Note: this is the final draft of the article:

Development, Prescription and Adherence to Exercise Programs in the management of people with Hand Osteoarthritis: a scoping review protocol

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Accepted on 6th September 2018 for publication in the journal:
JBI Database of Systematic Reviews and Implementation Reports

JBI: Joanna Briggs Institute

Development, Prescription and Adherence to Exercise Programs in the management of people with Hand Osteoarthritis: a scoping review protocol

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Acknowledgment

The reviewers thank Paula Sands (PS) of the Health Services Library, University of Southampton for her expert advice regarding the relevant existing literature and support in searching for evidence.

The reviewers gratefully acknowledge the support provided by Arthritis Research UK to the Faculty of Health Sciences, University of Southampton.

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Introduction

Hand Osteoarthritis (OA) is a common adult joint disorder with a higher prevalence in women (44%) than men (38%).[1,2] Age is a common risk factor for developing hand OA. According to the Centre for Disease Control and Prevention, OA affects adults of all ages with an increase at 45 years.[3] With the globally aging population, the prevalence of OA is expected to rise. People with hand OA often experience pain, joint stiffness, poor grip strength and reduced hand function that can influence daily functional tasks with associated socioeconomic burden to both patients and society.[4,5] Considering the high prevalence rate and socioeconomic impact, OA is a recognized global public health concern that warrants the need to evaluate current and promising evidence-based management interventions to improve the quality of life of individuals living with hand OA.

Many pharmacologic and non-pharmacologic treatment interventions are recommended in the management of hand OA.[6] Among these, exercises are frequently recommended. Despite mixed reports of its beneficial effects,[7] current evidence supports the use of hand exercises in the management of hand OA.[8-10] The National Institute for Health and Care Excellence,[11] the American College of Rheumatology[12] and European League Against Rheumatism (EULAR)[13] recommend the use of low impact physical activity, self-management and joint protection strategies, among others as a core part of hand OA management despite limited research evidence. The EULAR, recommended hand range of motion and strengthening exercises based on level IV evidence (expert opinion)[14] due to the paucity of quality research evidence. The EULAR also reported the lack of an exhaustive literature review in the guideline development and acknowledged that perhaps less commonly used hand OA management interventions may have been missed. The need to scope the literature for all available research evidence on hand exercise in hand OA management is therefore timely and warranted.

Several treatment interventions have been criticised as lacking robust evidence-based development and reporting.[15] The development of an evidence-based exercise program should be based on synthesized evidence from quality research evidence, clinical expertise and client evidence.[16] However, current literature highlights the lack of consensus regarding the design of such programmes for people with hand OA.[17] Due to this uncertainty, there is a need to ascertain whether the existing literature on hand exercise interventions adheres to the recognized evidence-based treatment development approach as recommended by experts.[16,18] From a qualitative enquiry exploring patients' perceptions and experiences of hand OA management, participants appeared to be unsure as to whether exercising their hands and fingers might aggravate their hand OA.[19] Such ambivalence in patient perceptions and other psychological factors may impact on exercise adherence and suggests the need to further

explore the uptake, tolerance and adherence of individuals to hand OA exercise. Strategies employed to routinely monitor these psychosocial factors that may influence exercise adherence are patient education, systematic goal setting, action planning, motivational interviewing, diaries and self-monitoring of physical exercise.[20,21] The implementation of these strategies is reported to increase physical activity and reduce the symptoms of pain, depression and anxiety among people with rheumatoid arthritis.[22] The need to understand and summarize beneficial exercise adherence strategies employed in the management of hand OA is therefore warranted.

The present authors conducted a preliminary search of existing scoping and systematic reviews on the review topic in Cochrane Library, Prospero and Joana Briggs Institute (JBI) Database of Systematic reviews and Implementation Reports in November 2017 prior to the start of this review. This process was performed to avoid evidence duplication following the recommendations of Peters et al.[23] From this search, a recently published Cochrane review [10] and an ongoing systematic review registered on Prospero[24] were identified. Despite having similar themes of reviewing exercises for hand OA, the present proposed scoping review differs from the above systematic reviews regarding its objectives and scope of research literature search. First, whereas the above systematic reviews aimed to establish the effectiveness of exercise in people with hand OA, this present scoping review aims to identify the breadth of literature that focuses on the development of exercises employed in hand OA management. This will inform exercise development in this patient population. Premised on this, the current reviewers are not only interested in Randomized Controlled Trials (RCTs) but will include other study designs and development papers that contribute to this field of literature. Secondly, this current scoping review, following recommendations of the above Cochrane review[10] aims to ascertain how hand OA exercises are implemented in clinical practice and research. In achieving this, the reviewers additionally aim to ascertain whether the existing exercise programs are prescribed following clinical practice guideline recommendations. Unlike the systematic reviews extracting evidence from only RCTs, this current scoping review aims to identify evidence from all available literature sources to provide a wide spectrum of knowledge available on the review topic. The aim of the current reviewers is to document the available exercise programs used in the management of hand OA and scope the content of these exercises. For the purposes of the present review, we define “development” as the process of planning, implementation and evaluation of coordinated set of exercises designed to enhance the wellbeing and prevent or reduce the health limitations of people with hand OA. “Prescription” is defined as a written directive which constitutes the components and administration of any exercise program employed in the management of people with hand OA.

This scoping review is necessary and novel. It will add new knowledge to the body of evidence in the development and prescription of exercise for people with hand OA. It will provide a better understanding of both existing and promising concepts in the development and prescription of, and adherence to, exercises used in the management of hand OA for clinicians and researchers. Finally, this scoping review will synthesize evidence from a comprehensive

range of resources, what components contribute to the development and prescription of optimal hand OA exercise and the evidence-based exercise adherence strategies used. This will also serve as a guide and a useful resource to address the ultimate purpose of the reviewers, which is to develop a new exercise intervention to improve hand function and quality of life in people with hand OA. Evidence will be summarized, and results presented in logical, diagrammatic, tabular or narrative formats congruent with the review objectives, as required for the conduct and reporting of scoping reviews.[25,26]

The objectives of this scoping review are to: (1) identify and map the existing research literature on exercises for management of people with hand OA. (2) identify the breadth of literature regarding the development and prescription of, and adherence to, existing hand OA exercises; and (3) understand and summarize exercise adherence strategies employed in the prescription of these exercises.

Review Questions

1. What are the available published exercise programs implemented for people with hand OA?
2. Are the available exercises developed following theory-based treatment development approaches, i.e. (i) review of existing literature (ii) consultation with experts and (iii) consultation with patients?
3. Are these exercises prescribed following Clinical Practice Guideline recommendations with regards to Frequency, Intensity, Type and Time?
4. Is patient adherence to these exercises reported and what are the exercise adherence strategies used?

Keywords

Adults; exercise program; hand osteoarthritis; scoping review

Inclusion criteria

Type of Participants

This review will consider studies that include both male and female adults aged 18years and above with hand OA.

Concept of interest

Research papers that report the development, prescription or the evaluation of any exercise intervention targeted at the hand for the management of hand OA will be included. Papers that also report on patient adherence to these exercises and the exercise adherence strategies used in hand OA exercises will be included.

Context

Studies conducted in health care, community and home settings will be considered in this review, with no restrictions placed on the geographical location or culture.

Type of sources

All available literature from quantitative studies such as randomized controlled trials, experimental and non-experimental studies, cohort studies, surveys and longitudinal study designs will be considered. Qualitative literature such as interviews and focus group enquiries will also be considered. Additionally, text and opinion pieces, abstracts, conference papers and reviews with the exception of economic papers will be considered for this review.

Methods

The scoping review methodology adopted in this review is that developed by the JBI[25] based on the seminal Asksey and O'Malley framework [27] and the more recent Levac et al. approach.[28] By using the JBI systematic scoping review methodology,[25] the reviewers indicate their compliance with the prospective PRISMA-ScR checklist[29] when it becomes available to support the global standardization of the conduct and reporting of scoping reviews as recommended in literature.[23]

Search strategy

The reviewers aim to find both published and unpublished studies to identify all available evidence with regards to exercises in the management of people with hand OA. The JBI recommended 3-stage search strategy would be utilized. A first limited search of CINAHL (Appendix I) and MEDLINE (Appendix II) was undertaken using identified keywords and subject headings in consultation with an experienced librarian (PS). This was followed by the analysis of text words contained in the abstracts and titles of the retrieved papers, and index terms used to describe these articles. A second search using all identified keywords and index terms will be conducted across all selected published and unpublished literature sources. A third and final search will be the examination of the reference lists and citations of all included full text records. Reviewers will contact authors of relevant studies and reviews for further information when appropriate. Records published in the English language from January 1998 until the present will be applied as limiters.

The published databases to be searched include:

- Medline (Ebsco)
- CINAHL (Ebsco)
- Cochrane library
- PEDro
- AMED
- Web of science
- OT seeker

The search for unpublished records will include:

- NICE evidence search
- UK clinical research network study portfolio
- Arthritis research UK
- British library
- WHO international clinical trial registry platform
- International clinical trials registry platform
- Open Grey

Considering the iterative search strategy of scoping reviews,[23] additional keywords and potentially useful search terms and data sources will be incorporated into the literature search strategy as the reviewers become more familiar with the evidence base when appropriate.

Study Selection.

All identified records will be collated and managed with the citation management software Endnote X8 (Clarivate Analytics, PA, USA). The authors aim to find all available literature sources on the review topic with the exception of economic papers. Study titles and abstracts will be selected and screened by BS and MS. Full text retrieval and screening will be undertaken by BS and crosschecked by MS. Any disagreement will be resolved through a discussion among reviewers. Reasons for excluding studies on full text will be documented and reported in the review.

Data Extraction

The Data extraction process also referred to as “charting the results”[23] according to the JBI will be performed to provide a rational and descriptive summary of the findings congruent with the review objectives. A draft data extraction form (Appendix III) to record relevant information was adapted for use in this review based on the exemplar produced by the JBI institute.[23] The charting form will be piloted following suggestions of scoping review experts[27,28] on three studies by each reviewer to ensure that all key information relevant to the review question is extracted. Due to the iterative nature of the data extraction process, the charting form may be refined or updated during the review stage depending on the outcomes of the emerging themes or any useful unforeseen data that may be encountered. The data charting process will be undertaken by all reviewers, 90% by BS and 5% each by MS and JA. Additionally, MS will check 5% of data extracted by BS for accuracy and any discrepancies will be discussed and resolved at reviewers’ meetings. Authors of included studies will be contacted to clarify and or obtain missing data where needed.

Presentation of Results

The study selection process will be illustrated diagrammatically with a PRISMA flow diagram[30] and narratively as recommended in the literature.[31] The extracted data such as the aim, study design and participants' characteristics will be summarized with diagrams and figures were appropriate. For the purposes of this review, we define the word "map" as the process of summarizing the evidence[28]. Key findings categorised under the a priori and emerging themes will be mapped logically in diagrammatic, tabular or descriptive formats congruent with the review scope and objective. Identified gaps in knowledge will also be mapped in tabular or descriptive formats, as appropriate and conclusions drawn based on the review questions. Clear and specific recommendations for the conduct of future primary research or systematic reviews based on the gaps in knowledge identified from the results will be presented as recommended by experts in the field.[26]

List of abbreviations

AMED	Allied and Complimentary Medicine Database
CDC	Centre for Disease Control and Prevention
CINAHL	Cumulative Index to Nursing and Allied Health Literature
EULAR	European League Against Rheumatism
JBI	Joana Briggs Institute
MEDLINE	Medical Literature Analysis and Retrieval System Online
NICE	National Institute for Health and Care Excellence
PEDro	Physiotherapy Evidence Database
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PRISMA-ScR:	Preferred Reporting Items for Systematic Reviews and Meta-Analyses-Scoping Review
WHO	World Health Organization

Funding

The first reviewer (BS) was sponsored by the Commonwealth Scholarship Commission, UK to pursue doctoral studies.

Conflict of Interest

The authors declare no conflict of interest

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Appendices

Appendix I: Preliminary CINAHL (Ebsco) Search strategy (27-11-17)

#	Query	Records retrieved
S1	(MH "Osteoarthritis+")	
S2	osteoarthritis	
S3	osteoarthriti*	
S4	osteoarthrosis	
S5	degenerative joint disease	
S6	degenerative arthritis	
S7	OA	
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	
S9	(MH "Hand+") OR (MH "Hand Joints+") OR (MH "Finger Joint")	

S10	(MH "Carpal Joints") OR "carpal joint"	
S11	(MM "Carpometacarpal Joints") OR "Carpometacarpal joint" or "CMC joint"	
S12	(MH "Wrist Joint") OR (MH "Wrist") OR "wrist" OR (MH "Osteoarthritis, Wrist")	
S13	"Phalangeal joint" OR "interphalangeal joints"	
S14	"Digits" OR phalanges OR fingers OR periphery	
S15	(MH "Thumb") OR "thumb"	
S16	""thumb joint""	
S17	"trapeziometacarpal joint"	
S18	"Basal thumb joint"	
S19	digital osteoarthritis	
S20	S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19	
S21	S8 AND S20	
S22	(MH "Therapeutic Exercise") OR (MH "Upper Extremity Exercises") OR (MH "Arm Exercises") OR (MH "Isokinetic Exercises") OR (MH "Isometric Exercises")	
S23	exercise	
S24	exercis*	
S25	"hand exercises" OR "upper limb exercises"	
S26	(MH "Open Kinetic Chain Exercises") OR "task specific exercises" OR (MH "Resistance Training") OR (MH "Sport Specific Training")	
S27	(MH "Exercise") OR "stretching exercises" OR (MH "Resistance Training")	
S28	"strengthening exercises" OR "Functional exercises"	
S29	(MH "Physical Activity") OR "physical activity"	
S30	(MH "Rehabilitation") OR "rehabilitation" OR (MH "Home Rehabilitation+")	
S31	rehab*	
S32	(MH "Physical Therapy") OR "physiotherapy"	
S33	physiotherap*	
S34	(MH "Occupational Therapy") OR "occupational therapy" OR (MH "Occupational Therapy Practice, Research-Based") OR (MH "Occupational Therapy Practice, Evidence-Based") OR (MH "Research, Occupational Therapy") OR (MH "Occupational Therapy Practice") OR (MH "Home Occupational Therapy")	
S35	"explosive exercises"	
S36	"ballistic exercises"	
S37	functional exercise OR functional training	
S38	S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37	
S39	S21 AND S38 Limiters: English language, 1998-the present, available abstracts	149

Appendix II: Preliminary MEDLINE (Ebsco) search strategy (28-11-2017)

#	Query	Records retrieved
S1	(MH "Osteoarthritis+")	
S2	osteoarthritis	
S3	osteoarthriti*	
S4	"osteoarthrosis"	

S5	"degenerative joint disease"	
S6	"degenerative arthritis"	
S7	"OA"	
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	
S9	(MH "Hand+") OR "hand" OR (MH "Hand Bones") OR (MH "Hand Joints")	
S10	(MH "Carpal Joints") OR (MH "Carpal Bones") OR "carpals"	
S11	(MH "Wrist") OR "wrist" OR (MH "Wrist Joint+")	
S12	(MH "Carpometacarpal Joints") OR (MH "Finger Joint") OR "carpometacarpal joint"	
S13	(MM "Metacarpophalangeal Joint") OR "metacarpophalangeal joint"	
S14	(MH "Finger Phalanges") OR "phalangeal joint"	
S15	Fingers OR "phalanges OR phalanx" OR digits	
S16	(MH "Thumb") OR "thumb"	
S17	"thumb joint" OR "thumb joints" OR "basal thumb joint"	
S18	"trapeziometacarpal joint"	
S19	digital osteoarthritis	
S20	S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19	
S21	S8 AND S20	
S22	(MH "Exercise+") OR "exercise" OR (MH "Exercise Therapy+") OR (MH "Warm-Up Exercise") OR (MH "Cool-Down Exercise") OR (MH "Exercise Movement Techniques+") OR (MH "Resistance Training")	
S23	exercis*	
S24	(MH "Hand Strength") OR "hand exercises" OR "hand exercise programme"	
S25	(MH "Circuit-Based Exercise") OR (MH "Exercise Therapy") OR "exercise training"	
S26	(MH "Muscle Stretching Exercises") OR "exercise intervention"	
S27	"functional exercises" OR "functional exercise programme"	
S28	"task-specific training"	
S29	"physical activity"	
S30	(MH "Rehabilitation") OR "rehabilitation" OR (MH "Physical and Rehabilitation Medicine") OR (MH "Telerehabilitation")	
S31	rehab*	
S32	(MH "Physical Therapy Modalities") OR "physiotherapy"	
S33	physiotherap*	
S34	"physical therapy"	
S35	(MH "Occupational Therapy") OR "occupational therapy"	
S36	"ballistic exercises"	
S37	"explosive exercises"	
S38	S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37	
S39	S21 AND S38 Limiters: English, available abstracts, years (1998-the present)	919

Appendix III: Data Extraction Instrument (Adapted JBI Data Charting Form [23])

Scoping Review Details
Title:
Review Objective:
Reviewer ID:

Inclusion/Exclusion		
	Inclusion	**Exclusion**
Population		
Concept		
Context		
Included Study Details and Characteristics		
Study citation details (authors, date, title, journal, volume, issue, ages)		
Type of publication (journal article, grey literature or book)		
Country of publication		
Aim		
Key findings		
Study design		
Participants (details e.g. age/sex and number)		
Study setting		
Details extracted from study		
A priori Themes (Details in relation to the concept of the scoping review)		
Components of exercise (Frequency, Type, intensity and time)		
Was the exercise developed following theory-based treatment development? (evidence review, expert opinion & patient preference)	Yes	No
Was the exercise prescribed following best guideline recommendations?	Yes	No
Was exercise adherence reported?		
Exercise adherence strategies used (e.g. Diaries, phone apps, etc.)		
Emerging Themes (Details not captured a priori but relevant to the review)		
a.		
b		