



Predictors of Successful Weight Control: Cross-Cultural Moderators of Treatment Outcomes

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INTRODUCTION

Given the heterogeneity of effect sizes within the population for any treatment, identifying moderators of outcomes is critical [1]. In weight management programs, there is a high individual variability in terms of weight loss and an overall modest success [2]. Some people will adopt and sustain attitudes and behaviors associated with weight loss, while others won't [3]. To predict weight loss outcome just from the subject's baseline information would be very valuable [4,5]. It would allow to:

- Better match between treatments and individuals
- Identify the participants with less probability of success (or potential dropouts) in a given treatment and direct them to alternative therapies
- Target limited resources to those most likely to succeed
- Increase cost-effectiveness and improve success rates of the programs

Few studies have been dedicated to describe baseline predictors of treatment success. The Healthy Weight for Life (USA) study is one of the few. Its findings are now being cross-validated in Portuguese samples. This paper describes these cross-cultural comparisons.

METHODS

Three separate overweight/obese samples from weight control programs were analyzed: one American sample "The Healthy Weight for Life" (US) study and two Portuguese samples of the "Promotion of Exercise and Health in Obesity" study (PT1, PT2).

1) "The Healthy Weight for Life" (US)

Participants: 158 perimenopausal women (age: 48.0±4.5 y; BMI: 31.0±3.8 kg/m²)
Timeline: 4 months intervention + 12 months follow up

2) "Promotion of Exercise and Health in Obesity", study 1 (PT1)

Participants: 140 premenopausal women (age: 38.3±5.9 y; BMI: 30.3±3.7 kg/m²)
Timeline: 4 months intervention + 12 months follow up

3) "Promotion of Exercise and Health in Obesity" study 2 (PT2)

Participants: 89 premenopausal women (age: 38.0±7.7 y; BMI: 32.3±4.3 kg/m²)
Timeline: 12 months intervention + 24 months follow up (results not yet available)

INTERVENTION

All programs were cognitive-behavioral in nature, based on regular group meetings (weekly to bi-weekly) to encourage to make progressive changes in lifestyle (eating habits and physical activity) to achieve a moderate daily energy deficit.

ASSESSMENT

Number of previous diets, weight outcome evaluations with the **Goals and Relative Weight Questionnaire** ("dream", "happy", "acceptable", "disappointing weight") [6], influence of weight loss on the individual's health, interpersonal life, work, mobility, self-esteem, sexual function, activities of daily living and eating with the **Impact of Weight on Quality of Life - Lite** questionnaire (IWQOL-Lite) [7], self-motivation with **Self-Motivation Inventory** (SMI) [8], self-esteem with the **Self-Esteem/Self-Concept Questionnaire** [9], exercise perceived barriers with the **Exercise Perceived Barriers scale** (EPB) [10], self-efficacy for exercise behaviors with the **Self-Efficacy for Exercise Behaviors scale** (SEEB) [11]. Body image was evaluated with three different questionnaires: **Body Shape Questionnaire** [12], **Body Image Assessment Questionnaire** (body size dissatisfaction) [13] and **Body Cathexis Questionnaire** [14]. The amount of physical activity during childhood, teen years and adulthood was evaluated by a questionnaire (PT2).



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RESULTS

"Healthy Weight for Life" (US) 4 and 16 months

Of the 158 women that entered the study, 136 finished the intervention (attrition, 14%) and 111 complied with all follow-up assessments at month 16 (attrition, 30%). After the 4-month intervention, average weight loss was -5.1±3.3 kg (6.2±4.6% of initial weight). At month 16, completers loss an average of 4.6±5.5 kg (-5.5±7.7% of initial weight). Using BOCF, mean change in weight was -3.2±5.9 kg (-3.9±6.9% of initial weight) and LOCF+ -3.0±5.4 kg (-3.7±7.6% of initial weight).

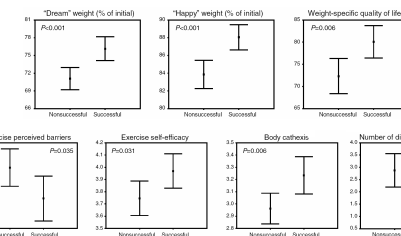
CORRELATION BETWEEN BASELINE PSYCHOSOCIAL MEASURES AND CHANGES IN WEIGHT (US)

	Correlations with weight changes					
	4 months		16 months			
	Completers	BOCF	Completers	LOCF+	BOCF	BOCF
Weight/diet history						
Number of diets in past year	0.37***	0.35***	0.25*	0.22*	0.24**	0.24**
Life frequency of up/down weight (± 4.5 kg)	-0.07	0.08	-0.09	0.00	-0.02	-0.02
Years at current weight	0.19	0.19*	-0.04	0.08	0.06	0.06
Dream weight" (as % baseline weight)	-0.02	-0.09	-0.01	-0.16	-0.18*	-0.18*
*Disappointing weight" (as % baseline weight)	-0.03	-0.12	0.01	-0.10	-0.03	-0.03
*Acceptable weight" (as % baseline weight)	-0.15	-0.28**	-0.02	-0.20*	-0.15*	-0.15*
*Happy weight" (as % baseline)	-0.10	-0.26**	-0.08	-0.27**	-0.21**	-0.21**
Quality of Life						
Impact of weight on quality of life	-0.12	-0.19*	-0.04	-0.15*	-0.15*	-0.15*
Psychological Characteristics						
Self-esteem/self-concept	-0.20	-0.21*	0.01	-0.10	-0.04	-0.04
Depression	0.06	0.15	-0.05	0.13	0.06	0.06
Exercise perceived barriers	0.12	0.21*	0.20*	0.22**	0.17*	0.17*
Exercise social support	0.15	0.16	0.06	0.00	0.05	0.05
Exercise self-efficacy	-0.10	-0.19*	-0.18	-0.25**	-0.18*	-0.18*
Body image						
Body shape concerns	0.03	0.14	-0.02	0.11	0.11	0.11
Body size dissatisfaction	0.15	0.28**	0.07	0.19*	0.17*	0.17*
Body cathexis	-0.07	-0.18	-0.12	-0.18*	-0.22**	-0.22**

*p<0.05, **p<0.01, ***p<0.001 on Spearman rank correlation.
LOCF+: last observation carried forward; LOCF+: a modified version of last observation carried forward, with 0.2 kg/month added since the last measured weight; BOCF: baseline observation carried forward. Results at 4 months are from a sub-sample (n=112) of the total group. These results were already presented elsewhere [2, 15, 16].

At the end of the intervention, the sample was divided into three groups, by tertiles of weight loss. The strongest correlates of weight loss were: at least 4.5 kg weight loss in the past 2 years (p<0.001), number of diets in the last year (p=0.001), "acceptable weight" (p=0.006), "happy weight" (p=0.011), work scale of IWQOL-Lite (p=0.007), health scale of IWQOL-Lite (p=0.030), self-motivation (p=0.006), self-esteem/self-concept (p=0.008), and body size dissatisfaction (p=0.002).

COMPARISONS BETWEEN SUCCESSFUL AND UNSUCCESSFUL PARTICIPANTS AT MONTH 16



T-test comparisons. Successful participants completed 16 assessments and lost 5% or more of initial weight (n=53); non-successful participants dropped out or completed the study without weight loss (n=71).

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"Promotion of Exercise and Health in Obesity" study 1 (PT1) 4 and 16 months

Of the 140 women who entered the study, 135 finished the 4-month intervention (attrition, 3.5%) and 96 complied with all follow-up assessments at month 16 (attrition, 31%). After the intervention, weight loss was -3.0±3.2 kg (-3.7±4.0%) for the completers and -2.9±3.2 kg (-3.5±4.0%) using the BOCF. At month 16, completers loss an average of 3.5±5.3 kg. Using BOCF, mean weight change was -2.4±4.6 kg (-3.1±5.9%) and with LOCF+ was -2.2±5.1 kg (-2.8±6.5%). In this study, potential predictors were selected based on results from the US sample (cross-cultural validation).

CORRELATION BETWEEN BASELINE PSYCHOSOCIAL MEASURES AND CHANGES IN WEIGHT (PT1)

	Correlations with weight changes			
	4 months		16 months	
	LOCF	Completers	LOCF+	BOCF
Weight/diet history				
Months on current weight	-0.13	0.17	0.06	0.10
Number of diets in past year	0.26**	0.08	0.13	0.11
Weight Outcome evaluations				
"Dream weight" (as % baseline weight)	0.08	0.00	0.00	0.02
"Disappointing weight" (as % baseline weight)	0.22*	0.22*	0.18*	0.19*
"Acceptable weight" (as % baseline weight)	0.33***	0.23*	0.18*	0.15
"Happy weight" (as % baseline)	0.27***	0.21**	0.14	0.09
Impact of weight on quality of life	0.02	0.04	-0.04	-0.06
Quality of Life Psychological Characteristics				
Self-motivation	-0.19*	-0.02	-0.08	-0.04
Self-esteem/self-concept	0.00	0.14	0.07	0.13
Exercise behaviour				
Depression	0.08	0.15	0.11	0.10
Exercise perceived barriers	0.08	0.15	0.11	0.10
Exercise social support	0.08	0.15	0.11	0.10
Exercise self-efficacy	-0.03	0.09	0.04	0.09
Body image				
Body shape concerns	0.03	0.03	0.08	0.04
Body size dissatisfaction	0.09	0.20	0.17*	0.19*

*p<0.05, **p<0.01, ***p<0.001 on Spearman rank correlation.
LOCF+: a modified version of last observation carried forward, with 0.2 kg/month added to the last measured weight; BOCF: baseline observation carried forward.
† When weight change was adjusted for baseline weight, body size dissatisfaction emerged as a predictor (p=0.038); Results at 4 months were already presented elsewhere [5].

"Promotion of Exercise and Health in Obesity" study 2 (PT2) 12 months

Of the 89 women that entered the study (1st and 2nd of three cohorts), 74 finished the 12-month intervention (attrition, 17%). After the intervention, average weight loss was -6.4±5.3 kg (-7.5±6.2%) for completers, -5.3±5.7 kg (-6.3±6.7%) using the LOCF+, and -5.6±5.3 kg (-6.6±6.3%) using the BOCF imputation method.

CORRELATION BETWEEN WEIGHT/DIET AND PHYSICAL ACTIVITY HISTORY AND CHANGES IN WEIGHT (PT2)

	Correlations with weight changes		
	Completers		
	LOCF+	LOCF+	BOCF
Weight/diet history			
Months on current weight	0.02	-0.11	-0.11
Number of diets in past year	0.58**	0.28*	0.28*
Age when started dieting	-0.04	-0.10	-0.08
Number of diet attempts	0.15	0.11	0.10
Physical Activity History (in minutes per year)			
Childhood	0.01	0.05	0.06
Teen years	-0.01	-0.01	-0.02
Adulthood	-0.07	-0.03	-0.05
Thought life	-0.03	0.01	0.02

*p<0.05, **p<0.01 on Spearman rank correlation. LOCF+: a modified version of last observation carried forward, with 0.2 kg/month added to the last measured weight; BOCF: baseline observation carried forward.

CONCLUSIONS

- In all samples, **previous dieting** negatively predicted weight loss by the end of intervention and follow-up period; in both US and PT1 samples, **poorer body image** was also a predictor of less weight loss at 4 and 16 months (data not yet analyzed in PT2 study).
 - In the US sample, **higher weight loss expectations, poorer weight-specific quality of life, lower self-motivation, less exercise self-efficacy and more perceived barriers** were predictors of smaller weight losses at 4 and 16 months.
 - In PT1, findings for **self-motivation** as positive predictor were replicated in the short-term. In opposition, **higher expectations** predicted larger weight losses both in the short and long-term.
 - In PT2, preliminary results show that lifetime physical activity does not predict weight loss.
- Similar prediction patterns have emerged across cultures although some differences may also exist, namely regarding pre-treatment **weight loss expectations**. Collectively, **previous dieting and higher body dissatisfaction** are negative moderators of weight loss during behavioral treatment.