Bassängträning jämfört med landbaserad träning

Bassängträning är en efterfrågad behandlingsmetod för många olika patientgrupper som behöver träna på ett avlastat sätt. Vissa förespråkar att den mjukare bassängträningen kan vara ett sätt att påbörja träning, som sedan kan övergå till tyngre övningar.

Fråga:
”Vilken effekt har bassängträning jämfört med landbaserad träning för habilitering och rehabilitering?”

Sammanfattning

Upplysningstjänsten har identifierat nio systematiska översikter samt tjugofem primärstudier som jämfört bassängträning med landbaserad träning

Sammanfattningsvis noterades liknande förbättringar i båda grupperna för de granskade sjukdomstillstånden i majoriteten av översikterna. I de flesta översikter angav författarna få identifierade studier och bristande studiekvalité som orsaker till att man inte kunnat dra slutsatser om vilken träningsform som kan vara mer fördelaktig. Sammantaget skiljde sig de identifierade studierna med avseende på kvalitet, studiedesign, patientantal, träningsprogram, duration och utfallsmått.

SBU har inte tagit ställning i sakfrågan eftersom de enskilda studiernas kvalitet inte har bedömts och resultaten inte vägts samman. Vi har inte beaktat etiska eller samhälleliga aspekter och inte heller patienternas attityd till behandlingen.

Bakgrund

Bassängträning är en efterfrågad behandlingsmetod för många olika patientgrupper med funktionsnedsättning som smärta, försämrad rörlighet och styrka och som behöver träna på ett avlastat sätt [1-3]. Vattnets bärkraft kan verka avlastande på kroppen. Det är lättare att förflytta sig i vatten än på land, rörelser kräver mindre muskelarbete och lederna avlastas. Vattenmotståndet kan i sin tur ha liknande funktion som ett träningsredskap [1]. Vatten kan möjliggöra träning hos patienter som har svåra smärtor, dålig rörlighet eller styrka, eller för dem som har svårt att röra sig på land på grund av dålig balans och ökad fallrisk. Vissa förespråkar att den mjukare bassängträningen kan vara ett sätt att påbörja träning, som sedan kan övergå till tyngre övningar [2].

Bassängträning delas ofta upp i kategorierna styrka, rörlighet samt uthållighetsträning [3]. Träningen leds av specialutbildad personal, ofta sjukgymnaster. Varmt vatten i sig används även för att mjuka upp stela muskler. Det finns teorier om att varmt vatten minskar smärtkänslighet, ökar blodflödet och ger muskelavslappning [1]. Hydrostatisk effekt sägs kunna minska ödem och sympatikusaktivitet. Vattnets egna egenskaper utnyttjas i olika former av hydro- och balneoterapi samt spabehandlingar som ofta inte inkluderar behandling av sjukgymnast eller något träningsmoment.

Avgränsningar

Upplysningstjänsten har gjort sökningar i databaserna PubMed, Embase, Cinahl, Amed, Cochrane Library och CRD. Vi har även gjort sökningar i olika HTA-organisationers databaser, samt andra svenska myndigheters hemsidor. Detta svar inkluderar studier som har utvärderat effekten av bassängträning jämfört med träning på land. Vi har exkluderat artiklar som utvärderar behandling av barn, träningsvärk, träning för viktminskning, förebyggande träning samt hydroterapi vid förlossning. Vattenbehandling utan träning (viss hydroterapi, balneoterapi samt spabehandling) och studier där bassängträning enbart jämförs med kontrollgrupp utan specificerad träning har exkluderats. Några av dessa patient- och kontrollgrupper inkluderas dock i översikterna och studierna nedan. Icke-systematiska översiktsartiklar, konferensabstrakt, fallstudier och pågående studier har exkluderats. Studier på andra språk än engelska, svenska, norska och danska har även exkluderats.

Resultat av litteratursökningen

Litteratursökningen genererade totalt 3 387 träffar. Vi har läst alla abstrakt. Av dessa identifierades nio systematiska översikter, samt 25 primärstudier som ingår i svaret. De artiklar som inte ingår i svaret har exkluderats på grund av studiedesign eller för att de inte var relevanta för frågeställningen (se avsnittet ”Avgränsningar”). Observera att vi varken har bedömt kvaliteten på översikterna eller de ingående studierna. Det är sannolikt att flera av studierna kan ha lägre kvalitet än vad SBU inkluderar i sina ordinarie utvärderingar.

Riktlinjer

En av de vanligaste indikationerna för bassängträning är reumatoid artrit. Socialstyrelsen har utvärderat detta i sina riktlinjer om rörelseorganens sjukdomar [4]. Enligt Socialstyrelsen är det vetenskapliga underlaget otillräckligt för att bedöma hur handledd bassängträning påverkar ledfunktion, smärta samt hälsorelaterad livskvalitet jämfört med handledd träning på land (mycket låg evidensstyrka). Handledd bassängträning tycks enligt Socialstyrelsen ge en förbättring av ledrörligheten samt en viss förbättring av den självskattade ledfunktionen jämfört med instruerad träning på egen hand på land (låg evidensstyrka).

Systematiska översikter

Upplysningstjänsten har identifierat nio systematiska översikter [5-13] som utvärderat effekten av bassängträning för habilitering och rehabilitering (Tabell 1).

I översikten av Barker [5] från 2014 utvärderades effekten av bassängträning hos patienter med olika muskuloskeletala sjukdomar. Bassängträningsprogrammen varierade mellan de inkluderade studierna med avseende på duration (3–52 veckor), frekvens (1–7 gånger/vecka), och träningstid (30–60 min). Övningar som ingick i de olika programmen skiljde sig, men programmen bestod generellt av liknande delmoment såsom uppvärmning, styrka, stretching, olika rörelser, aerobics och nedvarvning. Metaanalyser utfördes för smärta, fysisk funktion och livskvalitet för bassängträning jämfört med landbaserad träning. Enligt författarna skiljde sig de inkluderade studierna avsevärt, vilket gjorde det svårt att göra jämförelser mellan studierna och dra slutsatser om vilken träningsform som var mer fördelaktig.

I översikten av Bidonde [6] från 2014 undersöktes effekten av bassängträning på rörlighet hos patienter med olika neurologiska sjukdomar. Antalet deltagare i de inkluderade studierna varierade från 23–134 deltagare. Längden på bassängträningsprogrammen varierade från 3–32 veckor, med 1–4 pass/vecka. Sessionstider varierade från 30–70 minuter. Träningspassen var utformade att vara så lika som möjligt som de landbaserade träningsprogrammen. Träningspassen bestod av uppvärmning, riktade övningar och nedvarvning. De vanligaste övningarna var aerobics, styrketräning, balans och koordination. Vattentemperaturen varierade från 27°C till 37°C. Metaanalyser utfördes för smärta, trötthet, självskattad fysisk funktion, psykisk hälsa samt depression. Sammantaget fanns det enligt författarna för få studier som jämförde bassängträning med landbaserad träning för att kunna dra slutsatser om vilket som var mer fördelaktigt.

Grande [7] utvärderade år 2014 effekten av bassängträning hos patienter med astma. De inkluderade studierna var generellt små, med 32–70 deltagare. Bassängträningsprogrammen varierade med avseende på duration (1 dag–24 veckor), frekvens (1–5 gånger/vecka), och träningstid (40–60 min). Temperaturen i vattnet varierade från 33°C till 35°C. Sammantaget var enligt författarna de inkluderade

studierna av låg kvalitet med skillnader i träningstid och intensitet samt skillnader i astmabesvär. Ofta mättes surrogatmått istället för patientviktiga utfall.

Översikten av Marinho-Buzelli [8] från år 2014 utvärderade effekten av bassängträning på rörlighet hos patienter med olika neurologiska sjukdomar. De inkluderade studierna var generellt små, med 7–45 deltagare. Längden på bassängträningsprogrammen varierade från 2 veckor till 8 månader, med 1–5 pass/vecka. Sessionstider varierade från 40–60 minuter. Träningspassen bestod av uppvärmning, riktade övningar och nedvarvning. De vanligaste övningarna var aerobics, stärkande, balans och koordination. Temperaturen av poolerna varierade från 24°C till 34°C. Enligt författarna var evidensen otillräcklig för att kunna bedöma om bassängträning var överlägsen landbaserad träning. Skillnader i studiedesign och utfallsmått av de inkluderade studierna gjorde det svårt för författarna att dra viktiga slutsatser för en specifik grupp av neurologiska sjukdomar.

I översikten av Di Monaco [9] år 2013 utvärderades effekten av olika fysioterapeutiska behandlingar på patienter efter en höftprotesoperation. Två av de inkluderade studierna utvärderade effekten av bassängträning jämfört med landbaserad träning. I den ena studien bedömde författarna effekten av bassängträning på självskattad funktion, stelhet och smärta. De 70 deltagarna som inkluderades i studien fick behandling sex gånger per vecka under tre veckor. Varje session varade 40 minuter (plus 20 minuter av uppvärmning). I den andra studien jämfördes sjukgymnastik i bassäng med antingen ospecifik bassängträning eller landbaserad sjukgymnastik. Enligt författarna kunde inga slutsatser om bassängträningens effekt dras, då de identifierade studierna var få och hade motstridiga resultat.

Översikten av McNamara [10] år 2013 utvärderade effekten av bassängträning hos patienter med kroniskt obstruktiv lungsjukdom (KOL). De inkluderade studierna var generellt små, med 11–53 deltagare. Längden på bassängträningsprogrammen varierade från 4–12 veckor, med 2–3 pass/vecka. Sessionstider varierade från 35–90 minuter. Träningspassen var utformade att vara så lika som möjligt som de landbaserade träningsprogrammen. De inkluderade studierna var enligt författarna av låg och moderat kvalitet. Det fanns enligt författarna begränsat stöd för att bassängträning gav förbättrad uthållighetskapacitet jämfört med landbaserad träning. Författarna kunde inte dra några slutsatser om detta i sin tur ledde till bättre livskvalitet.

I översikten av Batterham [11] från år 2011 inkluderades studier som utvärderat effekten av bassängträning jämfört med landbaserad träning hos patienter med höft- eller knäartrit. Studierna var generellt små, med 11–57 deltagare. Bassängtränings-programmen varierade mellan de inkluderade studierna med avseende på duration (4–18 veckor), frekvens (1–3 gånger/vecka), och träningstid (30–60 min). Övningar som ingick i de olika programmen skiljde sig, men programmen bestod generellt av liknande delmoment såsom uppvärmning, styrka, stretching, olika rörelser, aerobics, balansövningar och nedvarvning. Temperaturen i poolerna varierade från 32°C till 36°C. Sammantaget var enligt författarna effekten av bassängträning jämförbar med landbaserad träning.

Mehrholz [12] inkluderade år 2011 fyra studier som utvärderat effekten av bassängträning på patienter som drabbats av stroke. Studierna var små, med 13–31 deltagare. I tre av studierna redovisades duration (8–12 veckor), frekvens (3–7 gånger/vecka), och träningstid (45–60 min). Temperaturen i poolerna angavs inte i någon av studierna. Enligt författarna var antalet deltagare för få för att kunna dra några slutsatser om interventionen.

Översikten av Jeglinsky [13] utvärderade år 2010 effekten av olika fysioterapeutiska behandlingar på patienter med cerebral pares. I översikten inkluderades en studie som utvärderade en sju veckors period av bassängträning och dess effekt på enkel skötsel och olika passiva rörelser. Denna studie inkluderade endast sex deltagare och studien bedömdes av författarna vara av låg kvalitet.

Sammanfattningsvis noterades liknande förbättringar i båda grupperna för de granskade sjukdomstillstånden i majoriteten av översikterna. I majoriteten av översikterna angav författarna få identifierade studier och bristande studiekvalité som orsaker till att man inte kunnat dra slutsatser om vilken träningsform som kan vara mer fördelaktigt. Upplysningstjänsten har inte beaktat etiska eller samhälleliga aspekter och inte heller patienternas attityd till behandlingen.

Tabell 1. Identifierade systematiska översikter

Included studies	Population	Intervention	Outcome
[5] Barker 2014			
26 studies 24 RCT 2 quasi-RCT	1135 participants with OA (14 studies) 184 participants with RA (2 studies) 116 participants with OA and/or RA (2 studies) 236 participants with FM (5 studies) 84 participants with LBP (2 studies) 61 participants with OP (1 study)	AT vs LBT (8 studies, AT=277,LBT=279) AT vs NT (11 studies, AT=577,NT=211) AT vs LBT and NT (7 studies, AT=203,LBT=200, NT=74)	Pain, physical function, and quality of life
Author's conclusions:			

Included studies	Population	Intervention	Outcome
"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."			
[6] Bidonde 2014			
16 studies RCT	881 participants with FM	AT vs LBT (5 studies, AT=110,LBT=107) AT vs NT (9 studies, AT=261,NT=268) AT vs OT (2 studies, AT=65,OT=62)	Multidimensional function, self-reported physical function, pain, stiffness, muscle strength, submaximal cardiorespiratory function, withdrawal rates and adverse effects.
Author's conclusions: "Aquatic versus land-based: There were no statistically significant differences between interventions for multidimensional function, self-reported physical function, pain or stiffness…We found a statistically significant difference between interventions for strength, favoring land-based training (2.40 kilo pascals grip strength, 95% CI 4.52 to 0.28). None of the outcomes in the aquatic versus land comparison reached clinically relevant differences of 15%. Withdrawals were similar in the aquatic and land groups and adverse effects were poorly reported, with no serious adverse effects in either group."			
[7] Grande 2014			
3 studies RCT	136 participants with asthma	AT vs LBT (AT=82,LBT=54)	Quality of life and exacerbations leading to use of steroids
Author's conclusions: "The small number of participants in the three included studies, the clinical and methodological heterogeneity observed and the high risk of bias assessed mean that we are unable to assess the place of water-based exercise in asthma. Randomised controlled trials are needed to assess the efficacy and safety of water-based exercise for adults with asthma."			
[8] Marinho-Buzelli 2014			
20 studies 4 RCT 4 non-RCT 12 before-and-after tests	98 participants with MS (5 studies) 61 participants with PD (5 studies)	AT vs LBT (3 studies, AT=35,LBT=35) AT vs LBT and NT (1 study, AT=19,LBT=19, NT=19)	Mobility

Included studies	Population	Intervention	Outcome
	98 participants with Stroke (4 studies) 9 participants with HSP (1 study) 16 participants with spinal cord injury (1 study) 16 participants with Cervical dystonia (1 study) 24 participants with brain injury (1 study) 28 participants with Poliomyelitis 23 participants with Spactic paresis	AT vs NT (10 studies, AT=54,NT=37) AT vs NC (10 studies, AT=131) AT vs OT (1 study, AT=10,OT=10)	
Author's conclusions: "There is "fair" evidence to suggest that aquatic therapy is beneficial in the attainment of mobility in individuals with Parkinson's disease, multiple sclerosis, stroke and spinal cord injury. However, there is insufficient evidence to show aquatic therapy is superior to land therapy to improve mobility in individuals with a neurological condition. The diversity in study design and outcome measures of the included studies made it difficult to identify significant conclusions for a specific group of neurological disorders."			
[9] Di Monaco 2013			
9 studies RCT	835 participants with THA	AT vs LBT (2 studies, n=97) Other (7 studies)	Impairment, activity, participation, health-related quality of life, and length of stay in hospital
Author's conclusions: "Inconclusive results were reported for aquatic exercises, bed exercises without external resistance or without its progressive increase according to the overload principle, and timing…Insufficient evidence exists to build up a detailed evidence-based exercise protocol after THA. Sparse results from few RCTs support specific exercise types which should be added to the usual mobility training in THA patients."			
[10] McNamara 2013			

Included studies	Population	Intervention	Outcome
5 studies 3 RCT 1 Semi-RCT 1 Randomised cross-over trial	176 participants with COPD	AT vs LBT (1 study, AT=5,LBT=6) AT vs NT (1 study, AT=25,NT=25) AT vs LBT and NT (3 studies, AT=41,LBT=48, NT=39)	Exercise capacity, quality of life
Author's conclusions: **"**There is limited quality evidence that water-based exercise training is safe and improves exercise capacity and quality of life in people with COPD immediately after training. There is limited quality evidence that water-based exercise training offers advantages over landbased exercise training in improving endurance exercise capacity, but we remain uncertain as to whether it leads to better quality of life. Little evidence exists examining the long-term effect of water-based exercise training."			
[11] Batterham 2011			
10 studies RCT	659 participants with RA or OA	AT vs LBT (10 studies, AT=354,LBT=305)	Function, mobility or patient satisfaction
Author's conclusions: "Outcomes following aquatic exercise for adults with arthritis appear comparable to land based exercise. When people are unable to exercise on land, or find land based exercise difficult, aquatic programs provide an enabling alternative strategy."			
[12] Mehrholz 2011			
4 studies RCT	94 participants after stroke	AT vs LBT (4 studies, AT=47,LBT=47)	Activities of daily living, ability to walk, muscle strength, postural balance or fitness after stroke
Author's conclusions: "The evidence from randomised controlled trials so far does not confirm or refute that water-based exercises after stroke might help to reduce disability after stroke. There is a lack of hard evidence for water-based exercises after stroke. Better and larger studies are therefore required."			
[13] Jeglinsky 2010			

Included studies	Population	Intervention	Outcome
13 studies 2 RCT 1 experimental study without randomization 10 observational studies without control groups	153 adolescents (>16 years of age) and adults with cerebral palsy	AT vs NC (1 study, AT=6) Other (12 studies)	Motor function, activity, muscle strength
Author's conclusions: "Evidence for the effect of physiotherapy on adolescents and adults with cerebral palsy is sparse, and therefore there is an urgent need for well-designed physiotherapeutic trials for these people."			

RCT=Randomized controlled trial, OA=Osteoarthritis, RA=Rheumatoid arthritis, FM=Fibromyalgia, LBP=Low back pain, OP=Osteoporosis, AT=Aquatic therapy LBT=Land-based therapy, NT=No treatment, OT=Other treatment, MS=Multiple sclerosis, PD=Parkinson's disease, HSP=Hereditary spastic paraparesis, NC=No control, THA=Total hip arthroplasty, COPD=Chronic obstructive pulmonary disease

Identifierade primärstudier

Upplysningstjänsten har även identifierat 25 studier som publicerats efter översikternas senaste sökdatum eller som inte täckts in av de systematiska översikterna. Dessa har sammanställts i Tabell 2 nedan.

Sammantaget skiljde sig de identifierade studierna med avseende på studiedesign, population, patientantal, träningsprogram, duration och utfallsmått.

Tabell 2. Identifierade studier

Study design	Population	Intervention	Duration	Outcome
[14] Arca 2014				
RCT	52 post-menopausal hypertensive women	Water-based aerobic training (n=19) Land-based aerobic training (n=19)	50-minute sessions, 3x per week for 12 weeks (33-33.5 °C)	Effect on BP, anthropometry HDL, LDL, VLDL, total cholesterol, triglycerides, creatinine, urea and urinary sodium

Study design	Population	Intervention	Duration	Outcome
		Non-intervention control (n=14)		
Author's conclusions: "In conclusion, lowering of BP in hypertensive women submitted to aquatic exercise was similar to the obtained with dry land training and more intense than in the inactive CG. Therefore, this is a controlled study that addresses the antihypertensive effect of water aerobic exercise in post-menopausal women."				
[15] Ciolac 2014				
RCT	54 participants with CLBP	Water-based exercise (n=27) Land-based exercise (n=27)	60 min, 2× per week for 12 weeks	Pain and mobility
Author's conclusions: "Back School program and Hydrotherapy could be valid treatment options in the rehabilitation of non-specific CLBP in elderly people. Both therapies proved to be effective and can be used in association with other rehabilitation programs. We believe that Back School program should be favored for its simplicity and the small number of resources required."				
[16] Dundar 2014				
RCT	69 participants with AS	Water-based exercise (n=35) Land-based exercise (home-based) (n=34)	60 min, 5× per week for 4 weeks (32–33 °C)	Pain, functional capacity, disease activity, spinal mobility, and quality of life
Author's conclusions: "It is concluded that a water-based exercises produced better improvement in pain score and quality of life of the patients with AS compared with home-based exercise."				
[17] Jaehyun 2014				
RCT	30 participants post stroke	Water-based exercise (n=15) Land-based exercise (n=15)	40 min, 3x per week for 12 weeks (33–35°C)	Static balance
Author's conclusions: "The results of this study suggest the feasibility and suitability of obstacle training in water for stroke patients."				
[18] Jung 2014				

Study design	Population	Intervention	Duration	Outcome
RCT	20 participants with spinal cord injury	Water-based exercise (n=10) Land-based exercise (n=10)	60 min, 3x per week for 8 weeks.	Pulmonary function
Author's conclusions: **"**In our study, although measurements of pulmonary function showed that FVC, FEV1, FEV1/FVC, and FEF were improved in both the groups, the error decreased more in the aquatic exercise group than in the land exercise group. Therefore, we assume that aquatic exercise therapy is more effective than land exercise therapy, even though land exercise therapy is also effective."				
[19] Mazloum 2014				
Perspective non-randomized study with pretest-posttest control group	40 participants with hemophilia	Land-based exercise (n=13) Hydrotherapy (n=14) Control (n=13)	40-55 min, for 4 weeks (27-35°C)	Pain severity and knee joint ROM.
Author's conclusions: "Using hydrotherapy in addition to usual rehabilitation training can result in beneficial effect in terms of pain and knee joint ROM. However, it appears that hydrotherapy is more effective in reducing pain"				
[20] Murtezani 2014				
RCT	61 post-menopausal women with osteoporosis	Water-based exercise (n=30) Land-based exercise (n=31)	35-55 min, 3× per week for 10 months (30°C)	Bone mineral density, muscle strength, flexibility, balance, gait time and pain
Author's conclusions: "After the exercise program, muscle strength, flexibility, gait time, pain, and bone density ($p<0.001$) improved significantly with LE compared to AE. There was no significant difference between the two groups with regard to balance at the 10-month follow-up."				
[21] Tripp 2014				
RCT	30 participants in post-acute inpatient rehabilitation at least two weeks after the onset of stroke	Halliwick-Therapy group (water-based exercise) (n=14) Conventional physio-	45 min, 3x per week for 2 weeks	Postural stability, ambulation and basic functional mobility

Study design	Population	Intervention	Duration	Outcome
		therapeutic treatment (n=16)		
Author's conclusions: "This study indicates that Halliwick-Therapy is safe and well tolerated in stroke patients in post-acute rehabilitation and has positive effects upon some aspects of mobility"				
[22] Volpe 2014				
Randomized single-blind controlled trial	34 participants with Parkinson's disease	Water-based exercise (n=17) Land-based exercise (n=17)	60 min, 5x per week for 2 months	Balance
Author's conclusions: "In conclusion, this study indicates that hydrotherapy may be a possible treatment for balance dysfunction in Parkinsonian patients with a moderate stage of disease, with the potential to improve postural stability, reducing falls rate in protected conditions. Further studies with a follow-up period are necessary in order to evaluate whether the balance improvement persists over time and which protocol of water exercises is more effective for balance training in Parkinson's disease."				
[23] Bansi 2013				
RCT	60 participants with multiple sclerosis	Water-based exercise (n=24) Land-based exercise (n=28)	30 min, daily for 3 weeks (28°C)	Short-term immune responses and cardio-respiratory fitness on HR-QoL and fatigue
Author's conclusions: "Overall, this study indicates beneficial effects of endurance training independent of the training setting during rehabilitation in PwMS. Short-term immune responses and cardiorespiratory fitness have the potential to influence HR-QOL and fatigue in PwMS. A quantified status of cardiorespiratory fitness and short-term immune responses seem feasible for predicting HR-QoL and fatigue in PwMS. Future research is required to clarify the impacts of short-term responses of cytokines and neurotrophins during exercise."				
[24] Bayraktar 2013				
Non-randomized single-blind controlled trial	18 participants with multiple sclerosis	Water-based Ai-Chi (n = 11) Land-based exercise at home (n = 7)	60 min, 2x per week for 8 weeks (28°C)	Static standing balance, functional mobility, muscle strength, fatigue
Author's conclusions:				

Study design	Population	Intervention	Duration	Outcome
"This study demonstrated that an 8 week Ai-Chi program is feasible and resulted in improvements in balance, functional mobility, strength and fatigue of individuals with MS. This study provides additional data for the existing research examining the effects of Ai-Chi programs in individuals with multiple sclerosis and provides useful clinical information for those health professionals using Ai-Chi as an intervention in this patient population. Further researches should investigate additional aspects of Ai-chi programs such as the long-term effects and its effectiveness in different levels of MS."				
[25] Han 2013				
Controlled study	62 participants with chronic stroke	Water-based exercise (n=31) Land-based exercise (n=31)	40 min, 3x per week for 6 weeks (33,5°C)	Balance ability
Author's conclusions: "Altogether, both land and water-based programs were well tolerated and triggered improvements in cardiorespiratory function."				
[26] Marandi 2013				
RCT	57 women with MS and a disability index (EDSS) of less than 4.5	Water-based exercise (n=19) Land-based Pilates (n=19) Non-intervention control (n=19)	60 min, 3x per week for 12 weeks	Muscular strength, hand strength
Author's conclusions: "No significant difference was observed between Pilates exercises and aquatic training, and we can say that both Pilates and aquatic training did put a significant effect on the muscle power of the MS patients. In addition, the difference between the two methods was negligible."				
[27] Nemcic 2013				
Single-blinded randomized study	72 participants with chronic low-back pain	Water-based exercise (n=36) Land-based exercise (n=36)	45 min, 5x per week for 3 weeks (36°C, mineral water)	Physical disability and lumbar mobility
Author's conclusions: "In conclusion, in our sample of patients with chronic low back pain, exercise treatment improved lumbar motion and decreased the level of physical disability. However, comparison of land-based exercises and water-based exercises in thermal mineral water did not demonstrate any significantly different result."				

Study design	Population	Intervention	Duration	Outcome
[28] Castro-Sanchez 2012				
RCT	73 participants with multiple sclerosis	Water-based Ai-Chi exercise (n=36) Land-based relaxation exercise (n=37)	60 min, 2x per week for 20 weeks (36◦C)	Pain, fatigue, spasms, depression, quality of life, disability and autonomy
Author's conclusions: "According to these results, a 20-week Ai-Chi aquatic exercise program produces a significant pain reduction in MS patients that lasts for 10 weeks after the end of the program. It also improves other MS-related symptoms, including disability, depression, and fatigue. These effects of the Ai-Chi aquatic program were superior to those of an equivalent exercise program in a therapy room."				
[29] Dronen 2012				
Pilot RCT	12 participants with ankylosing spondylitis	Water-based exercise (n=6) Land-based exercise (n=6)	45 min, 2x per week for 6 weeks (34°C)	Motion in spine and hips and disease activity
Author's conclusions: "Persons with ankylosing spondylitis may benefit at least as good from group training on land as in water, but the results must be interpreted with care since the number of participants was low."				
[30] Park 2011				
RCT	44 participants with chronic stroke	Water-based exercise (n=22) Land-based exercise (n=22)	35 min, 6x per week for 6 weeks (33-35°C)	Joint position sense, mobility and falling risk
Author's conclusions: "The results suggest that aquatic exercise is more effective than land exercise at improving the joint position sense and clinical functions of stroke patients."				
[31] Park 2011				
RCT	46 participants with chronic stroke	Water-based exercise (n=22) Land-based exercise (n=22)	35 min, 6x per week for 6 weeks (33-35°C)	Balance ability
Author's conclusions:				

Study design	Population	Intervention	Duration	Outcome
"This study found that stroke patients had better balance in an aquatic environment than in a land environment."				
[32] Sage 2011				
RCT	89 participants with Parkinson's disease	Water-based exercise (n=12) Land-based aerobic exercise (n=17) Land-based strength exercise (n=18) Land-based sensory attention-focused exercise (n=24) Wait-list control (n=18)	60 min, 3x per week for 12 weeks	Motor symptoms
Author's conclusions: "Of the exercise modalities tested, sensory attention-focused exercise and strength training were the most effective strategies for individuals with PD. Future randomized trials are needed to confirm these results and compare other promising strategies aimed at specific pathophysiological deficits of PD."				
[33] Teffaha 2011				
RCT	24 male CAD patients and 24 male CHF patients with stable clinical status	Water-based exercise (n=24) Land-based exercise (n=24)	50 min, 5x per week for 3 weeks (30-32°C)	Stroke volume, heart rate, LVEDD, LVEF, diastolic arterial pressure, peaks VO(2), power output
Author's conclusions: "Altogether, both land and water-based programs were well tolerated and triggered improvements in cardiorespiratory function."				
[34] Vivas 2011				
Pilot RCT	11 patients with idiopathic Parkinson's disease	Water-based exercise (n=5)	45 min, 2x per week for 4 weeks	Postural stability, Functional Reach Test

Study design	Population	Intervention	Duration	Outcome
		Land-based exercise (n=6)	(32°C)	(FRT), the Berg Balance Scale (BBS), the UPDRS, the 5-m walk test, timed Up and Go test.
Author's conclusions: "In this pilot study, physiotherapy protocols produced improvement in postural stability in PD that was significantly larger after aquatic therapy. The intervention protocols are shown to be feasible and seem to be of value in amelioration of postural stability-related impairments in PD. Some of the methodological aspects detailed here can be used to design larger controlled trials."				
[35] Bello 2010				
RCT	12 patients diagnosed with CLBP	Water-based exercise (n=6) Land-based exercise (n=6)	45–60 min, 2x per week for 6 weeks (32-34°C)	Pain, trunk flexibility
Author's conclusions: "In conclusion, water-based exercise and land-based exercise are both relevant in the management of LBP. Based on the outcomes of this study, water-based exercises caused better spinal flexibility in patients with CLBP than land-based exercises."				
[36] Giaquinto 2010				
RCT	70 patients with OA following TKA	Water-based exercise (n=28) Land-based gym treatment (n=30)	40 min, 6x per week for 3 weeks	Pain, stiffness, function
Author's conclusions: "Both groups improved. The WOMAC subscales, namely pain, stiffness and function, were all positively affected. Statistical analysis indicates that scores on all subscales were significantly lower for the HT group. The benefits gained by the time of discharge were still found after six months. HT is recommended after TKA in a geriatric population."				
[37] Lim 2010				
RCT	75 obese patients with knee OA	Water-based training (n=26) Land-based training (n=25)	40 min, 3x per week for 8 weeks (34°C)	Body fat composition, pain, physical function, quality of life

Study design	Population	Intervention	Duration	Outcome
		Non-intervention control (n=24)		
Author's conclusions: "AQE had an advantage in controlling the interference with activity because of pain. AQE may be an effective tool for patients with obesity who have difficulties with active exercise due to knee osteoarthritis."				
[38] Yennan 2010				
RCT	50 elderly with knee OA	Aquatic exercise (n=25) Land-based exercise (n=25)	65 min, 4x per week for 6 weeks	Postural sway, knee pain, strength, flexibility, knee scores and quality of life
Author's conclusions: "Female elderly patients with knee OA improved their postural sway control after six-week training. Both aquatic and land-based exercise program can increase muscle strength, flexibility, reduce pain, increase quality of life, and ability of daily living. Aquatic exercise showed better efficacy in the reduction of sway, compared to land-base exercise."				

RCT=Randomized controlled trial, n=number, BP=Blood pressure, HDL=High-density lipoprotein, LDL=Low-density lipoprotein, VLDL=Very low-density lipoprotein, CLBP=Chronic low back pain, AS=Ankylosing spondylitis, FVC=Forced vital capacity, FEV1=Forced expiratory volume, FEF=Forced expiratory flow, ROM=Range of motion, LE=Land-based exercise, AE=Aquatic exercise, HR-QoL=Health-related quality of life PwMS=Persons with MS, MS=Multiple sclerosis, EDSS=Expanded Disability Status Scale, PD=Parkinson's disease, CAD=Coronary artery disease, CHF=Chronic heart failure, LVEDD=Left Ventricular End Diastolic Diameter, LVEF=Left ventricular ejection fraction, VO=Oxygen consumption, LBP=Low back pain, OA=Osteoarthritis, WOMAC=The Western Ontario and McMaster Universities Arthritis Index, HT=Hydrotherapy, TKA=Total knee arthroplasty, AQE=Aquatic exercise

Projektgrupp

Detta svar är sammanställt av Sally Saad, Jessica Dagerhamn, Madelene Lusth Sjöberg och Jan Liliemark vid SBU.

Litteratursökning

Cochrane (CDSR, HTA, CENTRAL, DARE, EED) via Wiley 24 september 2014 **Bassängträning**		
	Search terms	**Items found**
Intervention: Bassängträning		
1.	"hydrotherapy":ti,ab,kw OR "hydrotherapy"[Mesh] OR "hydrotherapeutic":ti,ab,kw OR aquarobic:ti,ab,kw OR aquarobics:ti,ab,kw OR aquatics:ti,ab,kw OR "pool therapy":ti,ab,kw OR "pool exercise":ti,ab,kw OR "pool exercises":ti,ab,kw OR "pool based physiotherapy":ti,ab,kw OR "pool based physical therapy":ti,ab,kw OR "pool	2056

Cochrane (CDSR, HTA, CENTRAL, DARE, EED) via Wiley 24 september 2014 **Bassängträning**		
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Final	1	2056

The search result, usually found at the end of the documentation, forms the list of abstracts
[Mesh]= Term from the Medline controlled vocabulary, including terms found below this term in the MeSH hierarchy
ti,ab,kw = Title, abstract or keyword
" " = Citation Marks; searches for an exact phrase

CDSR = Cochrane Database of Systematic Review
HTA = Health Technology Assessments
CENTRAL = Cochrane Central Register of Controlled Trials, "trials"
DARE = Database Abstracts of Reviews of Effects, "other reviews"
EED = Economic Evaluations
The search result, usually found at the end of the documentation, forms the list of abstracts
[Mesh] = Term from the Medline controlled vocabulary, including terms found below this term in the MeSH

PubMed via NLM 24 september 2014 **Bassängträning**		
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hierarchy
[TIAB] = Title or abstract
* = Truncation

" " = Citation Marks; searches for an exact phrase

Embase via Embase.com 24 september 2014 **Bassängträning**		
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Final	1 Limits activated: Embase only	2085

The search result, usually found at the end of the documentation, forms the list of abstracts
/exp= Includes terms found below this term in the EMTREE hierarchy
:ab,ti = Abstract or title
* = Truncation
" " = Citation Marks; searches for an exact phrase

Cinahl via EBSCO 24 september 2014 **Bassängträning**		
	Search terms	**Items found**
Intervention: Bassängträning		
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Cinahl via EBSCO 24 september 2014 **Bassängträning**		
	training" OR "aquatic gymnastics" OR "aquatic aerobics") OR (MH "Hydrotherapy") OR (MH "Aquatic Exercises")	
Final	1	1617

The search result, usually found at the end of the documentation, forms the list of abstracts
TI = Title
AB = Abstract
MH = Term from the "Cinahl Headings" thesaurus
* = Truncation
" " = Citation Marks; searches for an exact phrase

Amed via EBSCO 24 september 2014 **Bassängträning**		
	Search terms	**Items found**
Intervention: Bassängträning		
1.	TI ("hydrotherapy" OR "hydrotherapeutic" OR aquarobic OR aquarobics OR aquatics OR "pool therapy" OR "pool exercise" OR "pool exercises" OR "pool based physiotherapy" OR "pool based physical therapy" OR "pool based occupational therapy" OR "pool based rehabilitation" OR "pool training" OR "pool based gymnastics" OR "pool based aerobics" OR "water based therapy" OR "water exercise" OR "water exercises" OR "water based exercise" OR "water based exercises" OR "water based training" OR "water gymnastics" OR "water aerobics" OR (water AND (physiotherapy OR "physical therapy" OR "occupational therapy")) OR "aquatic exercise" OR "aquatic exercises" OR "aquatic therapy" OR "aquatic physiotherapy" OR "aquatic rehabilitation" OR "aquatic training" OR "aquatic gymnastics" OR "aquatic aerobics") OR AB ("hydrotherapy" OR "hydrotherapeutic" OR aquarobic OR aquarobics OR aquatics OR "pool therapy" OR "pool exercise" OR "pool exercises" OR "pool based physiotherapy" OR "pool based physical therapy" OR "pool based occupational therapy" OR "pool based rehabilitation" OR "pool training" OR "pool based gymnastics" OR "pool based aerobics" OR "water based therapy" OR "water exercise" OR "water exercises" OR "water based exercise" OR "water based exercises" OR "water based training" OR "water gymnastics" OR "water aerobics" OR (water AND (physiotherapy OR "physical therapy" OR "occupational therapy")) OR "aquatic exercise" OR "aquatic exercises" OR "aquatic therapy" OR "aquatic physiotherapy" OR "aquatic rehabilitation" OR "aquatic training" OR "aquatic gymnastics" OR "aquatic aerobics") OR (MH "Hydrotherapy") OR (MH "Aquatic Exercises")	761
Final	1	761

The search result, usually found at the end of the documentation, forms the list of abstracts
TI = Title
AB = Abstract
DE = Term from the Amed thesaurus
* = Truncation
" " = Citation Marks; searches for an exact phrase

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