

Physical Activities - The Whole Day Matters

Supervised Exercise: How and Why

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CONFLICT OF INTEREST DISCLOSURE

I have no potential conflict of interest to report



Preoperative







IFSO

NAPOLI 2023





BMI = 63.1 kg/m²

To prescribe exercises for these patients, we need to take into account that:



Different realities and economic situation

Different levels of education and obesity

Access to information

Access to Physical Activity Centers

Private and Public Health System





Pre Bariatric Surgery

Individuals with reduced cardiorespiratory function

Osteo-muscular limitations

Low level Physical Activities

Low adherence to exercise programs



Marcon ER et al, 2011 Marcon ER et al, 2017 What do we find in the literature about preoperative exercise prescription?











Physical Activity and Bariatric Surgery





- 1631 duplicates
- 416 without physical exercise program
- 67 were guidelines, abstracts, systematic reviews or meta-analyses
- 2 were outside the analyzed period
- 106 post bariatric
- 47 compared pre and post surgery
- 10 evaluation of the profile of patients in the preoperative period, classifying them as active or sedentary
- 1 without defined exercise protocol



Excluded Articles 2280

Eligible Articles 21

Preoperative		Strength Training 9 Articles	
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Authors	Publication Year	Country	Intervention 1_Exercise 2_Couseling 3_Multidisciplinary	Intervention Time (Months)	n Total of the Study
Delgado Floody P (A)	2015	Chile	3	3	10
Delgado Floody P (C)	2015	Chile	3	3,5	14
Delgado Floody, P (B)	2015	Chile	1	3	28
Delgado Floody P (D)	2015	Chile	3	4	19
Delgado Floody P (A)	2016	Chile	3	5	13
Delgado Floody P (B)	2016	Chile	3	5	22
Delgado Floody, P	2017	Chile	1	6	22
Cofre-Lizama A	2017	Chile	1	8	16
Delgado-Floody, P	2018	Chile	3	5	20







✓ 3 Exercise Interventions ✓ 6 Multidisciplinary Interventions

Exercise Protocols:

All studies had the same research group and exercise protocol

Exercise:

3 times a week, 10 min warm-up and Resistance exercises

Multidisciplinary intervention:

Exercises, nutritional and psychological guidance.

<u>Results</u>

- Improved anthropometric and cardiometabolic parameters, and decreased psychiatric diseases
- Increased maximum dynamic and maximum isometric strength



Drooporativo	Aerobic Exercise
Preoperative	8 Articles

Authors	Publication Year	Country	Intervention 1_Exercise 2_Couseling 3_Multidisciplinary	Intervention Time (Months)	n Total of the Study
Tur JJ	2013	Espanha	3	12	143
Bond DS (A)	2015	USA	2	1,5	75
Bond DS (B)	2015	USA	2	1,5	75
Bond DS	2016	USA	2	1,5	75
Bond DS	2017	USA	2	1,5	33
Marcon ER	2017	Brazil	1 e 3	5	66
Barreto BLM	2018	Brazil	3	3	38
Lemanu D	2018	New Zealand	3	1,5	88



Aerobic Exercise 8 Articles



✤ All had control group



✓ 1 Exercise Intervention

✓ 7 Multidisciplinary or Couseling Interventions

- Time in daily MVPA
- ♦ Daily intervals \geq 10 minutes
- Number of steps/day
- General health scales
- Physical function
- Adherence and motivation for PA practice

Groups that received exercise prescription from a professional exercise specialist had better results



Concurrent Training (Aerobic + Strength) 4 Articles

Authors	Publication Year	Country	Intervention 1_Exercise 2_Couseling 3_Multidisciplinary	Intervention Time (Months)	n Total of the Study
Ortega LS	2014	Spain	3	2	10
Baillot A	2016	Canada	3	3	8
Baillot A	2017	Canada	3	3	6
Cadegiani FA	2017	Brazil	3	12	43



Concurrent Training 4 Articles

✓ 4 Multidisciplinary Interventions

Results in the Intervention groups





- Alanine transaminase
- Gamma glutamine
- Uric acid
- C-reactive protein



- Cardiometabolic Parameters
 Antropometric Parameters
- Adherence

- Online and face-to-face interventions did not show differences in Quality of Life and Psychological Barrier to the Practice of PA
- The frequency in exercise sessions was higher in online activities





- Reduced cardiorespiratory fitness (VO2max < 15.8 ml/kg/min) is associated with a longer operation and intubation time, estimated blood loss during surgery, and more frequent cardiovascular complications.
- Several factors are associated with more minutes of MVPA and 10.000 steps/day in postoperatively, such as:



Increasing exercise as a weight loss strategy Performing 150 minutes/week Reducing pain Starting PA 6 months before surgery

Improvements are observed in different interventions and in different exercise protocols



Gilbertson et al., 2020 Jabbour et al, 2022 Herrera-Santelices et al, 2022

Pos Bariatric Surgery

Substantial Weight Loss

Substantial Loss of Muscle Mass (Up to 30 -35% in 6 months)



The lack of skeletal muscles may be related to functional, immunological, metabolic and postural problems



33.5% drop in muscle mass may result in a decrease of more than 300 kcal / day





Energy expenditure

- The exercise promotes maintenance and/or increase of lean mass
- Improves physical fitness, metabolic health, quality of life and leads to additional weight and body fat loss
- Promotes greater weight loss at 12 and 24 months after bariatric surgery



Coen et al, 2016 Versiane et al 2017 Bellicha et al, 2021

Effect of exercise training before and after bariatric surgery: A systematic review

and meta-analysis

Alice Bellicha,^{60,1,2} Marleen A, van Baak, ³ Erancesca Battista, ⁴ Kristine Beaulieu, ⁵ John E, Blundell, ⁵ Luca Busetto, ^{6,7} Eliana V, Carraça, ⁸ Dror Dicker, ^{6,9} Jorge Encantado, ¹⁰ Andrea Ermolao, ⁴ Nathalie Earpour-Lambert, ^{6,11} Adrivan Pramono, ³ Euan Woodward, ⁶ and Jean-Michel Oppert ¹²

	(A) Change in body	weight (i	in kg)	
,	Study or Subgroup	Weight	Mean Difference IV, Random, 95% Cl	Mean Difference IV, Random, 95% CI
<u>Pos Bariatric Surgery</u> Exercise Groups and Control Groups	Campanha-Versiani Castello Coen (a) Coleman Daniels Hassannejad (a) Hassannejad (b) Herring Huck Mundbjerg (a) Onofre Oppert Shah Stegen Total (95% Cl)	weight 4.3% 6.7% 9.9% 3.4% 10.3% 8.3% 7.8% 8.7% 4.4% 14.2% 2.5% 9.4% 8.6% 1.4%	10, Random, 95% Cl 4.90 [-1.10, 10.90] 0.00 [-4.49, 4.49] -0.80 [-4.06, 2.46] -3.28 [-10.21, 3.65] -2.30 [-5.45, 0.85] -5.10 [-8.89, -1.31] -4.90 [-8.87, -0.93] -5.60 [-9.26, -1.94] -3.20 [-9.08, 2.68] -1.60 [-3.79, 0.59] -3.40 [-11.72, 4.92] 0.60 [-2.83, 4.03] 0.50 [-3.20, 4.20] 3.90 [-7.61, 15.41]	IV, Random, 95% Cl
	Heterogeneity: Tau* Test for overall effect 95% Prediction Inter	= 2.28; Ch :: Z = 2.56 rvals: (-5.4	i [*] = 20.14, df = 13 (P = 0.09); i [*] = 35% (P = 0.01) I, 1.8)	-20 -10 0 10 20 Favours [exercise] Favours [control]



Pos Bariatric Surgery Exercise Groups and Control Groups

(B) Change in fat mass (in kg)

Study or Subgroup	Weight	Mean Difference IV, Random, 95% CI	
Coen (a)	14.6%	-0.80 [-3.54, 1.94]	
Hassannejad (a)	7.3%	-6.00 [-11.04, -0.96]	
Hassannejad (b)	7.6%	-6.90 [-11.80, -2.00]	
Herring	13.6%	-4.00 [-6.98, -1.02]	
Huck	9.1%	-3.00 [-7.29, 1.29]	
Marchesi	18.3%	-2.22 [-4.18, -0.26]	
Oppert	16.5%	0.30 [-2.04, 2.64]	
Shah	9.6%	1.29 [-2.84, 5.42]	
Stegen	3.4%	1.70 [-6.50, 9.90]	

Total (95% Cl)100.0%-2.08 [-3.70, -0.45]Heterogeneity: Tau² = 2.76; Chi² = 15.86, df = 8 (P = 0.04); I² = 50%Test for overall effect: Z = 2.50 (P = 0.01)



(C) Change in lean body mass (in kg)

Study or Subgroup	Weight	Mean Difference IV, Random, 95% CI	Mean Difference IV, Random, 95% Cl
Campanha-Versiani	11.8%	2.40 [0.66, 4.14]	
Castello	9.1%	2.00 [-0.23, 4.23]	
Coen (a)	14.2%	-0.20 [-1.59, 1.19]	
Hassannejad (a)	4.2%	0.80 [-3.07, 4.67]	
Hassannejad (b)	3.9%	2.00 [-2.05, 6.05]	
Herring	13.4%	-1.60 [-3.10, -0.10]	
Huck	8.4%	-0.30 [-2.68, 2.08]	
Marchesi	8.4%	1.70 [-0.68, 4.08]	
Oppert	11.8%	1.10 [-0.64, 2.84]	
Shah	10.6%	0.10 [-1.84, 2.04]	
Stegen	4.1%	2.20 [-1.72, 6.12]	
Total (95% CI)	100.0%	0.68 [-0.20, 1.56]	•
Heterogeneity: Tau ²	= 0.92; Ch	$i^2 = 18.12$, df = 10 (P =	05); 1 ² = 45%
Test for overall effect	: Z = 1.52	(P = 0.13)	-10 -5 0 5 10
95% Prediction Inte	rvals: (-1.7	7. 3.1)	ravours [control] ravours [exercise]

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Pos Bariatric Surgery Exercise Groups and Control Groups

(A) Change in VO₂max

	Std. Mean Difference		Std. Mean Difference
Study or Subgroup	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Coen (b)	23.5%	0.44 [0.05, 0.84]	
Huck	8.7%	0.47 [-0.56, 1.50]	
Marchesi	6.3%	2.16 [0.89, 3.43]	
Mundbjerg (b)	19.3%	0.66 [0.14, 1.18]	
Onofre	5.1%	1.82 [0.38, 3.26]	
Oppert	17.2%	0.45 [-0.14, 1.04]	
Shah	10.9%	1.13 [0.25, 2.01]	
Stegen	8.9%	0.02 [-0.99, 1.04]	
Total (95% CI)	100.0%	0.70 [0.35, 1.06]	•
Heterogeneity: Tau ²	= 0.10; Chi	$^{2} = 12.09$, df = 7 (P = 0.10); $I^{2} = 42\%$	
Test for overall effect	: Z = 3.89	(P < 0.0001)	-4 -2 0 2 4 Favours (control) Favours (exercise)

(B) Change in walking test distance

Std. Mean Difference		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Weight	IV, Random, 95% Cl	IV, Random, 95% CI
Castello	17.1%	0.72 [-0.17, 1.62]	
Coleman	15.8%	4.79 [3.58, 5.99]	
Hassannejad (a)	17.2%	0.44 [-0.41, 1.28]	
Hassannejad (b)	17.0%	0.61 [-0.30, 1.51]	+
Herring	16.3%	2.07 [0.96, 3.17]	
Stegen	16.6%	0.40 [-0.62, 1.43]	
Total (95% CI)	100.0%	1.46 [0.27, 2.66]	-
Heterogeneity: Tau ²	= 1.98; Chi	$^{2} = 44.67$, df = 5 (P < 0.00001); $l^{2} = 89$	9%
Test for overall effect	t: Z = 2.40	(P = 0.02)	-10 -5 0 5 10 Favours [control] Favours [exercise]



Pos Bariatric Surgery Exercise Groups and Control Groups

(C) Change in muscle strength



Obesity Surgery March 2017, Volume 27, Issue 3, pp 763–773

What Is the Best Treatment before Bariatric Surgery? Exercise, Exercise and Group Therapy, or Conventional Waiting: a Randomized Controlled Trial

Authors	Authors and affiliations	
Emilian Rejane Mar	con 🖂 , S. Baglioni, L. Bittencourt, C. L. N. Lopes, C. R. Neumann, M. R. M. Trindade	

OBJECTIVE:

OBESITY SURGE

Investigate the effect of an exercise program with and without cognitive-behavioral therapy, compared by a control group, on weight, functional capacity, and cardiometabolic profile on bariatric surgery preoperative.





Exercises Protocol

(EXER and EXER+CBT)



2023





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The interventions positively influenced the patients' health

Control Group in 5 months Increased severity of comorbidities assessed and cardiovascular risk



Face-to-Face /// Online Program

Before and After Bariatric Surgery



PESO III Supervised Exercise Program for Obesity III

Public Health Care



TCHÊ MEXE ADULTO

TCHÊ MEXE GURIZADA







+ 600 Patients <u>+ 50 Patients per Exercises Sessions</u>

















First moment: Physical exercise | **Second moment**: Lectures on acquiring healthy habits

WhatsApp Groups : Information, Socialization and Education





WhatsApp Business

Information

250 Patients

#PESOIII		YouTube Channel #TCHÊMEXE #PESOIII			PESOIII - TCHÊ MEXE ** 5 WhatsApp Group Invite Acesse este link para entrar no meu grupo do WhatsApp: https://chat.whatsapp.com/BxogytmDteOJEo5gYs36G0				
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E-BOOK OF RECIPES

- Recipes submitted by patients
- Various recipes to use 100% of the food
- Working together with the pedagogy and nutrition students





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#EBIDAS

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EDUCAÇÃO NA COZINHA

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SALGADAS -



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INGREDIENTES

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PÃO DE FOLHAS E TALOS

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INGREDIENTES





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Recommendations for exercise prescription in bariatric patients

- Taking into account individual preferences for prescribing exercise
- Create strategies that facilitate and involve the individual in the exercise program (pleasant enviroments, music, scenery, etc)
- Exercise supervision by an experienced exercise specialist increases adherence and reduces the risks that can be posed by PA
- Exercising in the preoperative period of bariatric surgery increases adherence and postoperative benefits.

Maybe the world can come together and teach each other



Discussing adherence, motivation, strategies and exercise prescription in bariatric surgery individuals is essential.

To change lives we need to change behavior and physical exercise is part of this process. We need to make patients aware of the importance of regular exercise and assist them in discovering their physical abilities.



















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