Supplemental Material

Supplement 1: Example of Search strategy

Search Details

Query Translation:

(("high-intensity interval training"[MeSH Terms] OR ("high-intensity"[All Fields] AND "interval"[All Fields] AND "training"[All Fields] OR ("high-intensity interval training"[All Fields] OR ("high"[All Fields] AND "intensity"[All Fields] AND "interval"[All Fields] AND "training"[All Fields] OR "high intensity interval training"[All Fields]) OR ("high intensity interval training"[All Fields]) OR (interval[All Fields] AND ("education"[Subheading] OR "education"[All Fields] OR "training"[All Fields] OR "education"[MeSH Terms] OR "training"[All Fields])) OR (high[All Fields] AND

Search URL

Result:

<u>1801</u>

Translations

interval	"high-intensity interval training" [MeSH Terms] OR ("high-intensity" [All Fields] AND "interval" [All Fields] AND "training" [All Fields]) OR "high-intensity interval training" [All Fields] OR ("high" [All Fields] AND "intensity" [All Fields] AND "interval" [All Fields] AND "training" [All Fields]) OR "high intensity interval training" [All Fields]
training	"education" [Subheading] OR "education" [All Fields] OR "training" [All Fields] OR "education" [MeSH Terms] OR "training" [All Fields]
exercise	"exercise"[MeSH Terms] OR "exercise"[All Fields]
water	"water"[MeSH Terms] OR "water"[All Fields] OR "drinking water"[MeSH Terms] OR ("drinking"[All Fields] AND "water"[All Fields]) OR "drinking water"[All Fields]
hydrotherapy	"hydrotherapy"[MeSH Terms] OR "hydrotherapy"[All Fields]
immersion	"immersion"[MeSH Terms] OR "immersion"[All Fields]
head	"head"[MeSH Terms] OR "head"[All Fields]
swim	"swimming"[MeSH Terms] OR "swimming"[All Fields] OR "swim"[All Fields]

Database:

PubMed

User query:

((high intensity interval training OR interval training OR high intensity OR intermittent exercise OR plyometric)) AND (aquatic exercise OR water exercise OR hydrotherapy OR immersion OR head out aquatic OR water run OR swim)

Supplement 2. Summary of authors assessment of risk of bias

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Bento 2015	?	?	•	?	•	?	
Broman 2006	?	?	•	?	?	?	
Connolly 2016	?	?	•	•	•	?	
Hamer 1990	?	?	•	?		?	
Michaud 1995			•	?		?	?
Mohr 2014	?	?	•	?	•	?	•
Mohr 2015	?	?	•	•	•	?	•
Moreira 2013	•	?	•	•	•	?	•
Moreira 2014	•	?	•	•	•	?	•
Munukka 2016	•	•	•	•	•	?	•
Nordsborg 2015	?	?	•	•	•	?	•
Rebold 2013	?	?	•	?	?	?	?
Waller 2017	•	•			•	?	

Supplement 3. Methodological quality assessment of included studies – PEDro scale

Study	1	2	3	4	5	6	7	8	9	10	11	Total
Bento 2014	1	1	0	1	0	0	0	0	0	1	1	4/10
Broman 2006	1	1	0	1	0	0	0	0	0	1	1	4/10
Connolly 2016 ^a	1	1	0	1	0	0	0	1	0	1	1	5/10
Hamer 1990	1	1	0	1	0	0	0	0	0	1	1	4/10
Munukka 2016 ^b	1	1	1	1	0	0	1	1	1	1	1	8/10
Michaud 1995 ^x	1	0	0	1	0	0	0	0	0	1	1	3/10
Mohr 2015 ^a	1	1	0	1	0	0	0	1	0	1	1	5/10
Mohr 2015 ^a	1	1	0	1	0	0	0	1	0	1	1	5/10
Moreira 2013 ^c	1	1	1	1	0	0	1	1	0	1	1	7/10
Moreira 2014 ^c	1	1	1	1	0	0	1	0	0	1	1	6/10
Nordsborg 2015 ^a	1	1	0	1	0	0	0	0	0	1	1	4/10
Rebold 2013	1	1	0	0	0	0	0	0	0	1	1	3/10
Waller 2017 ^b	1	1	0	1	0	0	0	1	1	1	1	6/10

Scale of item score 0 = absent/ unclear, 1= present, The PEDro scale criteria are:- (1) specification of eligibility criteria (2) random allocation (3) concealed allocation (4) prognostic similarity at baseline (5) subject blinding (6) therapist blinding (7) assessor blinding (8) greater than 85% follow up of at least one key outcome (9) intention to treat analysis (10) between group statistical comparison for at least one key outcome (11) point estimates and measures of variability provided for at least one key outcome. ^{a, b, c} = papers describing same interventional study; ^x = non RCT

Supplement 4. Consensus on Exercise Reporting Template (CERT) assessment.

CERT CHECKLIST

	ITEM																			
Article	1	2	3	4	5	6	7a	7b	8	9	10	11	12	13	14a	14b	15	16a	16b	TOTAL SCORE / 19
Bento	0	0	1	0	1	1	1	1	1	0	0	0	1	1	1	1	1	0	0	11
Broman	1	1	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	15
Hamer	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18
Michaud	1	0	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	15
Mohr	0	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	15
Moreira	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	16
Rebold	1	0	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	14
Waller	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	17

^{1 =} YES; 0 = NO

For each Item describe: (1) ex equipment (2) personnel expertise (3) indiv or gp (4) supervised or unsup (5) adherence to ex (6) motivation strategies (7a and b) when and how ex progressed (8) ex replication (9) home program (10) non -ex components (11) type and advesrse events (12) setting (13) ex intervention (14a and b) ex generic or indiv tailored (15) starting level (16a and b) adherence measurement and delivered as per protocol

Supplement 5. Sensitivity analysis for effect of A-HIIT versus control on aerobic performance

Figure 5.1. Effect of A-HIIT versus control with removal of studies based on high selection bias

	Aqu	iatic HI	IT	C	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Broman 2006	27.2	2.1	15	23.3	4	9	13.3%	1.28 [0.37, 2.20]	
Hamer 1990	53.98	4.83	9	49.93	4.58	8	11.2%	0.82 [-0.19, 1.82]	 •
Mohr 2014	692	343.7	21	454	192.3	20	25.5%	0.83 [0.19, 1.47]	
Waller 2017	1.83	0.16	43	1.76	0.17	44	50.0%	0.42 [-0.00, 0.85]	-
Total (95% CI)			88				100.0%	0.68 [0.34, 1.03]	•
Heterogeneity: Tau ² = Test for overall effect:					-4 -2 0 2 4 Favours control Favours A-HIIT				

Figure 5.2. Effect of A-HIIT versus control with removal of studies based on low methodological quality

	Aqu	atic HI	IT	C	ontrol		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Broman 2006	27.2	2.1	15	23.3	4	9	13.3%	1.28 [0.37, 2.20]	
Hamer 1990	53.98	4.83	9	49.93	4.58	8	11.2%	0.82 [-0.19, 1.82]	 •
Mohr 2014	692	343.7	21	454	192.3	20	25.5%	0.83 [0.19, 1.47]	
Waller 2017	1.83	0.16	43	1.76	0.17	44	50.0%	0.42 [-0.00, 0.85]	-
Total (95% CI)			88			81	100.0%	0.68 [0.34, 1.03]	•
Heterogeneity: Tau ² = Test for overall effect					= 0.34);	$I^2 = 11$.%		-4 -2 0 2 4 Favours control Favours A-HIIT

Figure 5.3. Effect of A-HIIT versus control with removal of studies with high attrition bias

	Aquatic HIIT				Control		!	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	I IV, Random, 95% CI
Broman 2006	27.2	2.1	15	23.3	4	9	19.3%	1.28 [0.37, 2.20]] —
Mohr 2014	692	343.7	21	454	192.3	20	31.9%	0.83 [0.19, 1.47]] —
Waller 2017	1.83	0.16	43	1.76	0.17	44	48.8%	0.42 [-0.00, 0.85]] -
Total (95% CI)			79			73	100.0%	0.72 [0.26, 1.18]	1 ◆
Heterogeneity: Tau² = Test for overall effect					= 0.20)	$I^2 = 3$	9%		-4 -2 0 2 4 Favours control Favours A-HIIT

Figure 5.4. Effect of A-HIIT versus control with removal of studies with training frequency of 2 or less per week

	Aqu	atic HI	IT	C	ontrol		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Hamer 1990	53.98	4.83	9	49.93	4.58	8	9.7%	0.82 [-0.19, 1.82]	
Michaud 1995	2.49	0.68	10	1.99	0.36	12	12.3%	0.91 [0.02, 1.80]	
Mohr 2014	692	343.7	21	454	192.3	20	23.8%	0.83 [0.19, 1.47]	
Waller 2017	1.83	0.16	43	1.76	0.17	44	54.1%	0.42 [-0.00, 0.85]	-
Total (95% CI)	0.00	1. ·2 · a	83	2 /D	0.61)	84	100.0%	0.62 [0.30, 0.93]	•
Heterogeneity: Tau ² = Test for overall effect:					= 0.61);	1" = 0%	6		-4 -2 0 2 4 Favours control Favours A-HIIT

Figure 5.5. Effect of A-HIIT versus control with removal of studies conducted eight weeks or less

	Aqı	uatic HI	ΙΤ	C	ontrol		!	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Mohr 2014	692	343.7	21	454	192.3	20	32.4%	0.83 [0.19, 1.47]	-
Waller 2017	1.83	0.16	43	1.76	0.17	44	67.6%	0.42 [-0.00, 0.85]	-
Total (95% CI)			64			64	100.0%	0.55 [0.18, 0.93]	◆
Heterogeneity: Tau ² = Test for overall effect			-		= 0.29)	$; I^2 = 9$	%		-4 -2 0 2 4 Favours control Favours A-HIIT

Supplement 6. Sensitivity analysis for effect of A-HIIT versus control on lower limb strength

Figure 6.1. Effect of A-HIIT versus control with removal of studies with high attrition bias

	Aqu	atic H	IIT	C	ontrol		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Moreira 2013	12	2.94	59	11	2.36	41	52.7%	0.37 [-0.04, 0.77]	-
Waller 2017	355	67	42	352	67	42	47.3%	0.04 [-0.38, 0.47]	+
Total (95% CI)			101			83	100.0%	0.21 [-0.10, 0.53]	•
Heterogeneity: Tau² = Test for overall effect			-2 -1 0 1 2 Favours control Favours A-HIIT						

Figure 6.2. Effect of A-HIIT versus control with removal of studies conducted 8 weeks or less

	Aqu	atic H	IIT	C	ontrol		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Bento 2015	73	26	20	59	12	16	18.2%	0.65 [-0.02, 1.33]	-
Moreira 2013	12	2.94	59	11	2.36	41	42.8%	0.37 [-0.04, 0.77]	
Waller 2017	355	67	42	352	67	42	39.0%	0.04 [-0.38, 0.47]	-
Total (95% CI)			121			99	100.0%	0.29 [-0.01, 0.60]	•
Heterogeneity: Tau ² = Test for overall effect			-2 -1 0 1 2 Favours control Favours A-HIIT						

Supplement 7. Sensitivity analysis for effect of A-HIIT versus control on body fat mass

Figure 7.1. Effect of A-HIIT versus control with removal of studies with low methodological quality

	Aqua	atic H	IIT	C	ontrol		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Mohr 2014	41.4	5.5	21	41.5	4.92	20	32.1%	-0.02 [-0.63, 0.59]	
Waller 2017	24.8	8.8	43	26.4	8.1	44	67.9%	-0.19 [-0.61, 0.23]	
Total (95% CI)			64			64	100.0%	-0.13 [-0.48, 0.21]	•
Heterogeneity: Tau ² = Test for overall effect				-2 -1 0 1 2 Favours control Favours A-HIIT					

Figure 7.2. Effect of A-HIIT versus control with removal of studies with training frequency 2 or less per week

	Aquatic HIIT			Control			9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Mohr 2014	41.4	5.5	21	41.5	4.92	20	32.1%	-0.02 [-0.63, 0.59]	
Waller 2017	24.8	8.8	43	26.4	8.1	44	67.9%	-0.19 [-0.61, 0.23]	
Total (95% CI)			64			64	100.0%	-0.13 [-0.48, 0.21]	•
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.20$, $df = 1$ (P = 0.66); $I^2 = 0\%$ Test for overall effect: $Z = 0.75$ (P = 0.45)									-2 -1 0 1 2 Favours control Favours A-HIIT

Supplement 8. A-HIIT versus control – adverse events

Figure 8.1. Effect of A-HIIT versus control for minor adverse events

	Aquatic	HIIT	Cont	rol		Risk Difference	Risk Difference
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Bento 2015	0	25	0	19	10.3%	0.00 [-0.09, 0.09]	
Broman 2006	0	18	0	11	4.3%	0.00 [-0.13, 0.13]	
Hamer 1990	1	12	0	8	1.5%	0.08 [-0.15, 0.31]	
Michaud 1995	0	16	0	7	2.2%	0.00 [-0.19, 0.19]	
Mohr 2014	0	21	0	20	9.5%	0.00 [-0.09, 0.09]	
Moreira 2013	0	64	0	44	55.4%	0.00 [-0.04, 0.04]	
Rebold 2013	0	13	0	12	3.8%	0.00 [-0.14, 0.14]	
Waller 2017	2	43	1	44	13.0%	0.02 [-0.05, 0.10]	
Total (95% CI)		212		165	100.0%	0.00 [-0.02, 0.03]	•
Total events	3		1				
Heterogeneity: Tau ² =	0.00; Ch	$i^2 = 0.9$	4, df = 7	7 (P = 1)	1.00); $I^2 =$	- 0%	
Test for overall effect:							-0.2 -0.1 0 0.1 0.2 Favours Control Favours A-HIIT

Figure 8.2. Effect of A-HIIT versus control for serious adverse events

	Aquatic HIIT		Control			Risk Difference	Risk Difference
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Bento 2015	0	25	0	19	10.4%	0.00 [-0.09, 0.09]	
Broman 2006	0	18	0	11	4.3%	0.00 [-0.13, 0.13]	
Hamer 1990	0	12	0	8	2.3%	0.00 [-0.18, 0.18]	
Michaud 1995	0	16	0	7	2.2%	0.00 [-0.19, 0.19]	
Mohr 2014	0	21	0	20	9.5%	0.00 [-0.09, 0.09]	
Moreira 2013	1	64	1	44	27.1%	-0.01 [-0.06, 0.05]	
Rebold 2013	0	13	0	12	3.8%	0.00 [-0.14, 0.14]	-
Waller 2017	0	43	0	44	40.4%	0.00 [-0.04, 0.04]	
Total (95% CI)		212		165	100.0%	-0.00 [-0.03, 0.03]	•
Total events	1		1				
Heterogeneity: Tau ² =	0.00; Ch	$i^2 = 0.0$	5, df = 7	7 (P = 1)	1.00); $I^2 =$	- 0%	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
Test for overall effect:	Z = 0.14	(P = 0.	89)				-0.1 -0.05 0 0.05 0.1 Favours control Favours A-HIIT