Effekt av trening i varmtvanns-basseng for personer med muskel-skjelettlidelser

Rapport fra Kunnskapssenteret nr 11–2015
Systematisk oversikt

kunnskapssenteret

Muskelskjelettlidelser er utbredt i den norske befolkningen, og kostnader knyttet til slike lidelser er betydelige og økende. Trening i varmtvannsbasseng er et av mange behandlingsalternativer for denne pasientgruppen. Kunnskapssenteret har oppsummert forskning om effekt av trening i varmtvannsbasseng på egenmeldt sykefravær. Vi inkluderte to kontrollerte studier. Vi har vurdert dokumentasjonen til å ha svært lav kvalitet.

Vi fant at: • Kvinner med fibromyalgiplager og kronisk utbredt smerte som fikk trening i varmtvannsbasseng i kombinasjon med opplæringsprogram var ikke mindre borte fra arbeid enn dem som kun fikk tilbud om opplæringsprogram. Funnet er svært usikkert. • Kvinner med fibromyalgi som fikk trening i varmtvannsbasseng i kombinasjon med trening på land, kognitiv atferdsterapi og en brosjyre, hadde færre fraværsdager enn dem som kun fikk en brosjyre. Vi har svært liten tillit til dette resultatet. • Vi fant ingen kontrollerte studier som evaluerte effekt av trening i varmtvannsbasseng på sykefravær for

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andre pasientgrupper enn personer med fibromalgi eller kronisk utbredt smerte.

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Kunnskapssenteret vil takke Anne Christie (ekstern fagfelle), Aase Aamland (ekstern fagfelle), Hilde H. Holte (intern fagfelle) og Kristin T. Dahm (intern fagfelle) for å bidratt med sin ekspertise i dette prosjektet. Kunnskapssenteret tar det fulle ansvaret for synspunktene som er uttrykt i rapporten.
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Hovedfunn

Muskelskjelettlidelser er utbredt i den norske befolkningen, og kostnader knyttet til slike lidelser er betydelige og økende. Trening i varmtvannsbasseng er et av mange behandlingsalternativer for denne pasientgruppen. Kunnskapssenteret har oppsummert forskning om effekt av trening i varmtvannsbasseng på egenmeldt sykefravær.

Vi inkluderte to kontrollerte studier. Vi har vurdert dokumentasjonen til å ha svært lav kvalitet. Vi fant at:

- Kvinner med fibromyalgiplager og kronisk utbredt smerte som fikk trening i varmtvannsbasseng i kombinasjon med opplæringsprogram var ikke mindre borte fra arbeid enn dem som kun fikk tilbud om opplæringsprogram. Funnet er svært usikkert.
- Kvinner med fibromyalgi som fikk trening i varmtvannsbasseng i kombinasjon med trening på land, kognitiv atferdsterapi og en brosjyre, hadde færre fraværsdager enn dem som kun fikk en brosjyre. Vi har svært liten tillit til dette resultatet.
- Vi fant ingen kontrollerte studier som evaluerte effekt av trening i varmtvannsbasseng på sykefravær for andre pasientgrupper enn personer med fibromyalgi eller kronisk utbredt smerte.

Tittel:
Effekt av trening i varmtvannsbasseng for personer med muskelskjelettlidelser

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Publikasjonstype:

Systematisk oversikt

En systematisk oversikt er resultatet av å
- innhente
- kritisk vurdere og
- sammenfatte

relevante forskningsresultater ved hjelp av forhåndsdefinerte og eksplisitte metoder.

Svarer ikke på alt:

Oppsummerer kun effekten av trening i varmtvannsbasseng til personer med muskelskjellettlidelser fra 18 år. Gravide kvinner med bekkenløsning er ikke vurdert. Tiltak som thalassoterapi, behandlingsreiser, og opphold i varmtvannsbasseng der type trening ikke er rapportert er heller ikke vurdert.

Hvem står bak denne publikasjonen?

Kunnskapssenteret har gjennomført oppdraget etter forespørsel fra Norsk Revmatikerforbund

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Når ble litteratursøket utført?

Søk etter studier ble avsluttet i juli 2014.

Fagfeller:

Anne Christie, fysioterapeut/ PhD/ forsker, Nasjonalt revmatologisk rehabiliterings- og kompetansesenter

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Sammendrag

Bakgrunn

Muskelskjelettlidelser er utbredt i den norske befolkningen. Revmatiske lidelser (som revmatoid artritt og Bekhterevs sykdom), degenerative lidelser (som artroser og osteoporose), fibromyalgi, rygg-, nakke-, skulder- og bekkenlidelser er de vanligste muskelskjelettlidelsene. Det er store individuelle variasjoner i hvilken grad de ulike muskelskjelettlidelsene påvirker smerte, livskvalitet, dagligliv og arbeidsliv. Ulike diagnoser fra muskelskjelettsystemet er blant de vanligste årsakene til sykmelding. Ofte fører muskelskjelettlidelser til varig arbeidsuførhet.

Trening i varmtvannsbasseng er et av mange tilbud som gis til personer med muskelskjelettlidelser i Norge, og spesielt til personer med revmatoid artritt, fibromyalgi og gravide med bekkenløsning. Siden gruppen muskelskjelettlidelser er heterogen, kan man forvente ulik effekt av trening i varmtvannsbasseng. Norsk Revmatikerforbund bestilte en systematisk oversikt over effekt av trening i varmtvannsbasseng på sykefravær og tilbakegang til arbeidslivet hos personer med muskelskjelettlidelser.

Hensikten med oppdraget var å svare på følgende spørsmål:

1. Hva er effekter av trening i varmtvannsbasseng sammenliknet med ingen trening, venteliste for behandling eller annen type trening på sykefravær og tilbakeføring til arbeidslivet hos personer med kroniske muskelskjellettlidelser?
2. Hva finnes av systematiske oversikter som har oppsummert effekter av trening i varmtvannsbasseng på smerte, funksjon og/eller livskvalitet hos personer med kroniske muskelskjellettlidelser?

Metode

Vi søkte i følgende databaser: MEDLINE, AMED, Embase, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, Health Technology Assessment (HTA) Database, Database of Abstracts of Reviews of Effects (DARE), OTSeeker, PEDro, CINAHL, PubMed og Web of Science. Søkestrategien ble utarbeidet i samarbeid med bibliotekar.

Inklusjonskriteriene var som følger:

1) Populasjon: Personer ≥18 år med kroniske muskelskjelettlidelser
2) Intervensjon: Trening i varmtvannsbasseng med eller uten kombinasjon av annen type tiltak (som kognitiv adferdsterapi, arbeidsrettede programmer eller opplæringsprogram i mestring av smerter og liknende)
3) Sammenlikning: Ingen trening, venteliste eller annen type trening (ikke trening i varmtvannsbasseng)
4) Utfall: Målt på registerbasert eller selvrapportert sykefravær, antall dager borte fra arbeid grunnet sykdom (muskelskjelettlidelser), sykemelding eller tilbakeføring til arbeid (spørsmål 1) eller smerte, funksjon og livskvalitet (spørsmål 2),
5) Studiedesign: Undersøkt i randomiserte kontrollerte studier og klinisk kontrollerte studier (spørsmål 1) eller systematiske oversikter (spørsmål 2).

For å besvare spørsmål 1 gjorde vi et systematisk søk etter kontrollerte enkeltstudier. Studier som møtte våre inklusjonskriterier ble vurdert for systematiske feil med verktøyet Risk of bias (RoB). Til slutt vurderte vi hvilken tillit vi hadde til resultatene og graderte kvaliteten på den samlede dokumentasjonen ved å bruke Grading of Recommendations Assessment, Development and Evaluation (GRADE).

For å belyse spørsmål 2 søkte vi etter systematiske oversikter. Vi identifiserte relevante oversikter. Oversiktenes resultater ble ikke oppsummert, men oversiktenes sammendrag ble presentert i en sortert liste.

Resultat

Søket etter kontrollerte enkeltstudier ga 1763 treff, hvorav to kontrollerte studier ble inkludert. Begge studiene evaluerte effekter av trening i varmtvannsbasseng for kvinner med fibromyalgi, målt på Fibromyalgia Impact Questionnaire (FIQ). FIQ oppga en total skår basert på ti delskalaer. Kun én av disse skalaene var relevant for våre inklusjonskriterier. Med denne skalaen rapporterte pasienten hvor mange dager hun hadde vært borte fra arbeid den siste uken på grunn av fibromyalgi. Den randomiserte kontrollerte studien viste ingen prosentvis forskjell i fraværsdager den siste uken på grunn av fibromyalgiplager og kronisk utbredt smerte blant kvinner som fikk trening i varmtvannsbasseng i kombinasjon med opplæringsprogram, sammenliknet med dem som kun fikk tilbud om opplæringsprogram (MD: -9,32 % (95 % KI -23,94 til 5,30)). Dette funnet er svært usikkert. Den ikke-randomiserte kontrollerte studien viste at kvinner med fibromyalgi som fikk trening i varmtvannsbasseng i kombinasjon med trening på land, kognitiv atferdsterapi og en brosjyre, hadde færre fraværsdager sammenliknet med dem som kun fikk en brosjyre (normaliserte data fra 0-10: MD: -0,69 (95 % KI -1,03 til -0,35). Vi har svært liten tillit til dette resultatet.

Det systematiske litteratursøket identifiserte totalt 62 systematiske oversikter som oppsummerte effekter av trening i varmtvannsbasseng på smerte, funksjon og livskvalitet. Disse systematiske oversiktene er kategorisert og vedlagt i en liste.

Diskusjon

Siden de to inkluderte studiene kun omhandlet effekter av trening i varmtvannsbasseng til kvinner med henholdsvis fibromyalgi og kronisk utbredt smerte, er overførbarheten til andre muskelskjellettlidelser begrenset. Den ene studien var en randomisert kontrollert studie og den andre var en ikke-randomisert kontrollert studie, derfor kunne de ikke slås sammen i meta-analyse og måtte GRADE-vurderes hver for seg. Utfall ble målt med FIQ, et verktøy som ikke skiller husarbeid og lønnet arbeid og hvor kun en av ti delskalaer omhandler sykefravær. Ulik beregningsmetode for dette utfallet medførte at resultatene ikke var direkte sammenliknbare. På grunn av disse begrensningene ved dokumentasjonsgrunnlaget ble kvaliteten på dokumentasjonen vurdert til svært lav. Det medfører at vi har svært liten tillit til effektestimatet, og at effekten kan være betydelig forskjellig fra effektestimatet.

Konklusjon

Basert på funnene fra to kontrollerte studier, er det uvisst om trening i varmtvannsbaseng påvirker sykefravær hos kvinner med fibromyalgi eller kronisk utbredt smerte.

For å kunne besvare om trening i varmtvannsbasseng påvirker sykefravær og tilbakeføring til arbeidslivet hos personer med muskelskjelettlidelser er det behov for randomiserte kontrollerte studier som:

- inkluderer andre deltakere enn kvinner med fibromyalgi og kronisk utbredt smerte
- evaluerer effekter av trening i varmtvannsbasseng alene (f.eks. trening i varmtvannsbasseng i kombinasjon med trening på land sammenliknet med kun trening på land)
- evaluerer effekter av trening i varmtvannsbasseng på sykefravær eller tilbakegang til arbeidslivet

Søket identifiserte også 62 systematiske oversikter som oppsummerte effekter av trening i varmtvannsbasseng på smerte, funksjon og livskvalitet hos personer med muskelskjelettlidelser. Disse oversiktene belyste spørsmål 2.

Key messages

Musculoskeletal disorders are common in the Norwegian population. These disorders are reported as the main contributor to sick leave and work absence. The Norwegian Rheumatism Association commissioned the Norwegian Knowledge Centre 1) to summarise the effects of hydrotherapy (training in warm water) on sick absence and return- to- work among persons with musculoskeletal disorders, and 2) to provide a list of systematic reviews that summarised the effects of hydrotherapy on pain, function and quality of life.

A systematic review was conducted that included two studies. Both studies investigated the effects of hydrotherapy in combination with another type of training and cognitive behavior therapy or an education program that promoted coping strategies on self-reported sick absence during the last week among women with fibromyalgia.

The two studies showed that:

- It is unclear if hydrotherapy in combination with an educational programme for women with fibromyalgia or chronic widespread pain, give less self-reported days off work due to fibromyalgia symptoms compared to education programme only. The documentation was of very low quality.
- It is unclear if hydrotherapy in combination with land-based training, cognitive therapy and a patient information leaflet to women with fibromyalgia, give less self-reported days off work due to fibromyalgia symptoms, compared to patient information leaflet only. The documentation was of very low quality.

None of the included studies evaluated the effects of hydrotherapy among other groups of musculoskeletal disorders than fibromyalgia and chronic widespread pain.

We identified 62 systematic reviews that summarised the effects of hydrotherapy on pain, function and quality of life. These systematic reviews are categorised and attached in a list.

Title:
The effect of hydrotherapy for persons with musculoskeletal disorders

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Type of publication:

Systematic review

A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.

Doesn't answer everything:

Water-based training in pregnant women with pelvic pain, thalassotherapy, or stay in warm water where type of training is not reported.

Publisher:

Norwegian Knowledge Centre for the Health Services

Updated:

Last search for studies:
July, 2014.

Peer review:

Anne Christie, PT/PhD/ researcher, National resource center for rehabilitation in rheumatology

Aase Aamland, MD/PhD, Specialist in general medicine, Vennesla GP group practice

Executive summary (English)

Background

Musculoskeletal disorders are frequent in the Norwegian population. The most common musculoskeletal disorders are rheumatoid arthritis, ankylosing spondylitis, osteoarthritis, osteoporosis, fibromyalgia, back-, neck-, shoulder- and hip disorders. Musculoskeletal disorders are reported as the main contributor to sick leave and disability retirement. There are great individual variations to what extent the different musculoskeletal disorders influence pain, quality of life, everyday life and work life. These disorders are reported as main contributors to sick leave and work absence. Often musculoskeletal disorders leads to permanent disability.

Hydrotherapy (training in warm water) is one of many rehabilitation interventions offered to persons with musculoskeletal disorders in Norway, especially to persons with rheumatoid arthritis, fibromyalgia, and pelvic girdle pain in pregnancy. Due to the heterogeneity of the musculoskeletal group, one might expect different effects of hydrotherapy depending on condition. The Norwegian Rheumatism Association commissioned the Norwegian Knowledge Centre to summarise the effects of hydrotherapy on sick leave and return- to- work among persons with musculoskeletal disorders.

Objective

The aim of this systematic review was to answer the following questions:

1. What is the effect of hydrotherapy (in this review: training in warm water) compared to no training, waiting list or another type of training on sick absence and return-to-work among persons with musculoskeletal disorders?
2. Are there systematic reviews summarising the effects of hydrotherapy on pain, function, and/or quality of life among persons with musculoskeletal disorders?

Method

We searched the following databases for relevant studies: MEDLINE, AMED, Embase, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, Health Tech-

nology Assessment (HTA) Database, Database of Abstracts of Reviews of Effects (DARE), OTSeeker, PEDro, CINAHL, PubMed og Web of Science. The search strategy was developed in collaboration with a librarian.

We included trials that met the following criteria:
(a) a study population suffering from musculoskeletal disorders for more than 3 months;
(b) evaluating the effects of hydrotherapy alone or in combination with other interventions;
(c) comparing to no hydrotherapy, waiting list or another type of training (but not training in warm water);
(d) with outcomes on self-reported or register-based sick absence, days away from work due to a musculoskeletal disorders, and return-to work (aim 1) and pain, function and quality of life (aim 2); and
(e) randomised controlled trials and clinical controlled trials were eligible for inclusion to answer question 1 and systematic reviews were identified to answer question 2.

We searched for controlled trials to answer question one. Two reviewers screened the literature, critically assessed the risk of bias of the studies, and extracted data independently. We applied the instrument Grading of Recommendations Assessment, Development and Evaluation (GRADE) to assess the extent to which we have confidence in the effect estimates.

We searched for systematic reviews to answer the second question. Relevant systematic reviews were identified. The results from these systematic reviews were not summarised and the reviews were not critically appraised. They were categorised in a list of abstracts only.

Results

The search for controlled trials yielded 1763 hits, of which two trials were included. Both of the studies evaluated the effects of hydrotherapy among women with fibromyalgia or chronic widespread pain, measured with the Fibromyalgia Impact Questionnaire (FIQ). FIQ reported a total score based on 10 subscales. Only one of these subscales met our inclusion criteria. The relevant subscale collected data on self-reported days off work due to fibromyalgia symptoms.

A randomised controlled trial showed that hydrotherapy including an educational programme for women with fibromyalgia or chronic widespread pain had small or no effects on self-reported percentage days off work due to fibromyalgia symptoms

compared to an educational programme only (MD: -9,32 % (95 % CI -23,94 % to 5,30 %). A non-randomised controlled trial showed that women with fibromyalgia participating in deep water running as part of a multimodal programme reported less days off work due to fibromyalgia symptoms, than women who only received a patient information leaflet (MD: -0,69 (95 % CI -1,03 to -0,35) (normalized score range 0-10) .

We also identified 62 systematic reviews summarising the effects of hydrotherapy on pain, function, and quality of life on for persons with musculoskeletal disorders. The reviews were categorised according to type of disorder and listed in the appendix.

Discussion

Both of the two included studies investigated the effects of hydrotherapy among women with fibromyalgia or chronic widespread pain limiting the possibility of generalisation to other musculoskeletal disorders. Due to the different study design of the two included studies, no meta-analysis was possible and therefore, the studies had to be GRADE evaluated separately. The outcome was measured with FIQ, an instrument that does not differentiate housework from paid work. In addition, only one out of ten subscales referred to sick absence. The studies reported different effect estimates on sick absence. Therefore, based on different calculation method the results on sick absence were not comparable. Due to these limitations, the quality of documentation was evaluated to very low. This influenced our confidence in the effect estimates and the true effect might be very different from the effect estimate.

Conclusion

Based on the findings from the two controlled trials included in this systematic review, it is unclear whether hydrotherapy influences sick absences among women with fibromyalgia or chronic widespread pain.

- More randomised controlled trials are needed that assess the effects of hydrotherapy on sick absence and return-to-work including other participants than women with fibromyalgia or chronic widespread pain.

62 systematic reviews that summarised the effects of hydrotherapy for persons with musculoskeletal disorders on pain, function and quality of life were identified. These reviews answered question two.

Innhold

Forord

Nasjonalt kunnskapssenter for helsetjenesten fikk i oppdrag fra *Norsk Revmatikerforbund (NRF) å oppsummere tilgjengelig forskning om effekter av trening i varmtvannsbasseng førte til lavere sykefravær og om personer med muskelskjelettlidelser kom raskere tilbake i arbeid. Videre ønsket NRF en liste over systematiske oversikter som undersøkte om trening i varmtvannsbasseng til personer med muskelskjelettlidelser påvirket smerte, funksjon og livskvalitet.*

Prosjektgruppen har bestått av:

- Prosjektkoordinator: forsker Hilde T. Myrhaug, Kunnskapssenteret
- Seniorforsker Vegard Strøm, Kunnskapssenteret
- Bibliotekar Elisabet Hafstad, Kunnskapssenteret
- Bibliotekar Ingvild Kirkehei, Kunnskapssenteret

Denne oversikten er ment å hjelpe beslutningstakere i helsetjenesten til å fatte velinformerte beslutninger som kan forbedre kvaliteten i helsetjenestene. I kliniske beslutninger må forskningsbasert dokumentasjon ses i sammenheng med andre relevante forhold, slik som pasientenes behov, klinisk erfaring og kontekst (som retningslinjer, politikk, økonomi, etikk, lover og regler).

Nasjonalt kunnskapssenter for helsetjenesten fremskaffer og formidler kunnskap om effekt av metoder, virkemidler og tiltak og om kvalitet innen alle deler av helsetjenesten. Målet er å bidra til gode beslutninger slik at brukerne får best mulig helsetjenester. Kunnskapssenteret er formelt et forvaltningsorgan under Helsedirektoratet, men har ingen myndighetsfunksjoner og kan ikke instrueres i faglige spørsmål.

Gro Jamtvedt	Liv Merete Reinar	Hilde T. Myrhaug
Avdelingsdirektør	*Seksjonsleder*	*Prosjektleder*

Problemstilling

Hensikten med oppdraget er å svare på følgende spørsmål:

1. Hva er effekten av trening i varmtvannsbasseng sammenliknet med ingen trening, venteliste eller annen type trening på sykefravær og tilbakegang til arbeidslivet hos personer med kroniske muskelskjellettlidelser?
2. Hva finnes av systematiske oversikter som oppsummerer effekten av trening i varmtvannsbasseng sammenliknet med ingen trening, venteliste eller annen type trening på smerte, funksjon og/eller livskvalitet hos personer med kroniske muskelskjellettlidelser?

Innledning

Muskelskjelettlidelser

Muskelskjelettlidelser er svært utbredt i den norske befolkningen, og forekomsten holder seg rundt 25 % (1, 2). Det er rapportert at i løpet av en måned vil 75-80 % av alle voksne oppleve muskelskjelettplager i en eller annen form (1). Det er store individuelle variasjoner i hvilken grad de ulike muskelskjelettlidelsene medfører smerte eller påvirker livskvalitet, dagligliv og arbeidsliv (2). Noen har lette plager som ikke krever noen behandling eller påvirker deltakelse i arbeidslivet. Andre har langvarige og/eller tilbakevendende plager som krever behandling og som påvirker deltakelse i arbeidslivet. Muskelskjelettlidelser utgjør en stor heterogen gruppe hvor blant annet sykdommer med klare årsaksforhold og konsekvenser inngår, men også lidelser der årsaksforhold og konsekvenser er mer uklare. I denne systematiske oversikten bruker vi begrepet muskelskjelettlidelser for hele gruppen. De vanligste muskelskjelettlidelsene er revmatiske lidelser (som revmatoid artritt og Bekhterevs sykdom), degenerative lidelser (som artroser og osteoporose), fibromyalgi, rygg-, nakke-, skulder- og bekkenlidelser (2).

Muskelskjelettlidelser og sykefravær

Muskelskjelettlidelser er den vanligste medisinske årsaken til sykefravær og uførepensjonering i Norge (3). I rapporten «Et muskel- og skjelettregnskap fra 2013» estimeres de totale muskelskjelettrelaterte kostnadene i Norge til å være mellom 69 og 73 milliarder kroner per år; nesten det dobbelte av summen i 2004 (4).

Muskelskjelettlidelser var årsaken til 36 % av legemeldte sykefraværstilfeller i 2013 (5) og 32 % av alle nye tilfeller av uføreytelser i 2011 (6). Rygglidelser dominerte som årsak både til sykefravær i 2008 og uføreytelser i 2006 og svarte for henholdsvis 11 % og 9 % (3). Nakke- og skulderlidelser svarte for 9 % av sykefraværet, og artrose og fibromyalgi stod for 10 % av nye tilfeller av uføreytelser. Kvinner, personer med lav utdanning og/eller monotont eller tungt fysisk arbeid ser ut til å ha økt risiko for muskelskjelettlidelser og at konsekvensene oftere gir seg utslag i sykefravær og uførhet (4,7).

Behandling av muskelskjelettlidelser

Siden de økonomiske kostnadene ved muskelskjelettlidelser og sykefravær øker, er det behov for tiltak som kan redusere både de samfunnsøkonomiske kostnadene og få personer med muskelskjelettplager raskere tilbake i arbeid. Systematiske oversikter viser at fysisk aktivitet og trening kan redusere smerter og bedre funksjon hos personer med muskelskjelettplager (8-10). Fysisk aktivitet kan defineres som «all kroppslig bevegelse produsert av skjelettmuskulatur som resulterer i en vesentlig økning av energiforbruket utover hvilenivå» (11). Trening er fysisk aktivitet som er planlagt, og som gjentas regelmessig for å bedre eller vedlikeholde den fysiske formen. Man kan trene både kondisjon, styrke, hurtighet, balanse og bevegelighet (12). I denne systematiske oversikten refererer vi til trening. Systematiske oversikter viser at effekten av fysisk aktivitet og trening for å redusere antall sykedager og eller å få personer med rygglidelser tilbake i jobb er uklar (8,13).

Siden gruppen muskelskjelettlidelser er heterogen, kan man forvente ulik effekt av intervensjoner, slik som trening i varmtvannsbasseng. Trening i varmtvannsbasseng er et av mange tilbud som gis til personer med muskelskjelettlidelser i Norge, og spesielt til personer med revmatoid artritt, fibromyalgi og gravide med bekkenløsning. Vannet er ofte oppvarmet til 32-36° Celsius (14), og kan støtte kroppen gjennom oppdrift og motstand, og redusere belastningen på ledd og leddforbindelser sammenlignet med tilsvarende aktivitet på land (15,16). Trening i varmtvannsbasseng kan også redusere smerte (17,18). Flere nyere systematiske oversikter har oppsummert effekten av trening i vann på smerter, funksjon og livskvalitet hos personer med revmatoid artritt og fibromyalgi, med lovende resultater (19-21). En før- og etter studie uten kontroll, viste at pasienter med fibromyalgi som trente i varmtvannsbasseng to ganger i uka, signifikant forbedret muligheten til å jobbe og reduserte sykefraværet (22). Videre viste en oversikt som oppsummerte effekten av rehabilitering i varmt klima til personer med revmatiske lidelser (23) hvor trening i varmtvannsbasseng inngikk at det er behov for mer robuste studier for å trekke gyldige konklusjoner. Sykefravær og tilbakegang til arbeidslivet ble ikke målt i denne oversikten eller noen av de andre nevnte oversiktene.

Sykefravær og tilbakegang til arbeidslivet er komplekse fenomener. Flere ser derfor betydningen av å forholde seg til langtidssykemelding som noe mer enn kun en konsekvens av f.eks. en muskelskjelettlidelse, og da som et resultat av interaksjon mellom medarbeideren og tre systemer; helsetjenesten, arbeidsmiljøet og økonomiske støtteordninger (24). Dette perspektivet har klare paralleller til International Classification of Functioning, Disability and Health (ICF) som er Verdens helseorganisasjons helseklassifikasjon og modell for å forstå hvilke konsekvenser en sykdom kan få for et individ (25). Intervensjoner eller programmer som bygger på dette perspektivet inneholder ofte kombinasjoner av informasjon og opplæring om diagnose, fysisk aktivitet, kognitiv atferdsterapi, hvordan takle smerter og stress, arbeidsrelatert

trening, og kontakt mellom aktører (pasient, arbeidsgiver, helsearbeidere, NAV og/eller forsikringsselskap). I slike intervensjoner eller programmer kan trening i vann inngå, og de vil være relevant for denne systematiske oversikten. Denne kompleksiteten representert både i populasjon, tiltak og utfallsmål, kan bidra til at det blir vanskelig å trekke konklusjoner. Likevel er det behov for oppsummert forskning som evaluerer om trening i varmtvannsbasseng alene eller som en del av en kompleks intervensjon kan påvirke sykefravær og tilbakegang til arbeidslivet.

Metode

Litteratursøking

Vi søkte systematisk etter litteratur i følgende databaser:

- MEDLINE
- AMED
- Embase
- Cochrane CENTRAL
- Cochrane Database of Systematic Reviews
- Health Technology Assessment (HTA) Database
- Database of Abstracts of Reviews of Effects (DARE)
- OTSeeker
- PEDro
- CINAHL
- PubMed
- Web of Science.

Forskningsbibliotekar Ingvild Kirkehei planla og utførte samtlige søk. Den fullstendige søkestrategien finnes i vedlegg 1. Søk etter primærstudier ble avsluttet juli 2014. Søket bestod av emneord og tekstord for hydroterapi eller trening i varmt vann og ble videre kombinert med søkeord for relevante diagnoser. Søket ble til sist avgrenset med filter for primærstudier.

I september 2014 ble samme søk utført for å finne systematiske oversikter.
I tillegg til søk i bibliografiske databaser, søkte vi etter pågående studier i Clinical Trials.gov og WHO International Clinial Trials Registry Platform (ICTRP).

Inklusjonskriterier

Studiedesign (i prioritert rekkefølge) for spørsmål 1 om sykefravær og tilbakegang til arbeid:

1. Randomiserte kontrollerte studier
2. Kliniske ikke-randomiserte kontrollerte studier

Studiedesign for spørsmål 2 om smerter, funksjon og/eller livskvalitet: Systematiske oversikter

Populasjon:	Personer ≥18 år med kroniske muskelskjelettlidelser. Med kroniske lidelser mener vi vedvarende plager i minimum tre måneder. Med muskelskjelettlidelser mener vi degenerative og revmatiske lidelser, fibromyalgi, rygg-, nakke-, og skulderlidelser. Personer med kroniske muskelskjelettlidelser som har andre fysiske eller psykiske tilleggslidelser (komorbiditet) eller studier som evaluerer effekten hos personer med kun en enkeltlidelse (f.eks. fibromyalgi), blir inkludert. Ved komorbiditet anses ikke disse lidelsene som hovedårsak til populasjonens funksjonsnedsettelse.
Tiltak:	Trening i varmtvannsbasseng med eller uten annen type tiltak (som kognitiv adferdsterapi, arbeidsrettede programmer mm). Treningen må være målrettet og strukturert, og kan foregå som individuell trening eller i gruppe. Den må ha en frekvens på minimum en gang per uke, over åtte ukers varighet. Treningen må være ledet av helsepersonell eller annet kvalifisert personell.
Sammenlikning:	Ingen trening, venteliste eller annen type trening (ikke trening i varmtvannsbasseng).
Utfall (for spørsmål 1):	Registerbasert eller selvrapportert sykefravær, antall dager borte fra jobben grunnet sykdom (muskelskjelettlidelser), tilbakegang til arbeidslivet eller sykemelding. Minst ett av disse utfallsmålene må være målt i den inkluderte studien.
(for spørsmål 2):	Smerte, funksjon og livskvalitet
Språk:	Engelsk, tysk, fransk, norsk, svensk og dansk.

Eksklusjonskriterier

Studiedesign:	Ikke-kontrollerte studier
Populasjon:	Personer <18 år, gravide kvinner med bekkenløsning
Tiltak:	Thalassoterapi, behandlingsreiser, og opphold i varmtvannsbasseng der (type) trening ikke er rapportert.

Artikkelutvelging

To personer gjennomgikk resultatene fra søkene uavhengig av hverandre. Ved tvil eller uenighet om relevans ble en tredje person konsultert. Den første utvelgelsen av litteraturen skjedde på basis av tittel og sammendrag av artiklene identifisert i søkene og i henhold til inklusjonskriteriene spesifisert ovenfor. Den andre utvelgelsen skjedde på basis av fulltekst og i henhold til de samme inklusjonskriteriene.

Systematiske oversikter som oppsummerte effekten av trening i varmtvannsbasseng på smerte, funksjon og/eller livskvalitet hos personer med muskelskjelettlidelser (spørsmål 2), finnes i vedlegg 2. Disse systematiske oversiktene er kun sortert på diagnose, og resultatene er ikke oppsummert, vurdert for systematiske feil eller vurdert for kvaliteten på dokumentasjonen.

Den følgende beskrivelsen av metode er kun knyttet til spørsmål 1.

Dataekstraksjon og analyser

Prosjektleder hentet ut relevant informasjon fra de inkluderte studiene og beskrev dette i oppsummeringstabeller. Følgende data ble ekstrahert fra de inkluderte studiene: Forfattere, år, land, populasjon, type trening i varmt vann, sammenlikninger, utfallsmål og resultater. En prosjektmedarbeider gikk gjennom beskrivelsene for å sikre at all relevant informasjon hadde kommet med. Vi kontaktet førsteforfatter av studier som møtte våre inklusjonskriterier, dersom relevant informasjon manglet. Tabell over ekskluderte studier med årsak til eksklusjon finnes i vedlegg 3.

Vi oppsummerte resultatene deskriptivt, siden studiene var for ulike for å kunne å slå sammen resultatene i meta-analyser.

Risiko for systematiske feil

Studier som møtte inklusjonskriteriene ble vurdert for risiko for systematiske feil («risk of bias»). Dette ble gjort ved bruk av sjekklister beskrevet i Kunnskapssenterets Håndbok; ”Slik oppsummerer vi forskning” (26). Dette omfatter bl.a. vurdering av kjente kilder for systematiske feil, som generering av randomiseringssekvens, skjult fordeling til grupper, blinding og vurdering av ufullstendige data eller manglende rapportering om utfallsmålene. To personer gjorde denne vurderingen uavhengig av hverandre. Ved uenighet ble vurderingene diskutert med en tredje person.

Vurdering av kvaliteten på dokumentasjon

For å vurdere hvilken tillit vi har til resultatene, brukte vi Grading of Recommendations Assessment, Development and Evaluation (GRADE). GRADE brukes for å oppsummere og gradere kvaliteten på den samlede dokumentasjonen (27). Denne metoden hjelper oss til å vurdere hvilken grad av tillit vi kan ha til dokumentasjonen for hvert av utfallsmålene (Tabell 1).

Tabell 1. GRADE-kategorier for betydning av påliteligheten til effektestimater

Vurdering av kvalitet	Betydning
Høy	Vi har stor tillit til at effektestimatet ligger nær den sanne effekten.
Moderat	Vi har middels tillit til effektestimatet: det ligger sannsynlig nær den sanne effekten, men det er også en mulighet for at det kan være forskjellig.
Lav	Vi har begrenset tillit til effektestimatet: den sanne effekten kan være vesentlig ulik effektestimatet.
Svært lav	Vi har svært liten tillit til at effektestimatet ligger nær den sanne effekten.

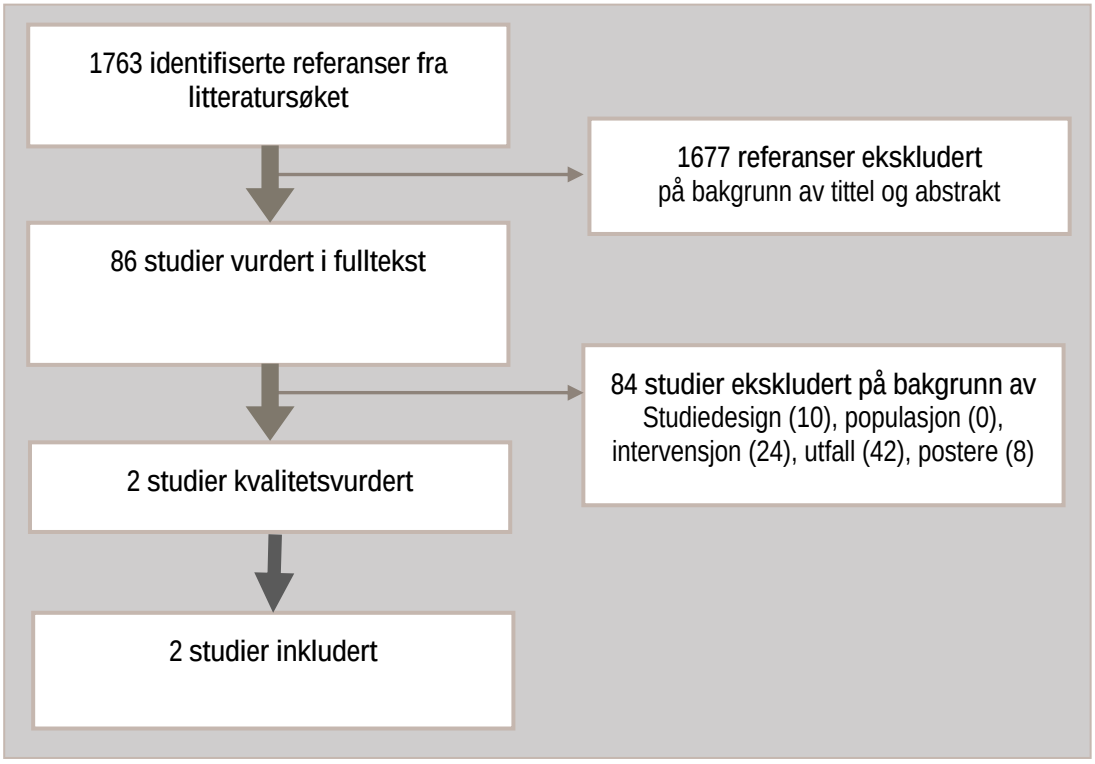
Fagfellevurdering

To interne medarbeidere som ikke var involvert i prosjektet fagfellevurderte prosjektplan og rapportutkast. De vurderte spesielt det metodiske innholdet i planen/rapporten. To eksterne fagfeller kommenterte utkast til prosjektplan, rapport og søkestrategi.

Resultat

Det systematiske litteratursøket resulterte i 1763 unike referanser for spørsmål 1, hvorav 1677 referanser ble ekskludert på bakgrunn av tittel og sammendrag. Vi vurderte 86 studier i fulltekst. Av disse var det ni studier som møtte våre inklusjonskriterier, men utfallsmålet (selvrapportert sykefravær rapportert med Fibromyalgia Impact Questionnaire (FIQ)) med effektestimat var mangelfullt rapportert. Vi kontaktet førsteforfatterne til disse studiene. Kun en av forfatterne svarte. 84 studier ble derfor ekskludert på bakgrunn av inklusjons-og eksklusjonskriterier (Figur 1). Liste over de ekskluderte studiene presenteres i vedlegg 3.

Figur 1. Flytskjema som viser utvelging av studier for spørsmål 1.



Beskrivelse av inkluderte studier for spørsmål 1

Vi inkluderte to studier (Cuesta Vargas & Adams (28) og Mannerkorpi et al. (29)) som evaluerte effekten av trening i varmtvannsbasseng på selvrapportert sykefravær

med Fibromyalgia Impact Questionnaire (FIQ). (Tabell 2). Delskala 3 på FIQ omhandler antall dager borte fra arbeid den siste uken på grunn av fibromyalgi.

Cuesta-Vargas & Adams (2011) (28) utførte en ikke-randomisert kontrollert studie som evaluerte effekten av trening i varmtvannsbasseng i kombinasjon med øvelser på land, kognitiv atferdsterapi og en brosjyre om fibromyalgi til kvinner med fibromyalgi (N=44, gjennomsnittsalder 54 år). Deltakerne rapporterte i gjennomsnitt 4.8 år med fibromyalgi, tre andre tilleggslidelser og bruk av to medikamenter. Tiltaket bestod av løping i vann (30 minutter x 3/uke), trening av bevegelighet og styrke på land (30 minutter x 3/uke) samt undervisning i kognitiv atferdsterapi i åtte uker. Kontrollgruppen fikk en brosjyre om fibromyalgi og fortsatte med sine vanlige aktiviteter. Primært utfallsmål var FIQ. Resultat for delskala 3 ble rapportert som en normalisert verdi mellom 0-10. Det ble ikke spesifisert at kun deltakere som var i lønnet arbeid skulle fylle ut denne delskalaen. Resultatene viste at gruppen som trente i varmtvannsbasseng, på land og som mottok kognitiv atferdsterapi og en brosjyre hadde færre selvrapporterte dager borte fra arbeid den åttende uka etter baseline enn gruppen som kun fikk en brosjyre (mean difference (MD) -0,69 (95 % KI -1,03 til -0,35)).

Mannerkorpi et al. (2009) (29) utførte en randomisert kontrollert studie som evaluerte effekten av bassengtrening til kvinner i alderen 18-60 år med fibromyalgi (FM) og kronisk utbredt smerte (N=166). Deltakere som rapporterte kroniske smerter i minst tre måneder og smerter ved palpasjon på 11 av 18 ømme punkter («tender points») ble klassifisert til FM (n=134). Deltakere med smerter i alle fire kvadranter av kroppen (delt horisontalt og vertikalt) i minst tre måneder og som ikke møtte kravet om ømme punkter, ble definert som deltakere med kronisk utbredt smerte (n=32). 35 % prosent av deltakerne i tiltaksgruppen arbeidet deltid og 10 % prosent fulltid, mens 27 % arbeidet deltid og 11 % fulltid i kontrollgruppen. Deltakere ble randomisert til trening i basseng (20 ganger) inkludert et opplæringsprogram om mestring (n=81) eller kun et opplæringsprogram (6 ganger) i 20 uker (n=85). Opplæringsprogrammet i mestring av FM-symptomer ble ledet av en fysioterapeut. Det varte i 1 time hver uke i seks påfølgende uker. Treningsprogrammet i basseng bestod av 20 sesjoner av 45 minutter en gang per uke i 20 uker. Vannet holdt 33 grader og treningen ble ledet av en fysioterapeut. Målet med treningen var å forbedre generell funksjon og å motivere til regelmessig fysisk aktivitet. Primær utfallsmål var FIQ. For endringer knyttet til delskala 3, oppgav førsteforfatter på forespørsel, baseline og post treatment skår etter 20 uker (30). Kun deltakere som var i lønnet arbeid 20 uker etter baseline, rapporterte prosent (0-100 %) sykefravær den siste uken (n=127). Basert på disse dataene var det ingen forskjell mellom gruppene på prosent dager borte fra arbeid siste uke på grunn av fibromyalgi (MD -9,3 % (95 % KI -23,9 til 5,3)).

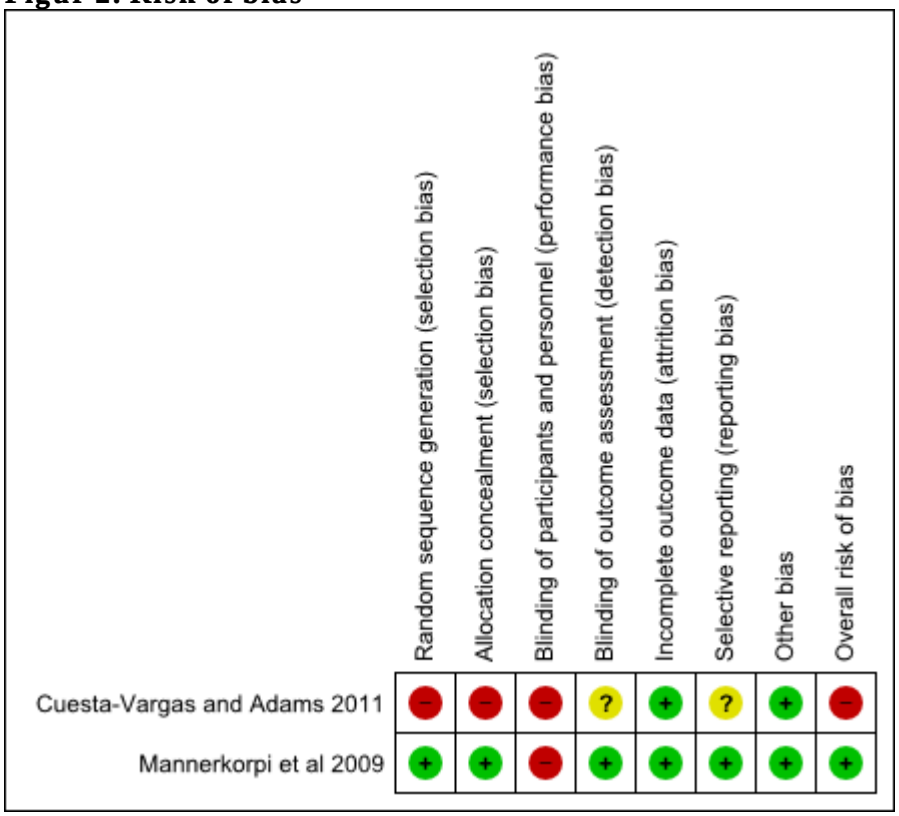
Tabell 2. Karakteristika ved inkluderte studier

Forfatter (år), land	Populasjon	Tiltak	Sammen-likning	Primært utfalls-mål	Resultat
Cuesta-Vargas & Adams (2011) (28), Spania	Inaktive kvinner med fibromyalgi (FM), N=44 Gjennom-snittsalder: 54,5 år	Trening i varmt vannbasseng (28-31°C), «Deep water running» med flytebelter (30 min x 3/uke i 8 uker) Trening på land: Kombinasjonsterapi bestående av individuelt tilpassede øvelser (bevegelighet og muskelstyrke). Treningen ble gitt under veiledning av fysioterapeut (30 min x 3/uke i 8 uker). I tillegg fikk tiltaksgruppen undervisning etter prinsippene i kognitiv atferdsterapi. Gruppen fikk også brosjyre om fibromyalgi.	Kontrollgruppen fikk brosjyre om fibromyalgi og fortsatte med sine vanlige aktiviteter	Selvrapporterte dager borte fra arbeid siste uke (; sykefravær), målt m/Fibromyalgia Impact Questionnaire (FIQ). Rådata ble transformert til normaliserte skår (range 0-10). Høy skår viser mer sykdom.	FIQ (selvrapporterte dager borte fra arbeid): Forskjell mellom gruppene Mean difference (MD): -0,69 (95 % KI -1,03, -0,35)
Manner-korpi et al. (2009) (29), Sverige	Kvinner med FM, N=166, hvorav 134 møtte kriteriene for FM og 32 for kronisk utbredt smerte Gjennom-snittsalder: 45,5 år	Trening i varmtvannsbasseng (33°C), ledet av en fysioterapeut (45 min x 1 /uke i 20 uker). Hensikten med treningen var personlig fremgang, å forbedre funksjon og å motivere til regelmessig fysisk aktivitet. I tillegg fikk tiltaksgruppa et opplæringsprogram (med teori om kroniske smerter, smertelindrende, fysisk aktivitet, stress, avslapning og livsstil) (1 time x 1/uke i 6 uker)	Opplærings-program (m/ teori om kroniske smerter, smertelindring, fysisk aktivitet, stress, avslapning og livsstil) (1 time x 1/uke i 6 uker)	Selvrapporterte dager borte fra arbeid siste uke (; sykefravær), målt m/FIQ (transformert fra 0-100 %)	FIQ (selvrapporterte dager borte fra arbeid i prosent): Forskjell mellom gruppene MD: -9,32 % (95 % KI -23,94 til 5,30)

Risiko for systematiske feil

Cuesta-Vargas & Adams (28) 2011 ble vurdert til å ha høy risiko for systematiske feil og Mannerkorpi et al. (29) til å ha lav risiko for systematiske feil (Figur 2). Cuesta-Vargas & Adams (28) var en ikke randomisert kontrollert studie der risiko for seleksjonsbias og utførelsesbias (mangel på blinding av deltakere og personell) ble vurdert til å være høy. For blinding av utfallsmåler (detection bias) og selektiv rapportering vurderte vi risikoen for systematiske feil til uklar. I studien til Mannerkorpi et al. (29) var det kun blinding av personell som gav høy risiko for bias. Ellers var studien godt beskyttet for systematiske feil. Det er ikke mulig å blinde deltakere og personell i disse to studiene, likevel har vi vurdert dette til å utgjøre en høy risiko for systematiske feil, siden dette kan påvirke resultatet ved selvrapportert endepunkt.

Figur 2. Risk of bias



Vurdering av kvaliteten på dokumentasjon

Vi vurderte kvaliteten på dokumentasjonen for de to studiene med GRADE (tabell 2).

Tabell 2. GRADE

Populasjon: Kvinner med fibromyalgi og kronisk utbredt smerte Intervensjon: Trening i varmtvannsbasseng i kombinasjon med andre tiltak Sammenligning: Brosjyre eller opplæringsprogram (kontroll)					
Utfall	Kontroll	Trening i varmt-vannsbas-seng i kom-binasjon med andre tiltak	Forskjell mellom gruppene MD (95 % KI)	Antall deltakere (studier)	Kvaliteten på dokumentasjo-nen (GRADE)
Selvrapportert syke-fravær etter 8 uker (FIQ, antall dager borte fra arbeid, skår 0-10). Rappor-tert fra den siste uken. (Cuesta-Vargas & Adams) (28)	1,30	0,61	-0,69 (-1,03 til -0,35)	41 (1)	⨁⊖⊖⊖ Svært lav[1,2,3]
Selvrapportert syke-fravær etter 20 uker (FIQ, prosent (0-100 %) sykefravær den siste uken. (Mannerkorpi et al) (29)	69 %	59 %	-9,32 % (-23,94 til 5,30)	127 (1)	⨁⊖⊖⊖ Svært lav[4,5,6]
KI: Konfidensintervall; MD: gjennomsnittlig forskjell					
[1]Studien trekkes på grunn av «high risk of bias», knyttet til mangel på randomisering, ikke registrert pro-tokoll, og kun rapportert signifikante resultater, [2] Trekk for problemer med overførbarhet, fordi både kvin-ner som utførte husarbeid og lønnet arbeid utenfor hjemmet kan ha svart på dette spørsmålet, og fordi FIQ er ment til å besvare noe annet enn våre utfallsmål, [3]Trekk for mangel på konsistens av resultater på grunn av kun en studie, [4]Trekk for bredt konfidensintervall og få deltagere, [5] Trekk for problemer med overførbarhet, fordi FIQ er ment til å måle noe annet enn våre utfallsmål, [6] Trekk for mangel på konsistens av resultater på grunn av kun en studie.					

Systematiske oversikter som oppsummerer effekten av trening i varmtvannsbasseng på smerte, funksjon og/eller livskvalitet (spørsmål 2)

Søket etter systematiske oversikter ga 908 unike referanser. Av disse var det 62 oversikter som vurderte effekten av trening i varmtvannsbasseng til personer med muskelskjelettlidelser målt på smerte, funksjon og/eller livskvalitet. Oversiktene omhandlet effekten av trening i varmtvannsbasseng til personer med:

- Revmatiske lidelser (n=10)
- Fibromyalgi (n=19)
- Artrose (n=20)
- Ryggplager (n=8)
- Muskelskjelettlidelser (n=5)

Disse systematiske oversiktene presenteres med sammendrag i vedlegg 2.

Diskusjon

Hensikten med spørsmål 1 var å undersøke om trening i varmtvannsbasseng til personer med muskelskjelettlidelser påvirket sykefravær og tilbakegang til arbeidslivet. Her søkte vi etter kontrollerte studier og laget en systematisk oversikt. For spørsmål 2 søkte vi etter systematiske oversikter som evaluerte effekten av trening i varmtvannsbasseng på smerter, funksjon og/eller livskvalitet til personer med muskelskjelettlidelser. Disse systematiske oversiktene ble kun kategorisert og vedlagt som en liste med tittel og sammendrag (vedlegg 2).

I denne systematiske oversikten inkluderte vi to studier (29, 30) som begge evaluerte effekten av trening i varmtvannsbasseng på selvrapportert sykefravær hos kvinner med fibromyalgi og kronisk utbredt smerte. Den ene studien (29), en randomisert kontrollert studie, fant ingen forskjell mellom gruppene som fikk trening i varmtvannsbasseng i kombinasjon med opplæringsprogram, sammenliknet med kun opplæringsprogram. Dette funnet er svært usikkert. Utfallsmål var antall dager borte fra arbeid på grunn av fibromyalgisymptomer. Den andre studien (28), en ikke randomisert kontrollert studie, fant at kvinner som fikk trening i varmtvannsbasseng i kombinasjon med andre tiltak og en brosjyre rapporterte færre dager borte fra arbeid, enn kvinner som kun fikk en brosjyre. Kvaliteten på dokumentasjonen ble vurdert til svært lav. Det medfører at vi har svært liten tillitt til effektestimatet. Dette bør ikke fortolkes som at tiltaket ikke har effekt, men det betyr at vi ikke vet om trening i varmtvannsbasseng påvirker sykefravær og tilbakegang til arbeidsliv hos personer med muskelskjelettlidelser.

Studien til Cuesta Vargas & Adams (28) omhandlet kun effekten av trening i varmtvannsbasseng til kvinner med fibromyalgi, så overførbarheten til andre muskelskjelettlidelser er begrenset. Et annet problem knyttet til overførbarhet av resultater til spørsmål 1, var at kun en av delskalaene i FIQ (delskala 3) omhandler sykefravær. Hensikten med FIQ er i utgangspunktet å samle inn data om problemer relatert til å ha en FM diagnose og ikke sykefravær. Delskala 3 skilte ikke sykefravær knyttet til husarbeid og lønnet arbeid. I studien til Mannerkorpi et al. (29) fremkom dette skillet, mens i studien til Cuesta Vargas & Adams (28) ble det ikke presisert. Mannerkorpi et al. (29), en svensk studie, opplyste dette spesifikt til deltakerne og kun deltakere som var i lønnet arbeid rapporterte på dette spørsmålet. Basert på funnene fra disse to studiene, var FIQ neppe et velegnet måleinstrument for å fange opp utfallsmål som sykefravær og tilbakegang til lønnet arbeid. Siden vårt spørsmål omhandlet sykefravær og tilbakegang til lønnet arbeid, var det viktig at inkluderte studier rapporterte sykefravær kun knyttet til lønnet arbeid. Et tredje problem knyttet til resultatenes overførbarhet var at trening i varmtvannsbasseng utgjorde ett av flere tiltak i et sammensatt program, som i Cuesta-Vargas & Adams (28) og Mannerkorpi et al. (29). I disse studiene ble effekten av hele «tiltakspakken» evaluert og ikke bare effekten av trening i varmtvannsbasseng. Disse problemene ved

studien til Cuesta Vargas & Adams (28) og Mannerkorpi et al. (29) medførte at vår tillitt til resultatene er svekket.

De to inkluderte studiene kunne ikke slås sammen i meta-analyse og måtte graderes hver for seg, siden den ene studien var en randomisert kontrollert studie og den andre en ikke-randomisert kontrollert studie. Dette medførte at studiene ble trukket for mangel på konsistente resultater i GRADE, siden det kun var et effektestimat fra en studie og studiene konkluderte forskjellig. Studiene (28,29) oppga også ulikt effektestimat på sykefravær (FIQ delskala 3; Tabell 2). Vi har kun forholdt oss til oppgitte data i artiklene og tilsendt informasjon fra Mannerkorpi el al (29). På grunn av ulik beregningsmetode for sykefravær var ikke resultatene direkte sammenliknbare.

Selv om vi har søkt etter kontrollerte studier i mange relevante databaser, kan vi ha mistet relevante kontrollerte studier. Det er alltid en mulighet for at noen studier kan ha brukt andre begreper eller at relevante artikler kan være publisert i andre databaser enn dem vi har søkt i. De kan også være publisert i tidsskrifter som ikke inkluderes i de databasene hvor vi har søkt. Alle disse grunnene kan bidra til at denne litteraturen ikke vil fanges opp av vårt søk.

Denne systematiske oversikten viser at det er få kontrollerte studier som har evaluert effekten av dette tiltaket på sykefravær hos personer med muskelskjelettlidelser. Vi inkluderte kun to studier som omhandlet trening i varmtvannsbasseng til kvinner med fibromyalgi eller kronisk utbredt smerte. Vi antar at denne mangelen på relevante studier skyldes utfallsmålene sykefravær og tilbakegang til arbeidslivet. Utfallsmål som smerte, funksjon og livskvalitet er oftere benyttet (se vedlegg 2). En oversikt (31) viser at det kan være en sammenheng mellom det å være i arbeid og livskvalitet. Dessuten viser en oversikt fra NAV (3) at muskelskjelettlidelser er den vanligste medisinske årsaken til sykefravær og uførepensjonering i Norge. Dette kan støtte relevansen for å bruke utfallsmålene sykefravær og tilbakegang til arbeidslivet for denne gruppen. Basert på funnene fra denne systematiske oversikten er det behov for randomiserte kontrollerte studier som undersøker om trening i varmtvannsbasseng påvirker sykefravær og tilbakegang til arbeidslivet hos personer med kroniske muskelskjelettlidelser.

Konklusjon

I denne systematiske oversikten har vi oppsummert to kontrollerte studier som har evaluert effekten av trening i varmtvannsbasseng på selvrapportert sykefravær hos henholdsvis kvinner med fibromyalgi og kronisk utbredte smerter. Kvaliteten på dokumentasjonen var for svak til å trekke noen konklusjoner om hvilken effekt trening i varmtvannsbasseng til kvinner med fibromyalgi og kroniske utbredte smerter har på sykefravær. Det betyr ikke at tiltaket er uten effekt, men denne systematiske oversikten viser at vi mangler kontrollerte studier som evaluerer effekten av trening i varmtvannsbasseng på sykefravær eller tilbakegang til arbeid hos personer med muskelskjelettlidelser.

Vi identifiserte 62 systematiske oversikter som har oppsummert effekten av trening i varmtvannsbasseng på smerte, funksjon og livskvalitet til personer med muskelskjelettlidelser. Disse systematiske oversiktene er kategorisert og vedlagt i en liste med titler og sammendrag.

Behov for videre forskning

For å kunne besvare om trening i varmtvannsbasseng påvirker sykefravær og tilbakegang til arbeidslivet hos personer med muskelskjelettlidelser er det behov for randomiserte kontrollerte studier som:

- inkluderer andre deltakere enn kvinner med fibromyalgi og kronisk utbredt smerte
- oppgir antall deltakere som er i arbeid, uføretrygdet eller sykemeldt
- evaluerer effekten av trening i varmtvannsbasseng alene (f.eks. trening i varmtvannsbasseng i kombinasjon med trening på land sammenliknet med kun trening på land)
- evaluerer effekten av trening i varmtvannsbasseng på sykefravær eller tilbakegang til arbeidslivet.

Referanser

1. Ihlebæk C, Brage S, Eriksen HR. Health complaints and sickness absence in Norway, 1996-2003. Occup Med (Lond) 2007;57(1):43-9.

2. Ihlebæk C, Brage S, Natvig B, Bruusgaard D. Forekomst av muskel- og skjelettlidelser i Norge. Tidsskr Nor Laegeforen 2010;23(130): 2365-8.

3. Legemeldte sykefraværstilfeller 3 kv 2004-2013. Diagnose og kjønn. Antall. NAV. [Lest 20. mai 2015]. Tilgjengelig fra: https://www.nav.no/no/NAV+og+samfunn/Statistikk/Sykefravar+-+statistikk/Tabeller/Legemeldte+sykefrav%C3%A6rstilfeller+3+kv+2005-2014.+Diagnose+og+kj%C3%B8nn.+Antall..399982.cms

4. Lærum E, Brage S, Ihlebæk C, Johnsen K, Natvig B, Aas E. Et muskel- og skjelettregnskap: forekomst og kostnader knyttet til skader, sykdommer og plager i muskel- og skjelettsystemet. Oslo: FORMI Klinikk for kirurgi og nevrofag; 2013. (MST-rapport 1/2013). http://www.formi.no/images/uploads/pdf/rapport_mussp_online.pdf

5. Andersen I, Frydenberg H, Mæland JG. Muskel- og skjelettplager og fremtidig sykefravær. Tidsskr Nor Laegeforen 2009;12(129):1210-3.

6. Ellingsen J. Statistikk uførepensjon per 31. desember 2010. NAV. [Oppdatert 15. apr. 2011; Lest 27. mai 2015]. Tilgjengelig fra: https://www.nav.no/no/NAV+og+samfunn/Statistikk/Sykefravar+-+statistikk/Relatert+informasjon/_attachment/275562?_download=true&_ts=12f580f9578

7. Xu YW, Cheng AS, Li-Tsang CW. Prevalence and risk factors of work-related musculoskeletal disorders in the catering industry: a systematic review. Work 2013;44(2):107-16.

8. Dahm K, Brurberg KG, Jamtvedt G, Hagen KB. Advice to rest in bed versus advice to stay active for acute low-back pain and sciatica. Cochrane Database Syst Rev 2010;(6):CD007612.

9. Golightly YM, Allen KD, Caine DJ. A comprehensive review of the effectiveness of different exercise programs for patients with osteoarthritis. Phys Sportsmed 2012;40(4):52-65.

10. Busch AJ, Webber SC, Richards RS, Bidonde J, Schachter CL, Schafer LA, et al. Resistance exercise training for fibromyalgia. Cochrane Database Syst Rev 2013;(12):CD010884.

11. Bouchard C, Shepard RJ, Stephens T (ed.). Physical activity, fitness, and health: international proceedings and consensus statement. Champaign, IL: Human Kinetics Publishers; 1994.

12. Fysisk aktivitet - faktaark med statistikk. Folkehelseinstituttet. [Oppdatert 08. feb. 2015; Lest 12. feb. 2015]. Tilgjengelig fra: http://www.fhi.no/artikler/?id=56857

13. Schaafsma FG, Whelan K, van der Beek AJ, van der Es-Lambeek LC, Ojajärvi A, Verbeek JH. Physical conditioning as part of a return to work strategy to reduce sickness absence for workers with back pain. Cochrane Database Syst Rev 2013;(8):CD001822.

14. Bartels EM, Lund H, Hagen KB, Dagfinrud H, Christensen R, Danneskiold-Samsøe B. Aquatic exercise for the treatment of knee and hip osteoarthritis. Cochrane Database Syst Rev 2007;(4):CD005523.

15. Hall J, Swinkels A, Briddon J, McCabe CS. Does aquatic exercise relieve pain in adults with neurologic or musculoskeletal disease? : a systematic review and meta-analysis of randomized controlled trials. Arch Phys Med Rehabil 2008;89(5):873-83.

16. Everdsen L, Maggs F, Nightingale P, Jobanputra P. A pragmatic randomized controlled trial of hydrotherapy and land exercises on overall well-being and quality of life in rheumatoid arthritis. BMC Musculoskelet Disord 2007;8:23.

17. Bender T, Karagülle Z, Balint GP, Gutenbrunnner C, Balint PV, Sukenik S. Hydrotherapy, balneotherapy, and spa treatment in pain management. Rheumatol Int 2005;25(3):220-4.

18. Kamioka H, Tsutani K, Okuizumi H, Mutoh Y, Ohta M, Handa S, et al. Effectiveness of aquatic exercise and balneotherapy: a summary of systematic reviews based on randomized controlled trials of water immersion therapies. J Epidemiol 2010;20(1):2-12.

19. Al-Qubaeissy KY, Fatoye FA, Goodwin PC, Yohannes AM. The effectiveness of hydrotherapy in the management of rheumatoid arthritis: a systematic review. Musculoskeletal Care 2013;11(1):3-18.

20. Brandão Lima T, Dias JM, Mazuquin BF, da Silva TC, Nogueira RMP, Pasqual Marques A, et al. The effectiveness of aquatic physical therapy in the treatment of fibromyalgia: a systematic review with meta-analysis. Clin Rehabil 2013;27(10):892–908

21. Langhorst J, Musial F, Klose P, Häuser W. Efficacy of hydrotherapy in fibromyalgia syndrome: a meta-analysis of randomized controlled clinical trials. Rheumatology (Oxford) 2009;48(9):1155-9.

22. Silva KM, Tucano SJ, Kümpel C, Castro AA, Porto EF. Effect of hydrotherapy on quality of life, functional capacity and sleep quality in patients with fibromyalgia. Rev Bras Reumatol 2012;52(6):851-7.

23. Forseth KØ, Hafstrøm I, Husby G, Opava CH. Comprehensive rehabilitation of patients with rheumatic diseases in warm climate: a literature review. J Rehabil Med 2010;42(10):897-902.

24. Briand C, Durand MJ, St-Arnaud L, Corbiere M. How well do return-to-work interventions for musculoskeletal conditions address the multicausality of work disability. J Occup Rehabil 2008; 18(2):207-217.

25. ICIDH-2: international classification of functioning, disability and health: final draft. Geneva: World Health Organization; 2001

26. Slik oppsummerer vi forskning: håndbok for Nasjonalt kunnskapssenter for helsetjenesten. Oslo: Nasjonalt kunnskapssenter for helsetjenesten; 2013.

27. Schunemann HJ, Oxman AD, Brozek J, Glasziou P, Jaeschke R, Vist GE, et al. Grading quality of evidence and strength of recommendations for diagnostic tests and strategies. BMJ. 2008;336(7653):1106-10.

28. Cuesta-Vargas A, Adams N. A pragmatic community-based intervention of multimodal physiotherapy plus deep water running (DWR) for fibromyalgia syndrome: a pilot study. Clin Rheumatol 2011;30(11):1455-62.

29. Mannerkorpi K, Nordeman L, Ericsson A, Arndorw M, GAU Study Group. Pool exercise for patients with fibromyalgia or chronic widespread pain: a randomized controlled trial and subgroup analyses. J Rehabil Med 2009;41(9):751-60.

30. Mannerkorpi K. [Personlig kommunikasjon i e-post fra Kaisa Mannerkorpi 19. september 2014].

31. Waddell G, Burton A. Is work good for your health and well-being? London: Department for Work and Pensions; 2006 https://www.gov.uk/government/publications/is-work-good-for-your-health-and-well-being

Vedlegg 1 Søkestrategi

Spørsmål 1. Søk etter enkeltstudier om evaluerer effekten av trening i varmtvannsbasseng på sykefravær og tilbakegang til arbeidslivet

Søketreff etter dublettsjekk: 1763

Søketreff før dublettsjekk: 3759
699 dyrestudier ble slettet i EndNote (etter søk på animal, animals, mouse, mice, rat, rats i tittel, sammendrag og emneord)

MEDLINE, Embase, Amed
Ovid samsøk
Dato: 26.6.2014

Søketreff: 2224
AMED Allied and Complementary Medicine 1985 to June 2014: 195
Embase 1980 to 2014 Week 25: 1293
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE(R) and Ovid OLDMEDLINE(R) 1946 to Present: 736

Søketreff etter Ovid dublettkontroll: 1752
AMED Allied and Complementary Medicine 1985 to June 2014: 107
Embase 1980 to 2014 Week 25: 1284
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE(R) and Ovid OLDMEDLINE(R) 1946 to Present: 361

1. Hydrotherapy/ use pmoz,amed or *hydrotherapy/ use emez
2. (hydrotherap* or hydrofitness or aquatherap*).tw.
3. Water/ use pmoz,amed or *water/ use emez
4. Balneology/ use pmoz or *Balneotherapy/ use emez or balneotherapy/ use amed
5. (aquatic or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy).tw. or water*.ti.
6. exp Exercise Therapy/ use pmoz,amed or exp *Kinesiotherapy/ use emez
7. exp Exercise/ use pmoz,amed or exp *exercise/ use emez
8. motor activity/ use pmoz or *physical activity/ use emez or physical fitness/ use amed
9. (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*).tw.
10. (3 or 4 or 5) and (6 or 7 or 8 or 9)
11. ((pool or pools or water* or bath* or aqua*) adj4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*)).tw.
12. 1 or 2 or 10 or 11

13. exp Musculoskeletal Diseases/ use pmoz or exp *musculoskeletal disease/ use emez or musculoskeletal disease/ use amed
14. exp musculoskeletal pain/ use pmoz,amed or exp *musculoskeletal pain/ use emez or exp back pain/ use pmoz or neck pain/ use pmoz,amed or *neck pain/ use emez or *shoulder pain/ use emez or *bachache/ use emez or bachache/ use amed
15. ((mus?ulos?eletal or muscular) adj (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)).tw.
16. ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) adj3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*)).tw.
17. (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat* or dystroph*).tw.
18. ((r?e?mat* adj3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*).mp.
19. ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) adj2 (disease or syndrome)).tw.
20. (be?hterev* or be?hterew* or ankylosing or marie-struempell*).tw.
21. gout*.tw.
22. (fibromyalgi* or fibromyosit* or fibrosit* or myofascial next pain).tw.
23. (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone adj2 (loss or densit*))).tw.
24. or/13-23
25. 12 and 24
28. random*.mp. or trial.ti. or (controlled adj2 (study or trial)).mp. or (before adj after adj study).tw. or control group*.tw
29. ("effect of" or "effects of").ti. and (study or trial).tw.
30. 28 or 29
31. 25 and 30
37. 31 use emez
38. limit 37 to embase
39. 31 not 37
40. 38 or 39
41. remove duplicates from 40

PEDro
Dato: 26.6.2014
Søketreff: 195

Advanced search
Therapy: hydrotherapy, balneotherapy
Subdiscipline: musculoskeletal
Method: clinical trial

OT Seeker

Dato: 26.6.2014

Søketreff: 33

Advanced search
Keywords: hydrotherapy OR water OR aquatherapy OR bath OR pool
Diagnosis/subdiscipline: Musculosceletal or connective tissue injuries / disorders / procedures
Method: randomised controlled trial

Cochrane CENTRAL
Dato: 26.6.2014
Søketreff: 411

#1 MeSH descriptor: [Hydrotherapy] this term only
#2 MeSH descriptor: [Water] this term only
#3 MeSH descriptor: [Balneology] explode all trees
#4 MeSH descriptor: [Exercise Therapy] explode all trees
#5 MeSH descriptor: [Exercise] explode all trees
#6 MeSH descriptor: [Motor Activity] explode all trees
#7 #2 or #3
#8 #4 or #5 or #6
#9 #7 and #8
#10 ((aquatic or aqua or pool or pools or water* or bath or balne?kine* or hydrokine* or aquakine* or immerse*) near/5 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or (physical next activit*) or kinesiotherap*))
#11 (water* near/1 (exercise* or gymnastic* or training))
#12 (hydrotherap* or hydrofitness or aquatherap*)
#13 #1 or #9 or #10 or #11 or #12
#14 MeSH descriptor: [Musculoskeletal Diseases] explode all trees
#15 MeSH descriptor: [Musculoskeletal Pain] explode all trees
#16 MeSH descriptor: [Back Pain] explode all trees
#17 MeSH descriptor: [Neck Pain] explode all trees
#18 (mus?ulos?eletal next (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*))
#19 ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) near/3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*))
#20 (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*):ab,kw,ti
#21 ((r?e?mat* near/3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*)
#22 ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) near/2 (disease or syndrome))
#23 (be?hterev* or be?hterew* or ankylosing or marie-struempell*)
#24 gout*
#25 (fibromyalgi* or fibromyosit* or fibrosit* or myofascial next pain)
#26 (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone near/2 (loss or densit*)))
#27 #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26
#28 #13 and #27

ISI Web of Science Core Collection
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Søketreff: 577

13 #10 AND #1
Refined by: Databases: (WOS) AND DOCUMENT TYPES: (CLINICAL TRIAL OR CORRECTION OR ABSTRACT)
12 #10 AND #1
Refined by: Databases: (WOS)
11 #10 AND #1

# 10	#9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2
# 9	TOPIC: (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone near/2 (loss or densit*)))
# 8	TOPIC: (gout* or fibromyalgi* or fibromyosit* or fibrosit* or (myofascial near/1 pain))
# 7	TOPIC: (be?hterev* or be?hterew* or ankylosing or struempell*)
# 6	TOPIC: ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) near/2 (disease or syndrome))
# 5	TOPIC: ((r?e?mat* near/3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*)
# 4	TOPIC: (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*)
# 3	TOPIC: ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) near/3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or limb* or joint* or muscular or muscle* or tendon* or ligament*))
# 2	TOPIC: ((musculoskeletal near/1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)))
# 1	TOPIC: (hydrotherap* or hydrofitness or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy or ((pool or pools or water* or bath* or aqua*) near/4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or "physical activity")))

Cinahl

Dato: 26.6.2014

Søketreff: 311

S35	S28 AND S33 Limiters - Exclude MEDLINE records
S34	S28 AND S33
S33	S29 OR S30 OR S31 OR S32
S32	TI ("effect of" or "effects of") AND AB (study or trial)
S31	TI (random* or (controlled N2 (study or trial)) or (before N1 after N1 study)) OR AB (random* or (controlled N2 (study or trial)) or (before N1 after N1 study))
S30	TI (trial)
S29	(MH "Randomized Controlled Trials")
S28	S15 AND S27
S27	S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26
S26	TI (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone N2 (loss or densit*))) OR AB (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone N2 (loss or densit*)))
S25	TI (gout* or fibromyalgi* or fibromyosit* or fibrosit* or myofascial pain) OR AB (gout* or fibromyalgi* or fibromyosit* or fibrosit* or myofascial pain)
S24	TI (be#hterev* or be#hterew* or ankylosing or marie-struempell*) OR AB (be#hterev* or be#hterew* or ankylosing or marie-struempell*)
S23	TI ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) N2 (disease or syndrome)) OR AB ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) N2 (disease or syndrome))
S22	TI ((r#e?mat* N3 (disease* or condition* or nodule*)) or r#e?matism or r#e?mart?rit*) OR AB ((r#e?mat* N3 (disease* or condition* or nodule*)) or r#e?matism or r#e?mart?rit*)
S21	TI (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art#rit* or osteoart#r* or mon?art?r* or oligoart?r* or capsulit* or art#ropat* or spondylit* or spondylos* or ent#esopat*) OR AB (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art#rit* or osteoart#r* or mon?art#r* or oligoar ...
S20	TI ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) N3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper

limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tend ...

S19 TI (mus?ulos?eletal N1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)) OR AB (mus?ulos?eletal N1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*))

S18 (MH "Back Pain+")

S17 (MH "Neck Pain") OR (MH "Shoulder Pain")

S16 (MH "Musculoskeletal Diseases+")

S15 S1 OR S2 OR S13 OR S14

S14 TI ((pool* or water* or bath*) N4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*)) OR AB ((pool* or water* or bath*) N4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*))

S13 S11 AND S12

S12 S7 OR S8 OR S9 OR S10

S11 S3 OR S4 OR S5 OR S6

S10 TI (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*) OR AB (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*)

S9 (MH "Physical Activity")

S8 (MH "Exercise+")

S7 (MH "Therapeutic Exercise+")

S6 TI (aquatic or aqua or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy or water) OR AB (aquatic or aqua or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy)

S5 (MH "Bathing and Baths")

S4 (MH "Balneology")

S3 (MH "Water+")

S2 TI (hydrotherap* or hydrofitness or aquatherap*) OR AB (hydrotherap* or hydrofitness or aquatherap*)

S1 (MH "Hydrotherapy+")

PubMed
Dato: 26.6.2014
Søketreff: 8

Enkelt søk etter artikler som er registret med “Epub ahead of Print”

(hydrotherapy OR (water AND exercise)) AND (musculosceletal OR arthr* or osteo* or rheumat* OR fibro* OR neck OR back OR shoulder OR pain) AND (study OR trial) AND publisher[sb]

Søk etter pågående studier (antall treff er ikke medregnet i søketreffet totalt)
Søketreff totalt etter dublettkontroll: 57

Clinical Trials
Dato: 30.6.2014

Søk 1
Advanced search
Title: hydrotherapy: 14

Søk 2
Advanced search
Interventions: hydrotherapy
Outcome measures: work OR sick leave: 22

WHO International Clinial Trials Registry Platform
Dato: 30.6.2014

Søk 1
Advanced search
Title: hydrotherapy: 20
Recruitment status: ALL

Søk 2
Simple search
hydrotherapy AND work: 12

Søk 3
Simple search
hydrotherapy AND leave: 2

Spørsmål 2. Søk etter systematiske oversikter som oppsummerer effekten av trening i varmtvannsbasseng på smerter, funksjon og/eller livskvalitet

Søketreff etter dublettsjekk: 908

Søketreff før dublettsjekk: 1151

MEDLINE, Embase, Amed
Ovid samsøk

Dato: 26.9.2014

Søketreff:
AMED Allied and Complementary Medicine 1985 to June 2014: 26
Embase 1980 to 2014 Week 25: 109
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE(R) and Ovid OLDMEDLINE(R) 1946 to Present: 102

Søketreff etter Ovid dublettkontroll:
AMED Allied and Complementary Medicine 1985 to June 2014: 12
Embase 1980 to 2014 Week 25: 107

Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE(R) and Ovid OLDMEDLINE(R) 1946 to Present: 50

1. Hydrotherapy/ use pmoz,amed or *hydrotherapy/ use emez
2. (hydrotherap* or hydrofitness or aquatherap*).tw.
3. Water/ use pmoz,amed or *water/ use emez
4. Balneology/ use pmoz or *Balneotherapy/ use emez or balneotherapy/ use amed
5. (aquatic or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy).tw. or water*.ti.
6. exp Exercise Therapy/ use pmoz,amed or exp *Kinesiotherapy/ use emez
7. exp Exercise/ use pmoz,amed or exp *exercise/ use emez
8. motor activity/ use pmoz or *physical activity/ use emez or physical fitness/ use amed
9. (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*).tw.
10. (3 or 4 or 5) and (6 or 7 or 8 or 9)
11. ((pool or pools or water* or bath* or aqua*) adj4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*)).tw.
12. 1 or 2 or 10 or 11
13. exp Musculoskeletal Diseases/ use pmoz or exp *musculoskeletal disease/ use emez or musculoskeletal disease/ use amed
14. exp musculoskeletal pain/ use pmoz,amed or exp *musculoskeletal pain/ use emez or exp back pain/ use pmoz or neck pain/ use pmoz,amed or *neck pain/ use emez or *shoulder pain/ use emez or *bachache/ use emez or bachache/ use amed
15. ((mus?ulos?eletal or muscular) adj (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)).tw.
16. ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) adj3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*)).tw.
17. (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat* or dystroph*).tw.
18. ((r?e?mat* adj3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*).mp.
19. ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) adj2 (disease or syndrome)).tw.
20. (be?hterev* or be?hterew* or ankylosing or marie-struempell*).tw.
21. gout*.tw.
22. (fibromyalgi* or fibromyosit* or fibrosit* or myofascial next pain).tw.
23. (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone adj2 (loss or densit*))).tw.
24. or/13-23
25. 12 and 24
26. ((systematic* adj2 review*) or meta-anal*).mp.
27. 25 and 26
33. 27 use emez
34. limit 33 to embase
35. 27 not 33
36. 34 or 35
37. remove duplicates from 36 [Systematiske oversikter]

PEDro
Dato: 26.9.2014
Søketreff: 75

Advanced search

Therapy: hydrotherapy, balneotherapy
Subdiscipline: musculoskeletal
Method: systematic review

OT Seeker
Dato: 26.9.2014
Søketreff: 25

Advanced search
Keywords: hydrotherapy OR water OR aquatherapy OR bath OR pool
Diagnosis/subdiscipline: Musculosceletal or connective tissue injuries / disorders / procedures
Method: systematic review

Cochrane Library
Dato: 26.9.2014

Søketreff
Cohrane Database of Systematic Reveiws: 495
DARE: 102
HTA: 4

#1	MeSH descriptor: [Hydrotherapy] this term only
#2	MeSH descriptor: [Water] this term only
#3	MeSH descriptor: [Balneology] explode all trees
#4	MeSH descriptor: [Exercise Therapy] explode all trees
#5	MeSH descriptor: [Exercise] explode all trees
#6	MeSH descriptor: [Motor Activity] explode all trees
#7	#2 or #3
#8	#4 or #5 or #6
#9	#7 and #8
#10	((aquatic or aqua or pool or pools or water* or bath or balne?kine* or hydrokine* or aquakine* or immerse*) near/5 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or (physical next activit*) or kinesiotherap*))
#11	(water* near/1 (exercise* or gymnastic* or training))
#12	(hydrotherap* or hydrofitness or aquatherap*)
#13	#1 or #9 or #10 or #11 or #12
#14	MeSH descriptor: [Musculoskeletal Diseases] explode all trees
#15	MeSH descriptor: [Musculoskeletal Pain] explode all trees
#16	MeSH descriptor: [Back Pain] explode all trees
#17	MeSH descriptor: [Neck Pain] explode all trees
#18	(mus?ulos?eletal next (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*))
#19	((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) near/3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*))
#20	(epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*):ab,kw,ti
#21	((r?e?mat* near/3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*)
#22	((felty* or caplan* or sjogren* or sicca* or reiter* or still*) near/2 (disease or syndrome))
#23	(be?hterev* or be?hterew* or ankylosing or marie-struempell*)

#24 gout*
#25 (fibromyalgi* or fibromyosit* or fibrosit* or myofascial next pain)
#26 (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone near/2 (loss or densit*)))
#27 #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26
#28 #13 and #27

ISI Web of Science Core Collection
Dato: 27.9.2014
Søketreff: 161

14 #12 and #13
13 "systematic review" or "meta-analyses" or "meta-analysis"
12 #10 AND #1
Refined by: Databases: (WOS)
11 #10 AND #1
10 #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2
9 TOPIC: (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone near/2 (loss or densit*)))
8 TOPIC: (gout* or fibromyalgi* or fibromyosit* or fibrosit* or (myofascial near/1 pain))
7 TOPIC: (be?hterev* or be?hterew* or ankylosing or struempell*)
6 TOPIC: ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) near/2 (disease or syndrome))
5 TOPIC: ((r?e?mat* near/3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*)
4 TOPIC: (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*)
3 TOPIC: ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) near/3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or limb* or joint* or muscular or muscle* or tendon* or ligament*))
2 TOPIC: ((musculoskeletal near/1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)))
1 TOPIC: (hydrotherap* or hydrofitness or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy or ((pool or pools or water* or bath* or aqua*) near/4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or "physical activity")))

Cinahl
Dato: 26.9.2014
Søketreff: 78

S35 S28 AND S33 Limiters - Exclude MEDLINE records
S34 S28 AND S33
S33 S29 OR S30 OR S31 OR S32
S32 PT Meta Analysis OR PT Systematic Review
S31 TI (systematic review or meta-anal* or (systematic* N2 search*) or (database* N2 search*)) OR AB (systematic review or meta-anal* or (systematic* N2 search*) or (database* N2 search*))
S30 (MH "Meta Analysis")
S29 (MH "Systematic Review")
S28 S15 AND S27
S27 S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26
S26 TI (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone N2 (loss or densit*))) OR AB (osteoporos* or osteopeni* or osteit* or osteochondrit* or (bone N2 (loss or densit*)))

S25 TI (gout* or fibromyalgi* or fibromyosit* or fibrosit* or myofascial pain) OR AB (gout* or fibromyalgi* or fibromyosit* or fibrosit* or myofascial pain)

S24 TI (be?hterev* or be?hterew* or ankylosing or marie-struempell*) OR AB (be?hterev* or be?hterew* or ankylosing or marie-struempell*)

S23 TI ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) N2 (disease or syndrome)) OR AB ((felty* or caplan* or sjogren* or sicca* or reiter* or still*) N2 (disease or syndrome))

S22 TI ((r?e?mat* N3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*) OR AB ((r?e?mat* N3 (disease* or condition* or nodule*)) or r?e?matism or r?e?mart?rit*)

S21 TI (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*) OR AB (epicondylit* or tend?nit* or tendinos* or bursit* or synovit* or sprain* or strain* or myosit* or myalgi* or whiplash or sciatica or lumbago or fibrosit* or art?rit* or osteoart?r* or mon?art?r* or oligoart?r* or capsulit* or art?ropat* or spondylit* or spondylos* or ent?esopat*)

S20 TI ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) N3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*)) OR AB ((pain* or ache* or ailment* or dysfunction* or disabilit* or lesion* or condition* or complaint* or disorder* or impairment* or injur*) N3 (neck or cervical or cervicogenic or back or lumbar or lumbo* or spine or spinal or disc or discs or pelvi* or sacroiliac* or shoulder* or elbow* or forearm* or wrist* or hand* or arm* or buttock* or hip* or knee* or ankle* or leg* or foot or feet or upper limb* or lower limb* or upper extremit* or lower extremit* or joint* or muscular or muscle* or tendon* or ligament*))

S19 TI (mus?ulos?eletal N1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*)) OR AB (mus?ulos?eletal N1 (affliction* or ailment* or disease* or disorder* or disabilit* or illness* or sickness* or condition* or pain or complaint* or lesion* or injur* or dysfunction* or impairment* or incapacit*))

S18 (MH "Back Pain+")

S17 (MH "Neck Pain") OR (MH "Shoulder Pain")

S16 (MH "Musculoskeletal Diseases+")

S15 S1 OR S2 OR S13 OR S14

S14 TI ((pool* or water* or bath*) N4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*)) OR AB ((pool* or water* or bath*) N4 (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit*))

S13 S11 AND S12

S12 S7 OR S8 OR S9 OR S10

S11 S3 OR S4 OR S5 OR S6

S10 TI (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*) OR AB (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or physical activit* or kinesiotherap*)

S9 (MH "Physical Activity")

S8 (MH "Exercise+")

S7 (MH "Therapeutic Exercise+")

S6 TI (aquatic or aqua or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy or water) OR AB (aquatic or aqua or balne?kine* or hydrokine* or aquakine* or immers* or kneipp or balneology or balneotherapy)

S5 (MH "Bathing and Baths")

S4 (MH "Balneology")

S3 (MH "Water+")

S2 TI (hydrotherap* or hydrofitness or aquatherap*) OR AB (hydrotherap* or hydrofitness or aquatherap*)

S1 (MH "Hydrotherapy+")

PubMed
Dato: 26.6.2014
Søketreff: 1
Enkelt søk etter artikler som er registret med “Epub ahead of Print”

(hydrotherapy OR (water AND exercise)) AND (musculoskeletal OR arthr* OR osteo* OR rheumat* OR fibro* OR neck OR back OR shoulder OR pain) AND ("systematic review" OR "meta-analyses" OR "meta-analysis") AND publisher[sb]

CRD Databases
Dato: 26.9.2014

Søketreff
DARE: 37
HTA: 4

1	MeSH DESCRIPTOR Hydrotherapy EXPLODE ALL TREES
2	(hydrotherap* or hydrofitness or aquatherap*)
3	MeSH DESCRIPTOR Water EXPLODE ALL TREES
4	MeSH DESCRIPTOR Balneology EXPLODE ALL TREES
5	MeSH DESCRIPTOR Exercise Therapy EXPLODE ALL TREES
6	MeSH DESCRIPTOR Exercise EXPLODE ALL TREES
7	MeSH DESCRIPTOR Motor Activity EXPLODE ALL TREES
8	#3 OR #4
9	#5 OR #6 OR #7
10	#8 AND #9
11	((aquatic or aqua or pool or pools or water* or bath or balneokine* or hydrokine* or aquakine* or immerse*) and (exercise* or rehabilitat* or physiotherapy or therap* or training or treatment* or gymnastic* or fitness* or "physical activity" or kinesiotherap*)):TI
12	(water* and (exercise* or gymnastic* or training)):TI
13	#1 OR #2 OR #10 OR #11 OR #12
14	MeSH DESCRIPTOR Musculoskeletal Diseases EXPLODE ALL TREES
15	MeSH DESCRIPTOR Musculoskeletal Pain EXPLODE ALL TREES
16	MeSH DESCRIPTOR Back Pain EXPLODE ALL TREES
17	MeSH DESCRIPTOR Neck Pain EXPLODE ALL TREES
18	(musculoskeletal):TI
19	(pain):TI
20	(rheumat*):TI
21	(fibromyalg*):TI
22	(bechtere*):TI
23	(osteo*):TI
24	(myalg*):TI
25	(arthrit*):TI
26	(osteoarth*):TI
27	(spondyli*):TI
28	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27
29	#13 AND #28

Prospero
Dato: 26.9.2014
Søketreff: 15
All text: hydrotherapy

Vedlegg 2 Liste over systematiske oversikter til spørsmål 2

62 systematiske oversikter har oppsummert effekten av trening i varmtvannsbasseng på smerter, funksjon og/eller livskvalitet. Disse blir presentert med sammendrag basert på diagnose i tabellene under:

Revmatiske lidelser (10 oversikter)	
1	**Hydrotherapy: review on the effectiveness of its application in physiotherapy and occupational therapy**. Health Technology Assessment Database 2004 (3):21. Abstract: IV. Summary. 1. The application of water to treat disease has been used throughout history. It is known that Hippocrates (460 – 375 BC) used hot and cold water in the treatment of multiple disease states. At present, hydrotherapy is applied to treat a myriad of diseases, including musculoskeletal problems. The majority of the evidence on the effectiveness of hydrotherapy to treat the described disease states and 'conditions' comes from small case series/reports and subsequent low level evidence (Level 4). 2. The higher level evidence that was reviewed does not suggest hydrotherapy is effective in treating osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, chronic low back pain, fibromyalgia or pressure ulcers. There were two papers that did suggest that post ACL reconstructive surgery patients may have better outcomes than those undertaking land based exercises alone. 3. The application of hydrotherapy is not always without risk. There are reports in the literature regarding legionella infections, burn, folliculitis and hypersensitivity pneumonitis which were directly related to the hydrotherapy.
2	Al-Qubaeissy KY, Fatoye FA, Goodwin PC, Yohannes AM. **The effectiveness of hydrotherapy in the management of rheumatoid arthritis: a systematic review**. Musculoskeletal Care 2013;11(1):3-18. Abstract: BACKGROUND: Hydrotherapy is frequently indicated for the rehabilitation of patients with rheumatoid arthritis (RA); nevertheless, there has been inadequate appraisal of its effectiveness. The potential benefits of hydrotherapy for patients with RA are to improve and/or maintain functional ability and quality of life.

	OBJECTIVES: The aim of this systematic review was to evaluate the effectiveness of hydrotherapy in the management of patients with RA. METHOD: AMED, CINAHL, EMBASE, MEDLINE, PubMed, Science Direct and Web of Science were searched between 1988 and May 2011. Keywords used were rheumatoid arthritis, hydrotherapy, aquatic physiotherapy, aqua therapy and water therapy. Searches were supplemented with hand searches of references of selected articles. Randomized controlled trials were assessed for their methodological quality using the Physiotherapy Evidence Database (PEDro) scale. This scale ranks the methodological quality of a study scoring 7 out of 10 as 'high quality', 5-6 as 'moderate quality' and less than 4 as 'poor quality'. RESULTS: Initially, 197 studies were identified. Six studies met the inclusion criteria for further analysis. The average methodological quality for all studies was 6.8 using the PEDro scale. Most of the studies reported favourable outcomes for a hydrotherapy intervention compared with no treatment or other interventions for patients with RA. Improvement was particularly noted in reducing pain, joint tenderness, mood and tension symptoms, and increasing grip strength and patient satisfaction with hydrotherapy treatment in the short term. CONCLUSIONS: There is some evidence to suggest that hydrotherapy has a positive role in reducing pain and improving the health status of patients with RA compared with no or other interventions in the short term. However, the long-term benefit is unknown. Further studies are needed.
3	Cairns AP, McVeigh JG. **A systematic review of the effects of dynamic exercise in rheumatoid arthritis**. Rheumatology International 2009;30(2):147-158. Abstract: Exercise is commonly used in the management of patients with rheumatoid arthritis (RA); however, there is little consensus in the literature to support its use. This systemic review aimed to determine the effects of dynamic exercise on patients with RA. A systematic search of Medline (1949–2007), Cinahl (1982–2007), Embase (1974–2007) and Cochrane library was performed for randomised-controlled trials using the keywords “rheumatoid arthritis” and “exercise” or “training” or “sport”. The methodological quality of studies was assessed using a ten-point scale. Eighteen papers relating to 12 different studies met inclusion criteria. The mean methodological quality score was 6.9/10. Studies using aerobic training, strength training and combinations of both were included. Patients with early, stable, and active RA were studied. A number of studies reported improvement in muscle strength, physical function and aerobic capacity with dynamic exercise. Some studies also reported improvements in disease activity measures, and small improvements in hip bone mineral density. One study reported significantly less progression of small joint radiographic damage of the feet in the dynamic exercise group. However, one study also reported worse large joint radiographic damage in patients using dynamic exercise who had pre-existing large joint damage, though this was a retrospective analysis. No studies reported worse outcomes for function, disease activity or aerobic capacity with dynamic exercise. Cardiovascular outcomes were not reported in any study, and no data were presented to assess the effect of exercise on patients with significant underlying cardiovascular disease. This systematic review suggests that the majority of patients with RA should be encouraged to undertake aerobic and/or strength training exercise. Exercise programmes should be carefully tailored to the individual, particularly for patients with underlying large joint damage or pre-existing cardiovascular disease.

4	Dagfinrud H, Hagen KB, Kvien TK. **Physiotherapy interventions for ankylosing spondylitis**. Cochrane Database of Systematic Reviews 2008 (1):CD002822. Abstract: Background: Ankylosing spondylitis (AS) is a chronic, inflammatory rheumatic disease. Physiotherapy is considered an important part of the overall management of AS.Objectives: To summarise the available scientific evidence on the effectiveness of physiotherapy interventions in the management of AS.Search methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, AMED, CINAHL and PEDro up to January 2007 for all relevant publications, without any language restrictions. We checked the reference lists of relevant articles and contacted the authors of included articles.Selection criteria: We included randomised and quasi-randomised studies with AS patients and where at least one of the comparison groups received physiotherapy. The main outcomes of interest were pain, stiffness, spinal mobility, physical function and patient global assessment.Data collection and analysis: Two reviewers independently selected trials for inclusion, extracted data and assessed trial quality. Investigators were contacted to obtain missing information.Main results: Eleven trials with a total of 763 participants were included in this updated review. Four trials compared individualised home exercise programs or a supervised exercise program with no intervention and reported low quality evidence for effects in spinal mobility (Relative percentage differences (RPDs) from 5-50%) and physical function (four points on a 33-point scale). Three trials compared supervised group physiotherapy with an individualised home-exercise program and reported moderate quality evidence for small differences in spinal mobility (RPDs 7.5-18%) and patient global assessment (1.46 cm) in favour of supervised group exercises. In one study, a three-week inpatient spa-exercise therapy followed by 37 weeks of weekly outpatient group physiotherapy (without spa) was compared with weekly outpatient group physiotherapy alone; there was moderate quality evidence for effects in pain (18%), physical function (24%) and patient global assessment (27%) in favour of the combined spa-exercise therapy. One study compared daily outpatient balneotherapy and an exercise program with only exercise program, and another study compared balneotherapy with fresh water therapy. None of these studies showed significant between-group differences. One study compared an experimental exercise program with a conventional program; statistically significant change scores were reported on nearly all spinal mobility measures and physical function in favour of the experimental program.Authors' conclusions: The results of this review suggest that an individual home-based or supervised exercise program is better than no intervention; that supervised group physiotherapy is better than home exercises; and that combined inpatient spa-exercise therapy followed by group physiotherapy is better than group physiotherapy alone.
5	Gaudin P, Leguen-Guegan S, Allenet B, Baillet A, Grange L, Juvin R. **Is dynamic exercise beneficial in patients with rheumatoid arthritis?** Joint, Bone, Spine 2008;75(1):11-17. Abstract: INTRODUCTION: Dynamic exercise therapy as defined by the American College of Sports Medicine for healthy individuals is of unclear relevance to patients with rheumatoid arthritis (RA). No recommendations on this issue are available. Few studies have evaluated the optimal program, frequency, or target population; furthermore, there is no consensus about the best assessment tools for monitoring clinical, functional, and structural parameters during dy-

	namic exercise therapy in patients with RA. METHODS: We conducted an extensive review of the literature published between 1964 and 2005. We identified nine randomized controlled studies that provided a high level of proof regarding the effects of dynamic exercise therapy in RA patients older than 18 years of age. RESULTS: Dynamic exercise programs improve aerobic capacity and muscle strength in patients with RA. Their effects on functional capacity are unclear, and many sources of bias influenced the study results. The clinical and laboratory safety profiles were good. The structural impact of dynamic exercise remains to be determined.
6	Kamioka H, Tsutani K, Okuizumi H, Mutoh Y, Ohta M, Handa S, et al. **Effectiveness of Aquatic Exercise and Balneotherapy: A Summary of Systematic Reviews Based on Randomized Controlled Trials of Water Immersion Therapies**. Journal of Epidemiology 2010;20(1):2-12. Abstract: Background: The objective of this review was to summarize findings on aquatic exercise and balneotherapy and to assess the quality of systematic reviews based on randomized controlled trials. Methods: Studies were eligible if they were systematic reviews based on randomized clinical trials (with or without a meta-analysis) that included at least I treatment group that received aquatic exercise or balneotherapy. We searched the following databases: Cochrane Database Systematic Review, MEDLINE, CINAHL, Web of Science, JDream II, and Ichushi-Web for articles published from the year 1990 to August 17, 2008. Results: We found evidence that aquatic exercise had small but statistically significant effects on pain relief and related outcome measures of locomotor diseases (eg, arthritis, rheumatoid diseases, and low back pain). However, long-term effectiveness was unclear. Because evidence was lacking due to the poor methodological quality of balneotherapy studies, we were unable to make any conclusions on the effects of intervention. There were frequent flaws regarding the description of excluded RCTs and the assessment Of publication bias in several trials. Two of the present authors independently assessed the quality of articles using the AMSTAR checklist. Conclusions: Aquatic exercise had a small but statistically significant short-term effect on locomotor diseases. However, the effectiveness of balneotherapy in curing disease or improving health remains unclear.
7	Ribeiro F, Leite M, Silva F, Sousa O. **Physical exercise in the treatment of ankylosing spondylitis: a systematic review**. Acta Reumatologica Portuguesa 2007;32(2):129-137. Abstract: Physical exercise (PE) is a regular component in various disorders management, such as ankylosing spondilitis (AS). AS is a chronic, and systemic rheumatic disorder without an effective treatment to restore the health. PE plays an important role in the prevention and management of the deformities related to AS. This review summarizes the randomized controlled trials that have examined the role of PE in AS patients' therapeutic process in order to promote an evidence based practise and to improve the AS patients care. Thirteen randomized controlled trials with a total of 1056 participants were identified in a Cochrane Central, Pubmed//Medline and PEDro databases computer-based search. The quality assessment of the thirteen randomised controlled trials was 5,62 points in the PEDro scoring scale. Three trials assessed the effects induced by the addition of PE interventions to the medication program, three trials compared in-

	dividualized home exercise with supervised group exercise, five trials compared alternative exercise programs (hydrotherapy and global posture reeducation) with traditional exercise programs usually recommended to treat AS patients, and two trials investigated the therapy cost effectiveness. The trials included in this review suggest that PE is a helpful therapy in the management of AS patients; PE should be performed in group under the physiotherapist supervision. New exercise-based approaches, hydrotherapy or global posture reeducation, offers promising results in the management of patients suffering from AS.
8	Verhagen AP, Cardoso JR, Bierma-Zeinstra SMA. **Aquatic exercise & balneotherapy in musculoskeletal conditions**. Best Practice and Research: Clinical Rheumatology 2012;26(3):335-343. Abstract: This is a best-evidence synthesis providing an evidence-based summary on the effectiveness of aquatic exercises and balneotherapy in the treatment of musculoskeletal conditions. The most prevalent musculoskeletal conditions addressed in this review include: low back pain, osteoarthritis, fibromyalgia and rheumatoid arthritis. Over 30 years of research demonstrates that exercises in general, and specifically aquatic exercises, are beneficial for reducing pain and disability in many musculoskeletal conditions demonstrating small to moderate effect sizes ranging between 0.19 and 0.32. Balneotherapy might be beneficial, but the evidence is yet insufficient to make a definitive statement about its use. High-quality trials are needed on balneotherapy and aquatic exercises research especially in specific patient categories that might benefit most.
9	Verhagen AP, de Vet HC, de Bie RA, Kessels AG, Boers M, Knipschild PG. **Taking baths: the efficacy of balneotherapy in patients with arthritis. A systematic review**. Journal of Rheumatology 1997;24(10):1964-1971. Abstract: OBJECTIVE: To review English, French, German, and Dutch language studies of the effectiveness of balneotherapy. Balneotherapy (hydrotherapy or spa therapy) is one of the oldest forms of therapy for patients with arthritis. One of the aims of balneotherapy is to relieve pain. METHODS: We performed a systematic review that included randomized and nonrandomized studies. Quality scores of the studies were determined using a criteria list. RESULTS: Most studies report positive findings, but all studies showed methodological flaws. A quality of life measurement was never reported as an outcome measure. None of the randomized clinical trials included intention-to-treat analysis or comparison of effects between groups. CONCLUSION: Because of the methodological flaws a conclusion about the efficacy of balneotherapy cannot be provided from studies we reviewed. We conclude that most flaws found could be avoidable in future research.; ; If this record is indexed on MEDLINE you may be able to obtain the full text of this article by visiting the PubMed web site (http://www.ncbi.nlm.nih.gov/entrez/query/static/citmatch.html).
10	Verhagen AP, de Vet HC, de Bie RA, Kessels AG, Boers M, Knipschild PG. **Balneotherapy for rheumatoid arthritis and osteoarthritis**. Cochrane Database of Systematic Reviews 2000 (2):CD000518.

	Abstract: BACKGROUND: Balneotherapy (hydrotherapy or spa therapy) for patients with arthritis is one of the oldest forms of therapy. One of the aims of balneotherapy is to soothe the pain and as a consequence to relieve patients' suffering and make them feel well. OBJECTIVES: To perform a systematic review to assess the effects of balneotherapy for rheumatoid arthritis and osteoarthritis. SEARCH STRATEGY: Using the Cochrane search strategy, studies were found by screening: 1) The Medline CD-ROM database from 1966 to June 1999 and 2) the database from the Cochrane Field 'Rehabilitation and Related Therapies', which contains also studies published in journals not covered by Medline. Also, 3) reference checking and 4) personal communications with authors was carried out to retrieve eligible studies. To perform an adequate assessment of the methodological quality the languages of the publications had to be: Dutch, English, French or German. Date of the most recent literature search: June, 1999 SELECTION CRITERIA: Studies were eligible if they were randomized controlled trials (RCT) comparing balneotherapy with any intervention or with no intervention. Patients included had rheumatoid arthritis (RA), osteoarthritis (OA) or some other form of arthritis. Trials incorporating patients with definite or classical rheumatoid arthritis (RA) as defined by the American Rheumatism Association Criteria (ARA) (Ropes 1958) (these criteria have changed over time) or by the criteria of Steinbrocker (1949) were regarded as a separate group. At least one of the WHO/ILAR core set of endpoints for RA clinical trials had to be the main outcome measures. DATA COLLECTION AND ANALYSIS: A criteria list used to assess the methodological quality was the one developed at the Department of Epidemiology at the Maastricht University, called "the Maastricht list". The quality scores and data abstraction of the studies were carried out independently by two reviewers (HdV, RdB). Disagreements were solved by consensus. MAIN RESULTS: Ten trials with 607 patients were included in this review. Most trials reported positive findings, but were methodologically flawed to some extent. A 'quality of life' outcome was reported by two trials. Just one of the randomized trials mentioned an intention-to-treat analysis and only three performed a comparison of effects between groups. Pooling of the data was not performed, because of heterogeneity of the studies, multiple outcome measurements, and, apart from two studies, the overall data presentation was too scarce to enable pooling of the data. REVIEWER'S CONCLUSIONS: One cannot ignore the positive findings reported in most trials. However the scientific evidence is weak because of the poor methodological quality, the absence of an adequate statistical analysis, and the absence, for the patient, of most essential outcome measures (pain, quality of life), Therefore, the noted "positive findings" should be viewed with caution. Because of the methodological flaws an answer about the efficacy of balneotherapy cannot be provided at this time. Flaws found in the reviewed studies could be avoided in future trials. [References: 10]

Fibromyalgi (19 oversikter)	
11	Baranowsky J, Klose P, Musial F, Haeuser W, Dobos G, Langhorst J. **Qualitative systematic review of randomized controlled trials on complementary and alternative medicine treatments in fibromyalgia**. Rheumatology International 2009;30(1):1-21.

Abstract: To review the evidence from trials of different complementary and alternative medicine treatments for fibromyalgia.

EMBASE, PubMed, PsycINFO, Cochrane Central Register of Controlled Trials (CENTRAL) and CAMbase were searched from 1190 to July 2007 for studies published in English or German. Search terms were reported.

Two reviewers assessed study quality with 16 published criteria; discrepancies were resolved by discussion. Criteria included homogeneity, comparability of baseline characteristics, randomisation method, description of dropouts, lost to follow-up, use of intention to treat analysis, study group size, intervention description, pragmatic study/control group, cointerventions avoided, use of placebo control, patient/assessor blinding and relevancy of outcome measures. Each study was awarded a score up to a maximum of 100. Further details were reported in the review.

The main results for each study were extracted. The authors did not state how data were extracted for the review.

Twenty-four RCTs (n=1,461) were included. Mean sample size was 57. Mean group size was 25. Quality scores ranged from 34 to 71.5.Mixed results were reported for various outcomes that included fibromyalgia impact questionnaire, pain and depression for: acupuncture (four RCTs) with significant improvements that favoured acupuncture in two RCTs, but no difference between groups for one RCT; balneotherapy/thermotherapy/hydrotherapy (seven RCTs), with significant improvements that favoured the intervention in five RCTs, but no significant differences between groups for two RCTs; manual manipulation (three RCTs) with two RCTs that reported favourable effects for the intervention groups and one RCT that found no significant differences between groups; and mind-body interventions (six RCTs) with two RCTs that reported positive effects for mindfulness-based stress reduction therapy (MBSR) alone and Integrated Group Therapy and four studies that found no significant differences between MBSR or body awareness therapy, both combined with qigong. A decrease in pain intensity was reported for magnetic therapy in comparison with control, but not for the other outcomes (one RCT). Significant improvements were reported in favour of a homeopathy intervention versus a placebo control for tender point count and tender point pain on palpation, fibromyalgia scores, global health ratings and helpfulness of treatment (one RCT). Pain reduction was significantly greater for participants on a vegetarian diet (one RCT) in comparison with those who received amitriptyline. No significant differences between music vibration therapy and control groups were found (one RCT).

The best evidence available was for balneotherapy and hydrotherapy interventions, which showed mostly positive results in multiple studies. Vegetarian diet, autogenic training, a session of music vibration and chiropractics appeared to be superior to other control interventions. There was no positive evidence for biofeedback, body awareness therapy and qigong. Evidence for other interventions was limited to single RCTs.

The review assessed a well-defined research question. Searches were carried out in a number of databases. Relevant data may have been missed through use of language limitations and exclusion of unpublished studies. The risk of reviewer error and bias was unclear as the authors did not report how studies were assessed for inclusion and how data were extracted. Some attempts were made to reduce risks of bias during study quality assessment. Relevant criteria were used. Study quality was variable, but in most cases was poor and sample sizes were often small. Although the authors attempted to restrict inclusion so as to reduce heterogeneity between studies, included studies were too heterogeneous to combine in a meta-analysis, particularly with regard

	to outcomes and interventions. A narrative synthesis appeared appropriate, but it would have been more informative if effect sizes had been reported to support the findings. Overall, the authors' conclusions appeared to appropriately consider the limitations of the included studies and the lack of data, but there was a risk that relevant data were missed. Practice: The authors did not state any implications for practice. Research: The authors stated that further studies were required to assess the effectiveness of complementary and alternative medicine interventions for fibromyalgia, including massage. Future studies needed to report details of randomisation, blinding and follow-up and should use standardised outcome measures such as visual analogue scale for pain measurement and Fibromyalgia Impact Questionnaire.
12	Bednar ML, Soroczynski AC, Groman MJ, Starczak CC, Callah C, Beaudoin M, et al. **Effectiveness of land-based and aquatic-based exercises for improving the health status of individuals with fibromyalgia: a systematic review**. Journal of Aquatic Physical Therapy 2012;19(2):26-35. Abstract: Ikke tilgjengelig.
13	Bidonde J, Busch AJ, Webber S, Schachter C, Danyliw A, Overend T, et al. **Aquatic exercise training for fibromyalgia: A systematic review**. Arthritis and Rheumatism 2013;65:S896. Abstract: Background/Purpose: Fibromyalgia (FM) is a chronic pain condition leading to reduced physical function. Exercise training is recommended for people with FM. We examined randomized controlled trials (RCTs) to evaluate benefits and harms of aquatic exercise training (AQ) in adults with FM. Methods: We searched 9 electronic databases. Selection criteria included full text publication of an RCT of AQ for adults diagnosed with FM, and provision of between-group outcome data. Studies were excluded if exercise in water was <50% of the full intervention. Pairs of reviewers independently screened and selected articles, assessed risk of bias, and extracted data on 24 outcomes in 4 domains: wellness, symptoms, physical fitness and adverse effects. Discordance was resolved through discussion. Benefits and harms of the interventions were evaluated using standardized mean differences (SMD) and 95% CI, with meta-analysis carried out when applicable. Results: We screened 1856 citations, 766 abstracts, and 156 fulltext articles. Fourteen RCTs examined AQ with a total of 820 participants. AQ was compared to control (9 studies) and to land exercise (5 studies). Risk of bias was rated low for randomization, incomplete outcome data, selective reporting, other bias, and blinding of outcome assessors. Allocation concealment, and blinding of participants and care providers were rated as unclear or high risk. Differences (SMD [95% CI]) between the AQ vs control were: multidimensional function -0.55 [-0.83, -0.27], self-reported physical function -0.44 [-0.76, -0.11], pain -0.53 [-0.76, -0.31], stiffness -1.08 [-2.05, -0.11], strength 0.63 [0.20, 1.05], and cardiovascular submaximal function 0.56 [0.27, 0.85] all favouring AQ ($p < 0.05$). Attrition was similar in AQ and control groups. Adverse effects were poorly reported, with no serious adverse effects reported. Differences (SMD [95%CI] for AQ compared to land exercise were: strength -0.74 [-1.44, -0.04] favoring land, and sleep -0.75 [-1.32, -0.17] favoring AQ. Older participants with longer disease duration and less pain/impact of disease at baseline responded better to AQ than their counterparts. Greater exercise frequency, accumulated pool time, and length of program were also associated with better results Conclu-

	sion: Low to moderate quality evidence suggests that AQ is beneficial for improving wellness, symptoms and fitness and that no serious adverse effects result from the intervention. Very low to moderate quality evidence suggests that there are no differences in benefits between AQ and land exercise except in muscle strength (evidence favoring land) and sleep (one study favoring aquatic).
14	Busch AJ, Barber KAR, Overend TJ, Peloso PMJ, Schachter CL. **Exercise for treating fibromyalgia syndrome**. Cochrane Database of Systematic Reviews 2007 (4):CD003786. Abstract: Background: Fibromyalgia (FM) is a syndrome expressed by chronic widespread body pain which leads to reduced physical function and frequent use of health care services. Exercise training is commonly recommended as a treatment. This is an update of a review published in Issue 2, 2002.Objectives: The primary objective of this systematic review was to evaluate the effects of exercise training including cardiorespiratory (aerobic), muscle strengthening, and/or flexibility exercise on global well-being, selected signs and symptoms, and physical function in individuals with FM.Search methods: We searched MEDLINE, EMBASE, CINAHL, SportDiscus, PubMed, PEDro, and the Cochrane Central Register for Controlled Trials (CENTRAL, Issue 3, 2005) up to and including July 2005. We also reviewed reference lists from reviews and meta-analyses of treatment studies. Selection criteria: Randomized trials that were selected focused on cardiorespiratory endurance, muscle strength and/or flexibility as treatment for FM. Data collection and analysis: Two of four reviewers independently extracted data for each study. All discrepancies were rechecked and consensus was achieved by discussion. Methodological quality was assessed by two instruments: the van Tulder and the Jadad methodological quality criteria. We used the American College of Sport Medicine (ACSM) guidelines to evaluate whether interventions had provided a training stimulus that would effect changes in physical fitness. Due to significant clinical heterogeneity among the studies we were only able to meta-analyze six aerobic-only studies and two strength-only studies. Main results: There were a total of 2276 subjects across the 34 included studies; 1264 subjects were assigned to exercise interventions. The 34 studies comprised 47 interventions that included exercise. Effects of several disparate interventions on global well-being, selected FM signs and symptoms, and physical function in individuals with FM were summarized using standardized mean differences (SMD). There is moderate quality evidence that aerobic-only exercise training at recommended intensity levels has positive effects global well-being (SMD 0.49, 95% CI: 0.23 to 0.75) and physical function (SMD 0.66, 95% CI: 0.41 to 0.92) and possibly on pain (SMD 0.65, 95% CI: -0.09 to 1.39) and tender points (SMD 0.23, 95% CI: -0.18 to 0.65). Strength and flexibility remain under-evaluated. Authors' conclusions: There is 'gold' level evidence (www.cochranemsk.org) that supervised aerobic exercise training has beneficial effects on physical capacity and FM symptoms. Strength training may also have benefits on some FM symptoms. Further studies on muscle strengthening and flexibility are needed. Research on the long-term benefit of exercise for FM is needed.
15	Busch AJ, Overend TJ, Schachter CL. **Fibromyalgia treatment: the role of exercise and physical activity**. International Journal of Clinical Rheumatology 2009;4(3):343-380. Abstract: Fibromyalgia, a disease of chronic widespread pain, fatigue, poor sleep, stiffness and

	many other symptoms, is associated with considerable disability and is estimated to affect 3.4% of the population. Optimal management of fibromyalgia is still in question, but exercise is recommended as one component of multidisciplinary management programs. In this review, we examine the effects of land-based and aquatic aerobic, strength and mixed exercise, as well as composite programs including exercise, on five important outcome constructs (global well-being, pain, tender points, physical function and depression). We detail adverse effects, attrition rates and adherence to exercise, as well as identify methodological problems in the published research. We provide evidence-based recommendations for exercise/physical activity for improvement of fibromyalgia symptoms and physical function and explore the importance and clinical implications of moving towards the application of the 2007 physical activity guidelines developed by the American College of Sports Medicine and the American Heart Association for individuals with fibromyalgia.
16	Cazzola M, Atzeni F, Salaffi F, Stisi S, Cassisi G, Sarzi-Puttini P. **Which kind of exercise is best in fibromyalgia therapeutic programmes? A practical review**. Clinical and Experimental Rheumatology 2010;28(6 Suppl 63):S117-124. Abstract: To assess the effectiveness of different forms of physical exercise on pain and physical and mental function in people with fibromyalgia. MEDLINE, EMBASE and The Cochrane Library were searched from January 1985 to August 2010 for studies published in English; limited search terms were reported. The proportion of drop-outs for each study was recorded in tables. No other quality assessment of the included studies was undertaken. Data were extracted on improvements in mental function, physical function and pain according to how these were presented in the individual studies.The authors did not state how many reviewers performed data extraction. Twenty-seven RCTs (1,596 participants) were included in the review. Fifteen studies (1,119 participants) assessed the effects of land-based aerobic activity, seven studies (288 participants) assessed the effects of water-based aerobic activity and five studies (189 participants) assessed muscle strengthening exercises. The proportion of participants in the studies that were reported to have dropped out during the study ranged from zero to 56%.Physical function: Nine out of 12 studies found that land-based aerobic exercise significantly improved physical function when compared to control; in four studies the control group had no treatment, in two studies the control group received education and in three studies the control group underwent flexibility and stretching exercises. Four out of five studies found that water-based aerobic exercise significantly improved physical function when compared to control; two studies used untreated controls, one study used a control group that had recreational activities other than swimming and one study compared water-based aerobic exercise with land-based aerobic exercise. All five studies of muscle strengthening exercises found a significant improvement in physical function compared to untreated controls or controls doing flexibility exercises.Pain: Six out of 11 studies found a statistically significant reduction in spontaneous pain with land-based aerobic exercise compared to control and five studies found no evidence of a difference in pain levels. Five out of seven studies found a reduction in pain in water-based aerobic exercise when compared to either untreated controls (two participants) or land-based aerobic exercise (three participants). The other two

	studies found no evidence of a statistical difference between randomised groups. Two out of five muscle strengthening exercises studies found that strengthening exercises was significantly more effective in reducing pain compared to no treatment or flexibility exercises; three of five studies found no evidence of a statistical difference between randomised groups.Mental function: Three studies found a statistically significant reduction in symptoms of anxiety and depression with land-based aerobic exercise compared to either no treatment controls or controls doing stretching exercises. It was not reported how many studies measured depression or other aspects of mental function. One study found a statistically significant benefit in fatigue and cognitive function with land-based aerobic exercise compared to no treatment. Five out of seven studies found a statistical improvement in mental function (depression, anxiety, quality of life and/or general mental health) with water-based aerobic exercise compared to control that included no treatment, games, land-based aerobic exercise or water-based aerobic exercise in a pool (compared to sea-based aerobic exercise). Two out of five muscle strengthening exercises studies found that these improved symptoms of depression. Physical exercise was effective for slight to moderate improvement in aerobic fitness, functional status and quality of life in fibromyalgia patients. No clear differences were found between the various types of programme. The review addressed a clear research question. Inclusion criteria were broad but mostly appropriate, although criteria for diagnosis of fibromyalgia were not reported. Various sources were used to identify published studies in English, so publication and language biases could not be excluded. The authors did not report how many reviewers selected studies or extracted data, so reviewer error and bias during these processes could not be ruled out. The reviewers did not assess the included studies for quality (other than noting the proportion of drop-outs), so the reliability of the findings was unclear. Few details were provided about the participants in the included studies. Studies were synthesised in narrative format, which was appropriate given the wide variation in intervention and control groups and outcomes. Analysis in subgroups according to the nature of physical exercise was appropriate. Some control groups undertook other types of physical exercise to that of the intervention being compared and actual findings were not presented in quantitative form, which made interpretation of the results difficult. Results were presented as the proportion of studies that measured a particular outcome that found significant positive effects of physical exercise. The total number of studies that measured an outcome was not always reported, so the reliability and strength of the findings were not clear. The authors compared the findings between subgroups with indirect comparisons, which was of questionable value. The wide variation within and unknown quality of the limited evidence base, potential bias in the review process and limited reporting of results mean that the conclusions must be treated with caution. Practice: The authors suggested that various types of exercise could be used in the same or different treatment sessions and that the availability of rehabilitation facilities and patient preference should be taken into account. Research: The authors stated that future studies should consider possible interactions between different classes of drugs used for fibromyalgia management and different types of physical exercise in order to identify synergistic effects in different subsets of patients.
17	Haeuser W, Klose P, Langhorst J, Moradi B, Steinbach M, Schiltenwolf M, et al. **Efficacy of different**

	types of aerobic exercise in fibromyalgia syndrome: a systematic review and meta-analysis of randomised controlled trials. Arthritis Research & Therapy 2010;12(3). Abstract: Introduction: The efficacy and the optimal type and volume of aerobic exercise (AE) in fibromyalgia syndrome (FMS) are not established. We therefore assessed the efficacy of different types and volumes of AE in FMS. Methods: The Cochrane Library, EMBASE, MEDLINE, PsychInfo and SPORTDISCUS (through April 2009) and the reference sections of original studies and systematic reviews on AE in FMS were systematically reviewed. Randomised controlled trials (RCTs) of AE compared with controls (treatment as usual, attention placebo, active therapy) and head-to-head comparisons of different types of AE were included. Two authors independently extracted articles using predefined data fields, including study quality indicators. Results: Twenty-eight RCTs comparing AE with controls and seven RCTs comparing different types of AE with a total of 2,494 patients were reviewed. Effects were summarised using standardised mean differences (95% confidence intervals) by random effect models. AE reduced pain (-0.31 (-0.46, -0.17); P < 0.001), fatigue (-0.22 (-0.38, -0.05); P = 0.009), depressed mood (-0.32 (-0.53, -0.12); P = 0.002) and limitations of health-related quality of life (HRQOL) (-0.40 (-0.60, -0.20); P < 0.001), and improved physical fitness (0.65 (0.38, 0.95); P < 0.001), post treatment. Pain was significantly reduced post treatment by land-based and water-based AE, exercises with slight to moderate intensity and frequency of two or three times per week. Positive effects on depressed mood, HRQOL and physical fitness could be maintained at follow-up. Continuing exercise was associated with positive outcomes at follow-up. Risks of bias analyses did not change the robustness of the results. Few studies reported a detailed exercise protocol, thus limiting subgroup analyses of different types of exercise. Conclusions: An aerobic exercise programme for FMS patients should consist of land-based or water-based exercises with slight to moderate intensity two or three times per week for at least 4 weeks. The patient should be motivated to continue exercise after participating in an exercise programme.
18	Lange M, Petermann F. **Current therapy for fibromyalgia with physical activities and psychosocial interventions. A systematic review. [German]**. Aktuelle Rheumatologie 2011;36(1):54-60. Abstract: Background: A multimodal therapy is recommended for the treatment of fibromyalgia. The combination of physical activities and psychosocial interventions has been shown to be effective. This paper presents a systematic overview of the current state of research regarding the therapy for fibromyalgia with physical activities and psychosocial interventions. Methods: The databases PubMed, Embase and PsychINFO were searched for studies published from the publication of the S3-guidelines up to September 2010. Results: Training of physical activities, such as aqua-training, aerobic and stretching has a positive impact on coping with the disease. Equally, psychosocial interventions, like multimodal therapy, behaviour therapy and relaxation, have been shown to reduce the symptoms of fibromyalgia. Conclusions: Future studies should analyse the long-term effects of the interventions. Moreover, studies should analyse the costs and benefits of the interventions. Furthermore, it should be analysed under which circumstances the patients will be able to transfer the physical activities into their daily lives. Georg Thieme Verlag KG Stuttgart.

19	Langhorst J, Musial F, Klose P, Hauser W. **Efficacy of hydrotherapy in fibromyalgia syndrome: a meta-analysis of randomized controlled clinical trials**. Rheumatology 2009;48(9):1155-1159. Abstract: To assess the efficacy of hydrotherapy in fibromyalgia syndrome (FMS). MEDLINE, PsycINFO, SCOPUS, Cochrane Central Register of Controlled Trials (CENTRAL) and CAMbase were searched without language restrictions to December 2008. Search terms were reported in supplementary data online, but this was not accessible. Reference lists of original articles, qualitative systematic reviews and evidence-based guidelines were searched manually for additional studies. Only studies published as full papers were included. Methodological quality was assessed by the van Tulder score using 11 criteria; studies were rated low (score 1 to 4), moderate (score 5 to 7) and high quality (score 8 to 11). The reviewers did not state how the study quality assessment was undertaken. Two reviewers independently extracted data to calculate standardised mean differences (SMDs), using means and standard deviation or change scores for each intervention, and 95% confidence intervals (CI). Ten RCTs were included in the review (n=446, range 24 to 80). Three studies had a moderate quality score and seven had a low quality score. None of the included studies undertook an intention-to-treat analysis or performed an adequate allocation concealment. Due to the small number of studies it was not possible to assess publication bias, although fail-safe N suggested that publication bias was absent.By the end of therapy, hydrotherapy resulted in a significant reduction of pain (SMD -0.78, 95% CI -1.42 to -0.13; nine study arms) and improved HRQoL (SMD -1.67, 95% CI -2.91 to -0.43; four studies). At the latest follow-up (median 14 weeks), there was a significant reduction of pain (SMD -1.27, 95% CI -2.15 to -0.38; four studies) and improved HRQoL (SMD -1.16, 95% CI -1.96 to -0.36; four studies). Significant heterogeneity was present for all comparisons (I2>83%).Subgroup analyses were presented and sensitivity analyses did not alter the findings. There was moderate evidence that hydrotherapy had short-term beneficial effects on pain and HRQoL in fibromyalgia syndrome patients. There was a risk to over-estimate the effects of hydrotherapy due to methodological weaknesses of the studies and small trials included in meta-analysis. The review question was clear and was supported by appropriate inclusion criteria. A seemingly thorough search of the literature was conducted without language restrictions, which reduced potential for language bias. There was no specific search for unpublished studies, so it was possible that some relevant studies were missed; there were insufficient studies to assess whether publication bias was present. The reviewers went some way to minimise reviewer error and bias by undertaking study selection and data extraction in duplicate, but this did not appear to be the case for validity assessment. The authors assessed study quality and found it to be low in most studies. Most of the included trials were small and had methodological weaknesses that could have impacted on the reliability of their results. Given that different comparators and potentially different interventions were investigated, it was not clear that appropriate methods of synthesis were employed; evidence of significant statistical heterogeneity suggested that pooled estimates were of limited value. This was a generally well-conducted review and the findings reflected the evi-

	dence, but as acknowledged by the authors the reliability of the pooled results may have been compromised by the poor quality of included studies, small sample sizes and significant heterogeneity.One author had received funding from Eli-Lily, Janssen-Cilag, Mundipharma and Pfizer. Practice: The authors did not state any implications for practice Research: The authors stated that high quality studies with larger sample sizes were required to confirm the conclusions of this review.
20	Lima TB, Dias JM, Mazuquin BF, da Silva CT, Nogueira RM, Marques AP, et al. **The effectiveness of aquatic physical therapy in the treatment of fibromyalgia: a systematic review with meta-analysis**. Clinical Rehabilitation 2013;27(10):892-908. Abstract: OBJECTIVE: To assess the effectiveness of aquatic physical therapy in the treatment of fibromyalgia. DATA SOURCES: The search strategy was undertaken using the following databases, from 1950 to December 2012: MEDLINE, EMBASE, CINAHL, LILACS, SCIELO, WEB OF SCIENCE, SCOPUS, SPORTDiscus, Cochrane Library Controlled Trials Register, Cochrane Disease Group Trials Register, PEDro and DARE. REVIEW METHODS: The studies were separated into groups: Group I - aquatic physical therapy × no treatment, Group II - aquatic physical therapy × land-based exercises and Group III - aquatic physical therapy × other treatments. RESULTS: Seventy-two abstracts were found, 27 of which met the inclusion criteria. For the functional ability (Fibromyalgia Impact Questionnaire), three studies were considered with a treatment time of more than 20 weeks and a mean difference (MD) of -1.35 [-2.04; -0.67], P = 0.0001 was found in favour of the aquatic physical therapy group versus no treatment. The same results were identified for stiffness and the 6-minute walk test where two studies were pooled with an MD of -1.58 [-2.58; -0.58], P = 0.002 and 43.5 (metres) [3.8; 83.2], P = 0.03, respectively. CONCLUSION: Three meta-analyses showed statistically significant results in favour of the aquatic physical therapy (Fibromyalgia Impact Questionnaire, stiffness and the 6-minute walk test) during a period of longer than 20 weeks. Due to the low methodological rigor, the results were insufficient to demonstrate statistical and clinical differences in most of the outcomes.
21	McVeigh JG, McGaughey H, Hall M, Kane P. **The effectiveness of hydrotherapy in the management of fibromyalgia syndrome: A systematic review**. Annals of the Rheumatic Diseases 2007;66:427-427. Abstract: Hydrotherapy is often used in the treatment of fibromyalgia syndrome (FMS), however there has been limited evaluation of its effectiveness. The aim of this systematic review was therefore to examine the effectiveness of hydrotherapy in the management of FMS. AMED, BNI, CINAHL, The Cochrane Library, EMBASE, MEDLINE, ProQuest, PubMed, Science Direct and Web of Science were searched (1990-July 2006). Key words used 'fibromyalgia' and 'hydrotherapy', 'balneotherapy', 'aqua therapy', 'pool therapy', 'water therapy', 'swimming', 'hydrogalvanic', 'spa therapy', 'physiotherapy', 'physical therapy' and 'rehabilitation'. Searches were supplemented with hand searches of selected journals. Randomised controlled trials (RCTs) were assessed for methodological quality using the van Tulder scale. Ten RCTs met the inclusion criteria. Mean

	methodological quality was 4.5/9 on the van Tulder scale. Positive outcomes were reported for pain, health-status and tender point count. There is strong evidence for the use of hydrotherapy in the management of FMS.
22	Naumann J, Sadaghiani C. **Therapeutic benefit of balneotherapy and hydrotherapy in the management of fibromyalgia syndrome: A qualitative systematic review and meta-analysis of randomized controlled trials**. Arthritis Research and Therapy 2014;16(4). Abstract: Introduction: In the present systematic review and meta-analysis, we assessed the effectiveness of different forms of balneotherapy (BT) and hydrotherapy (HT) in the management of fibromyalgia syndrome (FMS).Methods: A systematic literature search was conducted through April 2013 (Medline via Pubmed, Cochrane Central Register of Controlled Trials, EMBASE, and CAMBASE). Standardized mean differences (SMDs) and 95% confidence intervals (CIs) were calculated using a random-effects model.Results: Meta-analysis showed moderate-to-strong evidence for a small reduction in pain (SMD -0.42; 95% CI [-0.61, -0.24]; P < 0.00001; I² = 0%) with regard to HT (8 studies, 462 participants; 3 low-risk studies, 223 participants), and moderate-to-strong evidence for a small improvement in health-related quality of life (HRQOL; 7 studies, 398 participants; 3 low-risk studies, 223 participants) at the end of treatment (SMD -0.40; 95% CI [-0.62, -0.18]; P = 0.0004; I² = 15%). No effect was seen at the end of treatment for depressive symptoms and tender point count (TPC).BT in mineral/thermal water (5 studies, 177 participants; 3 high-risk and 2 unclear risk studies) showed moderate evidence for a medium-to-large size reduction in pain and TPC at the end of treatment: SMD -0.84; 95% CI [-1.36, -0.31]; P = 0.002; I² = 63% and SMD -0.83; 95% CI [-1.42, -0.24]; P = 0.006; I² = 71%. After sensitivity analysis, and excluding one study, the effect size for pain decreased: SMD -0.58; 95% CI [-0.91, -0.26], P = 0.0004; I² = 0. Moderate evidence is given for a medium improvement of HRQOL (SMD -0.78; 95% CI [-1.13, -0.43]; P < 0.0001; I² = 0%). A significant effect on depressive symptoms was not found. The improvements for pain could be maintained at follow-up with smaller effects.Conclusions: High-quality studies with larger sample sizes are needed to confirm the therapeutic benefit of BT and HT, with focus on long-term results and maintenance of the beneficial effects.
23	Perraton L, Machotka Z, Kumar S. **Components of effective randomized controlled trials of hydrotherapy programs for fibromyalgia syndrome: a systematic review**. Journal of Pain Research 2009;2:165-173. Abstract: To summarise the components of hydrotherapy programmes for fibromyalgia syndrome. AMED, MEDLINE, CINAHL, EMBASE, PubMed, SPORTDiscus, Scopus, PEDro and Cochrane Central Register of Controlled Trials (CENTRAL) were searched in May 2009; search terms were reported. Only articles published in English in peer-reviewed journals from 1998 onwards were included. Study validity was assessed using the PEDro scale of: randomisation; allocation concealment; baseline similarity of groups; blinding of participants, therapists and outcome assessors; whether the drop-out rate was less than 15%; use of intention-to-treat analysis; between-group statistical

	comparisons; and whether point and variance estimates were reported. Maximum possible score was 10.Assessment was carried out by two reviewers independently; disagreements were resolved by discussion. Data were split into four components: exercise (type, duration and frequency); environmental (equipment used and location of hydrotherapy); service delivery (delivery, nature of supervision and any cointerventions); and outcome measures (grouped as pain or tenderness, quality of life and function). Results were reported as statistically significant or not. The authors did not report how many reviewers performed data extraction. Ten trials were included (sample sizes not reported). Overall trial quality was reported to be good (PEDro score ranged from 5 to 8). Only one trial had a dropout rate greater than 15%. No trials reported using an intention-to-treat analysis. All trials reported statistically significant results in favour of hydrotherapy. Nine trials reported statistically significant between-group benefits for the hydrotherapy group at the end of treatment for pain and function. Ten trials reported similar benefits for each of quality of life and function. Two trials reported benefits for pain/tenderness and function. Three trials reported benefits for quality of life and function. Ten trials reported statistically significant benefits for mental health outcomes (depression or anxiety). Six trials reported significant between-group differences at the end of the intervention. Two trials reported significant between-group differences at both end of intervention and follow-up. Exercise appeared to be the most important component of an effective hydrotherapy programme for fibromyalgia syndrome, particularly when considering mental health components. This review specified the inclusion criteria following PICO criteria. The aim was to assess components of effective hydrotherapy programmes and only trials that reported statistically significant results were included; the aim was not to look at the effectiveness of the programmes. A range of databases was searched. The restriction to studies published in English may have led to relevant studies being missed. Study quality was assessed and full results were reported. Study quality and selection were performed in duplicate to reduce reviewer error and bias; it was not reported whether data were extracted in the same way. Patient details and numbers were not reported and most of the findings were based on pre-post outcome changes rather than between-group differences, so the authors' conclusions should be treated with caution. Practice: The authors stated that clinicians could use the review findings to develop their own hydrotherapy programmes for fibromyalgia syndrome. The exercise component should include aerobic activity, warm-up, cool-down or relaxation periods as well as a flexibility or strength-based component, at least three times a week for at least four weeks.Research: The authors stated that further research was needed to determine the most appropriate duration of hydrotherapy programs for fibromyalgia syndromes and whether improvements were maintained when programmes were continued independently. More research to compare passive water-based therapies to hydrotherapy would be of value from an economic perspective.
24	Ramel J, Bannuru R, Griffith M, Wang C. **Exercise for fibromyalgia pain: A meta-analysis of randomized controlled trials**. Current Rheumatology Reviews 2009;5(4):188-193. Abstract: Objective: To systematically review the efficacy of exercise interventions on pain relief in patients with fibromyalgia (FM). Methods: We performed a comprehensive search of 8 western databases and reference lists through March 2009. We included randomized controlled trials

	(RCTs) with pain as an endpoint, measured by the Fibromyalgia Impact Questionnaire (FIQ) or a visual analogue scale (VAS). The exercise treatments were compared with a no-exercise control group. Study quality was assessed by the Jadad scale. We calculated effect sizes to assess the magnitude of treatment effect, and meta-analyzed for overall effect. Results: Forty-five studies were critically appraised for effects on pain. Ten RCTs published between 1992 and 2008, conducted in Europe and North America met eligibility criteria with 767 participants (98% women). Mean age was 47 years and mean symptom duration was 10 years. The meta-analysis results showed that 6 to 24 weeks of aerobic, strength training, pool and multi-component exercise had a statistically significant decrease in pain outcomes versus education, usual care and non-exercise controls. The pooled effect size was 0.45 (95% Confidence Interval, 0.09 to 0.80). Conclusion: Physical exercise may have positive effects on pain reduction in patients with FM. Long-term, rigorous and well-controlled randomized trials are warranted.
25	Sim J, Adams N. **Systematic review of randomized controlled trials of nonpharmacological interventions for fibromyalgia**. Clinical Journal of Pain 2002;18(5):324-336. Abstract: Objective: Little is known of the effectiveness of nonpharmacological interventions for fibromyalgia syndrome (FMS). The authors therefore carried out a systematic review from 1980 to May 2000 of randomized controlled trials (RCTs) of nonpharmacological interventions for FMS. Method: A search of computerized databases was supplemented by hand searching of bibliographies of key publications. The methodological quality of studies included in the review was evaluated independently by two researchers according to a set of formal criteria. Discrepancies in scoring were resolved through discussion. Results: The review yielded 25 RCTs, and the main categories of interventions tested in the studies were exercise therapy, educational intervention, relaxation therapy, cognitive-behavioral therapy, acupuncture, and forms of hydrotherapy. Methodological quality of studies was fairly low (mean score = 49.5/100). Most studies had small samples (median n for individual treatment groups after randomization = 20), and the mean power of the studies to detect a medium effect (d > 0.5) was 0.36. Sixteen studies had blinded outcome assessment, but patients were blinded in only 6 studies. The median longest follow-up was 16 weeks. Statistically significant between-group differences on at least one outcome variable were reported in 17 of the 24 studies. Conclusions: The varying combinations of interventions studied in the RCTs and the wide range of outcome measures used make it hard to form conclusions across studies. Strong evidence did not emerge in respect to any single intervention, though preliminary support of moderate strength existed for aerobic exercise. There is a need for larger, more methodologically rigorous RCTs in this area.
26	Thomas EN, Blotman F. **Aerobic exercise in fibromyalgia: A practical review**. Rheumatology International 2010;30(9):1143-1150. Abstract: The objective of the study was to determine the current evidence to support guidelines for aerobic exercise (AE) and fibromyalgia (FM) in practice, and to outline specific research needs in these areas. Data sources consisted of a PubMed search, 2007 Cochrane Data Base Systematic review, 2008 Ottawa panel evidence-based clinical practice guidelines, as well as additional references found from the initial search. Study selection included randomized clinical trials that com-

	pared an aerobic-only exercise intervention (land or pool based) with an untreated control, a non-exercise intervention or other exercise programs in patients responding to the 1990 American College of Rheumatology criteria for FM. The following outcome data were obtained: pain, tender points, perceived improvement in FM symptoms such as the Fibromyalgia Impact Questionnaire total score (FIQ), physical function, depression (e.g., Beck Depression Inventory, FIQ subscale for depression), fatigue and sleep were extracted from 19 clinical trials that considered the effects of aerobic-only exercise in FM patients. Data synthesis shows that there is moderate evidence of important benefit of aerobic-only exercise in FM on physical function and possibly on tender points and pain. It appears to be sufficient evidence to support the practice of AE as a part of the multidisciplinary management of FM. However, future studies must be more adequately sized, homogeneously assessed, and monitored for adherence, to draw definitive conclusions.
27	van Koulil S, Effting M, Kraaimaat FW, van Lankveld W, van Helmond T, Cats H, et al. **Cognitive-behavioural therapies and exercise programmes for patients with fibromyalgia: state of the art and future directions**. Annals of the Rheumatic Diseases 2007;66(5):571-581. Abstract: To assess the effectiveness of non-pharmacological treatments in patients with fibromyalgia. Studies that compared non-pharmacological interventions such as cognitive-behavioural therapy (CBT) and/or exercise with a control (e.g. standard treatment, placebo or no treatment) were eligible for inclusion. The included studies evaluated CBT interventions (e.g. CBT, relaxation (biofeedback), education), exercise interventions (e.g. aerobics, strength training, flexibility exercises, hydrotherapy) and interventions combining CBT and exercise. The interventions were delivered on an individual or group basis, at home, or as an out-patient. Treatment intensity varied and duration ranged from 19 days to 2 years. The control treatment included waiting list, standard treatment, treatment as usual, education, relaxation, false biofeedback relaxation, flexibility exercises, relaxation plus flexibility exercises, thermotherapy and a discussion group. Studies involving patients diagnosed with fibromyalgia using recognised diagnostic criteria were eligible for inclusion. The included studies were in patients with mean ages ranging from 33.7 to 59.5 years. The majority of studies reported a higher proportion of females. Studies were eligible for inclusion if they measured pain, disability and mood. The included studies assessed the long- and short-term effects on outcomes, as measured by various tools: visual analogue scales, myalgic scores, tender points, physical fitness and various questionnaires. The duration of follow-up ranged from post-intervention to 4 years. Randomised controlled trials (RCTs) were eligible for inclusion. MEDLINE (1966 to January 2006), PsycINFO (1806 to January 2006), EMBASE (1980 to January 2006) and the Cochrane Library (1993 to January 2006) were searched; the search terms were reported. Inaddition, references of original manuscripts and review articles were searched manually. The authors did not state that they assessed validity. However, they did mention aspects of validity such as drop-outs, sample size and the use of intention-to-treat analysis in tables or the text. The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on each outcome to determine the treatment effect post-intervention and at follow-up. For each study, treatment effects were classified as positive, negative, or no effect.

The studies were grouped by type of intervention and combined in a narrative.

Differences in certain study characteristics were presented in the tables.

Thirty RCTs (n=2,446: 1,469 receiving intervention and 977 receiving control) were included in the review.The sample sizes from 12 to 170 participants, with only 1 study reporting completion by all participants. Nine studies reported drop-out rates of more than 20%.CBT.The 3 studies assessing educational programmes reported no treatment effect on pain, disability or mood. Two of the 3 studies assessing relaxation showed positive treatment effects for pain in the short term; none of the 3 studies reported a positive effect on disability or mood. Three of the 5 studiesexamining multi-method CBT reported positive treatment effects for at least one outcome, which was maintained at follow-up for two of the studies.Exercise. Seven of the 10 studies investigating aerobic exercise alone indicated improvements in at least one outcome, but only one of the 3 studies with long-term follow-up reported long-term improvements; one also reported a negative effect on disability. Two of the 3 studies investigating strength training reportedpositive effects on disability; studies reported no effect on mood or pain. All 5 studies assessing combined aerobic exercise with strength training reported positive treatment effects for pain and/or disability, two of which reported long-term improvements.CBT and exercise.Two of the 6 studies examining education and exercise combined showed short-term improvements for at least one outcome, with two also reporting long-term improvements. The study assessing relaxation with exercise reported positive effects at follow-up for pain and disability in comparison with the control group. Both studies examining multi-method CBT with exercise indicated improvements for all three outcomes post-intervention, with improvements maintained for pain at follow-up.

The beneficial effects of non-pharmacological interventions appear limited.

The review question was clear and appropriate inclusion criteria were stated for the interventions, comparators, outcomes, study design and participants. Relevant literature searches were conducted using electronic databases and other appropriate sources. It was unclear whether any language restrictions were applied, thus the potential for language bias cannot be ruled out. This, together with an apparent lack of searching for unpublished material, means it is possible that relevant papers were missed. Attempts to minimise errors and reviewer bias in the review process were not reported. Although some aspects of validity were mentioned, a systematic assessment was not performed; this means that the reliability of the included studies and their subsequent synthesis is unclear. In addition, potentially important clinical characteristics (such as criteria used to diagnose fibromyalgia) were not presented, and some studies used CBT or exercise programmes as the control group. It was not clear whether studies classified as showing a positive effect showed a statistically significant improvement in outcome measures or just an improvement. Sample sizes were small and drop-out rates high in many of the studies. The analysis was further limited by methodological differences, including content and duration of the interventions, outcome measures and data analysis, and only 45% of the studies reported follow-up. However, the authors acknowledged such limitations and their conclusions are likely to be reliable.

Practice: The authors stated that individual differences between patients with fibromyalgia should be considered since these may influence the effectiveness of the interventions.Research: The au-

	thors stated that further research is required to examine the mechanisms that are associated with the development and maintenance of pain and disability, such as avoidance behaviour and pain-related fear. Future studies should tailor interventions by identifying the most effectiveinterventions in different subgroups of patients.
28	Winkelmann A, Hauser W, Friedel E, Moog-Egan M, Seeger D, Settan M, et al. **Physiotherapy and physical therapies for fibromyalgia syndrome: systematic review, meta-analysis and guideline**. Schmerz 2012;26(3):276-286. Abstract: BACKGROUND: The scheduled update to the German S3 guidelines on fibromyalgia syndrome (FMS) by the Association of the Scientific Medical Societies ("Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften", AWMF; registration number 041/004) was planned starting in March 2011. MATERIALS AND METHODS: The development of the guidelines was coordinated by the German Interdisciplinary Association for Pain Therapy ("Deutsche Interdisziplinären Vereinigung für Schmerztherapie", DIVS), 9 scientific medical societies and 2 patient self-help organizations. Eight working groups with a total of 50 members were evenly balanced in terms of gender, medical field, potential conflicts of interest and hierarchical position in the medical and scientific fields. Literature searches were performed using the Medline, PsycInfo, Scopus and Cochrane Library databases (until December 2010). The grading of the strength of the evidence followed the scheme of the Oxford Centre for Evidence-Based Medicine. The formulation and grading of recommendations was accomplished using a multi-step, formal consensus process. The guidelines were reviewed by the boards of the participating scientific medical societies. RESULTS AND CONCLUSION: Low-to-moderate intensity aerobic exercise and strength training are strongly recommended. Chiropractic, laser therapy, magnetic field therapy, massage and transcranial current stimulation are not recommended. The English full-text version of this article is available at SpringerLink (under "Supplemental").
29	Zao A, Barros P, Camelo A. **Fibromyalgia syndrome: The efficacy of aerobic exercise**. Annals of Physical and Rehabilitation Medicine 2014;57:e261. Abstract: Introduction.- Fibromyalgia syndrome (FMS) is characterized by chronic widespread pain, fatigue, tenderness on palpation and sleep disturbances. The optimal aerobic exercise (AE) type in this condition is not established. Therefore, the aim of this study was to evaluate the efficacy of different types of AE in FMS. Materials and methods.- Systematic review of the literature on AE in FMS published until October 2013 in MEDLINE, Cochrane Library, EMBASE and Scopus databases. Results.- Twenty-eight randomized controlled trials (RCTs) comparing AE with controls (treatment as usual, placebo, active therapy) and seven RCTs comparing different types of AE were analyzed (2494 patients). AE improved physical fitness (0.65; $P < 0.001$) and reduced pain (-0.31; $P < 0.001$), fatigue (-0.22; $P = 0.009$), depressed mood (-0.32; $P = 0.002$) and limitations of health-related quality of life (HRQOL) (-0.40; $P < 0.001$). Positive effects could be maintained at follow-up. Land-based and water-based AE (exercises with slight to moderate intensity; two or three times per week) reduced significantly pain. Discussion.- Aerobic exercise programme (land-based orwater-based exercises, with slight to moderate intensity, two or three

	times per week, for at least 4 weeks) should be recommended for FMS patients.
Personer med fibromyalgi utgjør dessuten deler av populasjonen i oversiktene 1 og 8.	

Artrose (20 oversikter)	
30	**Exercise good for knee osteoarthritis symptoms and function**. Journal of the National Medical Association 2010;102(3):261. Abstract: This author searched the usual databases for observational studies of the effect of exercise on the development of knee osteoarthritis and for randomized controlled trials of the effect of exercise on the progression of knee osteoarthritis. The former set of studies are generally limited by patient self-selection: groups of patients who choose to run or pursue other sports are compared with those who do not make that choice. Thus, persons who begin to experience pain, who have a history of injury, or who are obese may self-select not to exercise. The author concludes based on his review of the 5 cohort, 8 case-control, and 5 cross-sectional studies that running does not increase the risk of knee osteoarthritis for those who self-select that activity, and more moderate activities appear to be safe also as long as no acute injury occurs. Regarding the effect of exercise, the author identified 9 systematic reviews in the literature. Exercise - whether aquatic, land-based, aerobic, or strengthening - uniformly improved pain and function in patients with knee osteoarthritis more than no exercise.
31	Bartels EM, Lund H, Hagen KB, Dagfinrud H, Christensen R, Danneskiold-Samsøe B. **Aquatic exercise for the treatment of knee and hip osteoarthritis**. Cochrane Database of Systematic Reviews 2007 (4):CD005523. Abstract: Background: Clinical experience indicates that aquatic exercise may have advantages for osteoarthritis patients. Objectives: To compare the effectiveness and safety of aquatic-exercise interventions in the treatment of knee and hip osteoarthritis. Search methods: We searched MEDLINE from 1949, EMBASE from 1980, CENTRAL (Issue 2, 2006), CINAHL from 1982, Web of Science from 1945, all up to May 2006. There was no language restriction. Selection criteria: Randomised controlled trials or quasi-randomised clinical trials. Data collection and analysis: Two review authors independently selected trials for inclusion, assessed the internal validity of included trials and extracted data. Pooled results were analyzed using standardized mean differences (SMD).Main results: Thre is a lack of high-quality studies in this area. In total, six trials (800 participants) were included. At the end of treatment for combined knee and hip osteoarthritis, there was a small-to-moderate effect on function (SMD 0.26, 95% confidence interval (CI) 0.11 to 0.42) and a small-to-moderate effect on quality of life (SMD 0.32, 95% CI 0.03 to 0.61). A minor effect of a 3% absolute reduction (0.6 fewer points on a 0 to 20 scale) and 6.6% relative reduction from baseline was found for pain. There was no evidence of effect on walking ability or stiffness immediately after end of treatment. No evidence of effect on pain, function or quality of life were observed on the one trial including participants with hip osteoarthritis alone. Only one trial was identified including knee osteoarthritis alone, comparing aquatic exercise with land-based exercise. Immediately after treatment, there was a large effect on pain (SMD 0.86, 95%CI 0.25 to 1.47; 22% relative percent improvement), but no evidence of effect on stiffness or walking

	ability. Only two studies reported adverse effects, that is, the interventions did not increase self-reported pain or symptom scores. No radiographic evaluation was performed in any of the included studies. Authors' conclusions: Aquatic exercise appears to have some beneficial short-term effects for patients with hip and/or knee OA while no long-term effects have been documented. Based on this, one may consider using aquatic exercise as the first part of a longer exercise programme for osteoarthritis patients. The controlled and randomised studies in this area are still too few to give further recommendations on how to apply the therapy, and studies of clearly defined patient groups with long-term outcomes are needed to decide on the further use of this therapy in the treatment of osteoarthritis.
32	Batterham SI, Heywood S, Keating JL. **Systematic review and meta-analysis comparing land and aquatic exercise for people with hip or knee arthritis on function, mobility and other health outcomes**. BMC Musculoskeletal Disorders 2011;12:123. Abstract: To compare the effects of aquatic exercise with land-based exercise in patients with hip or knee arthritis. MEDLINE, CINAHL, AMED and the Cochrane Central Register of Controlled Clinical Trials (CENTRAL) were searched from inception up to July 2010 for studies in English; search terms were reported. Trial quality was assessed using the following criteria of the PEDro scale: eligibility criteria specified; random allocation; concealment of allocation; baseline similarity of treatment groups with respect to prognosis; blinding of patients, therapists and assessors; adequacy of follow-up; intention-to-treat analysis; at least one between-group statistical analysis reported; and at least one point estimate and variability for a key outcome reported. Trials were given a score out of 10.The assessment was performed by one reviewer with the results compared with published PEDro scores conducted by other reviewers when available (when published scores were not available a second reviewer performed an assessment). If there were disagreements another reviewer performed an assessment. Baseline and end of treatment data were extracted to calculate standardised mean differences with 95% confidence intervals (CI). Medians were used as best estimates of means. Long-term data were not extracted. Intention-to-treat data were prioritised over per-protocol data when possible. Although around half the trials had a (third) control arm, comparisons with control groups were beyond the scope of this publication.Two reviewers independently extracted the data, with disagreements resolved by discussion. Ten RCTs were eligible for inclusion (659 participants, range 22 to 115). PEDro quality assessment scores ranged from 5 to 8 out of 10.There was no statistically significant difference in functional outcomes between water based compared to land-based exercise groups. Following removal of one trial with a significant baseline imbalance, the standardised mean difference was 0.07 (95% CI -0.26 to 0.12, 7 trials) and there was no heterogeneity. There was also no statistically significant difference between groups for mobility (seven trials, $?^2$ not reported), dynamic balance (three trials, $?^2$=52%), indices evaluating multiple health domains (five trials, $?^2$=58%), and for the analysis pooling function plus multiple health domain indices (nine trials, $?^2$=33%).One trial reported measures of patient perception of the interventions, finding no difference between exercise groups for enjoyment.

	Outcomes following aquatic exercise for adults with arthritis appeared to be comparable to land-based exercise. When people were unable to exercise on land, or found land-based exercise difficult, aquatic programs provided an enabling alternative strategy. The review addressed a clear question and was supported by reproducible eligibility criteria. Several relevant electronic databases were searched, but the restriction to searching only for studies in English meant that some relevant trials may have been missed. It was unclear whether unpublished trials were sought. Therefore, the possibility of language or publication biases affecting the review results could not be ruled out. Suitable methods (such as independent duplicate processes) were used to reduce the risk of reviewer error and bias throughout the review. Trial quality was assessed and the results were used to guide sensitivity analyses. Comprehensive trial details were provided. Appropriate methods were used to pool data and to assess and investigate heterogeneity. However, sensitivity analyses by type of arthritis were not reported, so the review results related only to a mixed population. The review did not specifically examine the effect of the interventions on pain, an important outcome in this patient population; although most studies reported pain levels at baseline, it was unclear how many reported pain results at the end of treatment. The results also related to short-term comparisons. Nevertheless, the authors' conclusions are a fair reflection of the evidence presented, and appear likely to be reliable. Practice: The authors stated that, for people who have significant mobility or function limitations and are unable to exercise on land, aquatic exercise appeared to be a legitimate alternative that may enable people to successfully participate in exercise. Clinical decision making on exercise choice should consider patients' specific requirements and disabilities, patients' preferences, therapist expertise, and best available evidence along with practical considerations such as availability and cost.Research: The authors stated that high quality trial design, with intention-to-analysis, adequate follow-up and baseline similarity, would advance the quality of work in this field. The authors also noted a lack of information on patient satisfaction or adherence to exercise interventions, despite the importance of patient engagement in exercise programmes.
33	Bender T, Balint G, Prohaszka Z, Geher P, Tefner IK. **Evidence-based hydro- and balneotherapy in Hungary-a systematic review and meta-analysis**. International Journal of Biometeorology 2014;58(3):311-323. Abstract: Balneotherapy is appreciated as a traditional treatment modality in medicine. Hungary is rich in thermal mineral waters. Balneotherapy has been in extensive use for centuries and its effects have been studied in detail. Here, we present a systematic review and meta-analysis of clinical trials conducted with Hungarian thermal mineral waters, the findings of which have been published by Hungarian authors in English. The 122 studies identified in different databases include 18 clinical trials. Five of these evaluated the effect of hydro- and balneotherapy on chronic low back pain, four on osteoarthritis of the knee, and two on osteoarthritis of the hand. One of the remaining seven trials evaluated balneotherapy in chronic inflammatory pelvic diseases, while six studies explored its effect on various laboratory parameters. Out of the 18 studies, 9 met the predefined criteria for meta-analysis. The results confirmed the beneficial effect of balneotherapy on pain with weight bearing and at rest in patients with degenerative joint and spinal diseases. A similar effect has been found in chronic pelvic inflammatory disease. The review also revealed that balneotherapy has some beneficial effects on antioxidant status, and on metabolic and in-

	flammatory parameters. Based on the results, we conclude that balneotherapy with Hungarian thermal-mineral waters is an effective remedy for lower back pain, as well as for knee and hand osteoarthritis.
34	Brosseau L, Pelland L, Wells G, Macleay L, Lamothe C, Michaud G, et al. **Efficacy of Aerobic Exercises For Osteoarthritis (part II): A Meta-analysis**. Physical Therapy Reviews 2004;9(3):125-145. Abstract: Objective: Osteoarthritis (OA) affects a large proportion of the population. Aerobic exercise has long been a rehabilitation intervention for treating patients with OA in efforts to decrease pain and improve functional status. The purpose of this meta-analysis was to examine the efficacy of aerobic exercise among individuals with OA. Methods: A systematic review was conducted following a protocol of methods recommended by the Cochrane Collaboration. Eligible trials were identified by a literature search of Medline, Embase, and the Cochrane Controlled Trials Register. Twelve trials were included with 1363 patients undergoing various forms and combinations of aerobic physical activities including walking programmes, aquatic exercises, jogging in water, yoga and T'ai Chi. Results: The overall results of this analysis indicate that various forms of aerobic exercise, such as a walking programme, jogging in water, yoga and T'ai Chi can have statistically significant effects on pain, joint tenderness, functional status, and respiratory capacity for patients with OA. Conclusions: The most efficacious exercise regimen has yet to be determined but aerobic exercise in general is more beneficial for the OA patient than no exercise at all, and is superior or equivalent to strengthening exercises. The research indicates long-term effects need to be explored further, and combined behavioural strategies need to be studied to facilitate the sustainability of the beneficial effect of aerobic exercises.
35	Escalante Y, Saavedra JM, García-Hermoso A, Silva AJ, Barbosa TM. **Physical exercise and reduction of pain in adults with lower limb osteoarthritis: A systematic review**. Journal of Back & Musculoskeletal Rehabilitation 2010;23(4):175-186. Abstract: Osteoarthritis is a degenerative joint disease. The knee and hip joints are the most frequently affected. Treatments fall into three main categories: pharmacological, non-pharmacological, and surgical. Treatments can be applied alone or in combination. In the last few years, within the non-pharmacological category have been a growing importance of physical exercise programs aimed to reduce pain in knee and hip joints. The purpose of this review was to summarize evidence for the effectiveness and structure of exercise programs on pain in patients with hip and knee osteoarthritis. To that end, several databases were searched, retrieving 33 studies that evaluated the influence of different exercise programs on pain. These studies were grouped according to the characteristics of the exercise program: land-based intervention (strength program, Tai Chi, aerobic program), aquatic intervention (hydrotherapy), and mixed exercise programs. The main conclusions drawn were: (i) despite recommendations for the use of exercise programs as pain therapy in patients with hip and knee osteoarthritis, very few randomized clinical studies were conducted; (ii) the structure of the exercise programs (content, duration, frequency and duration of the session) is very heterogeneous; (iii) on overall, exercise programs based on Tai Chi have better results than mixed exercise programs, but without clear dif-

	ferences.
36	Forestier R, Francon A. **Crenobalneotherapy for limb osteoarthritis: Systematic literature review and methodological analysis**. Joint Bone Spine 2008;75(2):138-148. Abstract: Objectives: To conduct a systematic literature review on crenobalneotherapy for limb osteoarthritis and to discuss the study methods used to evaluate this treatment modality. Methods: We searched Medline using the following keywords: "spa therapy", "mud", "radon", "balneotherapy", and "hydrotherapy" in combination with "osteoarthritis", "arthrosis", and "gonarthrosis". We also reviewed the reference lists of articles retrieved by the Medline search. Studies that compared crenobalneotherapy to any other intervention or to no intervention were selected, and a checklist was used to assess their internal validity. External validity and the quality of the statistical analysis were evaluated also. Results: Crenobalneotherapy was associated with improvements in the evaluation criteria (pain, function, and quality of life) compared to baseline. However, inadequate internal validity precluded the establishment of a causal link between these improvements and crenobalneotherapy. External validity was often poorly defined. Some studies found no significant differences with the control group but failed to include a sample-size calculation, suggesting inadequate statistical power as a possible explanation for the result. In several studies, the use of multiple evaluation criteria and measurements led to a high risk of Type I error. Conclusion: Although the consistency of the results suggests a therapeutic effect of crenobalneotherapy in limb osteoarthritis, available studies are methodologically inadequate and sample sizes too small to allow definitive conclusions. We suggest a number of solutions to these shortcomings. Carefully designed studies in larger patient populations are needed to determine the role crenobalneotherapy in knee osteoarthritis.
37	Fransen M, McConnell S, Bell M. **Exercise for osteoarthritis of the hip or knee**. Cochrane Database of Systematic Reviews 2001 (2). Abstract: BACKGROUND: Biomechanical factors, such as reduced muscle strength and joint malalignment, have an important role in the initiation and progression of osteoarthritis (OA) of the hip or knee. Currently, there is no known cure for OA, however, disease-related factors, such as impaired muscle function and reduced fitness, are potentially amenable to therapeutic exercise. OBJECTIVES: To determine whether land-based therapeutic exercise is beneficial for people with OA of the hip or knee in terms of reduced joint pain, improved physical function and/or the patient's global assessment of therapeutic effectiveness. SEARCH STRATEGY: Five databases (the Cochrane Controlled Trials Register, the Cochrane Musculoskeletal Group Trials Register, MEDLINE, CINAHL, PEDro) were searched up until November 2002. SELECTION CRITERIA: All randomized controlled trials comparing some form of land-based therapeutic exercise (as opposed to exercises conducted in the water) with a non-exercise gr oup. DATA COLLECTION AND ANALYSIS: Two reviewers independently extracted data and assessed methodological quality. All analyses were conducted on continuous outcomes. MAIN RESULTS: Only 2 studies totaling about 100 participants, could potentially provide data on people with OA of the hip. However, for OA of the knee, 17 included studies provided data on 2562 participants. For pain, combining the results revealed a beneficial treatment effect (standardised mean difference) of.39 (95% confidence interval (CI).30 -.47) while for self-reported physical function a beneficial treatment effect

	of.31 (95% CI.23 -.39). Group format programs appeared to be as effective as treatments provided on a one-to-one basis. The results were sensitive to various aspects of study design methodology. REVIEWER'S CONCLUSIONS: Land-based therapeutic exercise was shown to reduce pain and improve physical function for people with OA of the knee. There were insufficient data to provide useful guideline s on optimal exercise type or dosage. Supervised exercise classe s appeared to be as beneficial as treatments provided on a one-to-one basis. Published by arrangement with John Wiley & Sons; Cochrane Reviews are regularly updated as new information becomes available and in response to comments and criticisms. The reader should consult The Cochrane Library for the latest version of a Cochrane Review. Many countries will have free access. Information on the Cochrane Library can be found at http://www.thecochranelibrary.com/view/0/index.html; If this record is indexed on MEDLINE you may be able to obtain the full text of this article by visiting the PubMed web site (http://www.ncbi.nlm.nih.gov/entrez/query/static/citmatch.html).
38	Gill SD, McBurney H. **Does Exercise Reduce Pain and Improve Physical Function Before Hip or Knee Replacement Surgery? A Systematic Review and Meta-Analysis of Randomized Controlled Trials**. Archives of Physical Medicine and Rehabilitation 2013;94(1):164-176. Abstract: Objective: To investigate the preoperative effects of exercise-based interventions on pain and physical function for people awaiting joint replacement surgery of the hip or knee. Data Sources: Four computer databases (CINAHL, MEDLINE, Embase, and Cochrane Library) were searched until July 4, 2012. Search terms included knee, hip, joint replacement, arthroplasty, physiotherapy, physical therapy, exercise, hydrotherapy, rehabilitation, and preoperative. Reference lists of retrieved articles were also screened. Study Selection: Randomized or quasi-randomized studies comparing an exercise-based intervention with a no-intervention group for people awaiting hip or knee joint replacement surgery were included. Outcomes were pain and physical function including self-reported function, walking speed, and muscle strength. One of 2 reviewers determined that 18 studies met the inclusion criteria. Data Extraction: The methodologic quality of each study was independently assessed by 2 reviewers using the PEDro scale, and a final PEDro score was determined by discussion and consensus between the reviewers. Participants' characteristics, content and design of the interventions, and data for quantitative synthesis were extracted by 1 reviewer. Data Synthesis: For participants awaiting knee replacement surgery, quantitative data synthesis found no significant differences between the exercise and no-intervention groups for pain, self-reported function, walking speed, or muscle strength. For participants awaiting hip replacement surgery, quantitative data synthesis found a significant difference between the groups, with standardized mean differences (SMDs) indicating a medium-sized effect in favor of intervention for both pain (SMD=.45; 95% confidence interval .15.75) and self-reported function (SMD=.46; 95% confidence interval .20.72). Conclusions: Exercise-based interventions Can reduce pain and improve physical function for people awaiting hip replacement surgery but not knee replacement surgery. Archives of Physical Medicine and Rehabilitation 2013;94:164-76 (C) 2013 by the American Congress of Rehabilitation Medicine
39	Golightly YM, Allen KD, Caine DJ. **A Comprehensive Review of the Effectiveness of Different Exercise Programs for Patients with Osteoarthritis**. Physician and Sportsmedicine 2012;40(4):52-65.

	Abstract: Exercise is recommended as a first-line conservative intervention approach for osteoarthritis (OA). A wide range of exercise programs are available and scientific evidence is necessary for choosing the optimal strategy of treatment for each patient. The purpose of this review is to discuss the effectiveness of different types of exercise programs for OA based on trials, systematic reviews, and meta-analyses in the literature. Publications from January 1997 to July 2012 were searched in 4 electronic databases using the terms osteoarthritis, exercise, exercise program, effectiveness, and treatment outcome. Strong evidence supports that aerobic and strengthening exercise programs, both land- and water-based, are beneficial for improving pain and physical function in adults with mild-to-moderate knee and hip OA. Areas that require further research include examination of the long-term effects of exercise programs for OA, balance training for OA, exercise programs for severe OA, the effect of exercise programs on progression of OA, the effectiveness of exercise for joint sites other than the knee or hip, and the effectiveness of exercise for OA by such factors as age, sex, and obesity. Efforts to improve adherence to evidence-based exercise programs for OA and to promote the dissemination and implementation of these programs are crucial.
40	Hernandez-Molina G, Reichenbach S, Zhang B, Lavalley M, Felson DT. **Effect of therapeutic exercise for hip osteoarthritis pain: Results of a meta-analysis**. Arthritis & Rheumatism-Arthritis Care & Research 2008;59(9):1221-1228. Abstract: Objective. Recommendations for lower extremity osteoarthritis (OA) and exercise have been primarily based on knee studies. To provide more targeted recommendations for the hip, we gathered evidence for the efficacy of exercise for hip OA from randomized controlled trials. Methods. A bibliographic search identified trials that were randomized, controlled, completed by >= 60%, of subjects, and involved an exercise group (strengthening and/or aerobic) versus a nonexercise control group for pain relief in hip OA. Two reviewers independently performed the data extraction and contacted the authors when necessary. Effect sizes (ES) of treatment versus control and the 12 statistic to assess heterogeneity across trials were calculated. Trial data were combined using a random-effects meta-analysis. Results. Nine trials met the inclusion criteria (1,234 subjects), 7 of which combined hip and knee OA; therefore, we contacted the authors who provided the data on hip OA patients. In comparing exercise treatment versus control, we found a beneficial effect of exercise with an ES of -0.38 (95% confidence interval [95% CI] -0.68 -0.08; P = 0.01), but with high heterogeneity (I-2 = 75%) among trials. Heterogeneity was caused by 1 trial consisting of an exercise intervention that was not administered in person. Removing this study left 8 trials (n = 493) with similar exercise strategy (specialized hands-on exercise training, all of which included at least some element of muscle strengthening), and demonstrated exercise benefit with an ES of -0.46 (95% CI -0.64, -0.28; P < 0.0001). Conclusion. Therapeutic exercise, especially with an element of strengthening, is an efficacious treatment for hip OA.
41	Kamioka H, Tsutani K, Mutoh Y, Okuizum H, Ohta M, Handa S, et al. **A systematic review of non-randomized controlled trials on the curative effects of aquatic exercise**. International journal of general medicine 2011;4:239-260.

	Abstract: BACKGROUND: The objectives of this review were to integrate the evidence of curative effects through aquatic exercise and assess the quality of studies based on a review of nonrandomized controlled trials (nRCTs). METHODS: Study design was a systematic review of nonrandomized controlled trials. Trials were eligible if they were nonrandomized clinical trials. Studies included one treatment group in which aquatic exercise was applied. We searched the following databases from 2000 up to July 20, 2009: MEDLINE via PubMed, CINAHL, and Ichushi-Web. RESULTS: Twenty-one trials met the inclusion criteria. Languages included were English (N = 9), Japanese (N = 11), and Korean (N = 1). Target diseases were knee and/or hip osteoarthritis, poliomyelitis, chronic kidney disease, discomforts of pregnancy, cardiovascular diseases, and rotator cuff tears. Many studies on nonspecific disease (healthy participants) were included. All studies reported significant effectiveness in at least one or more outcomes. However results of evaluations with the TREND and CLEAR-NPT checklists generally showed a remarkable lack of description in the studies. Furthermore, there was the problem of heterogeneity, and we were therefore not able to perform a meta-analysis. CONCLUSION: Because there was insufficient evidence on aquatic exercise due to poor methodological and reporting quality and heterogeneity of nRCTs, we were unable to offer any conclusions about the effects of this intervention. However, we were able to identify problems with current nRCTs of aquatic exercise, and propose a strategy of strengthening study quality, stressing the importance of study feasibility as a future research agenda objective.
42	McNair PJ, Simmonds MA, Boocock MG, Larmer PJ. **Exercise therapy for the management of osteoarthritis of the hip joint: a systematic review**. Arthritis Research & Therapy 2009;11(3). Abstract: Introduction Recent guidelines pertaining to exercise for individuals with osteoarthritis have been released. These guidelines have been based primarily on studies of knee-joint osteoarthritis. The current study was focused on the hip joint, which has different biomechanical features and risk factors for osteoarthritis and has received much less attention in the literature. The purpose was to conduct a systematic review of the literature to evaluate the exercise programs used in intervention studies focused solely on hip-joint osteoarthritis, to decide whether their exercise regimens met the new guidelines, and to determine the level of support for exercise-therapy interventions in the management of hip-joint osteoarthritis. Methods A systematic literature search of 14 electronic databases was undertaken to identify interventions that used exercise therapy as a treatment modality for hip osteoarthritis. The quality of each article was critically appraised and graded according to standardized methodologic approaches. A 'pattern-of-evidence' approach was used to determine the overall level of evidence in support of exercise-therapy interventions for treating hip osteoarthritis. Results More than 4,000 articles were identified, of which 338 were considered suitable for abstract review. Of these, only 6 intervention studies met the inclusion criteria. Few well-designed studies specifically investigated the use of exercise-therapy management on hip-joint osteoarthritis. Insufficient evidence was found to suggest that exercise therapy can be an effective short-term management approach for reducing pain levels, improving joint function and the quality of life. Conclusions Limited information was available on which conclusions regarding the efficacy of exercise could be clearly based. No stud-

	ies met the level of exercise recommended for individuals with osteoarthritis. High-quality trials are needed, and further consideration should be given to establishing the optimal exercises and exposure levels necessary for achieving long-term gains in the management of osteoarthritis of the hip.
43	Quicke JG, Foster NE, Thomas MJ, Holden MA. **Is long-term physical activity safe for older adults with knee pain?: A systematic review**. Osteoarthritis and Cartilage 2014;22:S11-S12. Abstract: Purpose: Knee pain attributable to osteoarthritis (OA) is common in older adults. Although exercise and physical activity are consistently recommended for older adults with knee pain in clinical guidelines, physical activity levels in this population remain low. This may, in part, be due to concerns over its long-term safety. Common and persisting narratives regarding joint "wear and tear" may lead to attributions that physical activity causes further joint damage, whilst pain during activity may be perceived as an indicator of harm. The aim of this study was to synthesise existing literature to determine whether long-term physical activity is safe for older adults with knee pain. Methods: A comprehensive systematic review was conducted using multiple electronic databases including MEDLINE, EMBASE, CINAHL, CENTRAL, AMED, SPORTDiscus, CISDOC, NIOSHTIC-2 and HSELINE from inception until 16th May 2013. Two reviewers independently screened all titles, abstracts and full texts for study inclusion and exclusion criteria. Any initial disagreement was resolved by discussion or consensus with a third reviewer where necessary. Inclusion criteria were: a) randomised controlled trials (RCT), prospective cohort studies (PCS) or case control studies (CCS); b) including adults over 45 years old with knee pain or OA; c) undertaking exercise or physical activity explicitly over at least three months; and d) measuring a safety related outcome including adverse events, pain, physical functioning, radiographic or magnetic resonance imaging (MRI) OA biomarker progression or progression to total knee replacement (TKR). Included studies were assessed for risk of bias using the Cochrane risk of bias tool for RCT and the Quality In Prognosis Studies risk of bias tool for PCS and CCS. Safety data were extracted and analysed by narrative synthesis. Results: In total, 8605 unique references were identified by the search and 37 primary studies were included in the review. The included studies were made up of 35 RCT, 1 PCS and 1 CCS, which were undertaken in 16 different countries and were of variable quality. In total, 7194 older adults with either knee pain or clinical, radiographic and combined OA diagnoses were included. The 35 RCT investigated a variety of exercise and physical activity interventions including: walking, Tai Chi, aerobics, strengthening, flexibility, balance, and exercise in water, of between three months and two years duration. 15 studies provided data on adverse events, 35 on pain, 32 physical functioning and 5 some form of radiographic or MRI biomarker of OA progression. In terms of safety results, only eight serious adverse events were reported: one inguinal hernia, five falls (one of which resulted in a head laceration injury and one a fractured radius), one participant fractured her foot as a result of dropping a weight and one had an exacerbation of existing back pain. Mild adverse events of increase in knee pain occurred in a minority of individuals in eight RCT. There was no evidence of a statistically significant increase in pain, decrease in physical function, or deterioration in radiographic or MRI findings (compared to either control group at follow up or within the same group comparing baseline to post treatment data). The single, moderate risk of bias, CCS investigated factors associated with OA progression to TKR in Finnish older adults. It concluded that increasing levels

	of regular exercise were associated with less chance of progression when compared to those who did not carry out regular exercise. The single, high risk of bias, PCS investigated occupational physical activity exposure in older adult members of a French energy company. From a set of 10 physical activity variables, only prolonged exposure to kneeling and squatting activities (between 1 and 25 years) was associated with severe knee pain (Adjusted OR 1.4 95% CI 1.04,1.85). Overall risk of bias across studieswas variable with performance, attrition, and reporting bias frequently being unclear. Conclusions: This systematic review demonstrates t at long-term exercise and physical activity, lasting three months or more, is safe for older adults with existing knee pain or OA. Serious adverse events with exercise are very rare. However, the risk of bias of included studies was often a concern. These findings match existing expert consensus regarding the safety of exercise and current recommendations for exercise and physical activity as "core" treatments in clinical guidelines. (Figure presented).
44	Romeo A, Parazza S, Boschi M, Nava T, Vanti C. **Manual therapy and therapeutic exercise in the treatment of osteoarthritis of the hip: A systematic review**. Reumatismo 2013;65(2):55-66. Abstract: This systematic review aimed at investigating the role of therapeutic exercise and/or manual therapy in the treatment of hip osteoarthritis (OA). Two independent reviewers (AR, CV) searched PubMed, Cinahl, Cochrane Library, PEDro and Scopus databases and a third one (SP) was consulted in case of disagreement. The research criteria were publication period (from May 2007 to April 2012) and publication language (English or Italian). Ten randomized controlled trials matched inclusion criteria, eight of which concerning therapeutic exercise and two manual therapy. Few good quality studies were found. At mid- and long-term follow-up land-based exercises showed insufficient evidence of effectiveness with respect to pain and quality of life, but positive results were found for physical function. Water exercises significantly reduced fall risk when combined with functional exercises. Programs containing progressive and gradual exposure of difficult activities, education and exercises promoted better outcomes, higher adherence to home program and increased amount of physical activity, especially walking. Manual therapy seemed to reduce pain and decrease disability at short-term. Less use of nonsteroidal anti-inflammatory drugs was statistically significant at long-term follow-up in patients treated with manual therapy. The relationship between clinical results and radiological grade of OA was not investigated. Encouraging results were found in recent literature for manual therapy and functional training. Further research is needed to elucidate this issue through high-quality trials, especially addressing the aspects that have not been thoroughly explored yet, for instance type, amount and scheduling of conservative treatment.
45	Uthman OA, Van Der Windt DA, Jordan JL, Dziedzic KS, Healey EL, Peat GM, et al. **Exercise for lower limb osteoarthritis: Systematic review incorporating trial sequential analysis and network meta-analysis**. BMJ (Online) 2013;347(7928). Abstract: Objective To determine whether there is sufficient evidence to conclude that exercise interventions are more effective than no exercise control and to compare the effectiveness of different exercise interventions in relieving pain and improving function in patients with lower limb

	osteoarthritis. Data sources Nine electronic databases searched from inception to March 2012. Study selection Randomised controlled trials comparing exercise interventions with each other or with no exercise control for adults with knee or hip osteoarthritis. Data extraction Two reviewers evaluated eligibility and methodological quality. Main outcomes extracted were pain intensity and limitation of function. Trial sequential analysis was used to investigate reliability and conclusiveness of available evidence for exercise interventions. Bayesian network meta-analysis was used to combine both direct (within trial) and indirect (between trial) evidence on treatment effectiveness. Results 60 trials (44 knee, two hip, 14 mixed) covering 12 exercise interventions and with 8218 patients met inclusion criteria. Sequential analysis showed that as of 2002 sufficient evidence had been accrued to show significant benefit of exercise interventions over no exercise control. For pain relief, strengthening, flexibility plus strengthening, flexibility plus strengthening plus aerobic, aquatic strengthening, and aquatic strengthening plus flexibility, exercises were significantly more effective than no exercise control. A combined intervention of strengthening, flexibility, and aerobic exercise was also significantly more effective than no exercise control for improving limitation in function (standardised mean difference-0.63, 95% credible interval-1.16 to-0.10). Conclusions As of 2002 sufficient evidence had accumulated to show significant benefit of exercise over no exercise in patients with osteoarthritis, and further trials are unlikely to overturn this result. An approach combining exercises to increase strength, flexibility, and aerobic capacity is likely to be most effective in the management of lower limb osteoarthritis. The evidence is largely from trials in patients with knee osteoarthritis.
46	Van Baar ME, Assendelft WJ, Dekker J, Oostendorp RA, Bijlsma JW. **Effectiveness of exercise therapy in patients with osteoarthritis of the hip or knee: a systematic review of randomized clinical trials**. Arthritis and Rheumatism 1999;42(7):1361-1369. Abstract: To determine the effectiveness of exercise therapy in patients with osteoarthritis (OA) of the hip or knee. Exercise therapy, defined as follows, was studied: a range of activities designed to improve strength, range of motion, endurance, balance, coordination, posture, motor function, or motor development. Exercise could be performed actively, passively, or against resistance and no restrictions were applied as to type of supervision or group size. Additional interventions were allowed. Interventions in the review included the following: individual and group therapy; supervised and home-based programmes; aerobic and aerobic hydrotherapy; resistance exercises; 'fitness walking'; strength training monitored on a dynameter; weight bearing and non weight bearing exercises; and non aerobic programmes directed to range of motion. Perioperative exercise therapy was excluded. Patients with OA of the hip or knee (assessed clinically, radiographically or a combination) were studied. Subjects included those with mild to moderate OA and included those recruited from the community and through clinical settings. The following outcomes were assessed: pain; self-reported disability; observed disability in walking; and patient's global assessment of effect. Randomised controlled trials (RCTs) that evaluated exercise in patients with OA of the hip or knee were included if results had been published as a full report. Trials were excluded if intervention and control groups had not received identical exercise therapy. Reasons were given for exclusion

of identified studies.

The following databases were searched: MEDLINE (January 1966 to September 1997); EMBASE (January 1988 to September 1997); and CINAHL (January 1982 to September 1997) using a highly sensitive search strategy for RCTs and systematic reviews. The Cochrane Controlled Trials Register was also searched and references in relevant review articles and trials were screened. No language restrictions were applied.

Validity was assessed using the following criteria as defined in the Maastricht-Amsterdam consensus list (see Other Publications of Related Interest no.2): validity criteria (including adequacy of randomisation; randomisation independent of person determining eligibility; control for cointerventions; reporting of cointerventions; adherence to interventions; blinding of carer, patient, and outcome assessor; use of relevant outcome measure; withdrawals and drop-outs with no substantial bias; <= 20% withdrawals for short-term follow up and <= 30% withdrawals for long term follow-up; identical timing of outcome assessment for all intervention groups; and intention-to-treat analysis); descriptive criteria (including specification of eligibility criteria; baseline similarity of groups; description of interventions; adverse effects described and attributed to allocated treatment; short term follow-up with outcome assessed at end of intervention period; and long-tern follow-up with outcome assessment at last 6 months after randomisation); and statistical criteria (including sample size and presentation of point estimate and distribution measures). Studies satisfying at least 50% of the validity criteria were classified as having 'acceptable validity' versus other studies classified as having 'low validity'. Studies with sufficient power of at least 0.8 (based on ES of 0.5) were distinguished from studies with low power. Validity was assessed by two reviewers independently according to the above criteria. Each internal validity criteria was scored as positive if bias was unlikely, negative if bias was likely or inconclusive if there was insufficient or missing information. A total score for internal validity was calculated (range of validity score from 0 to 12). Disagreements were resolved by consensus or with arbitration by a third reviewer. The study that was written by one reviewer was assessed by the other reviewer and by another uninvolved assessor.

The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Quantitative data were extracted by one reviewer. Effect sizes (ES) and 95% confidence intervals were calculated using Hedge's 'g' statistic for continuous outcome measures and Cohen's 'h' for differences in proportions. Calculation of Hedge's 'g' required calculation of the means and standard deviation for each group. In the absence of these data, ES was calculated from Z score and sample sizes. If possible ES was based on change scores. Where these were lacking, post-treatment scores were used. Power estimates for an ES of 0.2 and 0.5 were made.

The studies were combined in a narrative review.

Studies were weighted as to validity and their power levels and conclusions were based on studies that had both acceptable validity and sufficient power.

Twelve studies concerning 10 trials were included.Six RCTs satisfied at least 50% of the validity criteria. One trial did not satisfy any validity criteria. Methodological flaws included: lack of control for cointerventions; lack of intention-to-treat analysis; and insufficient information on methods used to allocate treatment, level of compliance, control for cointerventions, blinding of outcome assessment, eligibility criteria and description of interventions. Sample size and power of studies varied widely. Two studies had sufficient power (0.8 or more) to detect medium effects

(ES = 0.5) and were of acceptable validity.Most trials compared exercise therapy with either placebo therapy or no treatment.Pain: 4 different outcome measures were used. Results in the two trials with acceptable validity and sufficient power were ES (hip or knee OA) = 0.58 (95% CI: 0.54, 0.62) and ES for the other trial (knee OA only) = 0.47 (95% CI: 0.44, 0.50) for aerobic exercise and ES = 0.31 (95% CI: 0.28, 0.34) for resistance exercise. In both trials, subjects had radiographic evidence of mild to moderate OA. Conflicting results were noted in the other 4 trials, with one favouring exercise, one reporting ES of borderline significance, and 2 low validity, low power studies reporting no treatment effect. Evidence indicates that exercise therapy has a small to moderate beneficial effect on pain in knee OA and to a lesser extent hip OA.Self-reported disability: Three different outcome measures were used. Results in the two trials with acceptable validity and sufficient power were ES (hip or knee OA) = 0.26 (95% CI: 0.22, 0.30) and ES for the other trial (knee OA) = 0.41 (95% CI: 0.38, 0.44) for aerobic exercise and ES = 0.36 (95% CI: 0.33, 0.39) for resistance exercise. Results in the other 3 trials (all low validity and low power) were conflicting with two favouring exercise and one favouring the control therapy. Evidence indicates that exercise therapy has a small beneficial effect on self-reported disability in knee OA and to a lesser extent hip OA.Observed disability in walking: Four different outcome assessments were used. Results in the two trials with acceptable validity and sufficient power were ES (hip or knee OA) = 0.28 (95% CI: 0.24,0.32) and ES for the other trial (knee OA) = 0.89 (95% CI: 0.85, 0.93) for aerobic exercise and ES = 0.31 (95% CI: 0.28, 0.34) for resistance exercise. Results in the other two studies were conflicting with one (acceptable validity, low power) favouring the control intervention and the other (low validity, low power) trial favouring exercise. Exercise has a small beneficial effect on walking performance.Patient's global assessment of effect: Exercise has a medium to great beneficial effect according to one trial with acceptable validity and sufficient power reported ES (hip or knee OA) = 0.64 (95% CI: 0.60, 0.68). The other trial reporting this outcome (acceptable validity, low power) also favoured exercise.Comparisons between different exercise therapy: None of the 4 trials comparing interventions had both acceptable validity and high power. No evidence was available in favour of one particular type of exercise programme.

There is evidence of short-term beneficial effects of exercise therapy in patients with mild to moderate OA of the knee and, to a lesser extent, the hip. However, the small number of good studies restricts drawing firm conclusions.

The aims and inclusion criteria were stated. No language restrictions were applied to primary studies. Methodology was rigorously assessed and results from this assessment presented. Methods used to assess validity and data extraction were described. Given the heterogeneity among studies, a narrative review was appropriate. The discussion included consideration of the following limitations of the review: conclusions based on small numbers; only two RCTs had an acceptable validity score as well as sufficient power; limited number of studies assessed observed disability and patient's global assessment of effect; a number of different instruments were used to assess outcome measures; hardly any information was available on the long-term effects of exercise therapy; effectiveness of exercise therapy in patients with hip OA has hardly been studied; insufficient evidence was available to draw conclusions on the optimal content of an exercise therapy intervention; major threats to validity were present in the included studies such as lack of blinding of outcome assessors, absence of information on adherence to intervention, the quality of the outcome assessment instrument was not assessed, insufficient data was presented to calculate effect size, and intervention groups not comparable at baseline.More comprehensive details

	of the literature search such as keywords employed would have been helpful as would fuller details of the characteristics of participants. Only published studies were included leaving the review open to publication bias. Only one reviewer extracted quantitative data.The authors' conclusions are supported by the evidence presented. Practice: The authors consider that exercise therapy may be recommended for patient with OA of the knee and also for patients with OA of the hip with a mild to moderate stage of disease.Research: The authors consider that clinical trials are needed to study the long-term effectiveness of exercise therapy and the effectiveness of exercise therapy in patient with hip OA. Future studies should attend to the following: sufficient sample size; adherence to exercise therapy; controls for cointerventions; blinded outcome assessment; an adequate data analysis including an intention to treat analysis; and the incorporation of a standard set of outcome measures (see Other Publications of Related Interest).
47	Waller B, Ogonowska-Slodownik A, Vitor M, Lambeck J, Daly D, Kujala UM, et al. **Effect of therapeutic aquatic exercise on symptoms and function associated with lower limb osteoarthritis: a systematic review with meta-analysis**. Physical Therapy 2014:epub. Abstract: BACKGROUND: Current management of osteoarthritis (OA) focuses on pain control and maintaining physical function through pharmacological, nonpharmacological, and surgical treatments. Exercise, including therapeutic aquatic exercise (TAE), is considered one of the most important management options. Nevertheless, there is no up-to-date systematic review describing the effect of TAE on symptoms and function associated with lower limb OA. PURPOSE: The purpose of this study was to conduct a systematic review with meta-analysis to determine the effect of TAE on symptoms and function associated with lower limb OA. DATA SOURCES: The data sources used in this study were: MEDLINE, PubMed, EMBASE, CINAHL, PEDro, and SPORTDiscus. STUDY SELECTION: All studies selected for review were randomized controlled trials with an aquatic exercise group and a nontreatment control group. In total, 11 studies fulfilled the inclusion criteria and were included in the synthesis and meta-analysis. DATA EXTRACTION: Data were extracted and checked for accuracy by 3 independent reviewers. DATA SYNTHESIS: Standardized mean difference (SMD) with 95% confidence interval (95% CI) was calculated for all outcomes. The meta-analysis showed a significant TAE effect on pain (SMD=0.26 [95% CI=0.11, 0.41]), self-reported function (SMD=0.30 [95% CI=0.18, 0.43]), and physical functioning (SMD=0.22 [95% CI=0.07, 0.38]). Additionally, a significant effect was seen on stiffness (SMD=0.20 [95% CI=0.03, 0.36]) and quality of life (SMD=0.24 [95% CI=0.04, 0.45]). LIMITATIONS: Heterogeneity of outcome measures and small sample sizes for many of the included trials imply that conclusions based on these results should be made with caution. CONCLUSIONS: The results indicate that TAE is effective in managing symptoms associated with lower limb OA.
48	Wang SY, Olson-Kellogg B, Shamliyan TA, Choi JY, Ramakrishnan R, Kane RL. **Physical therapy interventions for knee pain secondary to osteoarthritis: A systematic review**. Annals of Internal Medicine 2012;157(9):632-644.

	Abstract: Background: Osteoarthritis is a leading cause of disability. Nonsurgical treatment is a key first step. Purpose: Systematic literature review of physical therapy (PT) interventions for community-dwelling adults with knee osteoarthritis. Data Sources: MEDLINE, the Cochrane Library, the Physiotherapy Evidence Database, Scirus, Allied and Complementary Medicine, and the Health and Psychosocial Instruments bibliography database. Study Selection: 193 randomized, controlled trials (RCTs) published in English from 1970 to 29 February 2012. Data Extraction: Means of outcomes, PT interventions, and risk of bias were extracted to pool standardized mean differences. Disagreements between reviewers abstracting and checking data were resolved through discussion. Data Synthesis: Meta-analyses of 84 RCTs provided evidence for 13 PT interventions on pain (58 RCTs), physical function (36 RCTs), and disability (29 RCTs). Meta-analyses provided low-strength evidence that aerobic (11 RCTs) and aquatic (3 RCTs) exercise improved disability and that aerobic exercise (19 RCTs), strengthening exercise (17 RCTs), and ultrasonography (6 RCTs) reduced pain and improved function. Several individual RCTs demonstrated clinically important improvements in pain and disability with aerobic exercise. Other PT interventions demonstrated no sustained benefit. Individual RCTs showed similar benefits with aerobic, aquatic, and strengthening exercise. Adverse events were uncommon and did not deter participants from continuing treatment. Limitation: Variability in PT interventions and outcomes measures hampered synthesis of evidence. Conclusion: Low-strength evidence suggested that only a few PT interventions were effective. Future studies should compare combined PT interventions (which is how PT is generally administered for pain associated with knee osteoarthritis). Primary Funding Source: Agency for Healthcare Research and Quality. 2012 American College of Physicians.
49	White L. **Aquatic physiotherapy for management of hip osteoarthritis: A literature review**. Aqualines-Newsletter of the Hydrotherapy Ass of Chartered Physiotherapists 2012;24(1):9-17. Abstract: Objective: To search the literature for evidence of aquatic physiotherapy effectiveness in hip osteoarthritis management. Background: Osteoarthritis prevalence is on the increase. Aquatic physiotherapy is widely thought of by physiotherapists as a beneficial treatment option for patients with osteoarthritis. Exercise is also recommended for management of hip osteoarthritis. Few studies have researched solely hip osteoarthritis and its management. Search Strategy: A systematic search of CINHAL, Cochrane Database of Systematic Reviews, Medline, PEDro and PubMed databases for aquatic physiotherapy and management of hip osteoarthritis. Selection Criteria: Clinical studies involving hip osteoarthritis and its management using aquatic physiotherapy. Results: Nine articles meet the selection criteria. These consisted of eight randomised controlled trials (RCT's) and one quasi-experimental designed study. Of the eight RCT's, three researched the effect of hydrotherapy on hip osteoarthritis and the remaining five investigated hip and knee osteoarthritis and hydrotherapy. The quasi- experimental study focused solely on hip osteoarthritis and hydrotherapy. Conclusion: Based on the current literature aquatic physiotherapy has potential benefits for pain reduction and increased function, however further research is needed to establish if it is an optimal treatment choice for hip osteoarthritis.
Personer med artrose utgjør dessuten deler av populasjonen i oversiktene 1,6, 8 og 10.	

Ryggplager (8 oversikter)	
50	Barone D, Gangaway JMK. **Aquatic physical therapy for low back pain: what are the outcomes?** Journal of Aquatic Physical Therapy 2007;15(2):18-24. Abstract: Background: APT (APT) is a pool based treatment program developed to take advantage of the properties of water in order to reduce stress on the joints and muscles by reducing the effects of gravity on the body. APT generally benefits those with low back pain (LBP). The warm water reduces muscle tone and pain, and the buoyancy reduces joint compressive forces associated with land-based treatment. Purpose: The purpose of this literature review is to assess the available literature related to aquatic PT treatment of patients with orthopedic LBP tp find available evidence, and identify areas of future exploration. Method: A systematic review of available and relevant articles was conducted using main databases including Pubmed, Pedro, Cochrane, and CINAHL. Results: Overall, aquatic PT has been found to allow for early initiation of exercise and a shorter rehabilitation period. The articles reviewed have also found that aquatic therapy reduces pain, increases the quality of life and functional mobility, and increases range of motion (ROM) and strength in patients with low back injuries.
51	Bender T, Balint G, Prohaszka Z, Geher P, Tefner IK. **Evidence-based hydro- and balneotherapy in Hungary-a systematic review and meta-analysis**. International Journal of Biometeorology 2014;58(3):311-323. Abstract: Balneotherapy is appreciated as a traditional treatment modality in medicine. Hungary is rich in thermal mineral waters. Balneotherapy has been in extensive use for centuries and its effects have been studied in detail. Here, we present a systematic review and meta-analysis of clinical trials conducted with Hungarian thermal mineral waters, the findings of which have been published by Hungarian authors in English. The 122 studies identified in different databases include 18 clinical trials. Five of these evaluated the effect of hydro- and balneotherapy on chronic low back pain, four on osteoarthritis of the knee, and two on osteoarthritis of the hand. One of the remaining seven trials evaluated balneotherapy in chronic inflammatory pelvic diseases, while six studies explored its effect on various laboratory parameters. Out of the 18 studies, 9 met the predefined criteria for meta-analysis. The results confirmed the beneficial effect of balneotherapy on pain with weight bearing and at rest in patients with degenerative joint and spinal diseases. A similar effect has been found in chronic pelvic inflammatory disease. The review also revealed that balneotherapy has some beneficial effects on antioxidant status, and on metabolic and inflammatory parameters. Based on the results, we conclude that balneotherapy with Hungarian thermal-mineral waters is an effective remedy for lower back pain, as well as for knee and hand osteoarthritis.
52	Hettinga D, Jackson A, Moffett J, May S, Mercer C, Woby S. **A systematic review and synthesis of higher quality evidence of the effectiveness of exercise interventions for non-specific low back pain of at least 6 weeks' duration**. Physical Therapy Reviews 2007;12(3):221-232.

	Abstract: Systematic reviews and randomised controlled trials (RCTs) generally support the use of exercise interventions to reduce pain and improve function in patients with chronic non-specific low back pain (LBP). However, many RCTs in the field of LBP include small numbers of subjects, have significant methodological limitations and use diverse exercise interventions. This review shows that the smaller RCTs often overestimate the true effectiveness or fail to detect true benefits. Also, statistically significant results from RCTs of low methodological quality might not be valid. This review showed that evidence from RCTs that are larger (>/= 40 subjects in exercise group), score high on the adapted van Tulder methodological quality criteria (>/= 5/10) and have used adequate statistical tests, support the use of exercise for patients with LBP of at least 6 weeks' duration, although the effect sizes tend to be smaller. This higher quality evidence particularly supports the use of strengthening exercises, (organised) aerobic exercises, general exercises, hydrotherapy and McKenzie exercises for back pain of at least 6 weeks' duration.
53	Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJEM, Ostelo RWJG, Guzman J, et al. **Multidisciplinary biopsychosocial rehabilitation for chronic low back pain**. Cochrane Database of Systematic Reviews 2014 (9):CD000963. Abstract: Background: Low back pain (LBP) is responsible for considerable personal suffering worldwide. Those with persistent disabling symptoms also contribute to substantial costs to society via healthcare expenditure and reduced work productivity. While there are many treatment options, none are universally endorsed. The idea that chronic LBP is a condition best understood with reference to an interaction of physical, psychological and social influences, the 'biopsychosocial model', has received increasing acceptance. This has led to the development of multidisciplinary biopsychosocial rehabilitation (MBR) programs that target factors from the different domains, administered by healthcare professionals from different backgrounds.Objectives: To review the evidence on the effectiveness of MBR for patients with chronic LBP. The focus was on comparisons with usual care and with physical treatments measuring outcomes of pain, disability and work status, particularly in the long term.Search methods: We searched the CENTRAL, MEDLINE, EMBASE, PsycINFO and CINAHL databases in January and March 2014 together with carrying out handsearches of the reference lists of included and related studies, forward citation tracking of included studies and screening of studies excluded in the previous version of this review.Selection criteria: All studies identified in the searches were screened independently by two review authors; disagreements regarding inclusion were resolved by consensus. The inclusion criteria were published randomised controlled trials (RCTs) that included adults with non-specific LBP of longer than 12 weeks duration; the index intervention targeted at least two of physical, psychological and social or work-related factors; and the index intervention was delivered by clinicians from at least two different professional backgrounds.Data collection and analysis: Two review authors extracted and checked information to describe the included studies, assessed risk of bias and performed the analyses. We used the Cochrane risk of bias tool to describe the methodological quality. The primary outcomes were pain, disability and work status, divided into the short, medium and long term. Secondary outcomes were psychological functioning (for example depression, anxiety, catastrophising), healthcare service utilisation, quality of life and adverse events. We categorised the control interventions as usual care, physical treatment, surgery, or wait list for surgery in separate meta-analyses. The first two compari-

	sons formed our primary focus. We performed meta-analyses using random-effects models and assessed the quality of evidence using the GRADE method. We performed sensitivity analyses to assess the influence of the methodological quality, and subgroup analyses to investigate the influence of baseline symptom severity and intervention intensity.Main results: From 6168 studies identified in the searches, 41 RCTs with a total of 6858 participants were included. Methodological quality ratings ranged from 1 to 9 out 12, and 13 of the 41 included studies were assessed as low risk of bias. Pooled estimates from 16 RCTs provided moderate to low quality evidence that MBR is more effective than usual care in reducing pain and disability, with standardised mean differences (SMDs) in the long term of 0.21 (95% CI 0.04 to 0.37) and 0.23 (95% CI 0.06 to 0.4) respectively. The range across all time points equated to approximately 0.5 to 1.4 units on a 0 to 10 numerical rating scale for pain and 1.4 to 2.5 points on the Roland Morris disability scale (0 to 24). There was moderate to low quality evidence of no difference on work outcomes (odds ratio (OR) at long term 1.04, 95% CI 0.73 to 1.47). Pooled estimates from 19 RCTs provided moderate to low quality evidence that MBR was more effective than physical treatment for pain and disability with SMDs in the long term of 0.51 (95% CI -0.01 to 1.04) and 0.68 (95% CI 0.16 to 1.19) respectively. Across all time points this translated to approximately 0.6 to 1.2 units on the pain scale and 1.2 to 4.0 points n the Roland Morris scale. There was moderate to low quality evidence of an effect on work outcomes (OR at long term 1.87, 95% CI 1.39 to 2.53). There was insufficient evidence to assess whether MBR interventions were associated with more adverse events than usual care or physical interventions.Sensitivity analyses did not suggest that the pooled estimates were unduly influenced by the results from low quality studies. Subgroup analyses were inconclusive regarding the influence of baseline symptom severity and intervention intensity.Authors' conclusions: Patients with chronic LBP receiving MBR are likely to experience less pain and disability than those receiving usual care or a physical treatment. MBR also has a positive influence on work status compared to physical treatment. Effects are of a modest magnitude and should be balanced against the time and resource requirements of MBR programs. More intensive interventions were not responsible for effects that were substantially different to those of less intensive interventions. While we were not able to determine if symptom intensity at presentation influenced the likelihood of success, it seems appropriate that only those people with indicators of significant psychosocial impact are referred to MBR.
54	Lewis A, Morris M, Walsh C. **Are physiotherapy exercises effective in reducing chronic low back pain?** Physical Therapy Reviews 2008;13(1):37-44. Abstract: The purpose of this systematic review was to evaluate the literature on the effectiveness of physiotherapy exercises in reducing chronic low back pain (CLBP). A systematic search of the medical databases was performed, with 64 articles retrieved. After the exclusion criteria were applied, 15 randomised controlled trials (RCTs) evaluating physiotherapy delivered exercise programmes to patients with CLBP remained. A methodological quality assessment was performed, showing the included studies to have medium to high quality. Prescribed physiotherapy exercises included general fitness and aerobic exercises, flexibility regimes, stretches, muscle strengthening and spinal stabilising exercises. These interventions were compared with each other as well as surgical stabilisation, yoga, hydrotherapy, back car education booklets and placebo groups. Overall, physiotherapy prescribed exercise programmes were found to be effective

	in reducing pain in patients with CLBP. However, there was no consensus on a specific technique or exercise format being consistently superior to other interventions.
55	Liddle SD, Baxter GD, Gracey JH. **Exercise and chronic low back pain: what works?** Pain 2004;107(1-2):176-190. Abstract: To investigate the type and quality of exercise interventions offered to patients with chronic low-back pain (CLBP), and to identify characteristics essential to achieve and maintain successful results. Studies using exercise, either alone or in combination, as the primary intervention were eligible for inclusion in the review. Studies conducted with male or female patients aged 16 to 74 years were eligible for inclusion. Trials including patients with spondylosis or spondylolisthesis were eligible only if the degree of slip was two or less. Trials were ineligible if they included patients with fibromyalgia or patients with possible serious spinal pathology. Studies were eligible for inclusion if they evaluated at least three of the five relevant outcomes: back-specific function, generic health status, pain, work disability and satisfaction with care or treatment outcome. Only randomised controlled trials (RCTs) with at least 10 patients per treatment group were eligible for inclusion. Studies were excluded from the review if they used the alternate allocation method of randomisation, or were of a low methodological quality (see On What Criteria was the Validity of Primary Studies...). MEDLINE, CINAHL, ProQuest, PEDro, ISI Web of Science, the Cochrane CENTRAL Register and PubMed were searched from 1990 to 2002 for studies in English and other languages; the search terms were reported. The reference lists of trials, review articles and meta-analyses were checked, and relevant journals were searched manually. The authors used quality criteria scales designed in 1997 by van Tulder, as recommended by the Cochrane Collaboration Back Review Group for Spinal Disorders. After slight adaptation, 10 items assessed internal validity, six assessed descriptive quality and two assessed statistical validity, giving a maximum score of 18 points. Trials were considered to be of high quality if they met at least 70% of the total methodological criteria and attained an internal validity score of at least 6 out of 10. Medium-quality trials met at least 50% of the methodological criteria and had an internal validity score of at least 5 out of 10. Low-quality trials also met at least 50% of the methodological criteria but had an internal validity score of less than 5. Trials of low methodological quality were then excluded from the review. Two reviewers independently assessed the methodological quality of the studies. One was blinded to the authors, institution and journal, and the other performed the literature search. Any disagreements were resolved by consensus with a third reviewer. The authors did not state how the papers were selected for the review, or how many reviewers performed the selection. The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.Data were extracted on the type of exercise intervention, using the broad categories of strengthening/flexibility, aerobic/strengthening, aerobic, multimodal, hydrotherapy, and other exercise. The quality of the exercise intervention was also extracted using

	the American College of Sports Medicine guidelines for exercise dose. Information on the supervision, compliance and follow-up in each trial were also extracted, and the effectiveness of the intervention was collected. An intervention was considered to be positive if there was a significant difference (P<0.05) before and after treatment. Studies deemed to be of a high or medium methodological quality were combined in a narrative. The studies were grouped according to the predominant exercise administered as the intervention and the type of strengthening exercise. The differences between the studies were also assessed through tabulation of the results. The results from those trials with low methodological quality were also taken into account, to determine whether trial quality correlated with treatment outcome. A total of 51 RCTs met the inclusion criteria and were scored for methodological quality. Of these, 21 were excluded because of low methodological quality and 14 were excluded for other reasons; these reasons were not reported, but are available from the authors. Therefore, a total of 16 RCTs with 1,730 participants were included in the review. The median sizes of the control and intervention groups were 42 and 43, respectively.Exercise was found to have a positive impact in all of the 16 RCTs, and the positive effects were generally maintained at follow-up. Nine of these RCTs (56%) reported a positive difference between the treatment groups, while the remaining 7 RCTs (44%) reported no difference between treatment groups. It was noted that trials that used a waiting-list, advice or electrotherapy as a control group reported more positive effects between the treatment groups. Those trials reporting no differences between treatment groups more commonly used an exercise-based control group. Of the 21 trials of low methodological quality that were excluded, 17 (81%) reported positive effects between the treatment groups.A total of 12 RCTs used predominantly strengthening exercise interventions, two thirds of which were of high exercise quality, and 10 of these 12 RCTs maintained positive results at follow-up. It was found that a wide variety of outcome measures were used in the trials. Supervision and adequate compliance were common. The main shortcomings of the RCTs were a lack of patient blinding, a lack of relevant outcome measures, unacceptable levels of drop-out (greater than 10%) and no intention-to-treat analysis. Exercise had a positive effect on patients with CLBP, and these positive effects were generally well maintained at follow-up. The review question was clear in terms of the intervention, study designs, patients and outcomes of interest. Several relevant electronic databases, reference lists and journals were searched. The search strategies were reported and no language restrictions were applied. However, unpublished studies were not sought and the potential for publication bias was not evaluated. It was not reported how the studies were selected for inclusion in the review or how the data extraction was performed; this means that errors and reviewer bias may be present. Adequate details of the individual studies were presented.A thorough assessment of the quality of the included studies was performed. The conclusions were based on the studies deemed to be of high or medium methodological quality; a narrative synthesis of these studies was presented, which seemed appropriate given the nature of the data. The authors' conclusions seem to follow logically from the evidence presented, although there was a potential for publication bias. Practice: The authors did not state any implications for practice.Research: More high-quality trials, using more appropriate outcome measures, are needed to assess the role of supervision and follow-up.

56	Pengel HM, Maher CG, Refshauge KM. **Systematic review of conservative interventions for subacute low back pain**. Pain Reviews 2002;9(3/4):153-163. Abstract: Objective: To evaluate the effect of conservative interventions on clinically relevant outcome measures for patients with subacute low back pain. This is particularly important because effective treatment for subacute low back pain will prevent the transition to chronic low back pain, a condition that is largely responsible for the high health care costs of low back pain. Design: Systematic review of randomized controlled trials. Main outcome measures: Methodological quality of each trial was assessed. Effect sizes and 95% confidence intervals were calculated for pain and disability and risk ratios for return to work. Results: Thirteen trials were located, evaluating the following interventions: manipulation, back school, exercise, advice, transcutaneous electrical nerve stimulation (TENS), hydrotherapy, massage, corset, cognitive behavioural treatment and co-ordination of primary health care. Most studies were of low quality and did not show a statistically significant effect of intervention. For the strict duration of low back pain (six weeks to three months), no evidence of high internal validity was found but when other methodological criteria were considered, evidence was found for the efficacy of advice. Furthermore, there is evidence that when a broader view is taken of the duration of subacute low back pain (seven days to six months), other treatments (e.g.manipulation, exercise, TENS) may be effective. Conclusions: Our review identified a major gap in the evidence for interventions that are currently recommended in clinical practice guidelines for the treatment of subacute low back pain. Lack of a uniform definition of subacute low back pain further limited current evidence.
57	Waller B, Lambeck J, Daly D. **Therapeutic aquatic exercise in the treatment of low back pain: a systematic review**. Clinical Rehabilitation 2009;23(1):3-14. Abstract: To evaluate the effectiveness of therapeutic aquatic exercise for the treatment of low back pain. PEDro, CINAHL, PUBMED, Cochrane Central Register of Controlled Trials (CENTRAL) and SPORTDiscus databases were searched to July 2007 for articles published in English. Search terms were reported. Reference lists of retrieved articles were scanned for additional articles. Validity was assessed using the PEDro scale to evaluate randomisation, blinding and follow-up. Dichotomous responses to 10 criteria within the PEDro scale were added together to give a total score of between 0 and 10. Studies that scored 6 or more points were considered to be of high methodological quality; those that scored less than 6 points were considered to be of low methodological quality. Studies were further assessed using the SIGN 50 assessment. Studies were classified into three categories: low bias where all or most criteria were fulfilled; moderate bias where some criteria were fulfilled; and high bias where few or no criteria were fulfilled. The authors did not state how many reviewers assessed validity. Data were extracted from individual studies on differences in pain scores between baseline and follow-up and between intervention and control groups. Extracted data were used to calculate standardised mean difference (MD) and 95% confidence intervals (CIs). The authors did not state how many reviewers extracted data. Seven trials (n=1,007) were included in the review. Methodological quality was considered low

	(one trial scored 6 points, one scored 5 points, two scored 4 points and three scored 2 points on the PEDro scale). Three trials reported adequate randomisation techniques; two reported quasi-randomisation techniques; the other two did not report the method of randomisation. No trials reported blinding of patients, one trial reported blinding of therapist and three trials reported blinding of outcome assessors. No trials conducted intention-to-treat analysis. Sample sizes ranged from 30 to 390. In two trials of pregnant women (n=719), the aquatic exercise group reported a reduction in pain (p=0.03 and p=0.04) and a reduction in the number of sick days related to low back pain (p=0.09 and p=0.03) compared to control groups. The remaining five trials (n=288) reported no statistically significant differences in effect between therapeutic aquatic exercise groups and control groups for pain scores. No studies reported negative effects on low-back pain due to therapeutic aquatic exercise. There was evidence to suggest that therapeutic aquatic exercise had a potentially beneficial effect for patients who experienced chronic low-back pain and pregnancy-related low-back pain. The review question was clear with explicit inclusion criteria. Several relevant databases were searched. The authors included only studies published in English, which may have resulted in loss of some relevant data. Validity was assessed using published criteria and the results of the assessment were reported. The potential for reviewer error and bias in the review process could not be assessed as the methods used to select studies for inclusion, extract data and assess validity were unclear. A narrative synthesis was appropriate given differences between studies in terms of interventions, participants and outcomes. In general, sample sizes were small (particularly when studies of pregnant women were excluded) and studies were of poor methodological quality. The reliability of the authors' cautious conclusion is uncertain due to the potential for language bias, poor-quality studies and a lack of reporting of review methods. Practice: The authors did not state any implications for practice.Research: The authors stated that further methodologically robust research in a clinical setting was needed to substantiate use of therapeutic aquatic exercise for treatment of chronic low-back pain.
Personer med ryggplager utgjør dessuten deler av populasjonen i oversiktene 1, 6 og 8 .	

Muskelskjelettlidelser (utenom artrose, fibromyalgi, revmatiske lidelser og ryggplager) (5 oversikter)	
58	Barker AL, Talevski J, Morello RT, Brand CA, Rahmann AE, Urquhart DM. **Effectiveness of Aquatic Exercise for Musculoskeletal Conditions: A Meta-Analysis**. Archives of Physical Medicine & Rehabilitation 2014;95(9):1776-1786. Abstract: Objective To investigate the effectiveness of aquatic exercise in the management of musculoskeletal conditions. Data Sources A systematic review was conducted using Ovid MEDLINE, Cumulative Index to Nursing and Allied Health Literature, Embase, and The Cochrane Central Register of Controlled Trials from earliest record to May 2013. Study Selection We searched for randomized controlled trials (RCTs) and quasi-RCTs evaluating aquatic exercise for adults with musculoskeletal conditions compared with no exercise or land-based exercise. Outcomes of interest were pain, physical function, and quality of life. The electronic search identified 1199 potential studies. Of these, 1136 studies were excluded based on title and abstract. A further 36 studies were excluded after full text review, and the remaining 26 studies were included in this review.

	Data Extraction Two reviewers independently extracted demographic data and intervention characteristics from included trials. Outcome data, including mean scores and SDs, were also extracted. Data Synthesis The Physiotherapy Evidence Database (PEDro) Scale identified 20 studies with high methodologic quality (PEDro score ≥6). Compared with no exercise, aquatic exercise achieved moderate improvements in pain (standardized mean difference [SMD]=−.37; 95% confidence interval [CI], −.56 to −.18), physical function (SMD=.32; 95% CI, .13–.51), and quality of life (SMD=.39; 95% CI, .06–.73). No significant differences were observed between the effects of aquatic and land-based exercise on pain (SMD=−.11; 95% CI, −.27 to .04), physical function (SMD=−.03; 95% CI, −.19 to .12), or quality of life (SMD=−.10; 95% CI, −.29 to .09). Conclusions The evidence suggests that aquatic exercise has moderate beneficial effects on pain, physical function, and quality of life in adults with musculoskeletal conditions. These benefits appear comparable across conditions and with those achieved with land-based exercise. Further research is needed to understand the characteristics of aquatic exercise programs that provide the most benefit.
59	Button K, Iqbal AS, Letchford RH, Deursen RW. **Clinical effectiveness of knee rehabilitation techniques and implications for a self-care treatment model**. Physiotherapy 2012;98(4):287-299. Abstract: BACKGROUND: Physiotherapy is a complex intervention frequently recommended for knee conditions. The International Classification of Functioning and Disability (ICF) can be used as a framework to evaluate evidence to develop care models and clinical guidelines. OBJECTIVE: To evaluate the clinical effectiveness of knee rehabilitation modalities categorised according to the ICF domains. DATA SOURCES: A keyword search of Medline, Cinahl, Amed, Embase and Cochrane databases from 1996 to 2010 using terms related to the knee joint and physiotherapeutic interventions. STUDY SELECTION: Reviewer assessment using inclusion/exclusion criteria and a quality assessment tool compiled from the Critical Appraisal Skills Programme Tool, Consort and Cochrane Bone Joint and Muscle Trauma Groups. DATA EXTRACTION: Information about the research design, intervention and subjects was extracted. Outcome measures and findings were categorised according to ICF domains. DATA SYNTHESIS: The majority of studies evaluated exercise. Findings were supportive but specific recommendations were limited due to variations in content and application. There was limited quality research to support the theory that manual therapy, electrotherapy or taping in isolation contributes to recovery. Multimodality physiotherapy programmes were found to be beneficial and to reflect clinical practice, but the effectiveness of each component is unknown. Outcome measures from the participation domain of the ICF were used least frequently and were not generally true measures of participation. CONCLUSION: Development of participation outcome measures is required to evaluate the long-term benefits of interventions. Rehabilitation should be based around delivery of effective exercise programmes incorporating participation outcomes to provide feedback and complement self-care for knee conditions.
60	Fappiano M, Gangaway JMK. **Aquatic physical therapy improves joint mobility, strength, and**

	edema in lower extremity orthopedic injuries. Journal of Aquatic Physical Therapy 2008;16(1):10-15. Abstract: Background: Aquatic exercise programs can incorporate large muscle activity in the lower extremities with full range of motion and minimal joint stress, and result in fewer musculoskeletal injuries. Purpose: The purposes of this literature review were to review available aquatic therapy literature in treating orthopedic lower extremity injuries and to identify gaps in the current body of knowledge to determine further research needs. Methods: Relevant articles were searched on main databases. All articles were then reviewed, standardized by title, author, journal, year, subject number and characteristics, purpose and type of study, methods, results, and limitations, and analyzed. Results: The articles evaluated demonstrated that aquatic physical therapy is beneficial in reducing pain and increasing quality of life, range of motion, joint extensibility, and strength. The studies also reported water and land based interventions used together are more effective in treating lower extremity injuries than land based interventions alone.
61	Hall J, Swinkels A, Briddon J, McCabe CS. **Does aquatic exercise relieve pain in adults with neurologic or musculoskeletal disease: a systematic review and meta-analysis of randomized controlled trials**. Archives of Physical Medicine and Rehabilitation 2008;89(5):873-883. Abstract: To assess the effectiveness of aquatic exercise in relieving pain in adults with neurologic or musculoskeletal disease. Fourteen databases including MEDLINE, AMED, EMBASE, SportDiscus, PEDro, CINAHL, ASSIA and The Cochrane Library were searched for the period January 1980 to June 2006 for English-language articles (search terms were reported). The reference lists of retrieved articles and relevant reviews were also searched. Two reviewers independently assessed study quality using the criteria for RCTs recommended by the Scottish Intercollegiate Guidelines Network (SIGN 50). Criteria assessed included randomisation, allocation concealment, blinding and similarity of groups at baseline. Studies were given an overall rating for risk of bias as low, moderate or high. The standardised mean difference (SMD) was calculated for subjective pain outcome. The authors did not state how many reviewers performed the data extraction. Nineteen studies (717 participants) were included. Sample sizes ranged from 14 to 312. Five studies were classified as high quality, three of moderate quality and 11 of low quality. Nine studies compared aquatic exercise to no treatment. Three studies were of sufficient quality and had appropriate data to include in the meta-analysis. There was a small but statistically significant reduction in pain levels in favour of aquatic exercise (SMD -0.17; 95% CI, -0.33, 0.01, p=0.04). Overall results of the nine studies were not consistent.Ten studies compared aquatic exercise to land exercise. Two studies were of sufficient quality and had appropriate data to included in the meta-analysis. There was no difference between the two interventions in pain outcome (SMD 0.11; 95% CI, -0.27, 0.50, p=0.56); all but one of the remaining studies were consistent with this finding. The authors stated that the statistical tests for heterogeneity were not significant for these analyses. Two studies compared aquatic exercise to immersion (one study was low quality). Neither study found a difference between the two interventions in pain outcome.

	Aquatic exercise had a small pain-relieving effect compared to no treatment, but there was insufficient evidence to draw firm conclusions. There was sound evidence that there are no differences in the pain-relieving effects of aquatic versus land exercise. This review had a clearly stated review question and searched an appropriate range of databases, although the inclusion of only non-English language papers introduces the risk of publication bias. Study quality was assessed. Appropriate measures were used to minimise the risk of error and bias in study selection and quality assessment, although it was unclear whether this was also the case for data extraction. Appropriate details from the included studies were reported. Differences between studies were discussed. The synthesis was appropriate, but the exclusion of studies based on quality means that only a small proportion of the available studies were included in the quantitative synthesis. There was no evidence of statistical heterogeneity, but the authors appropriately highlighted the clinical variability in the studies. Overall the authors' conclusions were appropriate and likely to be reliable, but given that the comparison of aquatic and land exercise is based on only two studies in a meta-analysis the conclusion regarding this comparator is arguably overstated. Practice: the authors did not state any implications for practice.Research: good quality RCTs were required to establish optimal combinations of exercise type and duration, water temperature and depth, and service delivery for diverse populations. Future systematic reviews should consider incorporating evaluations of pain behaviour and cognitive coping strategies.
62	Honda T, Kamioka H. **Curative and health enhancement effects of aquatic exercise: evidence based on interventional studies**. Open Access Journal of Sports Medicine 2012;3:27-34. Abstract: BACKGROUND: The purpose of this study was to report on the health benefits and curative effects of aquatic exercise. METHODS: We adopted the results of high-grade study designs (ie, randomized controlled trials and nonrandomized controlled trials), for which there were many studies on aquatic exercise. Aquatic exercise, in this study, means walking in all directions, stretching, and various exercises and conditioning performed with the feet grounded on the floor of a swimming pool. We excluded swimming. We decided to treat aquatic exercise, underwater exercise, hydrotherapy, and pool exercise as all having the same meaning. RESULTS: Aquatic exercise had significant effects on pain relief and related outcome measurements for locomotor diseases. CONCLUSION: Patients may become more active, and improve their quality of life, as a result of aquatic exercise.
Personer med muskelskjelettlidelser (foruten artrose, fibromyalgi, revmatiske lidelser og ryggplager) utgjør dessuten deler av populasjonen i oversiktene 1, 2, 8, 32, 35 og 37.	

Vedlegg 3 Ekskluderte enkeltstudier knyttet til spørsmål 1

	Ekskludert på grunn av studiedesign
1.	Banwell B, Essert M, Conley J. Joint aquatics: Aquatic exercise and therapy for rheumatic disease. Arthritis and Rheumatism 1996;39(9):W13-W13.
2.	Chetlin RD, Palermo L, Hobbs G, Sherlock L. The Effects of Combined Aquatic and Occupational Therapies in Older Adults with Osteoarthritis. Medicine and Science in Sports and Exercise 2013;45(5):644-644.
3.	LeFort SM, Hannah TE. Return to work following an aquafitness and muscle strengthening program for the low back injured. Archives of Physical Medicine and Rehabilitation 1994;75(11):1247-1255.
4.	Lineker SC, Badley EM, Hawker G, Wilkins A. Determining sensitivity to change in outcome measures used to evaluate hydrotherapy exercise programs for people with rheumatic diseases. Arthritis Care and Research 2000;13(1):62-65.
5.	Mannerkorpi K, Ahlmen M, Ekdahl C. Six- and 24-month follow-up of pool exercise therapy and education for patients with fibromyalgia. Scandinavian Journal of Rheumatology 2002;31(5):306-310.
6.	Munguia-Izquierdo D, Legaz-Arrese A. Assessment of the Effects of Aquatic Therapy on Global Symptomatology in Patients With Fibromyalgia Syndrome: A Randomized Controlled Trial. Archives of Physical Medicine and Rehabilitation 2008;89(12):2250-2257.
7.	Nasser EH, Plautz R, Camp CJ. The effects of aquatic and land based physical therapy on the physical and emotional functioning of chronic spine pain patients. Gerontologist 2001;41:291-291.
8.	Silva KM, Tucano SJ, Kumpel C, Castro AA, Porto EF. Effect of hydrotherapy on quality of life, functional capacity and sleep quality in patients with fibromyalgia. Revista Brasileira de Reumatologia 2012;52(6):851-857.
9.	Steinsland A, Johansen J. Water exercise - A beneficiary activity led by the regional and local branches of the Norwegian rheumatism association's (NRF). Annals of the Rheumatic Diseases 2007;66:673-673.
10.	Yazigi FG, Espanha M, Silva C, Armada-da-Silva P. Aquatic Exercises Improves Pain and 6MWT in Elderly Patients with Knee Arthritis. Medicine and Science in Sports and Exercise 2010;42(5):352-352.
	Ekskludert på grunn av intervensjon
1.	Amor B, Heuleu JN, Mery C, Courtillon A. (Therapeutic approach in the rehabilitation of chronic lower back pain. Comparative study of 3 techniques of lumbar reeducation) [French]. Revue du Rhumatisme et des Maladies Osteo-Articulaires 1979 Dec;46(12):689-696 1979.
2.	Bighea AC, Patru S, Marcu IR, Popescu RS. The effectivness of combined exercises and therapeutic ultrasound to patients with knee osteoarthritis. Annals of the Rheumatic Diseases 2013;72:349-349.
3.	Bressel E, Wing J, Miller A, Dolny D. High-Intensity Interval Training on an Aquatic Treadmill: A Promising Treatment Approach for Adults with Osteoarthritis. Medicine and Science in Sports and Exercise 2013;45(5):51-51.
4.	Budisin V, Cetinic N, Belovic-Ivankovic R, Dzidic I, Skala H, Grazio S. Comparison of land-based

and water-based therapeutic exercise in patients with chronic low-back pain. Clinical and Experimental Rheumatology 2009;27(5):726-726.
5. Calandre EP, Rodriguez-Claro ML, Rico-Villademoros F, Vilchez JS, Hidalgo J, Delgado-Rodriguez A. Effects of pool-based exercise in fibromyalgia symptomatology and sleep quality: a prospective randomised comparison between stretching and Ai Chi. Clinical & Experimental Rheumatology 2009;27(5 Suppl 56):S21-28.
6. Demirel R, Ucok K, Kavuncu V, Gecici O, Evcik D, Dundar U, et al. Effects of balneotherapy with exercise in patients with low back pain. Journal of Back and Musculoskeletal Rehabilitation 2008;21(4):263-272.
7. Eversden L, Maggs F, Nightingale P, Jobanputra P. A pragmatic randomised controlled trial of hydrotherapy and land exercises on global well being for people with rheumatoid arthritis (RA). Aqualines-Newsletter of the Hydrotherapy Ass of Chartered Physiotherapists 2006;2006(1):12-13.
8. Green J, McKenna F, Chamberlain MA. Osteoarthritis of the hip - are home exercises as useful as hydrotherapy? Clinical rehabilitation 1988;2(3):253-258.
9. Helliwell PS, Abbott CA, Chamberlain M. A randomised trial of three different physiotherapy regimes in ankylosing spondylitis. Physiotherapy 1996;82(2):85-90.
10. Hinman RS, Haywood SE, Day AR. Aquatic physiotherapy for lower limb osteoarthritis: a randomised controlled trial. [abstract]. Internal medicine journal 2005;35:A95.
11. Kainz B, Gulich M, Engel EM, Jackel WH. Vergleich dreier ambulanter therapieformen zur behandlung chronischer ruckenschmerzen - - ergebnisse einer multizentrischen, clusterrandomisierten studie (Comparison of three outpatient therapy forms for treatment of chronic low back pain -- findings of a multicentre, cluster randomized study) [German]. Die Rehabilitation 2006 Apr;45(2):65-77 2006.
12. Kennedy N, Stokes E, O'Shea E, Murphy TB, Bresnihan B, Fitzgerald O. Inpatients and outpatient rehabilitation for patients with rheumatoid arthritis: a clinical and economic assessment. Journal of Medical Economics 2007;10(4):515-528 2007.
13. Kim JI, Kang HS, Choi HJ, Kim IJ. The effects of aquatic exercise program combined with the self-help course on pain, weight, body mass, self-efficacy, and quality of life in patients having osteoarthritis. Arthritis and Rheumatism 1997;40(9):1195-1195.
14. Kulisch A, Bender T, Nemeth A, Szekeres L. Effect of thermal water and adjunctive electrotherapy on chronic low back pain: A double-blind, randomized, follow-up study. Journal of Rehabilitation Medicine 2009;41(1):73-79.
15. McIlveen B, Robertson VJ. The outcomes of low back pain following hydrotherapy. Proceedngs of the 1996National Physiotherapy Congress 1996: 260-261.
16. McVeigh JG, Hurley DA, Basford JR, Sim J, Baxter D, Finch MB. Effectiveness of a combined pool-based exercise and education programme compared to usual medical care in fibromyalgia syndrome: A randomised controlled trial. Annals of the Rheumatic Diseases 2006;65:557-558.
17. Nicholls E, Ahern M, Simionato E, Bovill I. Assessment of hydrotherapy as a therapeutic modality in rheumatic diseases. Proceedings 3rd Int Physiotherapy Congress 1990.
18. O'Connor C, Shannon UD, Mc Gowan B, Whelan B, Silke C. Hydrotherapy results in reduced pain and fatigue in patients with arthritis. Irish Journal of Medical Science 2014;183:S106-S106.
19. Solak O, Dundar O, Cakir T, Babaoglu S, Toktas H, Evcik D, et al. Water-based exercise program improves balance and quality of life in postmenopausal women with osteoporosis. Calcified Tissue International 2007;80:S150-S150.
20. Stener-Victorin E, Kruse-Smidje C, Jung K. Comparison between Electro-Acupuncture and Hydrotherapy, Both in Combination with Patient Education and Patient Education Alone, on the Symptomatic Treatment of Osteoarthritis of the Hip. Clinical Journal of Pain 2004;20(3):179-185.
21. Sylvester KL. Investigation of the effect of hydrotherapy in the treatment of osteoarthritic hips. Clinical Rehabilitation 1990;4(3):223-228.
22. Tefner IK, Nemeth A, Laszlofi A, Kis T, Gyetvai G, Bender T. The effect of spa therapy in chronic low back pain: A randomized controlled, single-blind, follow-up study. Rheumatology International 2012;32(10):3163-3169.
23. White J, Hornsby J, Hornsby G, Ullrich I, Briggs P, Yeater R. A pilot study to determine the efficacy of aquatic therapy on functional outcomes in fibromyalgia. Arthritis and Rheumatism 1999;42(9):S329-S329.
24. Ozkurt S, Donmez A, Karagulle MZ, Uzunoglu E, Turan M, Erdogan N. Balneotherapy in

fibromyalgia: A single blind randomized controlled clinical study. Rheumatology International 2012;32(7):1949-1954.

Ekskludert på grunn av utfallsmål

1. Arnold CM, Busch AJ, Schachter CL, Harrison EL, Olszynski WP. A Randomized Clinical Trial of Aquatic versus Land Exercise to Improve Balance, Function, and Quality of Life in Older Women with Osteoporosis. Physiotherapy Canada 2008;60(4):296-306.
2. Assis MR, Silva LE, Alves AM, Pessanha AP, Valim V, Feldman D, et al. A randomized controlled trial of deep water running: clinical effectiveness of aquatic exercise to treat fibromyalgia. Arthritis Care & Research 2006 Feb 15;55(1):57-65 2006.
3. Assis MR, Silva LE, Alves AB, Pessanha AP, Valim V, Feldman D, et al. "Deep water running" to treat fibromyalgia - an aerobic training in a swimming pool: A randomized, controlled study. Arthritis and Rheumatism 2003;48(9):S303-S303.
4. Baena-Beato PA, Artero EG, Arroyo-Morales M, Robles-Fuentes A, Gatto-Cardia MC, Delgado-Fernandez M. Aquatic therapy improves pain, disability, quality of life, body composition and fitness in sedentary adults with chronic low back pain. A controlled clinical trial. Clinical Rehabilitation 2014;28(4):350-360.
5. Bayraktar D, Guclu-Gunduz A, Lambeck J, Yazici G, Aykol S, Demirci H. Core stability exercises: In water or on land? Comparison of the effects of two different core stabilization trainings. Annals of the Rheumatic Diseases 2013;72.
6. Bravo G, Gauthier P, Roy PM, Payette H. Effects of an aquatic exercise program in osteopenic women. Journal of the American Geriatrics Society 1996;44(9):P14-P14.
7. Cadmus L, Patrick MB, Maciejewski ML, Topolski T, Belza B, Patrick DL. Aquatic exercise and quality of life in persons with osteoarthritis. American Journal of Epidemiology 2008;167(11):S6-S6.
8. Cameron M, Andersen MB, Speed HD. Is more better? Synergistic effects of manual therapy and warm water exercise in osteoarthritis. Annals of the Rheumatic Diseases 2004;63:549-549.
9. Chaparro G, Lievense C, Gabay L, Vrongistinos K, Stecyk S, Jung T. Comparison Of Balance Outcomes Between Aquatic And Land-based Exercises In Older Adults With Knee Osteoarthritis. Medicine and Science in Sports and Exercise 2013;45(5):289-289.
10. Cochrane T, Davey RC, Edwards SMM. Randomised controlled trial of the cost-effectiveness of water-based therapy for lower limb osteoarthritis. Health Technology Assessment 2005;9(31):III-+.
11. Cuesta-Vargas AI, Garcia-Romero JC, Arroyo-Morales M, Diego-Acosta AM, Daly DJ. Exercise, manual therapy, and education with or without high-intensity deep-water running for nonspecific chronic low back pain: a pragmatic randomized controlled trial. American Journal of Physical Medicine & Rehabilitation 2011;90(7):526-534; quiz 535-528.
12. Cusack T, McAteer MF, Daly LE, McCarthy CJ. Knee osteoarthritis: A randomized controlled trial comparing hydrotherapy and continuous short-wave diathermy. Arthritis and Rheumatism 2005;52(9):S506-S506.
13. Egsmose C, Falkenberg I, Hansen GL, Helin P. Hydrotherapy in rheumatoid arthritis - effect of season on relief of symptoms. Scandinavian journal of rheumatology Supplement 1986;59:48.
14. Fransen M, Nairn L, Winstanley J, Lam P. Hydrotherapy or taichi for osteoarthritis. [abstract]. Internal medicine journal 2006;36(suppl. 2):A69.
15. Gowans SE, DeHueck A, Voss S, Silaj A, Abbey SE. Six-month and one-year followup of 23 weeks of aerobic exercise for individuals with fibromyalgia. Arthritis Care and Research 2004;51(6):890-898.
16. Gusi N, Tomas-Carus P. Cost-utility of an 8-month aquatic training for women with fibromyalgia: a randomized controlled trial. Arthritis Research & Therapy 2008;10(1):R24.
17. Handa S-i, Kamijo Y-i, Yamazaki T, Genno H, Nose H. The effects of high-intensity interval walking training with water immersion in middel-aged and older women with knee osteoarthritis. Journal of Physiological Sciences 2009;59:356-356.
18. Hansen TM, Hansen G, Langgaard AM, Rasmussen JO. Longterm physical training in rheumatoid arthritis. A randomized trial with different training programs and blinded observers. Scandinavian Journal of Rheumatology 1993;22(3):107-112 1993.
19. Jentoft ES, Kvalvik AG, Mengshoel AM. Effects of pool-based and land-based aerobic exercise on

women with fibromyalgia/chronic widespread muscle pain. Arthritis Care & Research 2001 Feb;45(1):42-47 2001.
20. Kesiktas N, Karakas S, Gun K, Gun N, Murat S, Uludag M. Balneotherapy for chronic low back pain: A randomized, controlled study. Rheumatology International 2012;32(10):3193-3199.
21. Kim IS, Chung SH, Park YJ, Kang HY. The effectiveness of an aquarobic exercise program for patients with osteoarthritis. Applied Nursing Research 2012;25(3):181-189.
22. Kostopoulos D. Comparative effects of aquatic recreational and aquatic exercise programs on mobility, pain perception, and treatment satisfaction among elderly persons with osteoarthritis of the knee. 2000(88 p).
23. Landewe RBM, Peeters R, Masek BA, Verreussel RLP, The HSG. A 12 weeks clinical-trial to the effect of hydrotherapy in a thermomineral institution compared with hydrotherapy in a hospital-exercice-bath in patients with rheumatoid-arthritis. British Journal of Rheumatology 1992;31:31-31.
24. Latorre PA, Santos MA, Heredia-Jimenez JM, Delgado-Fernandez M, Soto VM, Manas A, et al. Effect of a 24-week physical training programme (in water and on land) on pain, functional capacity, body composition and quality of life in women with fibromyalgia. Clinical and Experimental Rheumatology 2013;31(SUPPL.79):72-80.
25. Lim JY, Tchai E, Jang SN. Effectiveness of Aquatic Exercise for Obese Patients with Knee Osteoarthritis: A Randomized Controlled Trial. PM and R 2010;2(8):723-731
26. Marcu IR, Patru S, Bighea A, Popescu RS, Bumbea AM. Effect of hydrotherapy vs. Conventional land-based exercise in patients with hiparthroplasty for osteoarthritis. Osteoporosis International 2014;25:S421.
27. Minor MA, Hewett JE, Webel RR, Anderson SK, Kay DR. Efficacy of physical conditioning exercise in patients with rheumatoid arthritis and osteoarthritis. Arthritis and Rheumatism 1989;32(11):1396-1405.
28. Munguia-Izquierdo D, Legaz-Arrese A. Exercise in warm water decreases pain and improves cognitive function in middle-aged women with fibromyalgia. Clinical and Experimental Rheumatology 2007;25(6):823-830.
29. Patrick DL, Ramsey SD, Spencer AC, Kinne S, Belza B, Topolski TD. Economic evaluation of aquatic exercise for persons with osteoarthritis. Medical Care 2001;39(5):413-424.
30. Patrick M, Patrick D, Maciejewski M, Topolski T, Belza B. How does aquatic exercise affect quality of life in persons with osteoarthritis? Arthritis and Rheumatism 2004;50(9):S469-S469.
31. Reid A, Brady A, Cusack T, Blake C, Mongey AB, Veale DJ, et al. Functional benefits following dynamic exercise in patients with RA taking anti-TNF therapy reflected in lower limb function tests but not the HAQ. Arthritis and Rheumatism 2010;62:2135.
32. Reid A, Brady A, Cusack T, Blake C, Mongey AB, Veale DJ, et al. Improvements in function following dynamic exercise in patients with RA taking anti-TNFalpha therapy. Irish Journal of Medical Science 2011;180:S211.
33. Reid A, Brady A, Cusack T, Blake C, Mongey AB, Veale DJ, et al. Improvements in function following dynamic exercise in patients with RA taking anti-TNFalpha therapy reflected in lower limb function tests. Irish Journal of Medical Science 2011;180:S171-S172.
34. Reid A, Brady A, Cusack T, Blake C, Mongey AB, Veale DJ, et al. RCT Examining the effects of exercise for people with rheumatoid arthritis on anti-TNFalpha medication. Rheumatology 2009;48:i159.
35. Rimmer B, Berry-Merriam D, Lineker S, Elsbett-Koeppen R, Fortier-Hughes J. The benefits of group recreational aquatic programs compared to land-based exercise programs for clients with self-reported arthritis: A pilot study. Journal of Aging and Physical Activity 2004;12(3):374-374.
36. Risum T, Lyngberg K, Telling M, Danneskiold-Samsøe B. Water exercise therapy for patient with rheumatoid arthritis. Scandinavian journal of rheumatology Supplement 1986;59:49.
37. Siu AM, Chui DY. Evaluation of a community rehabilitation service for people with rheumatoid arthritis. Patient education and counseling 2004;55(1):62-69.
38. Stenstrom CH, Lindell B, Swanberg E, Swanberg P, Harms-Ringdahl Nordemar KR. Intensive dynamic training in water for rheumatoid arthritis functional class II - A long-term study of effects. Scandinavian Journal of Rheumatology 1991;20(5):358-365.
39. Tomas-Carus P, Gusi N, Hakkinen A, Hakkinen K, Leal A, Ortega-Alonso A. Eight months of physical training in warm water improves physical and mental health in women with fibromyalgia:

A randomized controlled trial. Journal of Rehabilitation Medicine 2008;40(4):248-252.

40. Tomas-Carus P, Hakkinen A, Gusi N, Leal A, Hakkinen K, Ortega-Alonso A. Aquatic training and detraining on fitness and quality of life in fibromyalgia. Medicine and Science in Sports and Exercise 2007;39(7):1044-1050.

41. Tomas-Carus P, Gusi N, Hakkinen A, Hakkinen K, Raimundo A, Ortega-Alonso A. Improvements of muscle strength predicted benefits in HRQOL and postural balance in women with fibromyalgia: An 8-month randomized controlled trial. Rheumatology 2009;48(9):1147-1151.

42. Wang TT. Aquatic exercise improves flexibility, strength, and walk time in osteoarthritis. University of Washington; 2004. p. 157 p.

Ekskludert på grunn av dubletter

1. Adams N, Cuesta Vargas A. Multimodal physiotherapy plus deep water running (DWR) for fibromyalgia: A community based study. European Journal of Pain Supplements 2011;5(S1):43.

2. Jespersen A, Kendall SA, Lund H, Ribel-Madsen S, Bliddal H, Danneskiold-Samsoe B. Effects of water- and landbased strength training on isokinetic muscle strength in patients with fibromyalgia. Annals of the Rheumatic Diseases 2003;62:77-78.

3. Jespersen A, Kendall SA, Lund H, Ribel-Madsen S, Bliddal H, Danneskiold-Samsoe B. Effects of water- and land-based strength training on isokinetic muscle strength in patients with fibromyalgia. Arthritis and Rheumatism 2003;48(9):S693-S693.

4. Silva LE, Pessanha AC, Oliveira LM, Myamoto S, Valim V, Jones A, et al. Efficacy of water exercise in the treatment of patients with knee osteoarthritis: A randomized, single-blind, controlled clinical trial. Annals of the Rheumatic Diseases 2005;64:556-556.

5. Stenström C, Lindell B, Swanberg E, Swanberg P, Nordemar R. Intensive water exercise in functional class-II rheumatoid-arthritis (RA). Scandinavian Journal of Rheumatology 1986:49-49.

6. Mannerkorpi K, Nyberg B, Ahlmen M, Ekdahl C. Pool exercise combined with an education program for patients with fibromyalgia syndrome. A prospective, randomized study. Journal of Rheumatology 2000;27(10):2473-2481.

7. Mannerkorpi K, Ahlmen M, Ekdahl C. Pool exercises combined with patient education for patients with fibromyalgia syndrome. A six-month follow-up. Arthritis and Rheumatism 2000;43(9):S169-S169.

8. Mungufa-Izquierdo D, Legaz-Arrese A, Munguia-Alcalde V. Effects of exercise in warm water on pain and cognitive function in middle-aged women with fibromyalgia. Annals of the Rheumatic Diseases 2007;66:62-62.