



## The role of Food Addiction on sub-optimal weight loss and recurrent weight gain in bariatric surgery

Emanuela Bianciardi, MD, PhD  
University of Rome «Tor Vergata», Italy

**I have no potential conflict of interest to report**



# Weight Regain and Insufficient Weight Loss After Bariatric Surgery: Definitions, Prevalence, Mechanisms, Predictors, Prevention and Management Strategies, and Knowledge Gaps—a Scoping Review

Table 3 IWL and WR after BS: area and extent of current knowledge gaps

Knowledge gap	Extent of gap <sup>a</sup>		Summary
	WR	IWL	
Inconsistent reporting	++	++++	Small sample sizes and variability
Lack of standardization	+++	NA	Varied definitions, consensus statements, and guidelines of WR [8, 23]
Clinical significance	++	++++	Relationships between different WR definitions and clinical outcomes require to be established [8, 23] No data on clinical significance of IWL, urgently needed
Limited data on Prevalence	+	+++	Prevalence data mostly on WR [32–34] Sparse data on prevalence of IWL [36], mostly assessed when discussing indication for revisional surgery [17, 35, 39]
Mechanisms	+++	++++	Small studies on WR Very sparse data on mechanisms of IWL
Gut hormones	+++	++++	Ghrelin, GLP, GIP: sparse data, small sample sizes; no long-term evidence [43]; PYY: only rodent studies [46]; leptin evaluated only in women [47, 48]. Very few studies on gut hormones, leptin or PBH in relation to IWL
Dietary non-adherence	+++	++++	Few small-sized prospective studies, more RCTs required [50, 51] Virtually no prospective studies on associations of caloric intake, macronutrient composition, dietary non-adherence, and food indiscretion with IWL
Physical in/activity	+++	++++	Difficult to assess due to discrepancy between self-reported and measured PA [60, 61]; limited data on PA types, durations and levels and their associations with WR Very sparse data on PA types, durations and levels, and their associations with IWL
Mental health	+++	++++	Relationship between preoperative depression and WR is unclear; research is required to establish the direction of the relationship [64, 66] Few reports on number of psychiatric diseases and loss of control over eating in relation to IWL [63, 65]; virtually no data on associations of depression and binge eating with IWL [68]
Surgical	+	++++	Most studies on WR [72–75] Role of surgical causes in IWL practically not assessed
Management Behavioral	+++	++++	Small studies with short follow-up in WR, no RTCs [87, 88] No prospective studies of patients with IWL
Dietary	+++	++++	WR: few studies with small sample sizes and short durations (education sessions, structured dietary intervention); long-term, larger RCTs are needed [91, 92] No published data available on effects of dietary management in IWL
Pharmacological	+++	++++	Small-sized retrospective observational studies, short follow-ups [95, 96, 98]; no robust RCTs to provide level 1 evidence of role of pharmacological approaches to WR [102]
Surgical revision	+	++++	Effects of pharmacological therapy for IWL usually assessed in combination with WR [98, 102] Effects of surgical revision on weight usually assess WR and IWL combined [17]; no RCTs of the effects of various revisional surgeries on WR No RCTs of the effects of various revisional surgeries on IWL (for failed LAGB, LSG, RYGB) [99]

Ansari WE, Obesity Surgery (2021) 31:1755–1766





# Prevalence and Correlates of Food Addiction in Bariatric Surgery Candidates and Its Effect on Bariatric Surgery Outcome: A Prospective Observational Study

Razieh Salehian<sup>1</sup>  · Atefeh Ghanbari Jolfaei<sup>2</sup>  · Maryam Mansoursamaei<sup>3</sup>  · Ali Mansoursamaei<sup>4</sup>  · Mehrdad Vossoughi<sup>5</sup>  · Mahdieh Elyasi Galeshi<sup>6</sup> 

Received: 17 February 2023 / Revised: 20 April 2023 / Accepted: 25 April 2023

- «the effect of FA on weight loss outcomes was not significant»



# Prevalence of Food Addiction and Binge Eating in an Italian sample of bariatric surgery candidates and overweight/obese patients seeking low-energy-diet therapy

Bianciardi E et al, 2019

*No differences emerged in terms of prevalence of FA, degree of BE, co-occurrence of FA and BE, and Global Severity Index scores. The BS group showed higher BMI ( $p < 0.001$ ), food consumed more than planned ( $p = 0.011$ ), and unable to cut down or stop eating ( $p = 0.002$ ).*

Variables	Non-Surgery (N = 122)	Surgery candidates (N = 273)	Test Statistics
Age – M ± DS	41.92 ± 13.53	44.16 ± 11.17	t <sub>test</sub> = -1.72
BMI – M ± DS	31.72 ± 6.59	44.01 ± 7.82	t <sub>test</sub> = -15.17
Women – N (%)	86 (72.9)	207 (73.7)	$\chi^2$ = 0.03
Married or living with partner – N (%)	50 (41.0)	135 (50.9)	$\chi^2$ = 3.32
Employed – N (%)	97 (79.5)	189 (71.9)	$\chi^2$ = 2.55
BES total score – M ± DS	13.50 ± 9.30	14.09 ± 10.28	t <sub>test</sub> = -0.55
BES > 17 – N (%)	39 (32.0)	89 (31.8)	$\chi^2$ = 0.01
BES > 27 – N (%)	14 (11.5)	38 (13.6)	$\chi^2$ = 0.33
FA Diagnosis – N (%)	38 (31.1)	74 (26.3)	$\chi^2$ = 0.98
FA + BES (> 27) – N (%)	9 (7.4)	26 (9.3)	$\chi^2$ = 0.39
YFAS total score – M ± DS	2.59 ± 1.80	2.91 ± 1.89	t <sub>test</sub> = -1.59
Consumed more than planned – N (%)	13 (13.9)	71 (25.3)	$\chi^2$ = 6.40
Unable to cut down or stop – N (%)	109 (89.3)	272 (96.8)	$\chi^2$ = 9.16
Great deal of time spent – N (%)	29 (23.8)	94 (33.5)	$\chi^2$ = 3.76
Important activities given up – N (%)	25 (20.5)	57 (20.3)	$\chi^2$ = 0.01
Use despite consequences – N (%)	49 (49.2)	142 (50.5)	$\chi^2$ = 3.67
Tolerance – N (%)	58 (47.5)	123 (43.8)	$\chi^2$ = 0.49
Withdrawal – N (%)	29 (23.8)	59 (21.0)	$\chi^2$ = 0.38
Impairment or distress – N (%)	40 (32.8)	86 (30.6)	$\chi^2$ = 1.89
GSI – M ± DS	0.72 ± 0.59	0.63 ± 0.55	t <sub>test</sub> = 1.43

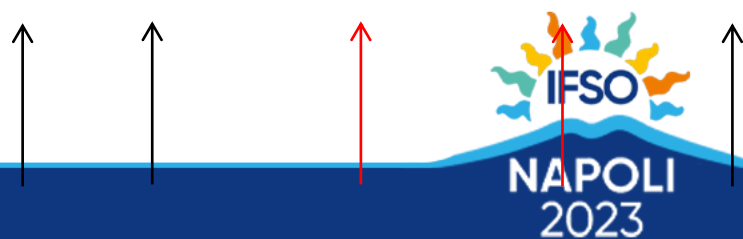
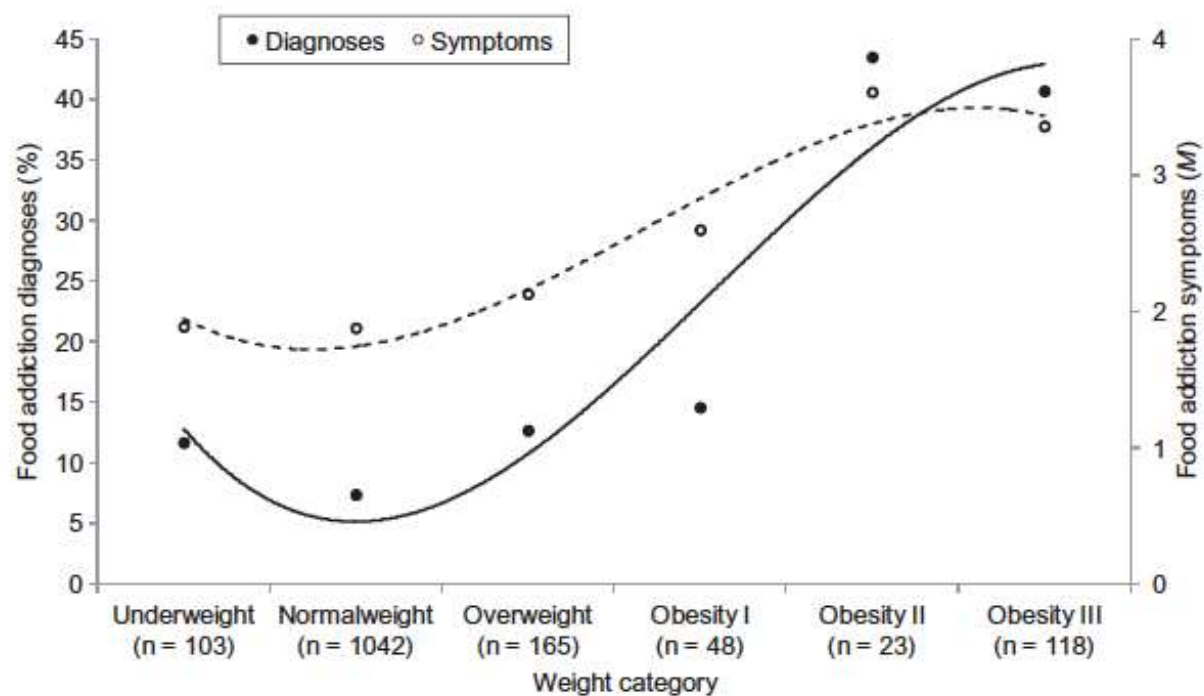
Abbreviation:

DS = standard deviation; BMI = Body Mass Index; BES = Binge Eating Scale; FA = Food Addiction; YFAS = Yale Scale; GSI = Global Severity Index



# Food addiction and body-mass-index: A non-linear relationship

Adrian Meule\*



# Food Addiction and Weight regain

## Food Addiction and Bariatric Surgery: A Systematic Review of the Literature

Valentina Ivezaj, Ph.D.<sup>1</sup>, Ashley A. Wiedemann, Ph.D.<sup>1</sup>, and Carlos M. Grilo, Ph.D.<sup>1,2</sup>

*Obes Rev.* 2017 December ; 18(12): 1386–1397.

The presence of pre-surgical food addiction was not associated with pre-surgical weight or post-surgical weight outcomes, yet pre-surgical food addiction **was related to broad levels of psychopathology**



**up to 35-38% of patients seeking BS regularly take psychiatric medications that are obesogenic**



**Non-adherence**  
(people with mental disorders are known to have poor adherence to treatments, less than 50%)



The Tor Vergata University  
Study - 1



Pierre-Auguste Renoir, 1880-1881



# Post-operative (one-year) psychiatric predictors of %EWL

Multiple stepwise regression analyses  
( $AdjR^2 .29$ ,  $p < .0001$ )

- BES-tot\_T1 ( $p < 0.001$ ,  $\beta = -0.47$ )
- SNAITH-tot\_<T1 ( $p = 0.03$ ,  $\beta = -0.22$ )



Binge eating and anhedonia were significant and independent predictors of lower %EWL after surgery  
(NS: STICSA , BDI, POMS, BIS, BID)



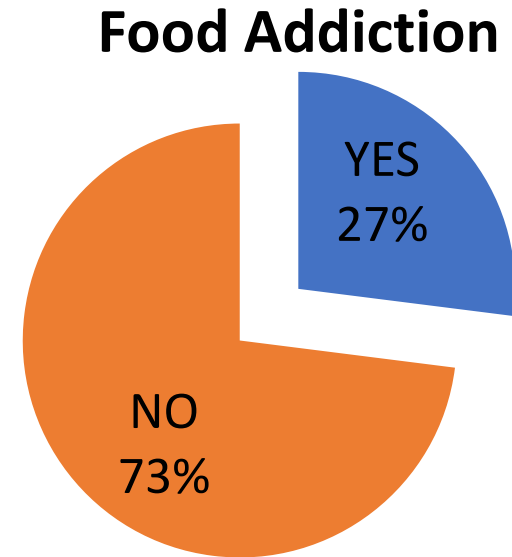
The Tor Vergata University  
Study - 2

Vincent Van Gogh, 1885

# Correlates of Food Addiction

538 patients

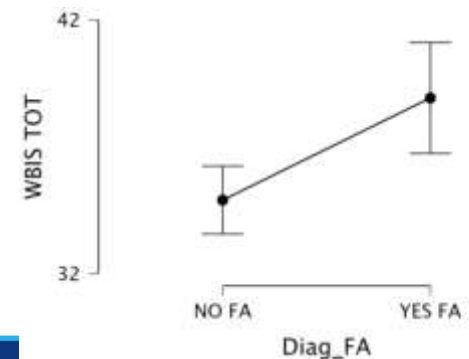
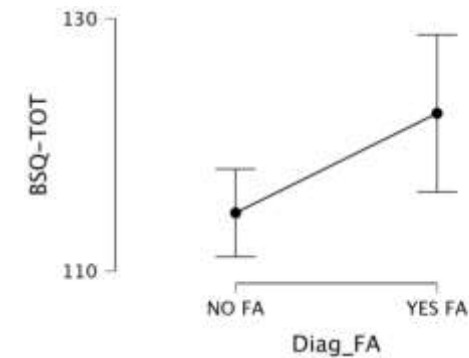
<b>Gender</b>	Male	151 (28%)
	Female	387 (72%)
<b>Mean age (min-max; <math>\pm</math>DS)</b>	43 (18 – 75 $\pm$ 11)	
<b>Mean BMI (min-max; <math>\pm</math>DS)</b>	40 (35–67 $\pm$ 6)	
<b>Couple relationship</b>	Yes	309 (57%)
	No	229 (43%)
<b>Occupation</b>	Yes	373 (69%)
	No	164 (31%)



**146/538 with FA (27%)  
(YALE Food Addiction Scale)**

# RESULTS – UNIVARIATE ANALYSIS

	p	Effect Size
Age	0,003	0,285
BMI	0,340	- 0,093
Education	0,979	0,003
Medical comorbidities	0,094	0,163
Body image dissatisfaction (BSQ)	0,024	- 0,220
Impulsivity (BIS)	0,402	- 0,081
Alexithymia (TAS-20)	0,187	- 0,128
Global Stress Index	0,210	0,122
Anhedonia (SHAPS)	0,372	- 0,087
WBIS TOT	0,002	-0,300



*In preparation*



# RESULTS – REGRESSION ANALYSIS

## Logistic Regression

### Model Summary – Diag\_FA

Model	Deviance	AIC	BIC	df	X <sup>2</sup>	p	McFadden R <sup>2</sup>	Nagelkerke R <sup>2</sup>	Tjur R <sup>2</sup>	Cox & Snell R <sup>2</sup>
H <sub>0</sub>	625.229	627.229	631.506	531						
H <sub>1</sub>	594.393	634.393	719.926	512	30.836	0.042	0.049	0.081	0.056	0.056

### Coefficients

	Estimate	Standard Error	z	Wald Test		
				Wald Statistic	df	p
(Intercept)	-3.048	1.745	-1.747	3.051	1	0.081
et.	-0.021	0.008	-2.457	6.034	1	0.014
BMI	0.009	0.017	0.514	0.264	1	0.607
BSQ-TOT	0.005	0.003	1.630	2.658	1	0.103
BIS-TOT	0.009	0.010	0.901	0.812	1	0.367
TAS-20-TOT	0.008	0.008	1.085	1.176	1	0.278
ETLE_dim	0.047	0.130	0.362	0.131	1	0.717
GSI	-0.464	0.578	-0.804	0.646	1	0.422
SHAPS_dim_TOT	0.013	0.024	0.521	0.272	1	0.602
WBIS TOT	0.018	0.008	2.266	5.133	1	0.023
SAF_Attitude	0.025	0.023	1.088	1.185	1	0.276
SAF_Knowledge	-0.019	0.015	-1.325	1.757	1	0.185
SAF_Barriers	-0.001	0.005	-0.266	0.071	1	0.790
Sesso (M)	0.444	0.468	0.949	0.900	1	0.343
psychiatric disorder (SI)	-0.118	0.699	-0.168	0.028	1	0.866
obesity familiarity (SI)	0.402	0.324	1.243	1.544	1	0.214
Sesso (M) * psychiatric disorder (SI)	-13.178	621.954	-0.021	4.489e-4	1	0.983
Sesso (M) * obesity familiarity (SI)	-0.402	0.542	-0.741	0.549	1	0.459
psychiatric disorder (SI) * obesity familiarity (SI)	0.421	0.766	0.549	0.302	1	0.583
Sesso (M) * psychiatric disorder (SI) * obesity familiarity (SI)	13.238	621.955	0.021	4.530e-4	1	0.983

Note. Diag\_FA level 'YES FA' coded as class 1.

WBIS was significant and independent predictor of Food Addiction

*In preparation*



Weight bias  
Bariatric surgery bias  
Adherence to treatments



The Tor Vergata University  
Study - 3



**Georg Flegel – (1600 circa)**



# Study sample

Our sample consisted of 770 patients seeking for surgery (336 women and 234 men).

A psychosocial behavioral examination and the following psychometrics were administered:

- Attachment Style Questionnaire (ASQ)
- Toronto Alexithymia Scale (TAS-20) the
- Yale Food Addiction Scale (YFAS).

Il 17% Binge Eating Disorder  
Il 20% Food Addiction

Variables	
Women - N (%)	536 (69.6)
Age - M ± SD	45.10 ± 11.26
Unmarried - N (%)	357 (46.4 %)
Employed - N (%)	543 (70.5 %)
Educational Level (years) - M ± SD	11.53 ± 3.47
Diagnosis of a psychiatric disorder <sup>1</sup> - N (%)	180 (23.4 %)
BED diagnosis- N (%)	133 (17.3 %)
Any medical comorbidities - N (%)	508 (66.0 %)
Obesity onset before the age of 12 - N (%)	198 (25.7 %)
BMI - M (SD)	43.82 ± 7.51
BMI 30.0–34.9 kg/m <sup>2</sup> - N (%)	49 (6.4 %)
BMI 35.0–39.9kg/m <sup>2</sup> - N (%)	214 (27.8 %)
BMI ≥ 40 kg/m <sup>2</sup> - N (%)	508 (65.8 %)
ASQ	
Confidence- M (SD)	34.98 ± 5.87
Discomfort - M (SD)	33.83 ± 7.38
Relationships as Secondary - M (SD)	17.11 ± 6.05
Need for Approval - M (SD)	18.47 ± 6.82
Preoccupation with Relationships - M (SD)	26.00 ± 1.82
Avoidant attachment - M (SD)	50.94 ± 11.77
Anxious attachment - M (SD)	44.47 ± 12.84
YFAS - M (SD)	2.96 ± 1.82
Food Addiction diagnosis N (%)	158 (20.5 %)
TAS-20 - M (SD)	44.32 ± 12.83
Possible alexithymia - N (%)	131 (17.0)
Alexithymia - N (%)	87 (11.3)
Note: <sup>1</sup> = excluding BED diagnosis	





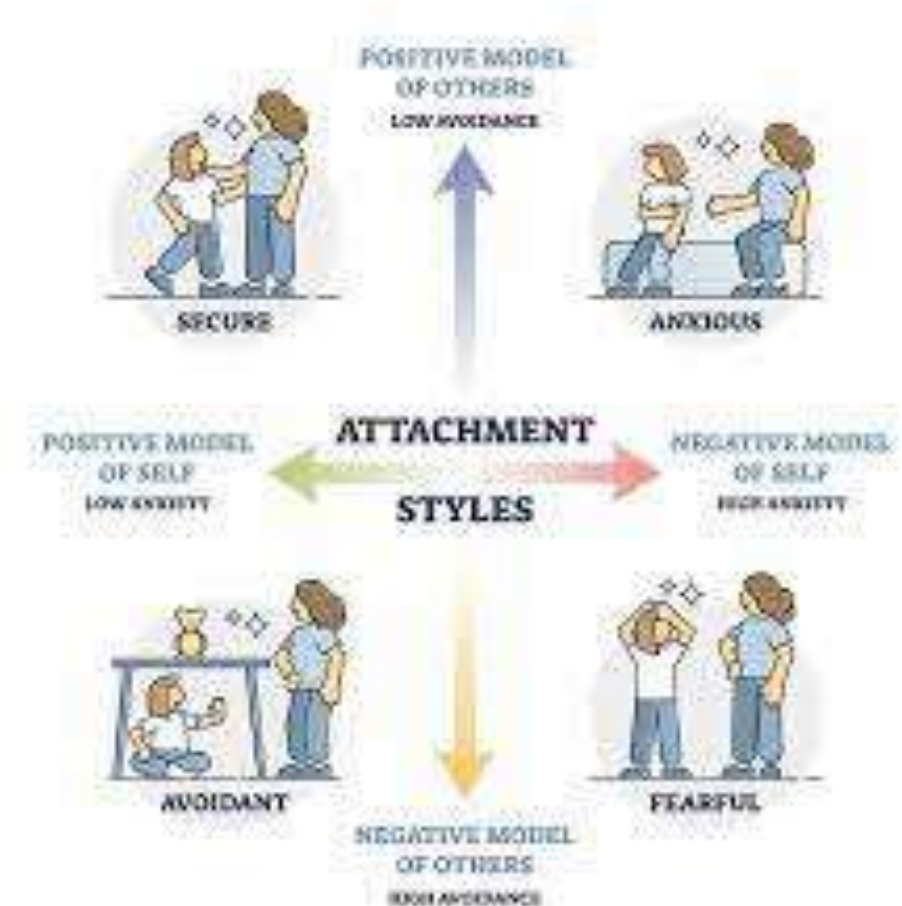
# The Attachment Style

**The Attachment Style** is an enduring characteristic of individuals which develops in the early years of life through the interactions with caregivers. The caregiver-infant repeated interactions serve as the basis for the so called «internal working models» of self and others. (will others be there when I need them?...what about my self-worth?)

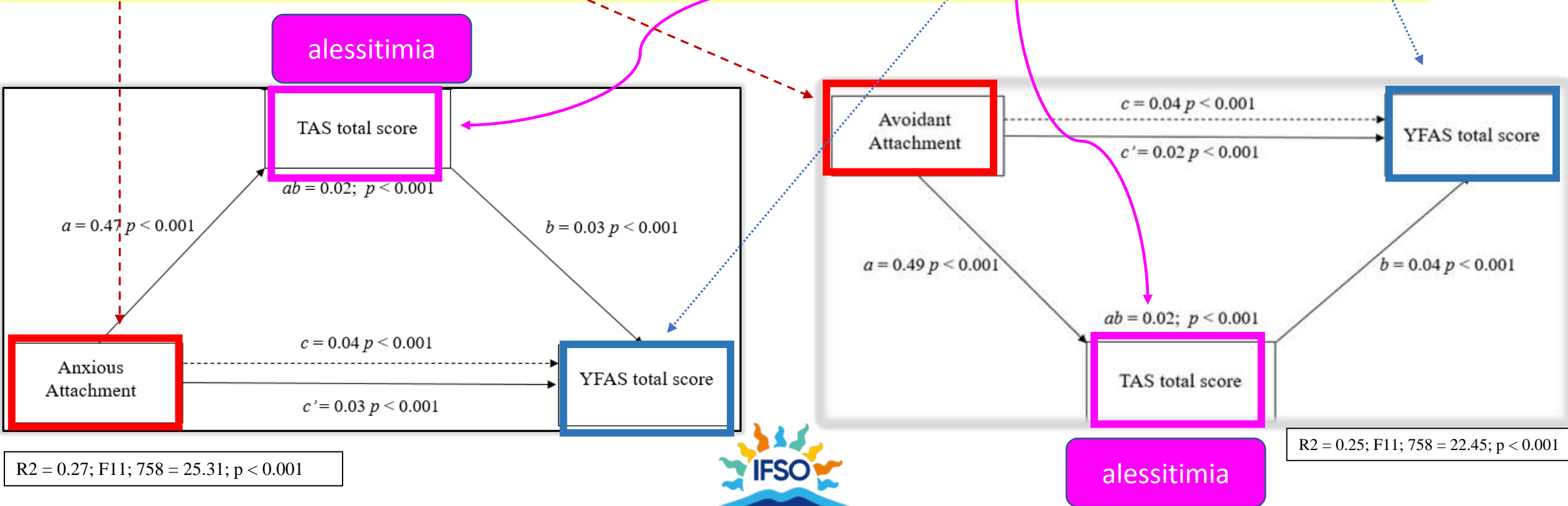
**The Attachment System** organize expectation about future relationships in adulthood, and guides behaviors, affect, as well as dealing with distress.

The Attachment System is a main psychological system which is activated in stress situations.

**When feeling distressed** the attachment system tells people to get close to someone which can provide support and help.



Insecure attachment styles showed direct effect on FA symptoms and an indirect effect which was mediated by Alexithymia.



# Clinical Implications

**Alexithymia** which means no words for emotions is the inability to recognize and communicate to others the inner emotions.

**Alexithymic individuals exhibit emotion processing deficits particularly** when task difficulty is increased, such as **under short time constraints (choice of food)**.

Deficits might also increase and **when the person is exposed to foods that have different relative importance which is the salience** (relative importance based on context).

This underlying mechanism contributes to problematic eating, obesity, and **weight regain** in the bariatric population.





The Tor Vergata University  
Study - 4



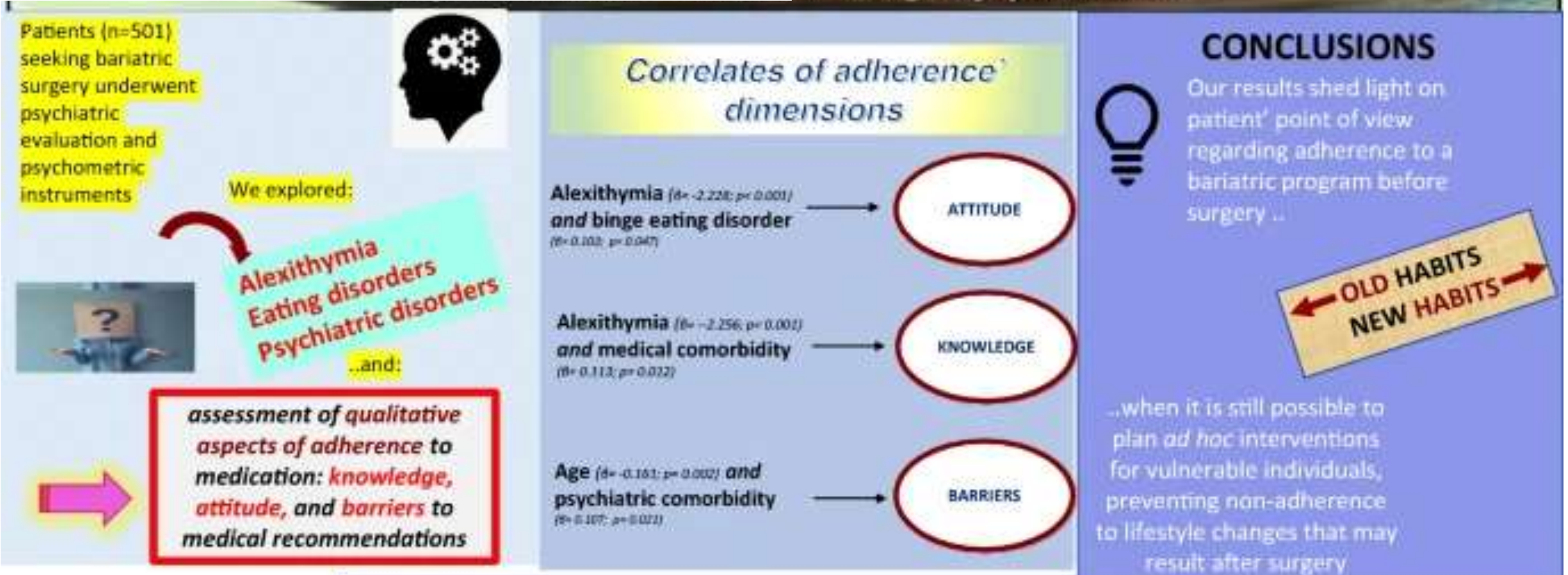


# Measuring Knowledge, Attitudes, and Barriers to Medication Adherence in Potential Bariatric Surgery Patients

Emanuela Bianciardi<sup>1,2</sup> · Claudio Imperatori<sup>3</sup> · Marco Innamorati<sup>3</sup> · Mariantonietta Fabbricatore<sup>3</sup> · Angelica Maria Monacelli<sup>1</sup> · Martina Pelle<sup>1</sup> · Alberto Siracusano<sup>1</sup> · Cinzia Niolu<sup>1</sup> · Paolo Gentileschi<sup>4</sup>

Obesity Surgery (2021) 31:4045–4054

ic surgery patients



Bianciardi E, Imperatori C, Innamorati M, Fabbricatore M, Monacelli A, Pelle M, Siracusano A, Niolu C, Gentileschi P. Measuring knowledge, attitudes, and barriers to medication adherence in potential bariatric surgery patients



## WHAT IS A THERAPEUTIC RELATIONSHIP ?

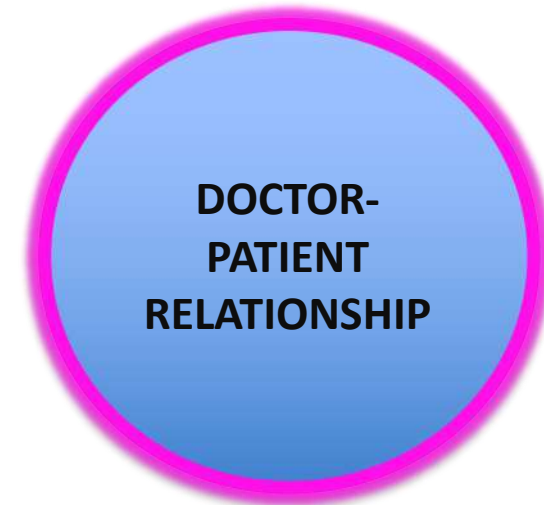
There are two kind of people: the first one is the one who cures, while the second is the one who is suffering. Both agree on one issue: health.

A “**special**” relationship (emotions and feelings, sorrow, anger, frustration, gratitude); with a “**common goal**” (for a mutual psycho-physical wellbeing); “**single**” (it must be related only to a specific relationship; indeed, in medicine, when a patient’s body is touched it is objectified); “**symmetrical**” (in mathematics, a binary relation  $R$  over a set  $X$  is defined as symmetrical only if, taking any two elements  $a$  and  $b$ , it holds that if  $a$  is related to  $b$ , also  $b$  is related to  $a$  – *To be married with... To be son of...*



# OVERCOMING THE TRADITIONAL MEDICAL MODEL: FROM THE DISEASE TO THE DOCTOR-PATIENT RELATIONSHIP

- *What therapeutic instruments are available?*



## THERAPEUTIC INSTRUMENTS (HIPPOCRATES):

- **WORD** (respectfully listening patients' history)
- **TOUCH** (visiting patients)
- **REMEDY** (the cure)



**CURE**



## The Attachment Styles

### SECURE

- 1-Can trust fairly easily
- 2-Is attuned to emotions
- 3-Can communicate upsets directly
- 4-Leads with cooperative and flexible behavior in relationships

### ANXIOUS

- 1-Has a sensitive nervous system
- 2-Struggles communicating needs directly
- 3-Tends to "act out" when triggered (i.e. makes partner jealous)

### AVOIDANT - DISMISSIVE

- 1-Downplays importance of relationships
- 2-Is usually extremely self-reliant
- 3-Can become more vulnerable when there is a big crisis

### AVOIDANT - FEARFUL

- 1-More dependent in relationships than avoidant - dismissive
- 2-Strongly fears rejection
- 3-Has low self-esteem
- 4-Has high anxiety in relationships

@silvykhucasian

Therefore, people with an insecure attachment style will have difficulty seeking medical help and building a therapeutic relationship



# What makes the patient better?

Insight

Physician's relationship  
with the patient

## THE LANCET

1280

JUNE 10, 1961

POINTS

### Points of View

#### WHAT MAKES THE PATIENT BETTER?

AINSLIE MEARES

M.D., B.Agr.Sc. Melb., D.P.M.

OF MELBOURNE, AUSTRALIA

These observations seem to indicate that some other factor besides suggestion and insight, and their subsidiary mechanisms, operates in the therapeutic situation. It may be that this factor can be resolved into some particular aspect of the physician's relationship with the patient, or more likely this relationship is the milieu which allows this other mechanism to operate.

[bianciardi@med.uniroma2.it](mailto:bianciardi@med.uniroma2.it)

