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Do intensive preoperative and postoperative multidisciplinary interventions impact healthrelated bariatric surgery outcomes? A systematic review

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Do intensive preoperative and postoperative multidisciplinary interventions impact health-related bariatric surgery outcomes? A systematic literature review and meta-analysis













Variation in response to bariatric surgery

Type of surgery

Surgical technique

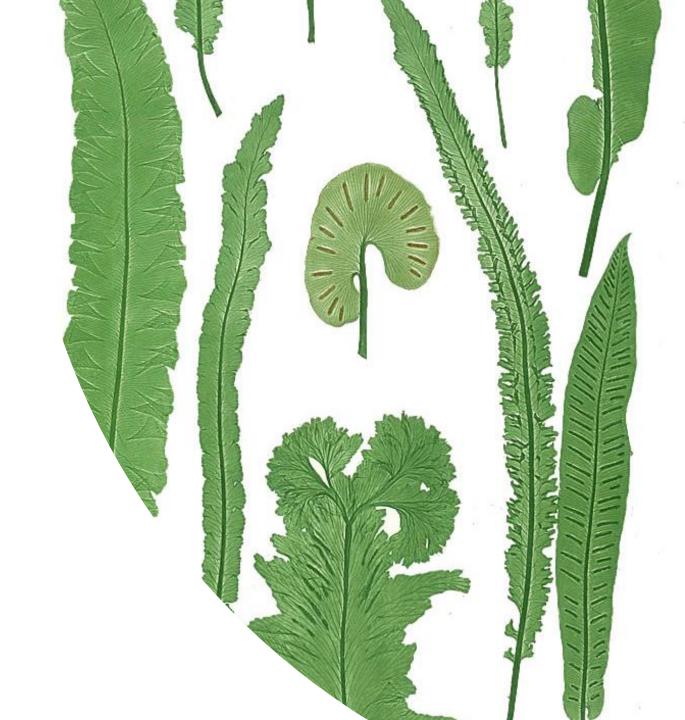
Non-modifiable patient variation

Psychosocial variables

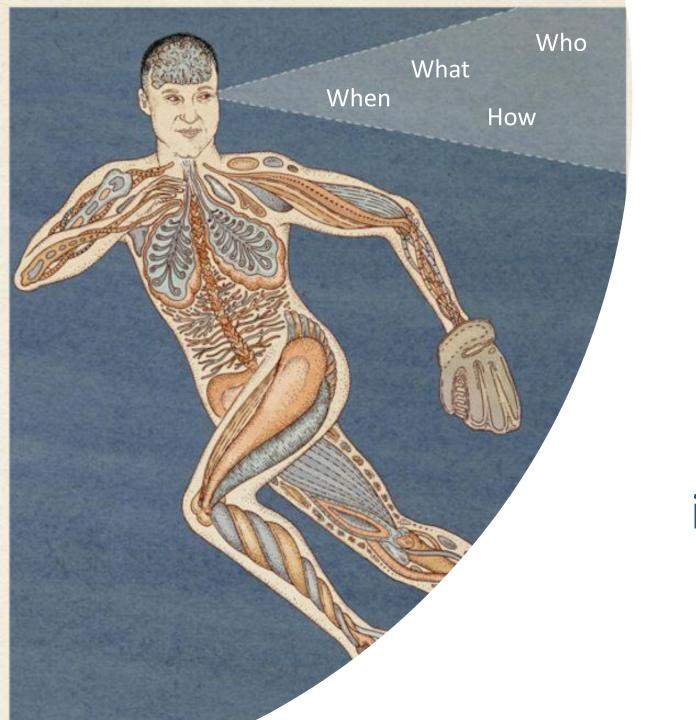
Eating patterns

Physical activity

Follow-up attendance







What is the effect of intensive versus standard pre- and/or postoperative MDT interventions on healthrelated outcomes postsurgery in adult bariatric patients?



SLR Methods & Findings

6 Databases

940 total participants

Unclear to high risk of bias (Cochrane)

Pre-op ≥2 weeks or Post-op ≥3 months 18 RCTs

(34 publications)

5 Meta-analyses (RevMan)

≥3 disciplines

6,871 records screened

GRADE
Certainty in body
of evidence













	Lifestyle & nutrition interventions n=4 studies	Psychology interventions n=5 studies	Physical focused interventions n=9 studies
Added a health disciplineIncreased intensity	100%100%	100%80%	100%100%
Interventionists	75% dietitian25% surgeon25% unclear	 20% physiotherapist 80% psychologist 20% psychiatrist 20% therapist 	 11% dietitian 33% physiotherapist 11% psychiatrist 44% exercise specialist 22% other
Content	Mostly counselling	Mostly CBT	Mostly supervised physical activity













Implementation characteristics

	Lifestyle & nutrition focused interventions n=4 studies	Psychology focused interventions n=5 studies	Physical activity focused interventions n=9 studies
Pre-opPost-opPre- and post-op	2 (50%)2 (50%)0	1 (20%)2 (40%)2 (40%)	2 (22%)6 (67%)1 (11%)
Duration:Pre-opPost-opPre- and post-op	6-months4 to 7.5-monthsN/A	 2.5-months 6 to 12-months 3.5 to 13.5-months 	1.5 to 3-months3 to 6-months6.5-months









Anxiety & Depression

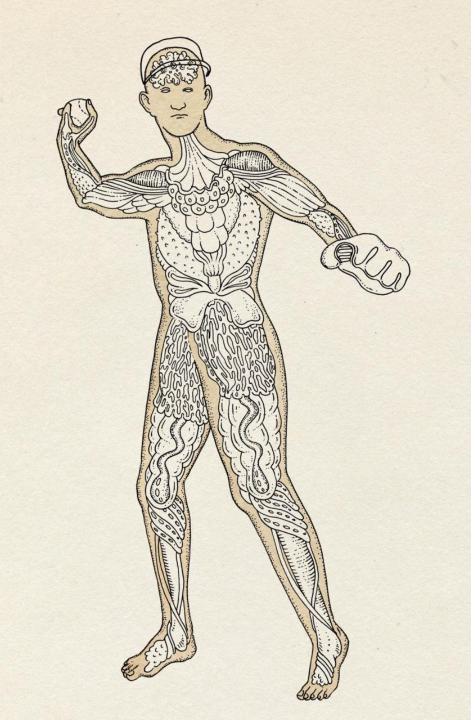
	Exp	eriment	al	(Control			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	S D	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Gade et al 2014 and 2015	-2.4	3.2493	43	-0.6	3.485	41	43.8%	-0.53 [-0.97, -0.09]	
Hollywood et al 2012 and 2015; Ogden et al 2015	-0.6	0.9	73	-0.5	0.9	72	56.2%	-0.11 [-0.44, 0.22]	
Total (95% CI)			116			113	100.0%	-0.29 [-0.70, 0.11]	-
Heterogeneity: Tau ² = 0.05; Chi ² = 2.28, df = 1 (P = 0 Test for overall effect: $Z = 1.41$ (P = 0.16)	l.13); l²=	56%						-	-1 -0.5 0 0.5 1 Favours [experimental] Favours [control]

Psychological interventions had **no effect** on post-op anxiety (SMD: -0.29 [95%CI: -0.70, 0.11] p=0.16; moderate heterogeneity; GRADE: Very low)

		eriment			Control			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Gade et al 2014 and 2015	-3.7	2.9244	43	-2.5	2.8514	41	41.2%	-0.41 [-0.84, 0.02]	
Hollywood et al 2012 and 2015; Ogden et al 2015	-0.84	0.7	73	-0.28	0.8	72	58.8%	-0.74 [-1.08, -0.40]	—
Total (95% CI)			116			113	100.0%	-0.61 [-0.92, -0.29]	•
Heterogeneity: Tau 2 = 0.02; Chi 2 = 1.39, df = 1 (P = 0 Test for overall effect: Z = 3.73 (P = 0.0002)	1.24); l²=	28%						-	-1 -0.5 0 0.5 1 Favours [experimental] Favours [control]

Psychological interventions **decreased depression** symptom scores (SMD: -0.61 [95%CI: -0.92, -0.29]; p=0.0002; low heterogeneity; GRADE: Very low)





Blood pressure

	Expe	rimen	tal	C	ontrol			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Balliot et al 2013, 2018	-9.9	12.1	13	-11.9	9.4	12	27.4%	2.00 [-6.46, 10.46]	-
Coen 2015, 2015; Woodlief 2015; Nunez Lopez 2015	-7.3	11.9	66	-4.2	12.8	62	59.0%	-3.10 [-7.39, 1.19]	─
Huck et al 2018	6.9	16.6	7	-0.25	6.5	8	13.6%	7.15 [-5.95, 20.25]	
Onofre et al 2017	-40	10	6	11.7	15	6	0.0%	-51.70 [-66.12, -37.28]	
Total (95% CI)			86			82	100.0%	-0.31 [-5.52, 4.90]	→
Heterogeneity: Tau 2 = 7.17; Chi 2 = 2.86, df = 2 (P = 0.24 Test for overall effect: Z = 0.12 (P = 0.91)); I ř = 309	%						-	-50 -25 0 25 50 Favours [experimental] Favours [control]

MDT interventions had **no effect** on post-op systolic blood pressure (MD: -0.31 [95%CI: -5.52, 4.90] p=0.91; low heterogeneity; GRADE: Very low)

	Expe	erimen	tal	C	ontro	I		Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Balliot et al 2013, 2018	-5.3	9.7	13	1.2	9.9	12	24.6%	-6.50 [-14.19, 1.19]	
Coen 2015, 2015; Woodlief 2015; Nunez Lopez 2015	-4.3	8.4	66	-2.7	8.5	62	34.9%	-1.60 [-4.53, 1.33]	
Huck et al 2018	1.4	11.3	7	-1.75	2.9	8	22.6%	3.15 [-5.46, 11.76]	
Onofre et al 2017	-21.6	10	6	-4.1	9.5	6	18.0%	-17.50 [-28.54, -6.46]	
Total (95% CI)			92			88	100.0%	-4.59 [-11.06, 1.89]	•
Heterogeneity: Tau² = 29.01; Chi² = 10.15, df = 3 (P = 0. Test for overall effect: Z = 1.39 (P = 0.16)	02); l²=	70%							-50 -25 0 25 50 Favours [experimental] Favours [control]

MDT interventions **no effect** diastolic blood pressure

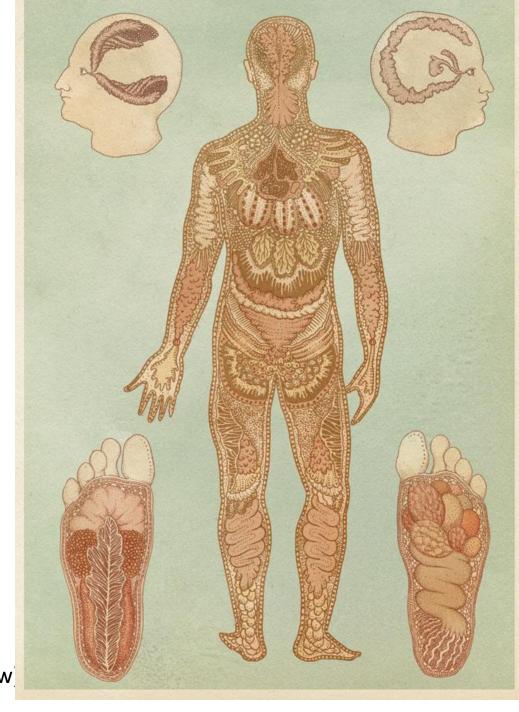
(SMD: -4.59 [95%CI: -11.06, 1.89]; p=0.16; high heterogeneity; GRADE: Very low)

Weight loss by MDT type

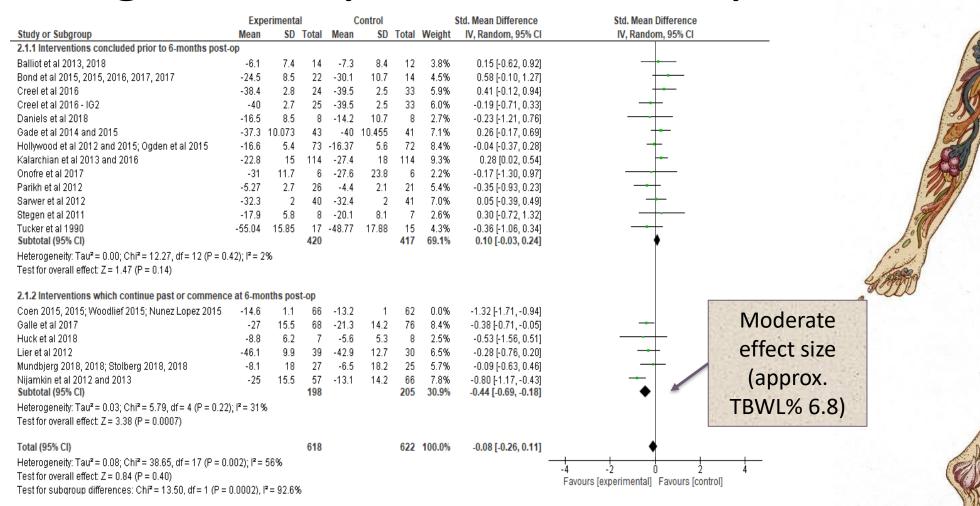
		erimenta			Control			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.3.1 Lifestyle and nutrition focused interventions									
Kalarchian et al 2013 and 2016	-22.8	15	114	-27.4	18	114	7.1%	0.28 [0.02, 0.54]	-
Nijamkin et al 2012 and 2013	-25	15.5	57	-13.1	14.2	66	6.5%	-0.80 [-1.17, -0.43]	
Parikh et al 2012	-5.27	2.7	26	-4.4	2.1	21	5.3%	-0.35 [-0.93, 0.23]	
Barwer et al 2012	-32.3	2	40	-32.4	2	41	6.1%	0.05 [-0.39, 0.49]	
Subtotal (95% CI)			237			242	25.1%	-0.19 [-0.73, 0.34]	~
Heterogeneity: Tau² = 0.26; Chi² = 22.93, df = 3 (P < 0.0 Fest for overall effect: Z = 0.71 (P = 0.48)	001); I²=	87%							
1.3.2 Psychology focused interventions									
ade et al 2014 and 2015	-37.3	10.073	43	-40	10.455	41	6.2%	0.26 [-0.17, 0.69]	+
Galle et al 2017	-27	15.5	68	-21.3	14.2	76	6.7%	-0.38 [-0.71, -0.05]	
Hollywood et al 2012 and 2015; Ogden et al 2015	-16.6	5.4	73	-16.37	5.6	72	6.8%	-0.04 [-0.37, 0.28]	+
Lier et al 2012	-46.1	9.9	39	-42.9	12.7	30	5.9%	-0.28 [-0.76, 0.20]	+
Fucker et al 1990	-55.04	15.85		-48.77	17.88	15	4.6%	-0.36 [-1.06, 0.34]	
Subtotal (95% CI)			240			234	30.2%	-0.14 [-0.39, 0.10]	◆
Heterogeneity: Tau² = 0.03; Chi² = 6.49, df = 4 (P = 0.17 Fest for overall effect: Z = 1.18 (P = 0.24)); I ² = 389	6							
1.3.3 Physical activity focused interventions									
Balliot et al 2013, 2018	-6.1	7.4	14	-7.3	8.4	12	4.3%	0.15 [-0.62, 0.92]	
Bond et al 2015, 2015, 2016, 2017, 2017	-24.5	8.5	22	-30.1	10.7	14	4.7%	0.58 [-0.10, 1.27]	 -
Coen 2015, 2015; Woodlief 2015; Nunez Lopez 2015	-14.6	1.1	66	-13.2	1	62	6.4%	-1.32 [-1.71, -0.94]	
Creel et al 2016	-38.4	2.8	24	-39.5	2.5	33	5.6%	0.41 [-0.12, 0.94]	+
Creel et al 2016 - IG2	-40	2.7	25	-39.5	2.5	33	5.7%	-0.19 [-0.71, 0.33]	
Daniels et al 2018	-16.5	8.5	8	-14.2	10.7	8	3.4%	-0.23 [-1.21, 0.76]	
Huck et al 2018	-8.8	6.2	7	-5.6	5.3	8	3.2%	-0.53 [-1.56, 0.51]	
Mundbjerg 2018, 2018; Stolberg 2018, 2018	-8.1	18	27	-6.5	18.2	25	5.5%	-0.09 [-0.63, 0.46]	
Onofre et al 2017	-31	11.7	6	-27.6	23.8	6	2.8%	-0.17 [-1.30, 0.97]	
Stegen et al 2011	-17.9	5.8	8	-20.1	8.1	7	3.2%	0.30 [-0.72, 1.32]	
Subtotal (95% CI)			207			208	44.7%	-0.12 [-0.60, 0.35]	•
Heterogeneity: Tau² = 0.43; Chi² = 44.14, df = 9 (P < 0.0	0001); l²	= 80%							
Fest for overall effect: Z = 0.51 (P = 0.61)									
Fotal (95% CI)			684			684	100.0%	-0.16 [-0.40, 0.08]	•
Heterogeneity: Tau² = 0.19; Chi² = 76.19, df = 18 (P < 0	00001); (²= 76%							+ + +
Fest for overall effect: Z = 1.29 (P = 0.20)									Favours [experimental] Favours [control]
Fest for subgroup differences: $Chi^2 = 0.04$, $df = 2$ (P = 0	000 17	0.00							ravours (experimental) ravours (control)

There is **no effect** of any MDT-type on weight loss

(SMD: -0.16 [95%CI: -0.40, 0.08]; p=0.20; high heterogeneity; GRADE: very low

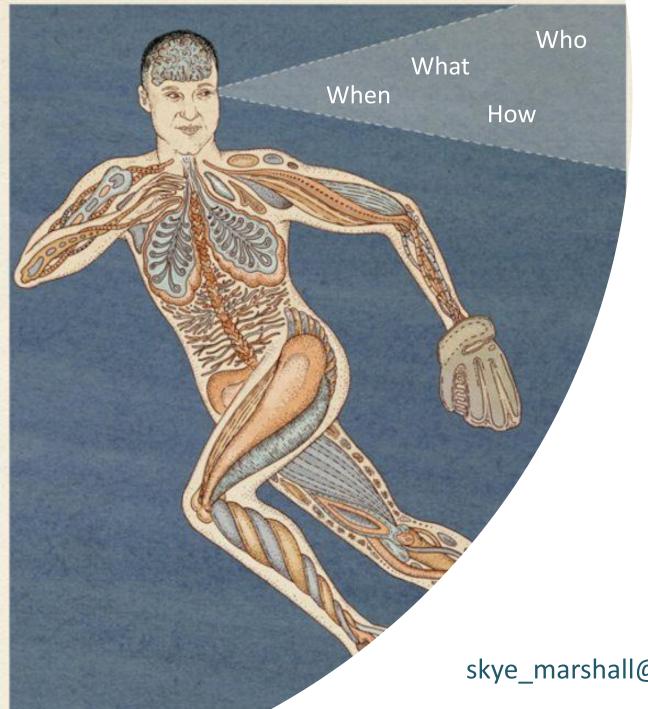


Weight loss by time of delivery



MDT interventions which continued past or commenced at 6-months post-op increased weight loss

(SMD: -0.44 [95%CI: -0.18, -0.69]; p=0.0007; moderate heterogeneity; GRADE: low)



Findings

When

Basic MDT support pre- and post-op + intensive MDT ≥3-months commencing 6months post-op

What

Lifestyle or diet counseling, supervised exercise, and/or cognitive behavioral therapy

Who

Any allied health + usual MDT

How

In-person or telehealth



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