and facilitating personal development.[26] The authors of the systematic review proposed a potentially essential difference between 'sport' and 'physical activity' and the impact this may have on wellbeing, and suggested that future research should take this into consideration. Furthermore, this review focused on the experiences of disability sport camps and competitions, with no review to date exploring the experiences and benefits of longer term sport participation in this population.

A review is required to synthesise the literature in this area as there is a limited understanding of the range of experiences and perceived health benefits of participation in these four populations. Understanding of these phenomena will enable the promotion of the health benefits and positive aspects of sport tailored to the specific populations. This may help to improve participation rates, ultimately improving the health and wellbeing of children, adolescents, adults and veterans. This review will also provide an insight into athletes' experiences at the elite level of sport, contributing to the small body of research, making recommendations for future research and enabling suggestions to improve performance.

Objectives

Aim: To explore the experiences and perceived health benefits of individuals with a disability participating in sport.

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1. To explore the experiences of children and adolescents, adults, elite athletes and veterans with a disability participating in sport.
2. To examine the perceived health benefits of participating in sport for children and adolescents, adults, elite athletes and veterans with a disability.

METHODS

This systematic review protocol follows the Preferred Reporting Items of Systematic Review and Meta-analysis Protocols (PRISMA-P) 2015 statement (supplementary file 1).[27] This protocol and search has been designed involving subject-specific expertise in the form of an expert in the field of elite disability sport (PM) and methodological expertise in the form of extensive systematic review publications (AR, NH, AS). The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO registration number: CRD42020169224).

Eligibility criteria:

Eligibility criteria are informed using the Sample, Phenomenon of Interest, Design, Evaluation and Research (SPIDER) concept which is designed for qualitative evidence synthesis.[28] Studies will be eligible for inclusion in this review if they meet the following criteria:

Sample: Studies which include individuals with a physical, visual or intellectual impairment who participate in sport, either competitively or recreationally. For studies with children and adolescents, the participants will be under 18; for studies with adults, the participants will be aged over 18; for studies with elite athletes, the participants will be of international standard or on the respective national team; and for studies with veterans the participants will be ex-armed forces members. Studies which include individuals who are classed as disabled through old age or a medical condition in isolation (e.g. diabetes) will be excluded. There is no age limit on participants.

Phenomenon of Interest: The experiences of individuals with a disability participating in sport where experience includes aspects such as the meaning of sport, the support for participation and the barriers and facilitators to sport. The second phenomenon of interest is the perceived health benefits of sport, which include a participant's self-reported benefits and comments suggesting the benefits of sport. Perceived health benefits include physical health benefits such as increased muscle tone and weight management, and mental health benefits such as improved confidence and reduced anxiety.

Studies investigating experiences and/or health benefits of a competition or sport programme less than 6 months in duration were excluded.

Designs: All types of study designs will be considered. Reviews will be excluded. Studies written in languages other than English will be excluded.

Evaluation: Any reported experience by individuals with a disability in sport will be explored such as overall experiences, meaning, barriers and facilitators experienced in sport. The perceived health benefits of sport participation will be explored via studies which have reported participant perceived health benefits in form of a questionnaire or verbally reported benefits.

Research type: Mixed methods research.

Information sources

The databases Medline (Ovid interface), EMBASE (Ovid interface), PyschINFO (Ovid interface), Web of Science (Clarivate Analytics interface), CINAHL Plus (EBSCO interface) and SportDiscus (EBSCO interface) will be searched from database inception to February 2020. Grey literature sources, including OpenGrey, will be searched. Hand searching of the following journals will be conducted to complement the search strategy: *Qualitative Research in Sport, Exercise and Health*, *Psychology of Sport and Exercise, Disability and Rehabilitation, British Journal of Sports Medicine, European Journal of Sports Science* and *International Journal of Sports Science*. The screening of the references of included studies will also take place. Active researchers who have published literature in this field will be contacted.

Search strategy

The search will be conducted independently by the lead author (BA, also the first reviewer) and a second reviewer. Initial scoping searches have refined the search terms for the databases which will be kept broad to ensure a sensitive search strategy. Free text searches and subject heading searches will be carried out to ensure completeness of the search. The main body of the search strategy will be consistent across databases however specific search terms will be adjusted for each database to reflect syntax differences (see supplementary file 2 for MEDLINE search strategy).[29]

Study records

Data management

The results of the literature search will be imported into EndNote X9 which will be used for data management and reference storage.[30] The reference, abstract and full text for all potentially eligible

studies will be stored to allow effective screening. Any duplicates will be removed prior to the selection process.

Selection process

The lead author and a second reviewer will independently screen the titles and abstracts of studies at the same time to determine inclusion using the pre-determined eligibility criteria. The eligibility criterion of eligible/not eligible/might be eligible will be used to assess the studies. Studies will be excluded if it is clear from the title and abstract that the content is not relevant to the objectives. When a study cannot be excluded based on the information provided in the title and abstract it will be graded as 'might be eligible'. After title and abstract screening, full-text copies of the potentially relevant studies will be obtained and eligibility determined. Studies will also be removed if the information available is insufficient for assessment and synthesis, such as full-text copies not being available. These studies will not be included in the synthesis but may be referenced in the discussion section. Consensus between the reviewers regarding study selection will be reached through a discussion and in the case where an agreement is not reached a third reviewer will be consulted. The kappa statistic will be used to test inter-rater reliability as it assesses the chance-corrected agreement between the two reviewers in assessing the eligibility of articles at the title/abstract stage and the full-text screening stage.[31] The study selection process will be carried out according to the PRISMA flow diagram and reported visually.[32]

Data collection process

Data will be extracted independently by the lead author and second reviewer from included studies using the standardised qualitative data extraction tool from the Joanna Briggs Institute (see supplementary file 3).[33] Piloting on five studies ahead of the main study will ensure completeness and suitability of the form. The form will be revised if necessary to include a section for study design, allowing the recording of whether the study is qualitative, quantitative or mixed methods in design. In the event of a disagreement between the two reviewers in data extracted, a third reviewer will be consulted.

Data items

Data extracted from the included studies will be presented in a table and the data items will include: participant information, data collection methods, data analysis methods and phenomenon of interest.

Outcomes and prioritisation

The experiences and perceived health benefits of children and adolescents, adults, elite athletes and veterans with a disability participating in sport constitute the phenomena of interest. All experiences reported by these individuals, including experiences of the benefits, barriers and facilitators to sports participation, will be explored provided that there is sufficient evidence.

Quality assessment

Initial scoping searches have suggested that studies with a range of designs will be eligible for inclusion in this systematic review. Therefore the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) will be used to create a quality rating score for all included studies (see supplementary file 4).[34] This tool is suitable for quality assessment because it allows the quality assessment of qualitative, quantitative and mixed-methods designs.[34] The QATSDD allows the appraisal of qualitative research which is vital for the qualitative research to contribute appropriately to the systematic review findings.[35] Additionally, good validity, inter-rater reliability and test-retest reliability have been established with this tool and it allows an in-depth understanding of the included review papers.[34,-36] A summary of the quality score and converted percentage score for each study will be reported in a table. The lead author and second reviewer will independently carry out the quality assessment and if there is a lack of consensus between the two after a discussion, the third reviewer will be consulted. If additional information is required from authors, such as an interview topic guide, the authors will be contacted for this information to facilitate quality assessment.

Data synthesis

Studies will be categorised into one of the four population categories for analysis based on the participants. For mixed populations, if the ages of participants can be aligned with specific quotations or results then the findings will be analysed in the respective population. The initial scoping searches demonstrated to the authors that both qualitative and quantitative studies would likely be included in the systematic review. Due to the potential heterogeneity in study designs, appropriate analysis methods will be required specific to the design. If mixed methods studies are included, they will be analysed qualitatively and/or quantitatively according to the relevance of each phase to the review objectives.

Thematic synthesis is an appropriate method for the synthesis of qualitative evidence and is based on thematic analysis, which is used for the analysis of primary research.[37-38] Therefore included qualitative studies will be analysed following the stages suggested by Thomas et al.[37] for qualitative evidence synthesis in systematic reviews. The lead author (BA) will undertake line-by-line coding of the text of included studies according to the content and meaning.[37] Translation will be employed, which is the process of identifying concepts and ideas in one study and recognising them in another.[39] A bank of codes will be created and maintained, which will then be grouped into descriptive themes based on connections between codes[37]. The final stage will involve generating analytical themes through discussing findings with the research team and generating concepts which answer the review questions.[37, 39]

A narrative synthesis will be conducted to analyse the quantitative studies.[40] This will involve a preliminary synthesis of the results of included studies and an exploration of the relationships within and between studies by comparing the results and generating common themes.[40] An integration matrix will be used to juxtapose the qualitative and quantitative data to determine agreement or disagreement within identified themes.[41-43]

The perceived health benefits of sport participation will be extracted either from questionnaires or verbally reported interview responses. The benefits will be analysed through content analysis, which involves coding and categorising data to determine the frequency and patterns of the health benefits across the different populations.[44] The lead author will immerse herself in the data and focus on the manifest content of the data.[44] This will involve analysing exactly what is said in the text and developing categories, which will be 'physical health benefits' and 'mental health benefits'.[44-45] The thematic synthesis, narrative synthesis and content analysis will be conducted by the lead author and checked by two other authors with experience in these fields.

Confidence in cumulative evidence

To assess the overall quality and strength of evidence two different approaches will be utilised. The GRADE-CERQual ('Grading of Recommendations, Assessment, Development and Evaluation'-'Confidence in the Evidence from Reviews of Qualitative research') will be used to assess how much confidence to place in the findings from the qualitative studies.[46] This approach helps provide a transparent, systematic framework to guide the confidence in qualitative synthesis findings and has the potential to increase the usability of the findings from this systematic review.[46] To assess the confidence in the findings from quantitative studies, the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) will be used.[47] GRADE is used rate the body of evidence at the outcome level, and is appropriate for use in this systematic review as it has been widely adopted

to grade the quality of evidence, make recommendations and present summaries of evidence.[48-49] The lead author will assess the overall body of evidence which will be rated as 'high', 'moderate', 'low' or 'very low' based on the GRADE certainty ratings.[48] A high rating would conclude that further research is not likely to greatly impact on confidence of findings and a low rating would suggest an uncertainty of effect and the need for further research.[46, 48]

DISCUSSION

This systematic review will be the first to synthesise the literature on the experiences and perceived health benefits of individuals with a disability participating in sport. It will explore the sport experiences and health benefits in different populations including children and adolescents, adults, elite athletes and veterans with a disability. At the end of the review we will have some insight into both the positive and negative aspects experienced by individuals with a disability when participating in sport. It will provide more information about the meaning of sport, and the barriers and facilitators faced by individuals with a disability. This systematic review will also provide insight into how the sporting experience can be improved for each population based on the experiences reported, with the potential to increase participation in sport through awareness of the barriers faced and the promotion of the positive aspects of sport participation. The findings from this review will provide a clear basis and direction to guide further research based on the areas which are determined to require more investigation following data synthesis. Due to the four populations which will be included in this review, the future research directions and recommendations for practice will be population specific. This will enable specific research groups to take the findings and move forward with future research. This protocol provides a detailed account of the rationale and methods to be used in the proposed systematic review to ensure full transparency of the process. This study raises no ethical issues and any potential biases in the review process will be reported in the discussion section of the final review paper. Any required amendments to this protocol will be reported in the final systematic review and on PROSPERO along with the date, description and rationale for amendment.

Patient and public involvement

This study and protocol have been informed through extensive contact with key stakeholders in the field in both a professional physiotherapy and clinical capacity, and in an athletic capacity through

contact with athletes with a disability. Since no individual data is needed, individuals with a disability will not be involved in data collection or analysis. Key stakeholders may be contacted for their input to the synthesis and interpretation of findings to inform results.

Implications

It is anticipated that the findings from this systematic review will provide an insight into the experiences and health benefits of participating in sport for individuals with a disability. It will provide insight into the meaning of sport, the barriers faced, facilitators increasing participation, and the physical and mental health benefits. Due to the exploration of these phenomena in the different population groups, the findings will be population-specific and relevant to specific research groups, personalising the research needed going forward. This review will identify gaps in the evidence and suggest future research, and the findings may underpin policy decision making for the provision of sport for individuals with a disability.

DECLARATIONS

Ethics and Dissemination

No ethical approval is required for this systematic review. The findings from this systematic review will be published in peer reviewed journals and disseminated to key stakeholders in disability sport.

Author Contributions

BA is an MSc by Research student at the University of Birmingham. AR, AS and NH are supervisors. PM is an expert in the field of disability sport. BA, AR, AS, PM and NH contributed to the systematic review topic. BA drafted the protocol with guidance and feedback from AR, AS and NH. AR, PM, AS and NH reviewed the manuscript and commented on the protocol. All authors have approved and contributed to the final manuscript.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

Competing interests

None declared.

Provenance and peer review

Not commissioned; externally peer reviewed.

Patient consent for publication

Not required.

REFERENCES

1. Slater D, Meade MA. Participation in recreation and sports for persons with spinal cord injury: review and recommendations. *NeuroRehabilitation*. 2004;19:121-129.
2. Shephard RJ. Benefits of sport and physical activity for the disabled: implications for the individual and for society. *Scandinavian journal of rehabilitation medicine*. 1991;23:51-59.
3. Barfield JP, Malone LA. Perceived exercise benefits and barriers among power wheelchair soccer players. *Journal of rehabilitation research and development.* 2013;50:231-238.
4. Johnson CC. The benefits of physical activity for youth with developmental disabilities: a systematic review. *Am J Health Promot.* 2009;23:157-167.
5. Sport England. *Active Lives Adult Survey May 18/19 Report.* Available from: https://www.sportengland.org/media/14239/active-lives-adult-may-18-19-report.pdf [Accessed 27th November 2019].
6. Carroll DD, Courtney-Long EA, Stevens AC. Et al. Vital signs: disability and physical activity—United States, 2009–2012. *Morbidity and mortality weekly report.* 2014;63:407-413.
7. International Paralympic Committee. *History of the Paralympic Movement.* Available from: https://www.paralympic.org/ipc/history [Accessed 29th November 2019].
8. Blauwet C, Willick SE. The Paralympic Movement: using sports to promote health, disability rights, and social integration for athletes with disabilities. *PM&R.* 2012;4:851-856.
9. Thomas N, Smith A. Disability, sport and society: An introduction. Oxon: Routledge; 2008.
10. Kemper HG, Ooijendijk WT, Stiggelbout M. Consensus about the Dutch Standard for healthy Excercise. *Tijdschrift voor Gezondheidswetenschappen*. 2000;78:180-183.
11. Sport England. *Trends* (*UK active lives survey).* Available at: https://activelives.sportengland.org/Result?queryId=34030# [Accessed: 3 March 2020].

12. Krane D., Orkis, K. *Sports and employment among Americans with disabilities.* Available at: https://www.moveunitedsport.org/wp-content/uploads/2015/11/Sports-and-Employment-Among-People-With-Disabilities-2.pdf [Accessed: 3 March 2020].
13. Sport England. *Active lives children and young people survey academic year 2018/19.* Available at: https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/2020-01/active-lives-children-survey-academic-year-18-19.pdf?cVMsdnpBoqROViY61iUjpQY6WcRyhtGs [Accessed: 3 March 2020].
14. Activity alliance. *Fears for the future generation as report shows disabled children miss out.* Available at: http://www.activityalliance.org.uk/news/5668-fears-for-future-generation-as-report-shows-disabled-children-miss-out [Accessed: 3 March 2020].
15. Sit, C.H., McManus, A., McKenzie, T.L. et al. Physical activity levels of children in special schools. *Preventive medicine*. 2007;45:424-431.
16. Sit, C.H., McKenzie, T.L., Cerin, E. et al. Physical activity and sedentary time among children with disabilities at school. *Med. Sci. Sports Exerc*. 2017;49:292-297.
17. Sit, C., Li, R., McKenzie, T.L. et al. Physical Activity of Children with Physical Disabilities: Associations with Environmental and Behavioral Variables at Home and School. *Int J Environ Res Public Health* 2019;16:1394.
18. Pan, C.Y., Liu, C.W., Chung, I.C. et al. Physical activity levels of adolescents with and without intellectual disabilities during physical education and recess. *Res Dev Disabil*. 2015;36:579-586.
19. Einarsson, I.O., Olafsson, A., Hinriksdóttir, G. et al. Differences in physical activity among youth with and without intellectual disability. *Med Sci Sports Exerc*. 2015;47:411-418.
20. International Paralympic Committee. *Summer Paralympic Games Overview.* Available from: https://www.paralympic.org/paralympic-games/summer-overview [Accessed 29th November 2019].
21. UK Sport. *Historical Funding Figures.* Available from: https://www.uksport.gov.uk/our-work/investing-in-sport/historical-funding-figures [Accessed 29th November 2019].
22. Pack S, Kelly S, Arvinen-Barrow M. "I think I became a swimmer rather than just someone with a disability swimming up and down:" paralympic athletes perceptions of self and identity development. *Disabil Rehabil*. 2017;39:2063-2070.
23. Kasum G, Mladenović M. The self-perception of athletes with disability. *Fizička kultura*. 2017;71(1):43-54.
24. De Cruz NP, Spray CM, Smith B. Implicit beliefs of disability and elite sport: the para-athlete experience. *Qualitative Research in Sport Exercise and Health*. 2019;11:69-91.

25. Sporner ML, Fitzgerald SG, Dicianno BE. et al. Psychosocial impact of participation in the national veterans wheelchair games and winter sports clinic. *Disabil Rehabil.* 2009;31:410-418.
26. Caddick N, Smith B. The impact of sport and physical activity on the well-being of combat veterans: A systematic review. *Psychology of Sport and Exercise*. 2014;15:9-18.
27. Moher D, Shamseer L, Clarke M. et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst rev*. 2015;4:1.
28. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qual Health Res*. 2012;22:1435-1443.
29. Bramer, W.M., de Jonge, G.B., Rethlefsen, M.L. et al. A systematic approach to searching: an efficient and complete method to develop literature searches. *J Med Libr Assoc*. 2018;*106:*531-541.
30. Clarivate. *EndNote X9.* Available from: https://endnote.com/ [Accessed: 2nd December 2019].
31. McHugh ML. Interrater reliability: the kappa statistic. *Biochem Med*. 2012;22:276-282.
32. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Medicine*. 2009;151:264-269.
33. Lockwood C, Porritt K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, Loveday H, Carrier J, Stannard D. *Joanna Briggs Institute Qualitative data extraction tool.* Available from: https://wiki.joannabriggs.org/display/MANUAL/Appendix+2.3%3A+JBI+Qualitative+data+extraction+tool [Accessed 2nd December 2019].
34. Sirriyeh R, Lawton R, Gardner P. et al. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract*. 2012;18:746-752.
35. Dixon-Woods M, Sutton A, Shaw R. et al. Appraising qualitative research for inclusion in systematic reviews: a quantitative and qualitative comparison of three methods. *J Health Serv Res Policy*. 2007;12:42-47.
36. Fenton L, Lauckner H, Gilbert R. The QATSDD critical appraisal tool: comments and critiques. *J Eval Clin Pract.* 2015;21:1125-1128.
37. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol*. 2008;8.
38. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3:77-101.
39. Britten, N., Campbell, R., Pope, C. et al. Using meta ethnography to synthesise qualitative research: a worked example. *J Health Serv Res Policy*. 2002;*7:*209-215.
40. Popay J, Roberts H, Sowden A. et al. Guidance on the conduct of narrative synthesis in systematic reviews. Available from:

https://www.researchgate.net/profile/Mark_Rodgers4/publication/233866356_Guidance_on_the_conduct_of_narrative_synthesis_in_systematic_reviews_A_product_from_the_ESRC_Methods_Programme/links/02e7e5231e8f3a6183000000/Guidance-on-the-conduct-of-narrative-synthesis-in-systematic-reviews-A-product-from-the-ESRC-Methods-Programme.pdf [Accessed: 10 January 2020].

41. Thomas J, Harden A, Oakley A. et al. Integrating qualitative research with trials in systematic reviews. *BMJ*. 2004 Apr 22;328(7446):1010-2.
42. Sandelowski M, Voils CI, Barroso J. Defining and designing mixed research synthesis studies. Research in the schools: a nationally refereed journal sponsored by the Mid-South Educational Research Association and the University of Alabama. 2006;13:29.
43. Caracelli VJ, Greene JC. Data analysis strategies for mixed-method evaluation designs. *Education Evaluation and Policy Analysis*. 1993;15:195-207.
44. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci*. 2013;15:398-405
45. Elo, S. and Kyngäs, H. The qualitative content analysis process. *J Adv Nurs.* 2008;62:107-115.
46. Lewin S, Booth A, Glenton C. et al. Applying GRADE-CERQual to qualitative evidence synthesis findings: introduction to the series. *Implement Sci.* 2018;13:1-10.
47. Guyatt G, Oxman AD, Akl EA. et al. GRADE guidelines: 1. Introduction—GRADE evidence profiles and summary of findings tables. *J Clin Epidemiol*. 2011;64:383-394.
48. Siemieniuk R, Guyatt G. *What is GRADE?* Available from: https://bestpractice.bmj.com/info/toolkit/learn-ebm/what-is-grade/ [Accessed 5th February 2020].
49. Guyatt GH, Oxman AD, Vist GE. et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;336:924-926.

Supplementary file 1.

PRISMA-P 2015 Checklist

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol

Section and topic	Item No	Checklist item	Signpost
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	P1. The experiences and perceived health benefits of individuals with a disability participating in sport: a systematic review protocol
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not applicable
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	P1. PROSPERO: CRD42020169224
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	P1. Beth Aitchison University of Birmingham Email: bla923@student.bham.ac.uk Dr Nicola Heneghan Lecturer in Physiotherapy School of Sport, Exercise and Rehabilitation Sciences College of Life and Environmental Sciences University of Birmingham Edgbaston, Birmingham, B15 2TT, UK Tel: 0121 415 8367 Email: n.heneghan@bham.ac.uk Dr Alison Rushton University of Birmingham

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Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	P12. BA developed the protocol with guidance and feedback from NH, AR and AS. BA is first reviewer and second reviewer is TBC. NH and AS are third and fourth reviewers. All authors have contributed to the development of the protocol and will contribute to the data interpretation. All authors have approved the final manuscript.
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:			
Sources	5a	Indicate sources of financial or other support for the review	P12-13. 'This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.'
Sponsor	5b	Provide name for the review funder and/or sponsor	Not applicable
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	Not applicable
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	P4 and P5. Introduction
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	P6. Introduction
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting,	P6-7. Eligibility criteria.

		time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	P7. Information sources.
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	P7 and supplementary file 2
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	P7.-8. Data management.
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	P8. Selection process
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	P8. Data collection process.
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	P8. Data items.
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	P9. Outcomes and prioritisation.
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	P9. Quality assessment.
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	P9-10. Data synthesis.
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	P9-10. Data synthesis
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Not applicable.
	15d	If quantitative synthesis is not appropriate, describe the type of	P9-10. Data synthesis.

		summary planned	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	P11. Discussion.
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	P10-11. Confidence in cumulative evidence.

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g764

Supplementary file 2.

Search strategy for MEDLINE database.

1	Experience*.ti,ab.
2	Benefit*.ti,ab.
3	Involve*.ti,ab.
4	Participa*.ti,ab.
5	1 or 2 or 3 or 4
6	Disab*.ti,ab.
7	Impair*.ti,ab.
8	Wheelchair*.ti,ab.
9	Exp Disabled Persons/
10	(disab* ad5 veteran*).ti,ab.
11	(disab* adj3 athlete*).ti,ab.
12	(para* adj3 athlete*).ti,ab.
13	Paralympi*.ti,ab.
14	6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15	Sports for Persons with Disabilities/
16	Sports/
17	15 or 16
18	5 and 14 and 17

Ti = title

Ab = abstract

Supplemenatary file 3.

Joanna Briggs Institute data extraction tool for qualitative research.

JBI QARI Data Extraction Tool for Qualitative Research

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Description

Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors conclusions

Comments

Complete Yes ☐ No ☐

Findings	Illustration form Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete Yes ☐ No ☐

Supplementary file 4.

Joanna Briggs Insitute Critical Appraisal Checklist for Qualitative Research

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer_____Date_____

Author _____Year_____Record Number_____

	Yes	No	Unclear	Not applicable
1. Is there congruity between the stated philosophical perspective and the research methodology?	☐	☐	☐	☐
2. Is there congruity between the research methodology and the research question or objectives?	☐	☐	☐	☐
3. Is there congruity between the research methodology and the methods used to collect data?	☐	☐	☐	☐
4. Is there congruity between the research methodology and the representation and analysis of data?	☐	☐	☐	☐
5. Is there congruity between the research methodology and the interpretation of results?	☐	☐	☐	☐
6. Is there a statement locating the researcher culturally or theoretically?	☐	☐	☐	☐
7. Is the influence of the researcher on the research, and vice- versa, addressed?	☐	☐	☐	☐
8. Are participants, and their voices, adequately represented?	☐	☐	☐	☐
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	☐	☐	☐	☐
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

Quality Assessment Tool for Studies with Diverse Designs

Criteria	0 = Not at all	1 = Very slightly	2 = Moderately	3 = Complete
Explicit theoretical framework	No mention at all.	Reference to broad theoretical basis.	Reference to a specific theoretical basis.	Explicit statement of theoretical framework and/or constructs applied to the research.
Statement of aims/objectives in main body of report	No mention at all.	General reference to aim/objective at some point in the report including abstract.	Reference to broad aims/objectives in main body of report.	Explicit statement of aims/objectives in main body of report.
Clear description of research setting	No mention at all.	General description of research area and background, e.g. 'in primary care'.	General description of research problem in the target population, e.g. 'among GPs in primary care'.	Specific description of the research problem and target population in the context of the study, e.g. nurses and doctors from GP practices in the east midlands.
Evidence of sample size considered in terms of analysis	No mention at all.	Basic explanation for choice of sample size. Evidence that size of the sample has been considered in study design.	Evidence of consideration of sample size in terms of saturation/information redundancy or to fit generic analytical requirements.	Explicit statement of data being gathered until information redundancy/saturation was reached or to fit exact calculations for analytical requirements.
Representative sample of target group of a reasonable size	No statement of target group.	Sample is limited but represents some of the target group or representative but very small.	Sample is somewhat diverse but not entirely representative, e.g. inclusive of all age groups, experience but only one workplace. Requires discussion of target population to determine what sample is required to be representative.	Sample includes individuals to represent a cross section of the target population, considering factors such as experience, age and workplace.
Description of procedure for data collection	No mention at all.	Very basic and brief outline of data collection procedure, e.g. 'using a questionnaire distributed to staff'.	States each stage of data collection procedure but with limited detail, or states some stages in details but omits others.	Detailed description of each stage of the data collection procedure, including when, where and how data were gathered.
Rationale for choice of data collection tool(s)	No mention at all.	Very limited explanation for choice of data collection tool(s).	Basic explanation of rationale for choice of data collection tool(s), e.g. based on use in a prior similar study.	Detailed explanation of rationale for choice of data collection tool(s), e.g. relevance to the study aims and assessments of tool quality either statistically, e.g. for reliability & validity, or relevant qualitative assessment.
Detailed recruitment data	No mention at all.	Minimal recruitment data, e.g. no. of questionnaire sent and no. returned.	Some recruitment information but not complete account of the recruitment process, e.g. recruitment figures but no information on strategy used.	Complete data regarding no. approached, no. recruited, attrition data where relevant, method of recruitment.
Statistical assessment of reliability and validity of measurement tool(s) (Quantitative only)	No mention at all.	Reliability and validity of measurement tool(s) discussed, but not statistically assessed.	Some attempt to assess reliability and validity of measurement tool(s) but insufficient, e.g. attempt to establish test–retest reliability is unsuccessful but no action is taken.	Suitable and thorough statistical assessment of reliability and validity of measurement tool(s) with reference to the quality of evidence as a result of the measures used.
Fit between stated research question and method of data collection (Quantitative)	No research question stated.	Method of data collection can only address some aspects of the research question.	Method of data collection can address the research question but there is a more suitable alternative that could have been used or used in addition.	Method of data collection selected is the most suitable approach to attempt answer the research question
Fit between stated research question and format and content of data collection tool e.g. interview schedule (Qualitative)	No research question stated.	Structure and/or content only suitable to address the research question in some aspects or superficially.	Structure & content allows for data to be gathered broadly addressing the stated research question(s) but could benefit from greater detail.	Structure & content allows for detailed data to be gathered around all relevant issues required to address the stated research question(s).
Fit between research question and method of analysis	No mention at all.	Method of analysis can only address the research question basically or broadly.	Method of analysis can address the research question but there is a more suitable alternative that could have been used or used in addition to offer greater detail.	Method of analysis selected is the most suitable approach to attempt answer the research question in detail, e.g. for qualitative IPA preferable for experiences vs. content analysis to elicit frequency of occurrence of events, etc.
Good justification for analytical method selected	No mention at all.	Basic explanation for choice of analytical method	Fairly detailed explanation of choice of analytical method.	Detailed explanation for choice of analytical method based on nature of research question(s).
Assessment of reliability of analytical process (Qualitative only)	No mention at all.	More than one researcher involved in the analytical process but no further reliability assessment.	Limited attempt to assess reliability, e.g. reliance on one method.	Use of a range of methods to assess reliability, e.g. triangulation, multiple researchers, varying research backgrounds.
Evidence of user involvement in design	No mention at all.	Use of pilot study but no involvement in planning stages of study design.	Pilot study with feedback from users informing changes to the design.	Explicit consultation with steering group or statement or formal consultation with users in planning of study design.
Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues.	Discussion of some of the key strengths and weaknesses of the study but not complete.	Discussion of strengths and limitations of all aspects of study including design, measures, procedure, sample & analysis.