



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO

BIOMEDICINA  
NEUROSCIENZE  
DIAGNOSTICA  
AVANZATA

6th Maudsley  
Mediterranean  
Forum

May 27 - 30, 2019



# Healthy lifestyle to reduce Psychiatric and physical morbidity: a path to prevention across Medicine

**Daniele La Barbera, MD - Giuseppe Maniaci, PhD**  
**Department of Biomedicine, Neuroscience and Advanced Diagnostic**  
**Section of Psychiatry – University of Palermo**

# OVERVIEW OT THIS TALK

1

- Lifestyle medicine: behaviours related to wellness

2

- The association of a healthy diet in the treatment of depression: a pilot study

Lifestyle medicine is an evidence-based approach to **preventing, treating** and even **reversing** diseases by replacing unhealthy behaviors with positive behaviors



According to the World Health Organization (WHO) and the United Nations (UN) more than 70% of diseases **worldwide** (cardiovascular diseases, type 2 diabetes, some types of cancer, high blood pressure, obesity etc) is due to factors related to Lifestyle



FEATURE



## Lifestyle medicine: a new medical specialty?

Educational developments suggest that lifestyle medicine is in the ascendance. **Anna Sayburn** asks if it could help reduce chronic disease—and whether it places blame on patients

Anna Sayburn *freelance journalist*



*“We’re going to introduce a new curriculum through public health teaching, which will educate students on nutrition, physical activity, and sleep, and give them skills in behavioural change.”*

Anne Swift

**EMOTIONAL**  
Coping effectively with life and  
creating satisfying relationships.

**FINANCIAL**  
Satisfaction with current and  
future financial situations.

**ENVIRONMENTAL**  
Good health by occupying pleasant,  
stimulating environments that  
support well-being.

**SOCIAL**  
Developing a sense of  
connection, belonging, and a  
well-developed support system.



**WELLNESS**

**INTELLECTUAL**  
Recognizing creative abilities  
and finding ways to expand  
knowledge and skills.

**SPIRITUAL**  
Expanding our sense of  
purpose and meaning in life.

**PHYSICAL**  
Recognizing the need  
for physical activity, diet,  
sleep, and nutrition.

**OCCUPATIONAL**  
Personal satisfaction and enrichment  
derived from one's work.

# Let's change perspective

Healthy lifestyle behaviors can be viewed not only as a way for reducing the risk of illnesses but also as a path for improving our performance and more generally our QoL (D. La Barbera)



**7 superheroes are protecting our lives..**



# Which superheroes?

1. Diet and nutrition
2. Physical activity
3. No use of legal and illegal drugs
4. Sleep (quality and duration)
5. Relational well-being (perceived social support)
6. Low stress levels
7. Free time activities



# 1. Diet and nutrition



**Ludwig Feuerbach**

*“We are what we eat..”*

# 1. Diet and nutrition

DE GRUYTER

Int J Adolesc Med Health 2015; aop

Ruopeng An\*

## Diet quality and physical activity in relation to childhood obesity

DOI 10.1515/ijamh-2015-0045

Received May 12, 2015; accepted July 10, 2015

**Keywords:** childhood obesity; diet; physical activity.



Article

## Associations between Unhealthy Diet and Lifestyle Behaviours and Increased Cardiovascular Disease Risk in Young Overweight and Obese Women

Megan C. Whatnall<sup>1</sup>, Clare E. Collins<sup>1</sup>, Robin Callister<sup>2</sup> and Melinda J. Hutchesson<sup>1,\*</sup>

THE LANCET

Volume 365, Issue 9453, 1 January 2005, Pages 36-42



Articles

### Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis

Mark A Pereira PhD<sup>a</sup>, Alex I Kartashov PhD<sup>b</sup>, Cara B Ebbeling PhD<sup>c</sup>, Prof Linda Van Horn PhD<sup>d</sup>, Prof Martha L Slattery PhD<sup>e</sup>, Prof David R Jacobs Jr PhD<sup>b, f</sup>, David S Ludwig MD<sup>c, g</sup>

Show more

[https://doi.org/10.1016/S0140-6736\(04\)17663-0](https://doi.org/10.1016/S0140-6736(04)17663-0)

Get rights and content



Int J Prev Med. 2013 May; 4(Suppl 2): S165–S179.

PMCID: PMC3678213

PMID: [23776719](https://pubmed.ncbi.nlm.nih.gov/23776719/)

### Stroke and Nutrition: A Review of Studies

Mehdi Foroughi,<sup>2</sup> Mohsen Akhavanzanjani,<sup>2</sup> Zahra Maghsoudi,<sup>2</sup> Reza Ghiasvand,<sup>1,2</sup> Fariborz Khorvash,<sup>3</sup> and Gholamreza Askari<sup>1,2</sup>

Author information • Article notes • Copyright and License information [Disclaimer](#)



## Is there an association between diet and depression in children and adolescents? A systematic review

Sundus Khalid\*, Claire M. Williams and Shirley A. Reynolds

*School of Psychology and Clinical Language Sciences, University of Reading, Earley Gate, Whiteknights, Reading RG6 7BE, UK*

*(Submitted 23 May 2016 – Final revision received 27 October 2016 – Accepted 30 November 2016)*



# BJPsych

The British Journal of Psychiatry

## Dietary pattern and depressive symptoms in middle age

Tasnime N. Akbaraly, Eric J. Brunner, Jane E. Ferrie, Michael G. Marmot, Mika Kivimaki and Archana

Singh-Manoux

BJP 2009, 195:408-413.

Access the most recent version at DOI: [10.1192/bjp.bp.108.058925](https://doi.org/10.1192/bjp.bp.108.058925)

This study suggests a protective effect of an overall diet rich in fruits, vegetables and fish, whereas an overall diet rich in processed meat, chocolates, sweetened desserts, fried food, refined cereals and high-fat dairy products seems to be deleterious for depression.



## Associations between selected dietary behaviours and academic achievement: A study of Australian school aged children

Tracy Burrows <sup>a</sup>  , Sharni Goldman <sup>a</sup>, Richard K. Olson <sup>b</sup>, Brian Byrne <sup>c</sup>, William L. Coventry <sup>c</sup>

- Greater consumption of vegetables with the evening meal (7 nights/week) was associated with higher test scores in the domains of spelling and writing.
- Increased consumption of sugar sweetened beverages was associated with significantly lower test scores in reading, writing, grammar/punctuation and numeracy.



## 2. Physical activity





REVIEW

Open Access

# Systematic review of the health benefits of physical activity and fitness in school-aged children and youth

Ian Janssen\*<sup>1,2</sup> and Allana G LeBlanc<sup>1</sup>



- The more physical activity, the greater the health benefit.
- Even modest amounts of physical activity can have health benefits in high-risk youngsters (e.g., obese).
- Children aged 5-17 years old should accumulate an average of at least 60 minutes per day and up to several hours of at least moderate intensity physical activity.
- Aerobic activities should make up the majority of the physical activity. Muscle and bone strengthening activities should be incorporated on at least 3 days of the week.

# 3. Substance use



# **Tobacco smoking and the risk of heart failure: A systematic review and meta-analysis of prospective studies**

**Dagfinn Aune<sup>1,2,3</sup>, Sabrina Schlesinger<sup>4</sup>, Teresa Norat<sup>1</sup> and Elio Riboli<sup>1</sup>**

European Journal of Preventive  
Cardiology  
0(00) 1–10  
© The European Society of  
Cardiology 2018  
Article reuse guidelines:  
[sagepub.com/journals-permissions](http://sagepub.com/journals-permissions)  
DOI: 10.1177/2047487318806658  
[journals.sagepub.com/home/ejpc](http://journals.sagepub.com/home/ejpc)  


- Smoking is associated with increased risk of heart failure.
- The risk decreases with increasing duration since smoking cessation.



## The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study

*Marta Di Forti, Diego Quattrone, Tom P Freeman, Giada Tripoli, Charlotte Gayer-Anderson, Harriet Quigley, Victoria Rodriguez, Hannah E Jongsma, Laura Ferraro, Caterina La Cascia, Daniele La Barbera, Ilaria Tarricone, Domenico Berardi, Andrei Szöke, Celso Arango, Andrea Tortelli, Eva Velthorst, Miguel Bernardo, Cristina Marta Del-Ben, Paulo Rossi Menezes, Jean-Paul Selten, Peter B Jones, James B Kirkbride, Bart PF Rutten, Lieuwe de Haan, Pak C Sham, Jim van Os, Cathryn M Lewis, Michael Lynskey, Craig Morgan, Robin M Murray, and the EU-GEI WP2 Group\**



- This multicentre case-control study across ten European and one Brazilian sites replicates the strong effect of daily use of high-potency cannabis on the odds for the psychosis onset;
- This effect was particularly strong in London and Amsterdam;
- Moreover it was provided the first direct evidence that cannabis use has an effect on variation in the incidence of psychotic disorders.

# 4. Satisfying sleep



# Recommended Amount of Sleep for a Healthy Adult: A Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society

**Consensus Conference Panel:** Nathaniel F. Watson, MD, MSc, Moderator<sup>1</sup>; M. Safwan Badr, MD<sup>2</sup>; Gregory Belenky, MD<sup>3</sup>; Donald L. Bliwise, PhD<sup>4</sup>; Orfeu M. Buxton, PhD<sup>5</sup>; Daniel Buysse, MD<sup>6</sup>; David F. Dinges, PhD<sup>7</sup>; James Gangwisch, PhD<sup>8</sup>; Michael A. Grandner, PhD, MSTR, CBSM<sup>7</sup>; Clete Kushida, MD, PhD<sup>9</sup>; Raman K. Malhotra, MD<sup>10</sup>; Jennifer L. Martin, PhD<sup>11</sup>; Sanjay R. Patel, MD, MSc<sup>12</sup>; Stuart F. Quan, MD<sup>12</sup>; Esra Tasali, MD<sup>13</sup>

**Non-Participating Observers:** Michael Twery, PhD<sup>14,\*</sup>; Janet B. Croft, PhD<sup>15,\*</sup>; Elise Maher, RPSGT<sup>16,\*</sup>

**American Academy of Sleep Medicine Staff:** Jerome A. Barrett<sup>17</sup>; Sherene M. Thomas, PhD<sup>17</sup>; Jonathan L. Heald, MA<sup>17</sup>

*Journal of Clinical Sleep Medicine (2015)*



- Adults should sleep 7 or more hours per night on a regular basis to promote optimal health.
- Sleeping less than 7 hours per night on a regular basis is associated with adverse health outcomes: weight gain and obesity, diabetes, hypertension, heart disease and stroke, depression, increased risk of death, impaired immune function, increased pain, impaired performance, increased errors and greater risk of accidents.
- Sleeping more than 9 hours per night on a regular basis may be appropriate for young adults, individuals recovering from sleep debt, and individuals with illnesses.

# Sleep, Cognition, and Normal Aging: Integrating a Half Century of Multidisciplinary Research

Perspectives on Psychological Science  
2015, Vol. 10(1) 97–137  
© The Author(s) 2014  
Reprints and permissions:  
sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1745691614556680  
pps.sagepub.com  


**Michael K. Scullin<sup>1,2</sup> and Donald L. Bliwise<sup>2</sup>**

<sup>1</sup>Department of Psychology and Neuroscience, Baylor University, and <sup>2</sup>Department of Neurology, Emory University School of Medicine

- Maintaining good sleep quality, at least in young adulthood and middle age, promotes better cognitive functioning and serves to protect against age-related cognitive declines.

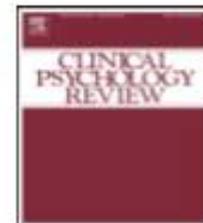
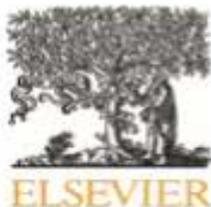


# 5. Relational well-being



*Can anybody find me  
somebody to love?*





## Social support and social negativity findings in depression: Perceived responsiveness to basic psychological needs<sup>☆</sup>

M. Sol Ibarra-Rovillard<sup>\*</sup>, Nicholas A. Kuiper

- Intimate, supportive and positive relationships have a beneficial effect on mental and physical health.
- The more one perceives that social relations satisfy basic psychological needs, the greater the degree of well-being.



**Instant messages vs. speech: hormones and why we still need to hear each other**

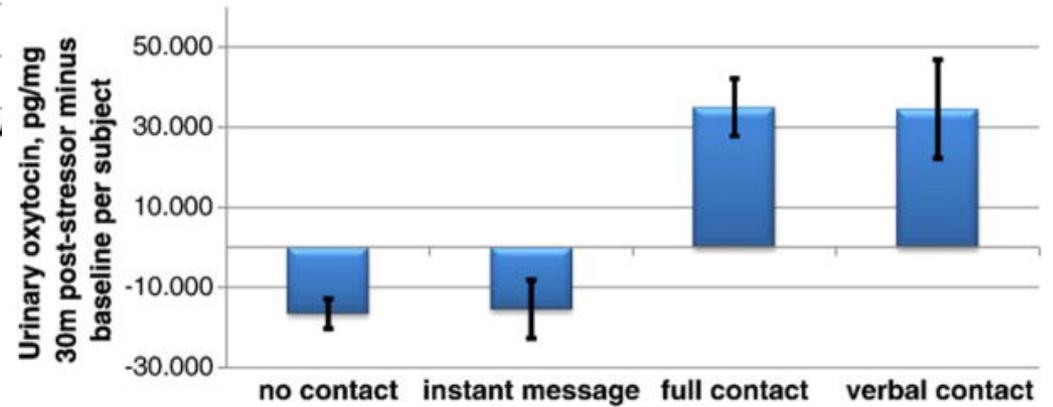
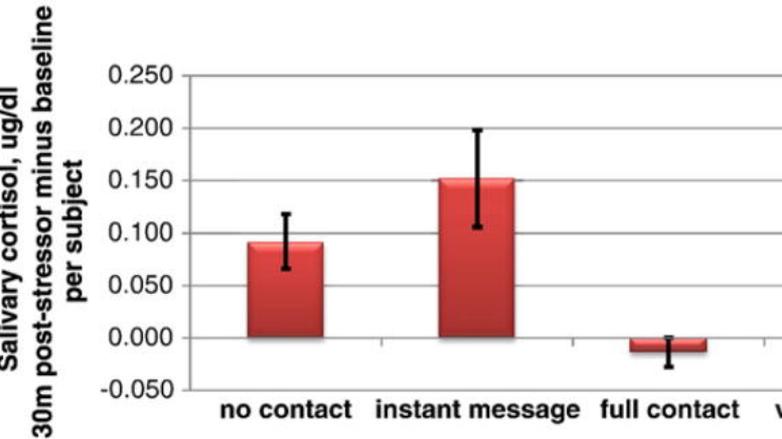
Leslie J. Seltzer<sup>a,b,\*</sup>, Ashley R. Prosocki<sup>a</sup>, Toni E. Ziegler<sup>c</sup>, and Seth D. Pollak<sup>a,b</sup>

<sup>a</sup>Department of Psychology, Waisman Center, University of Wisconsin-Madison, Madison, WI 53703, USA

<sup>b</sup>Department of Anthropology, University of Wisconsin-Madison, Madison, WI 53703, USA

<sup>c</sup>Wisconsin National Primate Research Center, Madison, WI 53705, USA

# Can the content of an emotional support conversation between parents and children convey real reassurance?



# 6. Stress and emotional life



## **Perceived Stress and Change in Cognitive Function Among Adults Aged 65 and Older**

Neelum T. Aggarwal, MD<sup>1,2,3</sup>, Robert S. Wilson, PhD<sup>1,2,3,7</sup>, Todd L. Beck, MS<sup>2,4</sup>, Kumar B. Rajan, Ph.D<sup>2,4</sup>, Carlos F. Mendes de Leon, PhD<sup>5</sup>, Denis A. Evans, MD<sup>2,4</sup>, and Susan A. Everson-Rose, PhD<sup>6</sup>

- Increased stress levels are associated with a rapid decline in cognitive function in adults aged 65 and older.





Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**ScienceDirect**

Health Professions Education 4 (2018) 70–77



[www.elsevier.com/locate/hpe](http://www.elsevier.com/locate/hpe)

## Stress and Quality of Life Among University Students: A Systematic Literature Review

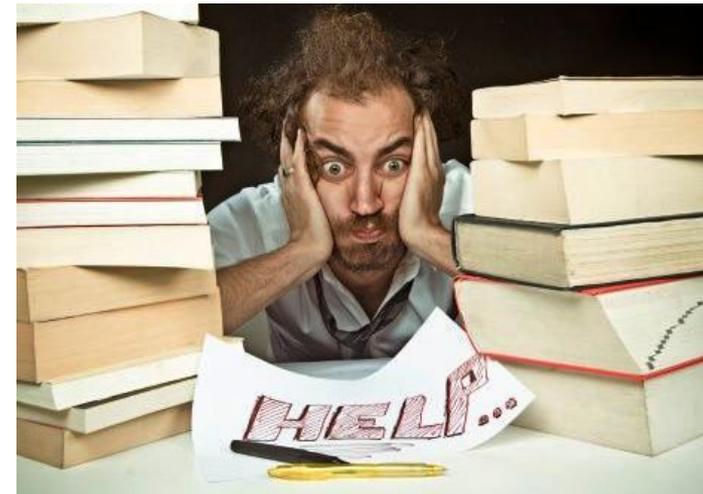
Ícaro J.S. Ribeiro\*, Rafael Pereira, Ivna V. Freire, Bruno G. de Oliveira, Cezar A. Casotti, Eduardo N. Boery

*Nursing & Health Postgraduate Program, State University of Southwest Bahia, Brazil*

Received 29 March 2017; accepted 29 March 2017

Available online 19 April 2017

- There is a strong association between high levels of stress and poor quality of life in university students.



Original article

# Psychosocial stress is associated with obesity and diet quality in Hispanic/Latino adults

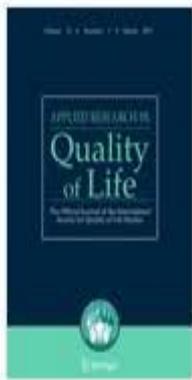
Carmen R. Isasi MD, PhD <sup>a</sup>  , Christina M. Parrinello MPH <sup>b</sup>, Molly M. Jung MPH <sup>a</sup>, Mercedes R. Carnethon PhD <sup>c</sup>, Orit Birnbaum-Weitzman PhD <sup>d</sup>, Rebeca A. Espinoza MA, MPH <sup>e</sup>, Frank J. Penedo PhD <sup>f</sup>, Krista M. Perreira PhD <sup>g</sup>, Neil Schneiderman PhD <sup>d</sup>, Daniela Sotres-Alvarez DrPH <sup>h</sup>, Linda Van Horn PhD <sup>c</sup>, Linda C. Gallo PhD <sup>i</sup>

- Greater number of chronic stressors and greater perceived stress were associated with higher total energy intake.
- Greater recent perceived stress was associated with lower diet quality.



# 7. Free time activities





## Leisure Activities and Life Satisfaction: an Analysis with German Panel Data

Claudia Schmiedeberg & Jette Schröder

- Meeting friends, playing sports and holiday contribute positively to life satisfaction.
- The excessive use of the Internet and spending too many hours in front of the TV are negatively correlated to the degree of life satisfaction.



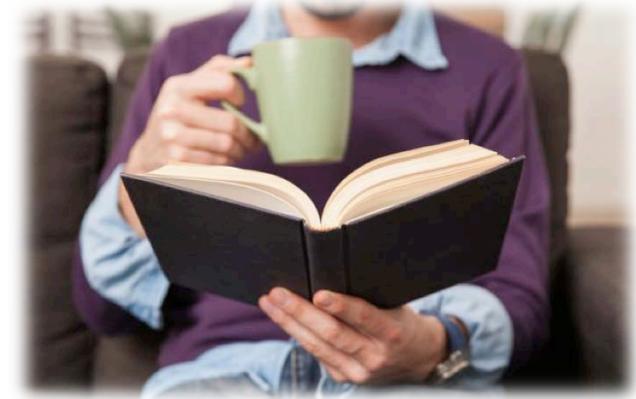
# The Importance of Leisure Activities in the Relationship between Physical Health and Well-Being in a Life Span Sample

Gerontology 2016;62:450-458  
DOI: 10.1159/000444415

Michelle E. Paggi<sup>a</sup> Daniela Jopp<sup>c,d</sup> Christopher Hertzog<sup>b</sup>



- Physical health is positively related to leisure activities.
- Leisure activities are positively related to well-being.





# ASSOCIATION BETWEEN HEALTHY LIFESTYLES AND ACADEMIC SUCCESS IN A SAMPLE OF ITALIAN UNIVERSITY STUDENTS



Maniaci G., Ferraro L., Scaglione A., Palummo A., Sideli L., Saia G. F., Pinetti G., Zarbo M., La Barbera D., La Cascia C.  
Department of Experimental Biomedicine and Clinical Neurosciences, University of Palermo, Italy;  
[giuseppe.maniaci02@unipa.it](mailto:giuseppe.maniaci02@unipa.it)

464 students attending  
16 different courses of  
the University of Palermo  
(mean age = 24,21;  
male = 26.5%)



## RESULTS

Our results showed that academic success is positively correlated with perceived social support ( $r = .097$ ;  $p = .038$ ) and negatively with internet use ( $r = -.097$ ;  $p = .037$ ).

Excessive internet use and lower perceived social support are associated with a lower academic performance.

Lower academic success is associated with use of illegal drugs ( $\chi^2 (1) = 11.126$ ;  $p = .001$ ) and physical inactivity ( $\chi^2 (1) = 3.977$ ;  $p = .046$ ).

# Take-home message

*Two different ways for improving our  
quality of life and increasing our  
lifespan...*

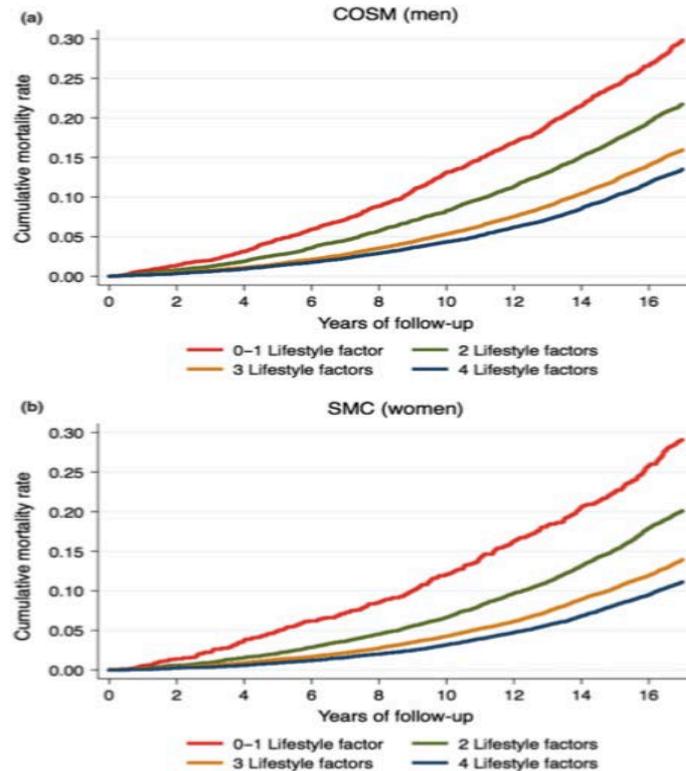


Adopting and maintaining healthy lifestyle behaviors can increase our lifespan

© 2017 The Association for the Publication of the Journal of Internal Medicine  
doi:10.1111/jim.12637  
**Combined impact of healthy lifestyle factors on lifespan: two prospective cohorts**

■ S. C. Larsson <sup>1</sup>, J. Kaluza<sup>1,2</sup> & A. Wolk<sup>1</sup>

<sup>1</sup>From the Unit of Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; and <sup>2</sup>Nutrition Research Laboratory, Warsaw University of Life Sciences-SGGW, Warsaw, Poland



**Fig. 2** Cumulative all-cause mortality rates according to number of healthy lifestyle factors in (a) the Cohort of Swedish Men (COSM) and (b) the Swedish Mammography Cohort (SMC). The mortality rates are standardized to the mean age in each cohort at baseline.

ORIGINAL CONTRIBUTION

Open Access

# “Death is certain, the time is not”: mortality and survival in *Game of Thrones*



Reidar P. Lystad<sup>1\*</sup>  and Benjamin T. Brown<sup>2</sup>

This study revealed that the probability of a character dying within the first hour after first being introduced on screen was about 14%.

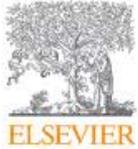




**The association of  
a healthy diet in  
the treatment of  
depression: a  
pilot study**

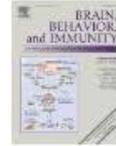


# Background



Brain, Behavior, and Immunity

Volume 31, July 2013, Pages 31-47



## The role of immune genes in the association between depression and inflammation: A review of recent clinical studies

Chiara Bufalino <sup>a, b</sup>, Nilay Heggul <sup>a</sup>, Eugenio Aguglia <sup>b</sup>, Carmine M. Pariante <sup>a</sup>  

BIOMEDICAL REPORTS 6: 15-20, 2017

## Role of inflammatory cytokines in depression: Focus on interleukin-1 $\beta$ (Review)

RAI KHALID FAROOQ<sup>1</sup>, KASHIF ASGHAR<sup>2</sup>, SHAHZINA KANWAL<sup>3</sup> and ALI ZULQERNAIN<sup>4</sup>

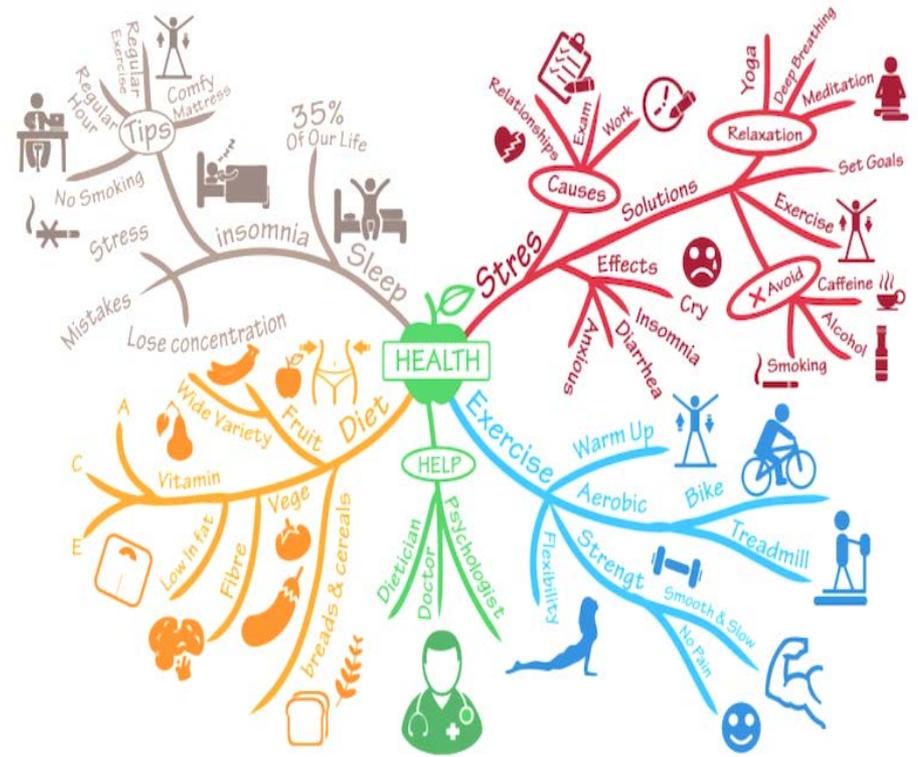
## Levels of serum interleukin (IL)-6, IL-1 $\beta$ , tumour necrosis factor- $\alpha$ and leptin and their correlation in depression

Kun Yang, Guangrong Xie, Zhongxing Zhang, Changhong Wang, Wenbo Li, Weiqiang Zhou, Yanqing Tang

## Cytokines, stress, and depressive illness

H. Anisman<sup>a, b</sup>, Z. Merali<sup>b, c</sup>

Pro-inflammatory cytokines can contribute to the development and worsening of depressive symptoms



# Diet

BJPsych

The British Journal of Psychiatry (2009)  
195, 408–413. doi: 10.1192/bjp.bp.108.058925

## Dietary pattern and depressive symptoms in middle age

Tasnime N. Akbaraly, Eric J. Brunner, Jane E. Ferrie, Michael G. Marmot, Mika Kivimaki  
and Archana Singh-Manoux



- This study revealed an increased risk of incident depression over five years for people consuming a Western style dietary pattern.
- Moreover, a reduced risk for those eating a whole foods diet pattern was observed

# AIMS

1. Verify the efficacy of a protocol of a body-oriented psychotherapy for depression
2. Verify if the association of a healthy diet with the treatment increase the outcomes (depression, self-esteem, QoL)
3. ~~Verify the effect of the combined treatment on the inflammation related to depression~~



# Inclusion criteria

- men and women reported a BDI-II score over than 13;
- age between 18 and 60 yo;
- drugs free;
- able to understand and sign informed consent;

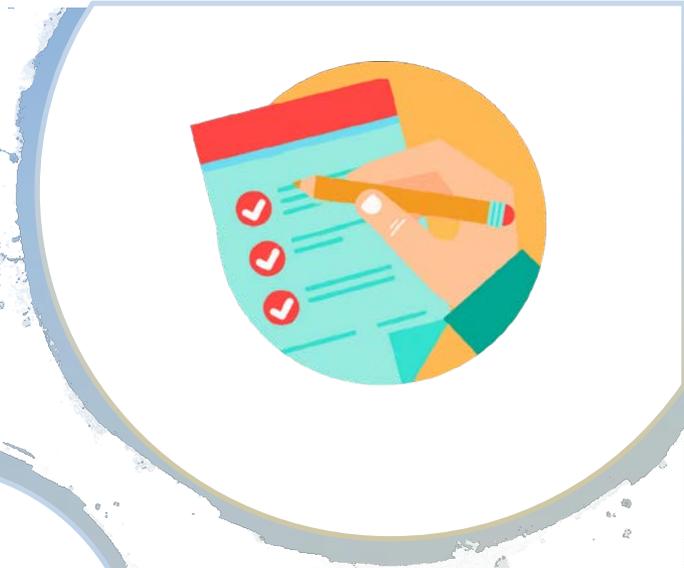
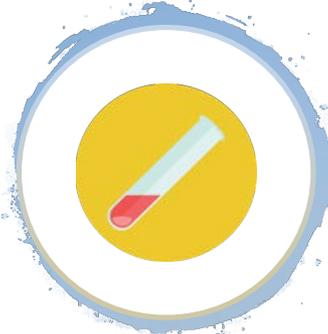


# Exclusion criteria:

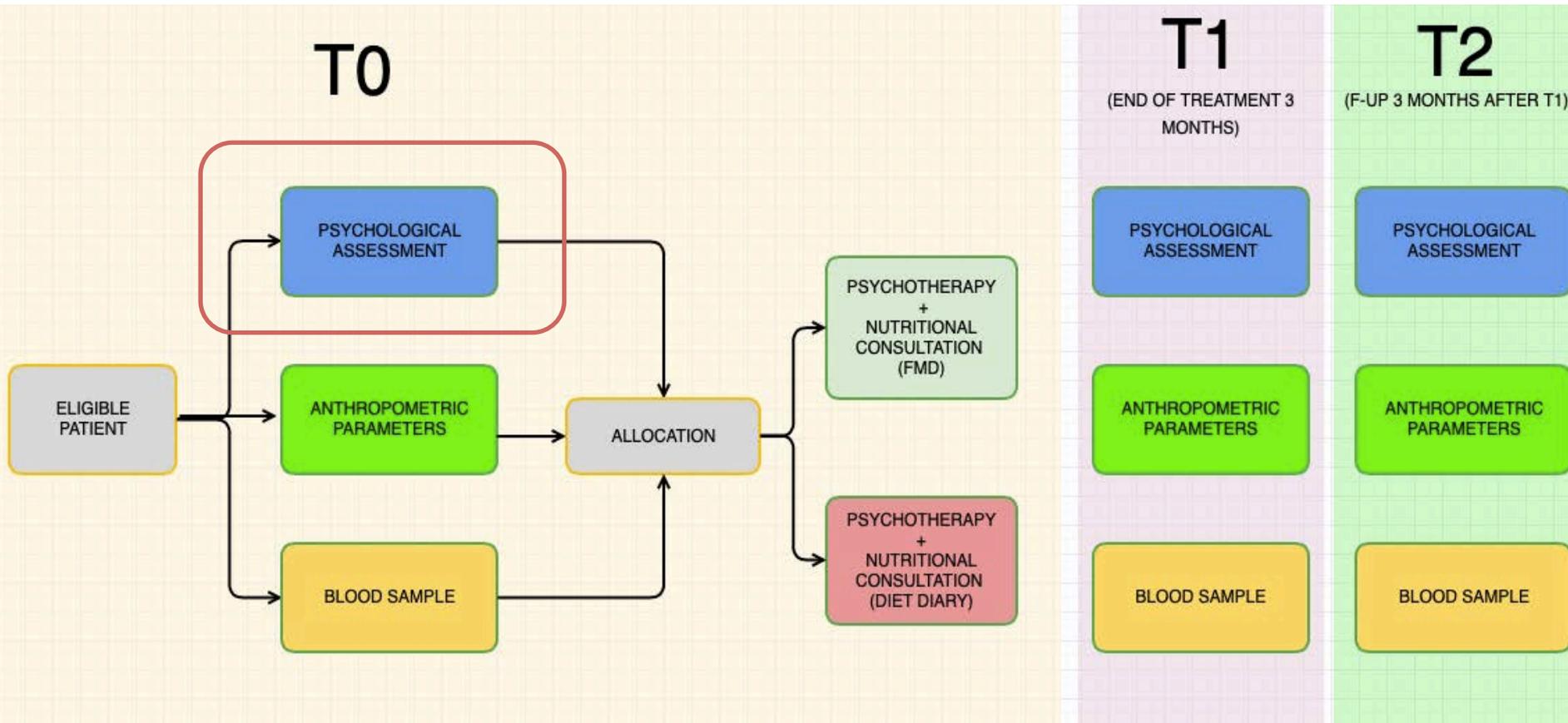
- schizophrenia or other psychotic disorders;
- primary anxiety disorder;
- eating disorders;
- bipolar disorder;
- $IQ < 65$ ;
- BMI less than 18.5 or more than 30;
- substance abuse or dependence (excluding nicotine);
- chronic inflammatory diseases;
- severe hepatic failure;
- serious infections (such as HIV, HBV and HCV);
- cancer in the previous 6 months;
- regular use of anti-inflammatory drugs for more than 15 days/month;
- difficulty in reading Italian or participation to other clinical trials;



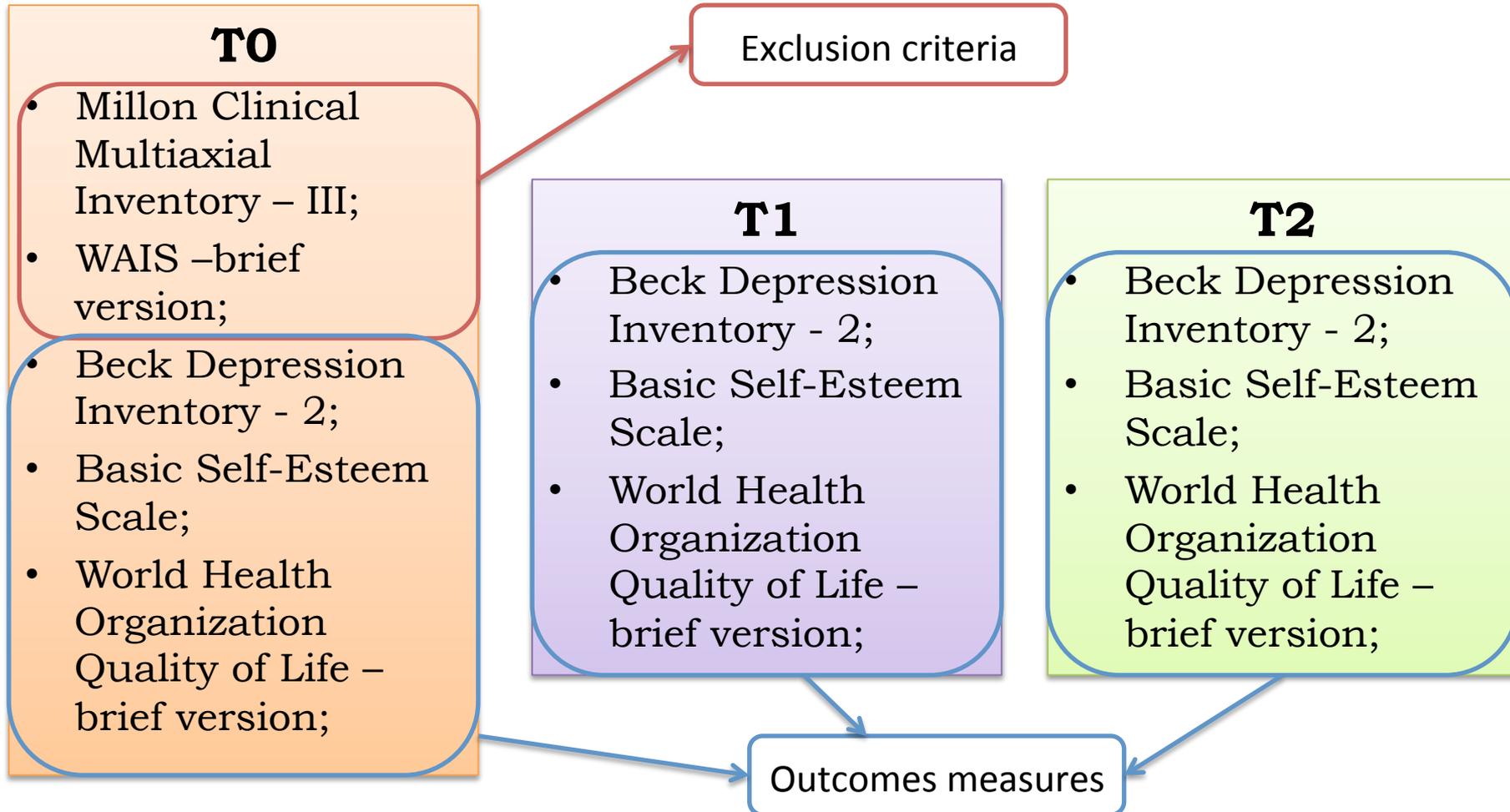
- 6 psychotherapists trained in Functional Psychology method, applied the intervention protocol.
- 3 psychologists administered the psychodiagnostic assessment;
- 1 nurse drew the blood samples;
- 1 nutritionist prescribed the diet (or a diet diary in the control group);



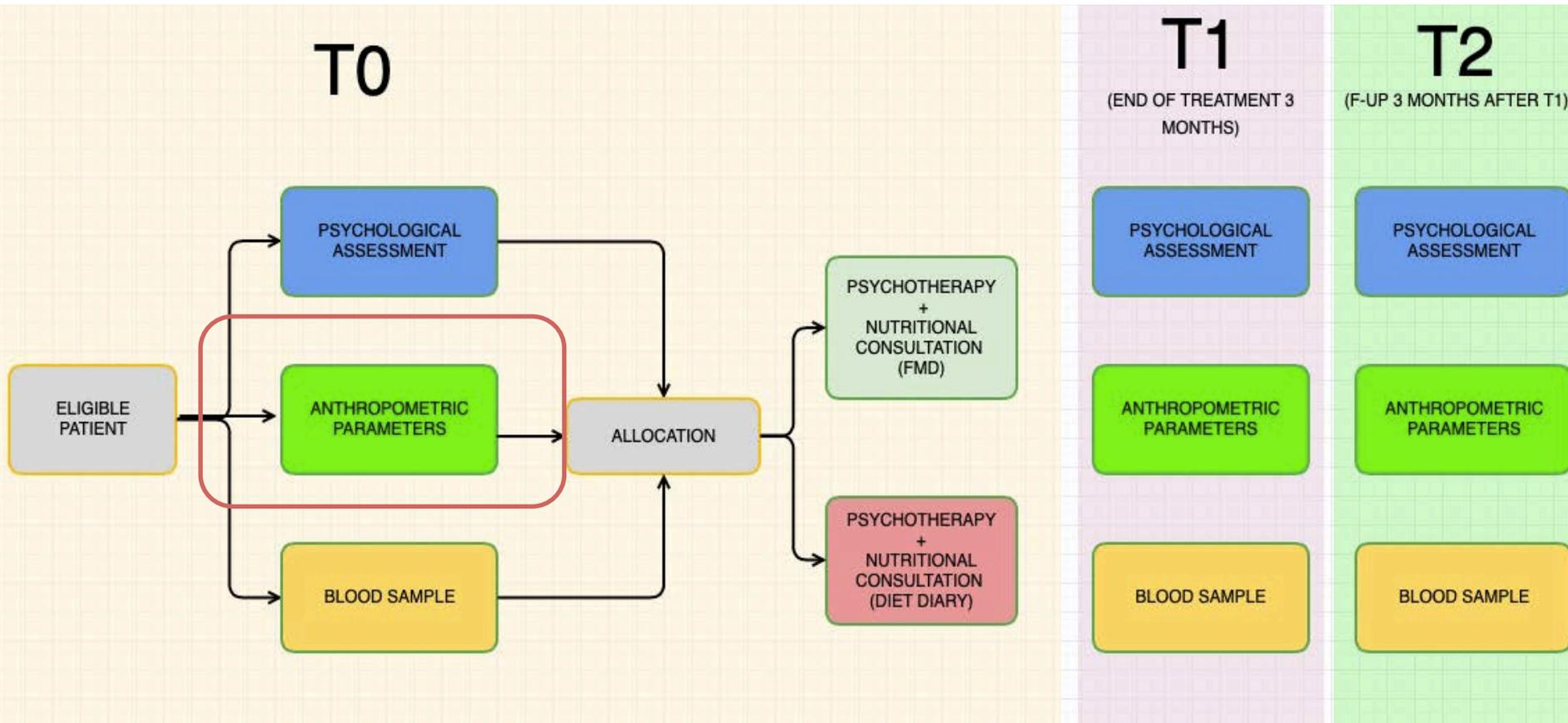
# RCT DESIGN



# Psychological assessment

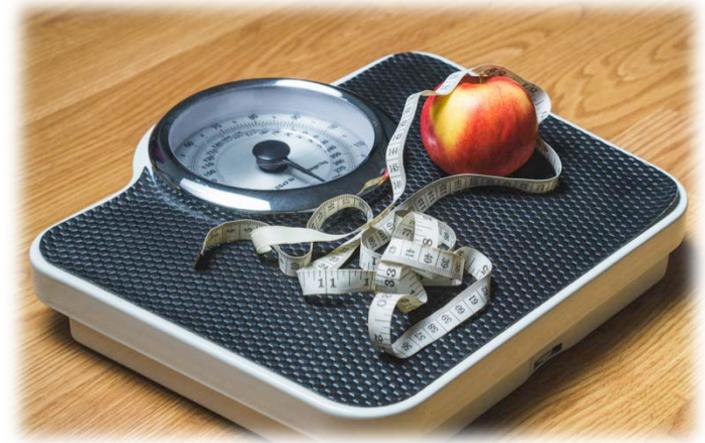


# RCT DESIGN



# Anthropometric measurements

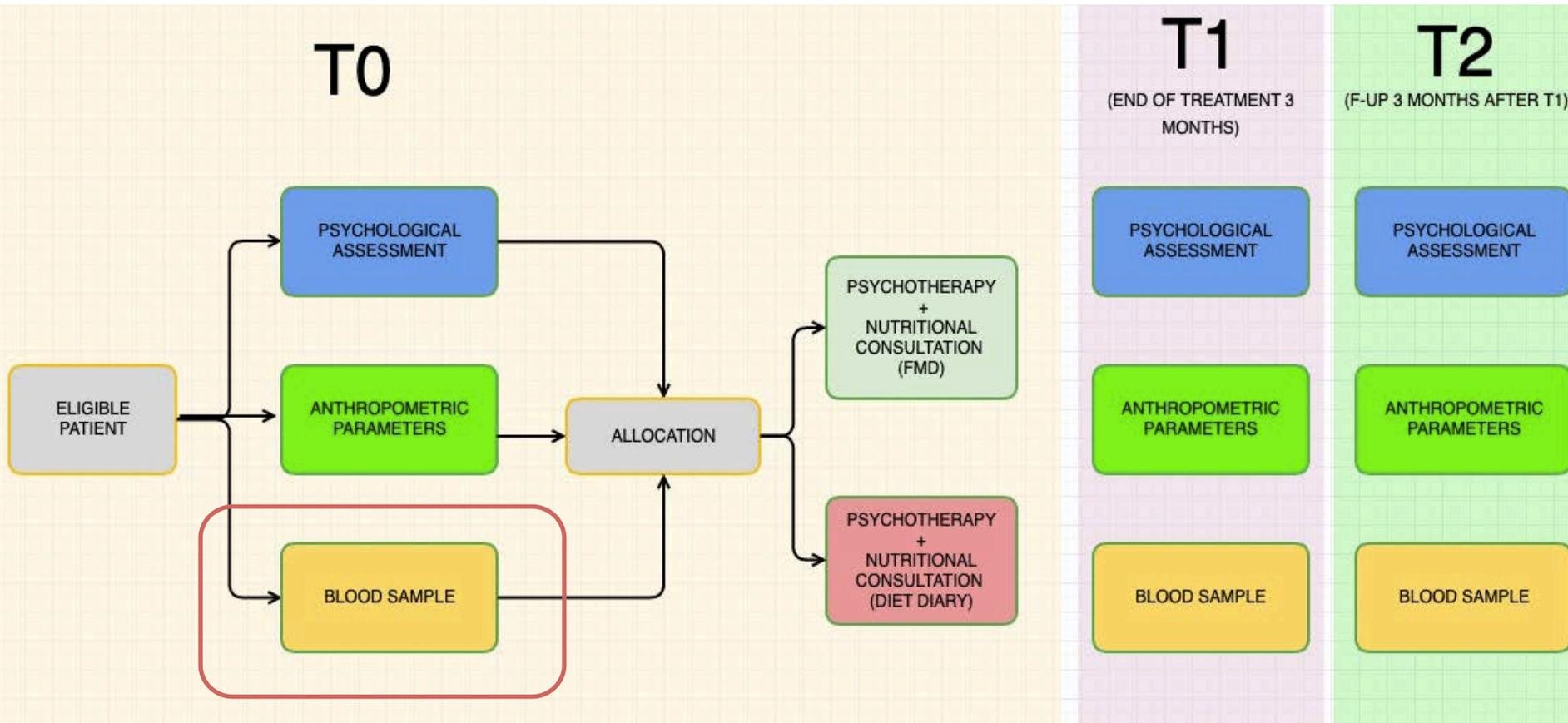
- **Weight**
- **Height**
- **BMI**
- **Waist circumference**



Body Mass Index

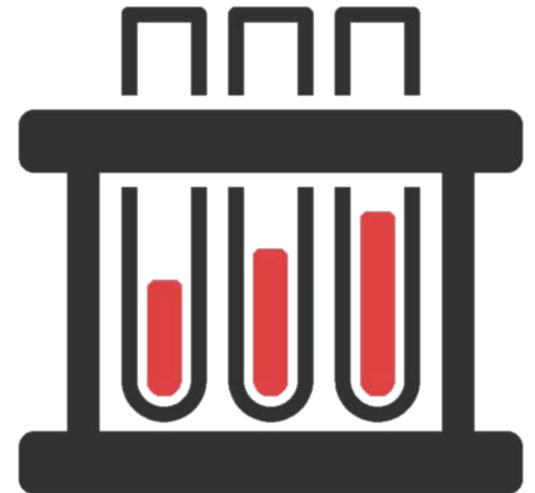


# RCT DESIGN

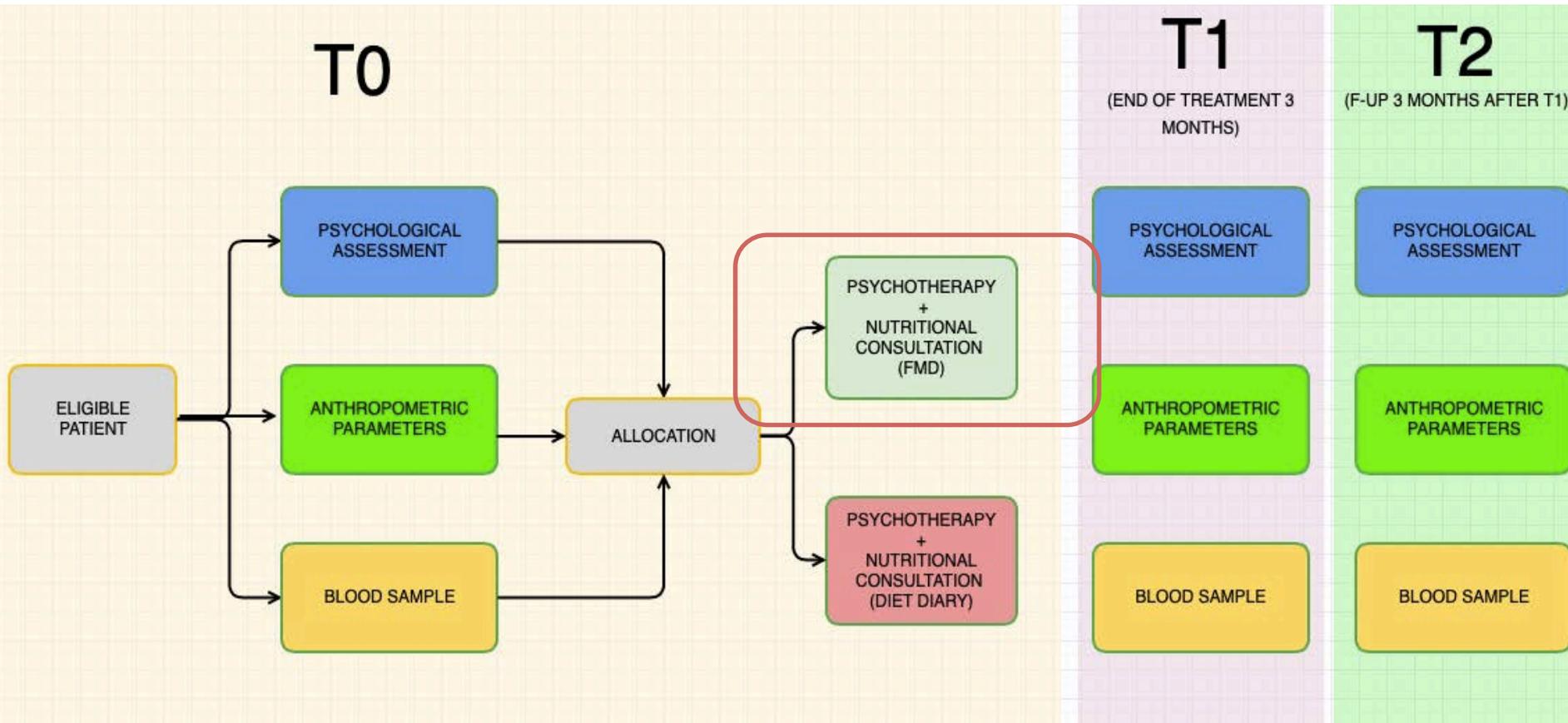


# Blood sample

- **LOOH, GSH**
- **IL-6, TNF  $\alpha$ , IL-1 beta**
- **Total cholesterol, HDL, triglycerides, AST / ALT, blood glucose, PCR, fibrinogen, PAI-1**



# RCT DESIGN



# PSY-FMD group

- 20 individual sessions of Functional Psychotherapy;
- each session lasted one hour and attended twice a week for the first 8 weeks and once a week for the remaining 4.
- Nutritional consultation and prescription of a Fasting Mimicking Diet

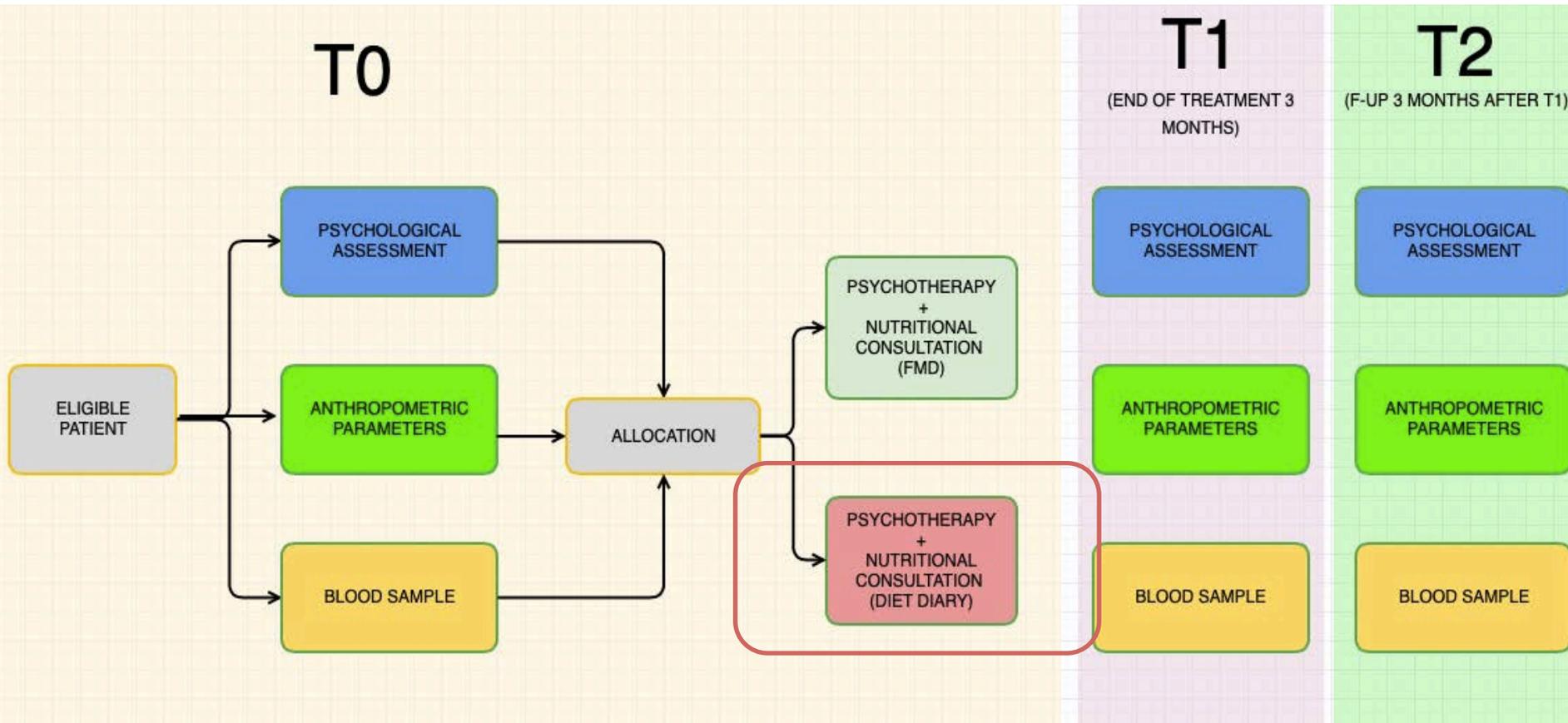


# Fasting Mimicking Diet

- FMD includes the consumption of vegetable-based soups, energy bars, infusions etc.
- Duration: 5 days a month for a total of 3 cycles: the first day of the diet will provide 1090 kcal (10% protein, 56% fat, 34% carbohydrate), the days 2- 5 will be identical in the formulation and will provide 725 kcal (9-10% protein, 44-56% fat, 34-47% carbohydrate).
- Between cycles of FMD the subjects stucked to a free diet.



# RCT DESIGN

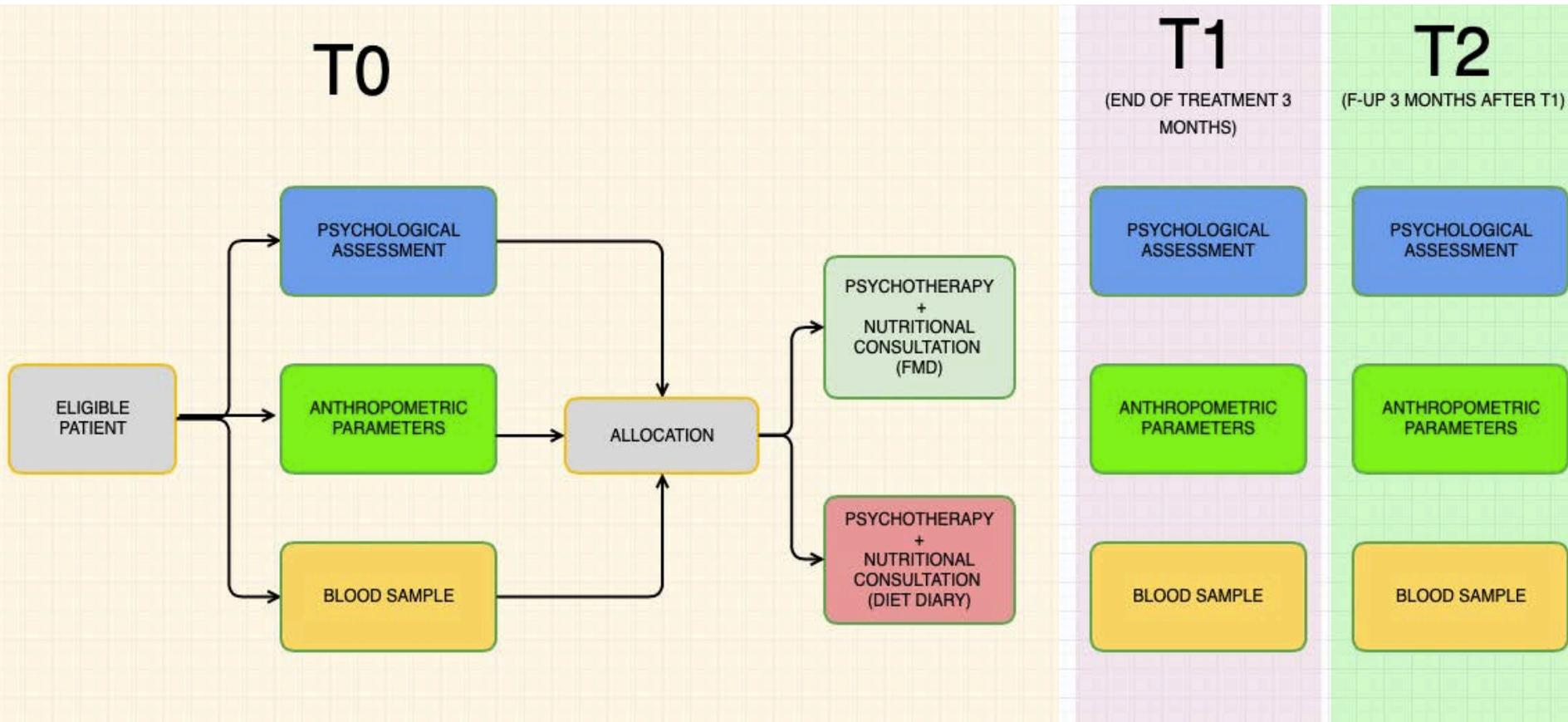


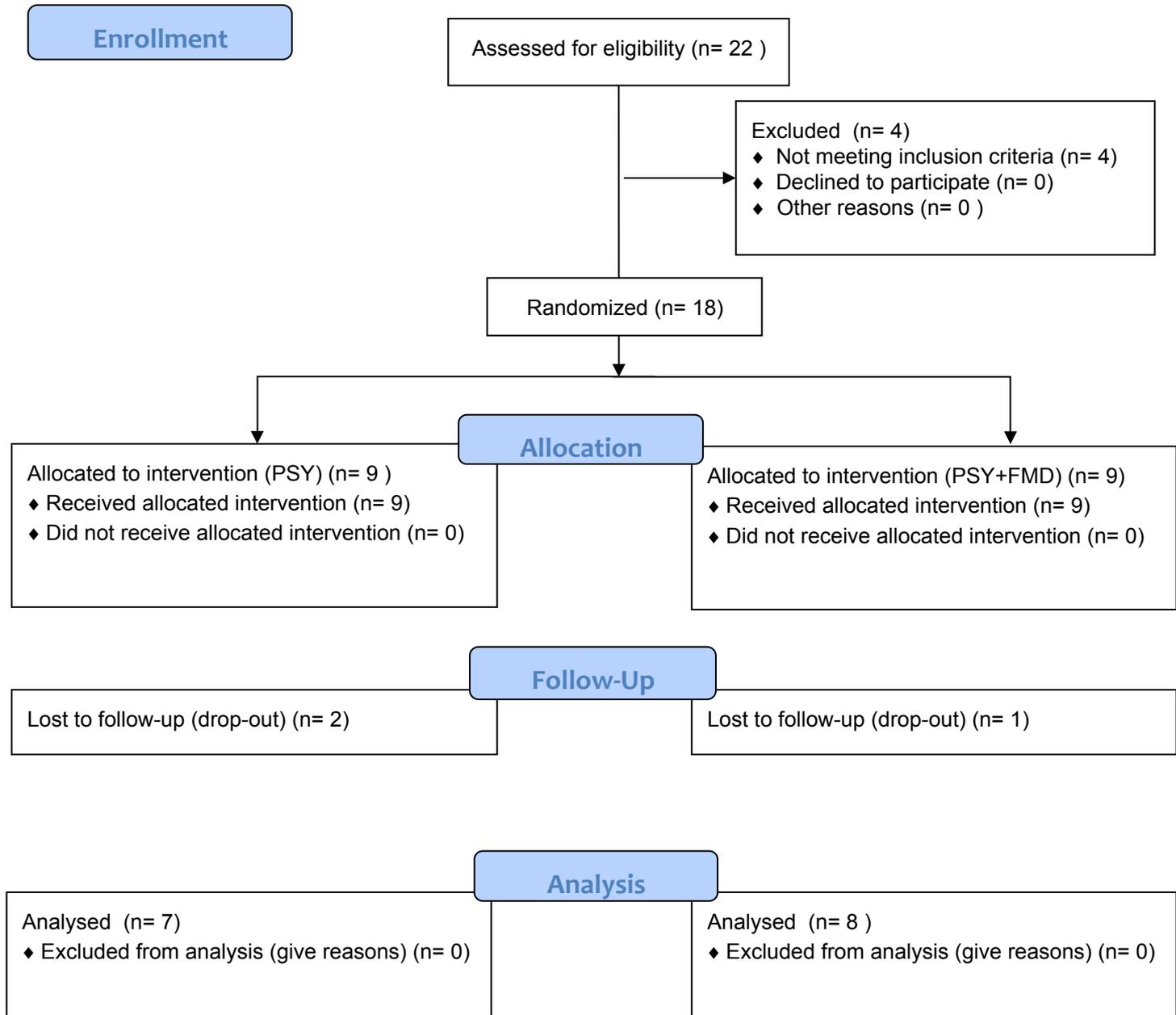
# PSY-group

- 20 individual sessions of Functional Psychotherapy;
  - each session lasted one hour and attended twice a week for the first 8 weeks and once a week for the remaining 4.
- Nutritional consultation plus food diary



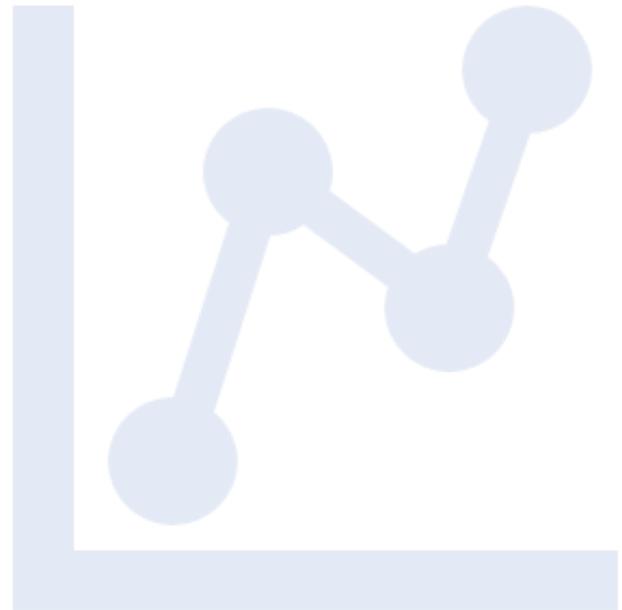
# RCT DESIGN







# Results



<b>Socio-demographic characteristics</b>	<b>PSY (n = 9) M (SD)</b>	<b>PSY-FMD (n = 9) M (SD)</b>	<b>T Test</b>
<b>Age</b>	30.11 (8.00)	32.22 (13.30)	-.408 NS

<b>Socio-demographic characteristics</b>	<b>PSY (n = 9) Frequency (%)</b>	<b>PSY-FMD (n = 9) Frequency (%)</b>	<b><math>\chi^2</math></b>
<b>Sex</b>	Females: 7 (77.8%)	Females: 5 (55.6%)	$\chi^2 (1) = 1.000$ NS
<b>Marital status</b>	Married: 3 (33.3%)	Married: 2 (22.2%)	$\chi^2 (1) = .277$ NS
<b>Educational level</b>	8y: 3 (33.3%); 13y: 5 (55.6%); 16y: 1 (11.1%); 18: 0 (0%)	8y: 1 (11.1%); 13y:4 (44.4%); 16 y: 3 (33.3%); 18: 1 (11.1%)	$\chi^2 (3) = 3.111$ NS

NS Not significant \* p < 05; \*\* p < 01; \*\*\* p < 005; \*\*\*\* p < 001

	<b>PSY (n = 9) M (SD)</b>	<b>PSY-FMD (n = 9) M (SD)</b>	<b>T Test</b>
<b>I. Q.</b>	92.66 (19.46)	108.77 (17.12)	-1.864 NS

NS Not significant \* p < 05; \*\* p < 01; \*\*\* p < 005; \*\*\*\* p < 001

<b>Personality disorders</b>	<b>PSY (n = 9) Frequency (%)</b>	<b>PSY-FMD (n = 9) Frequency (%)</b>	<b><math>\chi^2</math> Test</b>
<b>Schizoid</b>	2 (22.2%)	1 (11.1%)	$\chi^2$ (1) = .400 NS
<b>Avoidant</b>	1 (11.1%)	3 (33.3%)	$\chi^2$ (1) = 1.286 NS
<b>Depressive</b>	4 (44.4%)	5 (55.6%)	$\chi^2$ (1) = .222 NS
<b>Dependent</b>	2 (22.2%)	3 (33.3%)	$\chi^2$ (1) = .277 NS
<b>Histrionic</b>	1 (11.1%)	0 (0%)	$\chi^2$ (1) = 1.059 NS
<b>Narcissistic</b>	1 (11.1%)	0 (0%)	$\chi^2$ (1) = 1.059 NS
<b>Antisocial</b>	0 (0%)	0 (0%)	-
<b>Sadistic</b>	0 (0%)	1 (11.1%)	$\chi^2$ (1) = 1.059 NS
<b>Compulsive</b>	1 (11.1%)	0 (0%)	$\chi^2$ (1) = 1.059 NS
<b>Negativistic</b>	2 (22.2%)	0 (0%)	$\chi^2$ (1) = 2.250 NS
<b>Self-defeating</b>	1 (11.1%)	2 (22.2%)	$\chi^2$ (1) = .400 NS
<b>Schizotypal</b>	0 (0%)	0 (0%)	-
<b>Borderline</b>	0 (0%)	0 (0%)	-
<b>Paranoid</b>	0 (0%)	0 (0%)	-

NS Not significant \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .005$ ; \*\*\*\*  $p < .001$

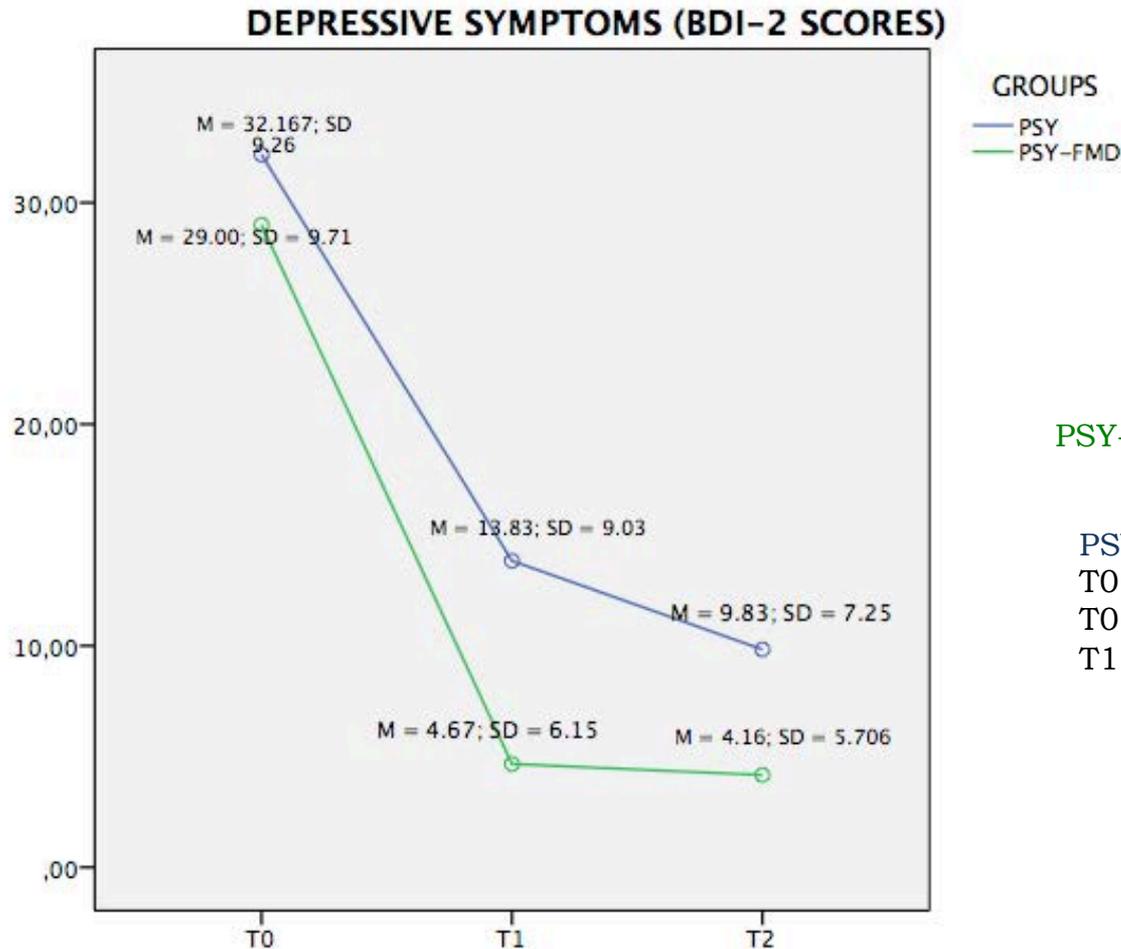
<b>Clinical Syndromes</b>	<b>PSY (n = 9)  Frequency (%)</b>	<b>PSY-FMD (n = 9)  Frequency (%)</b>	<b><math>\chi^2</math> Test</b>
<b>Anxiety</b>	5 (55.6%)	5 (55.6%)	$\chi^2$ (1) = .000 NS
<b>Somatic Symptom</b>	3 (33.3%)	0 (0%)	$\chi^2$ (1) = 3.600 NS
<b>Bipolar Disorder</b>	0 (0%)	0 (0%)	-
<b>Dysthymia</b>	3 (33.3%)	3 (33.3%)	$\chi^2$ (1) = .000 NS
<b>Alcohol Use</b>	0 (0%)	0 (0%)	-
<b>Drug Use</b>	0 (0%)	0 (0%)	-
<b>Post-Traumatic Stress</b>	0 (0%)	0 (0%)	-
<b>Thought Disorder</b>	2 (22.2%)	0 (0%)	$\chi^2$ (1) = 2.250 NS
<b>Major Depression</b>	4 (44.4%)	1 (11.1%)	$\chi^2$ (1) = 2.492 NS
<b>Delusional Disorder</b>	0 (0%)	0 (0%)	$\chi^2$ (1) = 2.250 NS

NS Not significant \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .005$ ; \*\*\*\*  $p < .001$

	<b>PSY (n = 9) M (SD)</b>	<b>PSY-FMD (n = 9) M (SD)</b>	<b>T Test</b>
<b>BDI</b>	32.00 (4.33)	29.00 (4.33)	.297 NS
<b>B-SES</b>	25.00 (17.67)	11.11 (13.17)	1.890 NS
<b>WHOQOL - Physical health</b>	36.50 (12.21)	27.37 (9.94)	1.739 NS
<b>WHOQOL – Psychological</b>	39.34 (9.34)	37.96 (4.39)	.403 NS
<b>WHOQOL - Social relationships</b>	50.92 (20.60)	41.66 (13.82)	1.120 NS
<b>WHOQOL – Environmental</b>	48.95 (11.58)	46.18 (6.77)	.621 NS
<b>BMI</b>	22.21 (2.20)	25.33 (3.81)	-2.118 NS

NS Not significant \* p < 05; \*\* p < 01; \*\*\* p < 005; \*\*\*\* p < 001

# Effect of treatment on depressive symptoms



PSY GROUP =  $F(2) = 9.504$ ,  $p = .005$

PSY-FMD GROUP =  $F(2) = 24.943$ ,  $p = .0001$

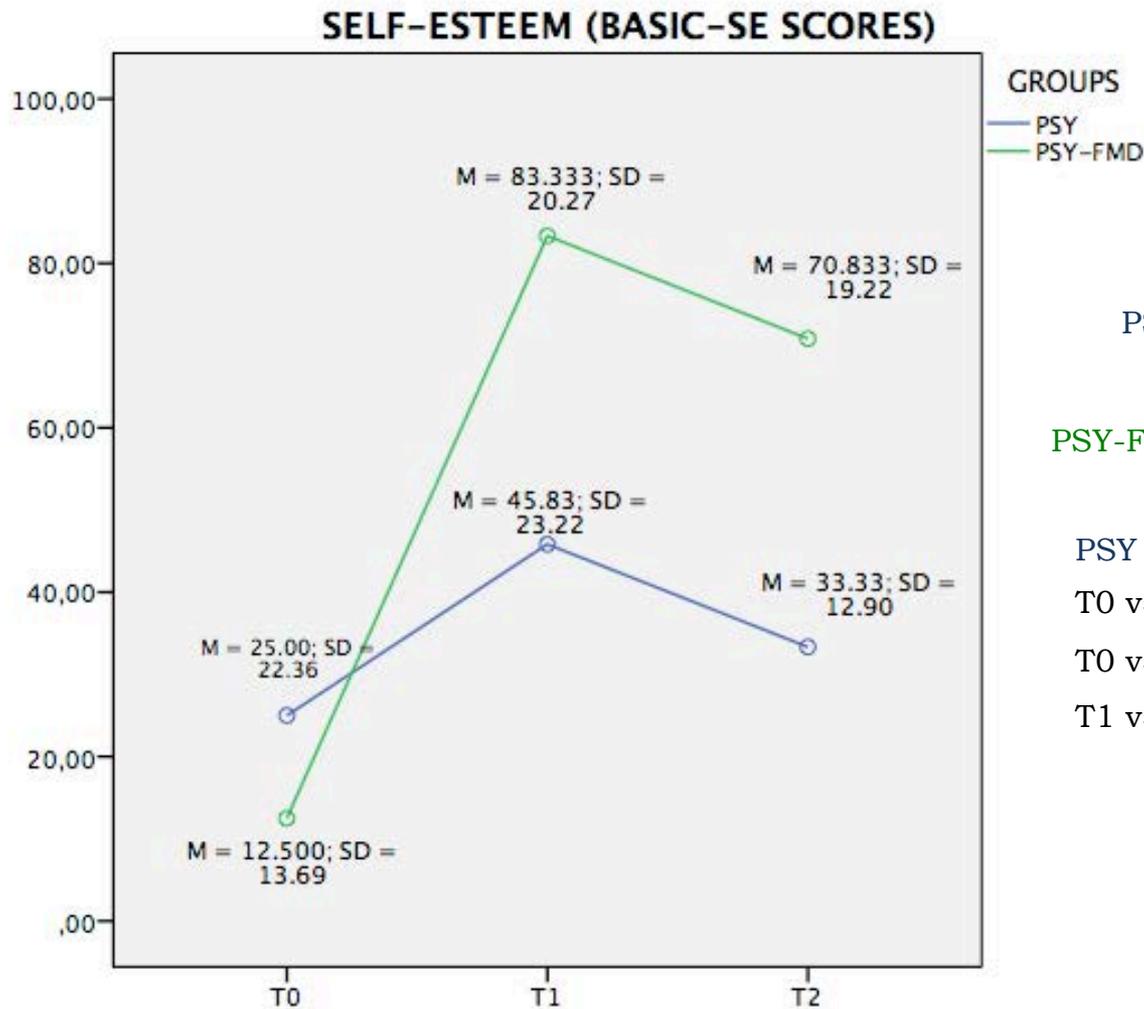
PSY GROUP vs PSY-FMD GROUP

T0 vs T1:  $t(10) = 1.296$   $p = .224$

T0 vs T2:  $t(10) = .431$   $p = .676$

T1 vs T2:  $t(10) = -.773$   $p = .457$

# Effect of treatment on self-esteem



PSY GROUP =  $F(2) = 3.451, p = .071$

PSY-FMD GROUP =  $F(2) = 12.191, p = .002$

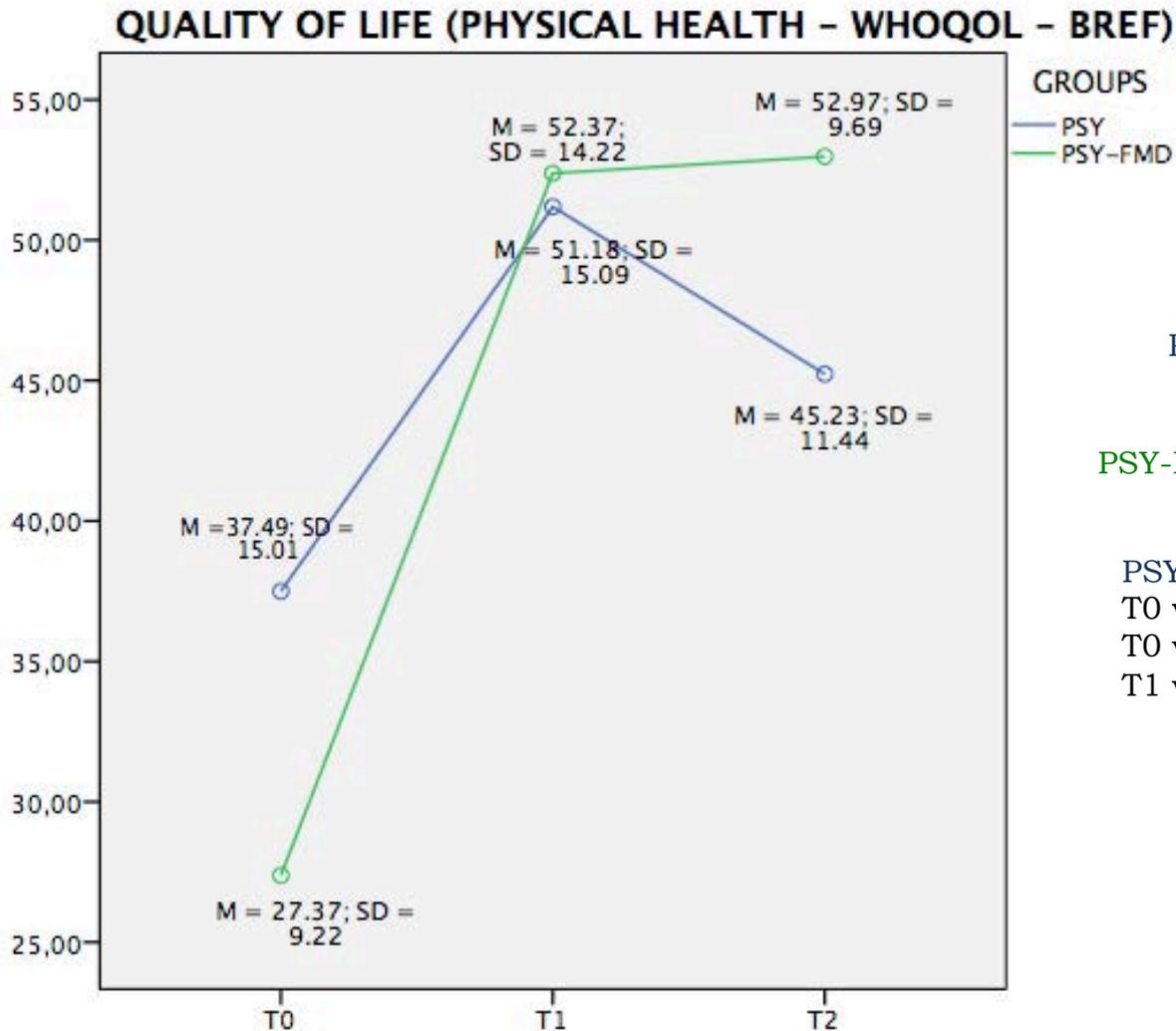
PSY GROUP vs PSY-FMD GROUP

T0 vs T1:  $t(10) = -3.956, p = .003$

T0 vs T2:  $t(10) = -3.371, p = .004$

T1 vs T2:  $t(10) = -1.136, p = .282$

# Effect of treatment on QoL - Physical Health



PSY GROUP =  $F(2) = 4.303$ ,  $p = .045$

PSY-FMD GROUP =  $F(2) = 5.156$ ,  $p = .029$

PSY GROUP vs PSY-FMD GROUP

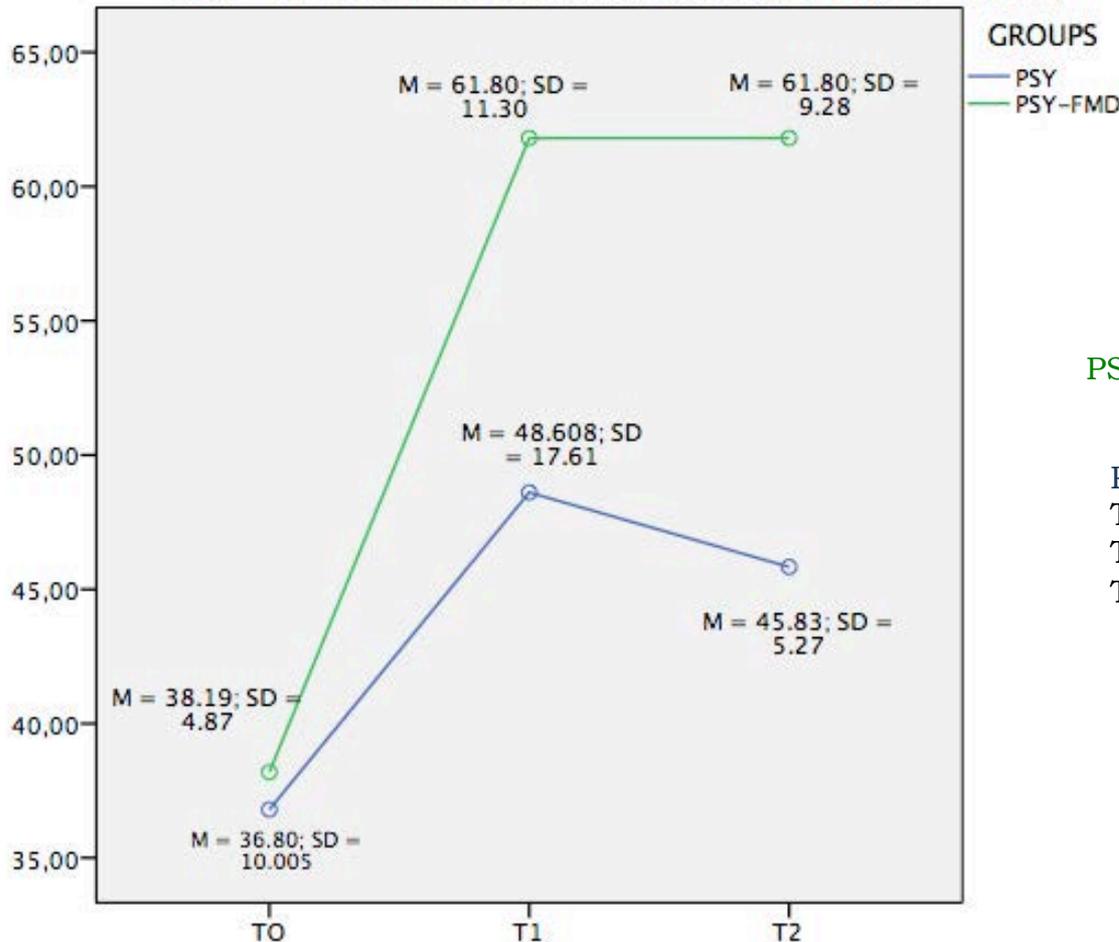
T0 vs T1:  $t(10) = -1.290$ ,  $p = .226$

T0 vs T2:  $t(10) = -2.716$ ,  $p = .022$

T1 vs T2:  $t(10) = -.774$ ,  $p = .457$

# Effect of treatment on QoL - Psychological Health

QoL - PSYCHOLOGICAL HEALTH (WHOQOL - BREF)



PSY GROUP =  $F(2) = 2.432, p = .138$

PSY-FMD GROUP =  $F(2) = 10.548, p = .003$

PSY GROUP vs PSY-FMD GROUP

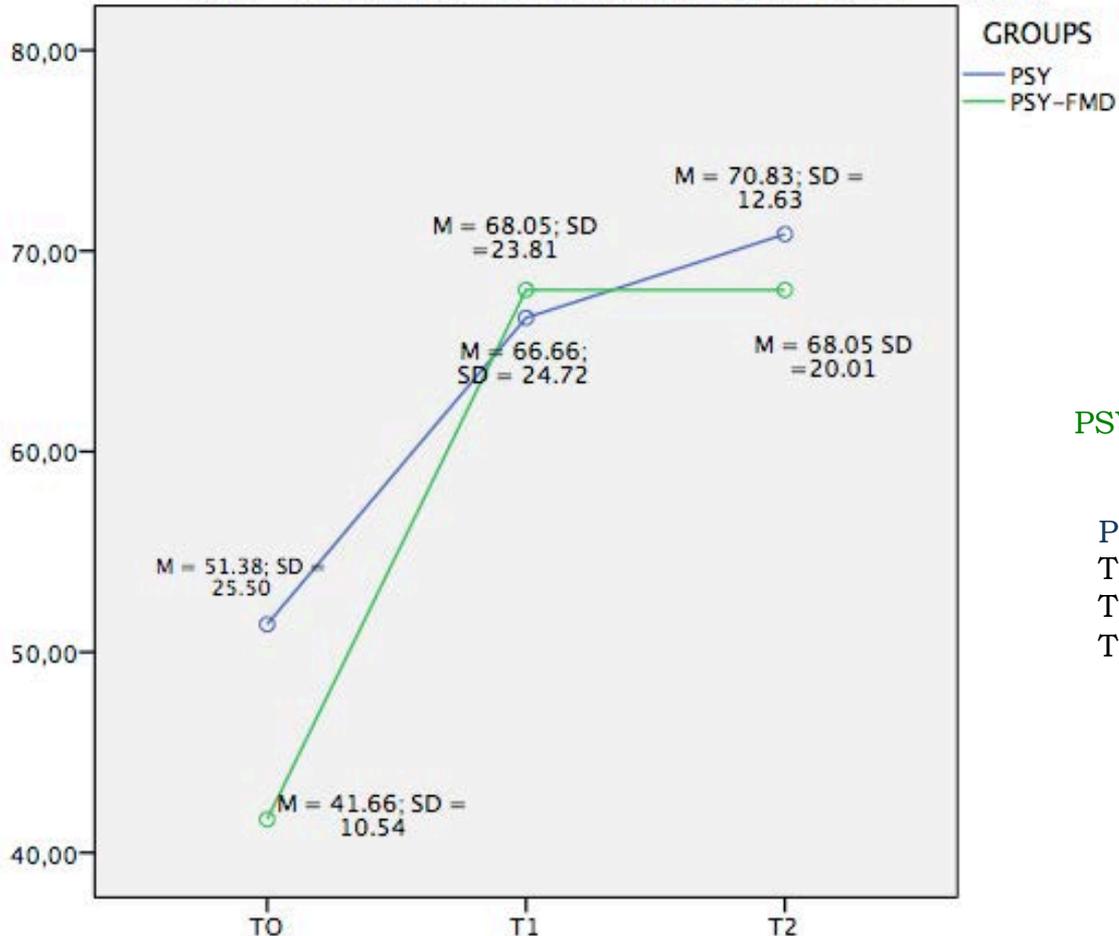
T0 vs T1:  $t(10) = -1.691, p = .122$

T0 vs T2:  $t(10) = -2.393, p = .038$

T1 vs T2:  $t(10) = -.339, p = .697$

# Effect of treatment on QoL – Social Relationships

QoL – SOCIAL RELATIONSHIPS (WHOQOL – BREF)



PSY GROUP =  $F(2) = 1.422, p = .286$

PSY-FMD GROUP =  $F(2) = 3.386, p = .075$

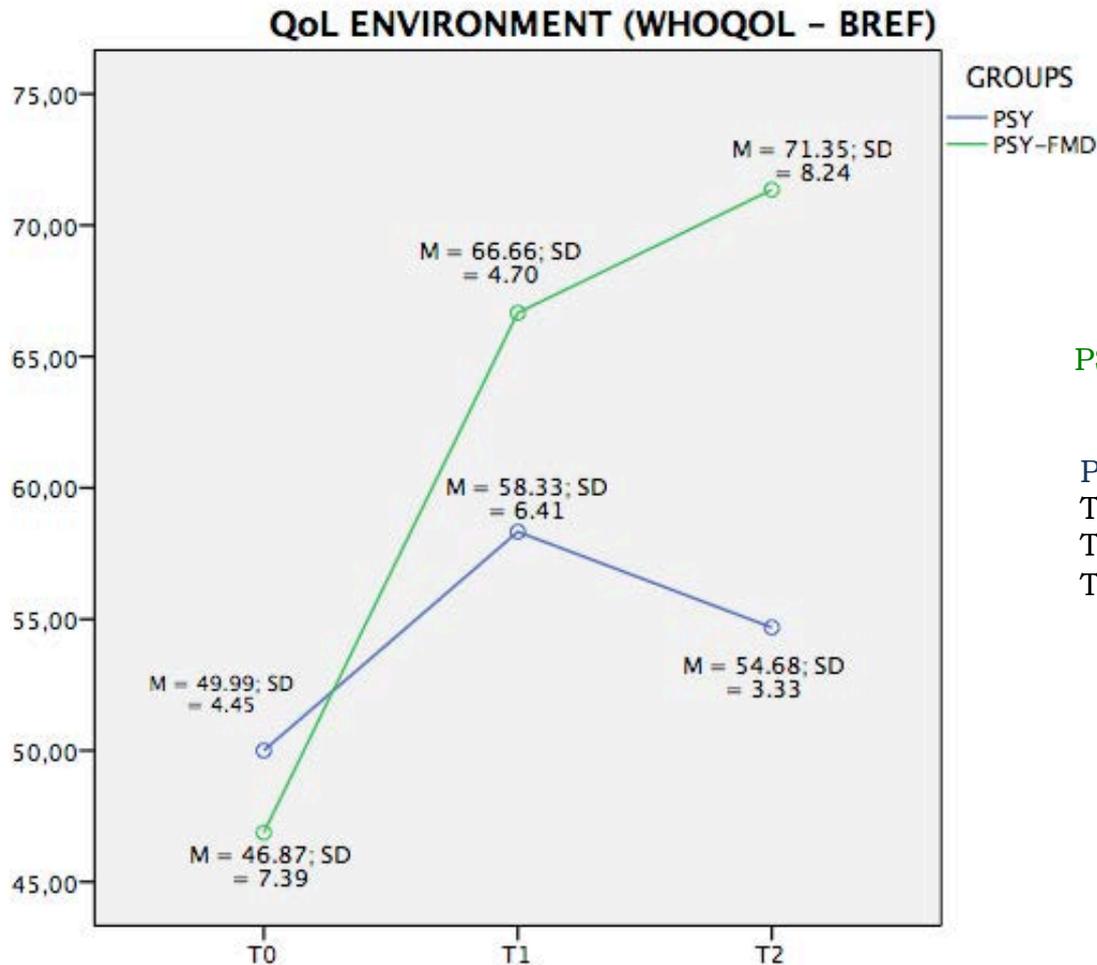
PSY GROUP vs PSY-FMD GROUP

T0 vs T1:  $t(10) = -1.105, p = .295$

T0 vs T2:  $t(10) = -.657, p = .526$

T1 vs T2:  $t(10) = .329, p = .749$

# Effect of treatment on QoL – Environment



PSY GROUP =  $F(2) = .712, p = .514$

PSY-FMD GROUP =  $F(2) = 26.436, p = .0001$

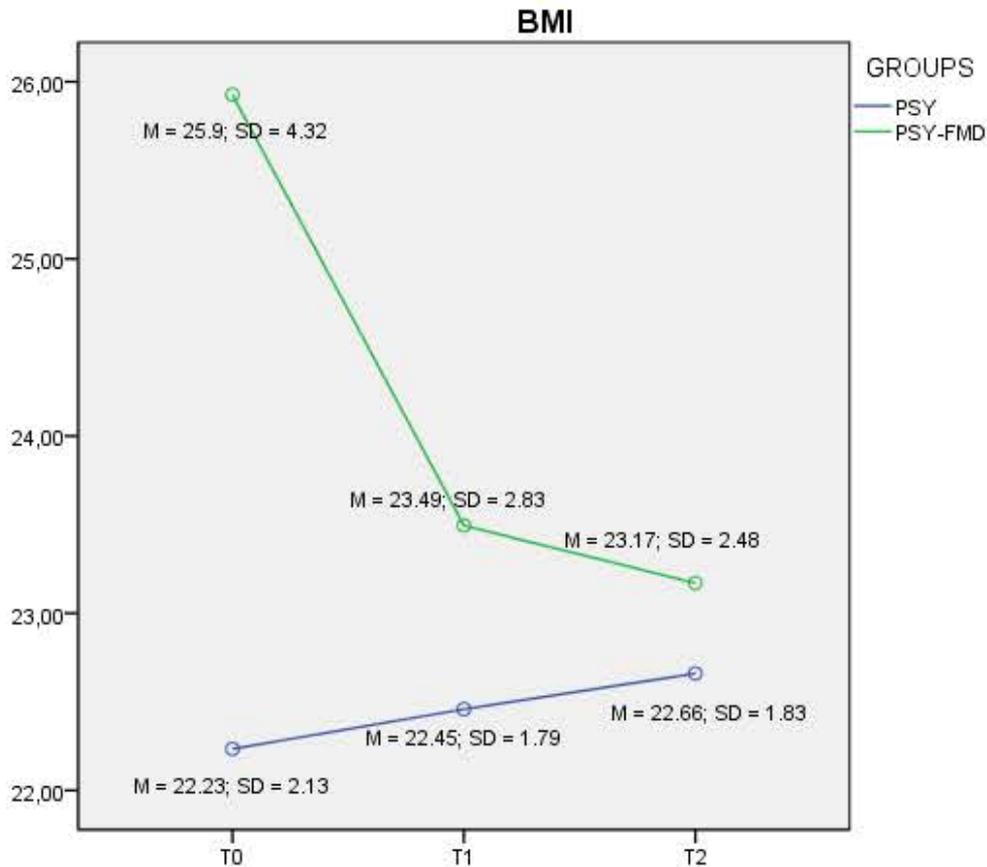
PSY GROUP vs PSY-FMD GROUP

T0 vs T1:  $t(10) = -1.432, p = .183$

T0 vs T2:  $t(10) = -2.514, p = .031$

T1 vs T2:  $t(10) = -1.081, p = .305$

# Effect of treatment on BMI



PSY GROUP =  $F(2) = .796, p = .484$

PSY-FMD GROUP =  $F(2) = 7.362, p = .010$

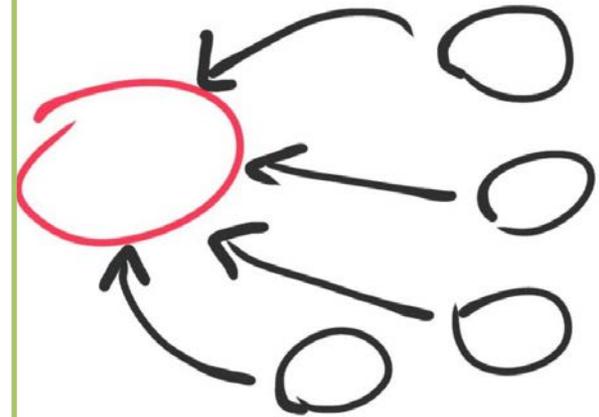
# Limitations

- Small sample size
- Limits of a FMD based on the prescription of real food *vs* standardized box
- Bias related to the compliance on following the FMD protocol



# Conclusions

1. The FT program has shown a strong efficacy on:
  - ✓ reducing depression
  - ✓ increasing self-esteem
  - ✓ increasing QoL
2. The addition of a FMD to the FT program lead to a significant improvement of:
  - ✓ Self-esteem
  - ✓ Physical QoL
  - ✓ Psychological QoL
  - ✓ Environment QoL
3. Future directions
  - ❑ Evaluate the effects of those treatment on the inflammation related to depression



# Thanks to:



Azienda Ospedaliera Universitaria  
Policlinico Paolo Giaccone  
di Palermo



## **Psychiatry Unit**

Prof. Daniele La Barbera

Dr. Erika La Cascia

Dr. Alessandra Giammanco

Dr. Roberta Di Peri

Dr. Laura Lumia

Dr. Zaira Sardella

Dr. Stefania Larcan

Dr. Yuri Mannella

Dr. Simonetta Montana

Dr. Laura Ferraro

Mrs. Daniela Spinnato

## **Internal Medicine**

Prof. Manfredi Rizzo

Dr. Roberto Citarrella

Dr. Dragana Nikolic

Dr. Roberta Chianetta

## **Clinical Biochemical Analysis**

Prof. Marcello Ciaccio

Dr. Giulia Bivona

# Fake or real environmental wellness?



**Thanks for your attention**

**Mail to: [giuseppe.maniaci02@unipa.it](mailto:giuseppe.maniaci02@unipa.it)**