



## BILATERAL RELATIONSHIP BETWEEN EXCESS WEIGHT AND MENTAL DISORDERS

*Relação bilateral entre excesso de peso e transtornos mentais*

*Relación bilateral entre el exceso de peso y trastornos mentales*

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### ABSTRACT

**Objective:** To determine the prevalence of excess weight in individuals with and without mental disorders. **Methods:** A cross-sectional, quantitative and analytical study carried out with 167 adult volunteers of both sexes, with and without mental disorders, and aged over 18 years, in the period from October to December 2015. The participants were recruited at the Psychosocial Care Center and at a Basic Health Unit of Teresina, Piauí, Brazil. A structured form was used to collect sociodemographic variables (age, sex, schooling, marital status and income) and anthropometric variables (weight and height). The anthropometric diagnosis was determined by the Body Mass Index, and the psychiatric diagnosis was according to the International Classification of Diseases (ICD 10). The data analysis was performed in a descriptive way, using the Chi-square test of independence ( $\chi^2$ ) to evaluate associations. For analysis of variance, the study applied the ANOVA test followed by Tukey's, with significance level at 5%. **Results:** Of the total of participants, 77.2% (n=129) had been diagnosed with mental disorders, and 22.8% (n=38) had not. Excess weight was observed in 73.1% (n=122) of those investigated, with a higher prevalence in the psychiatric population (89.4%, n=109). The mean BMI of the groups showed significant differences among schizophrenics (= 31.62 kg/m<sup>2</sup>; p<0.01), depressives (= 31.23 kg/m<sup>2</sup>; p=0.04), and those with other mood disorders (= 31.09 kg/m<sup>2</sup>; p=0.01) when compared to the group without mental disorders (= 25.51 kg/m<sup>2</sup>). **Conclusion:** It is evidenced the superiority of excess weight in the psychiatric population, especially in schizophrenics and depressives when compared to the population without mental disorders.

**Descriptors:** Overweight; Obesity; Mental Disorders; Public Health.

### RESUMO

**Objetivo:** Determinar a prevalência de excesso de peso em indivíduos com e sem transtornos mentais. **Métodos:** Estudo quantitativo, transversal e analítico, realizado com 167 voluntários adultos, de ambos os sexos, com ou sem transtornos mentais, e com idade superior a 18 anos, no período de outubro a dezembro de 2015. Os participantes foram recrutados no Centro de Atenção Psicossocial e em uma Unidade Básica de Saúde de Teresina, Piauí, Brasil. Utilizou-se formulário estruturado com variáveis sociodemográficas (idade, sexo, escolaridade, estado civil e renda) e antropométricas (peso e altura). O diagnóstico antropométrico foi realizado de acordo com índice de massa corporal, e o psiquiátrico conforme a Classificação Internacional de Doenças (CID 10). A análise dos dados foi feita de forma descritiva, utilizando-se o teste Qui-Quadrado de Independência ( $\chi^2$ ) para avaliar associações. Para a análise de variância aplicou-se o teste ANOVA seguido do de Tukey, com 5% de significância. **Resultados:** Do total de participantes, 77,2% (n=129) tinham diagnóstico de transtornos mentais e 22,8% (n=38), não. O excesso de peso foi verificado em 73,1% (n=122) dos investigados, com maior prevalência na população psiquiátrica (89,4%, n=109). As médias de IMC entre os grupos mostraram diferenças significativas entre esquizofrênicos (= 31,62 kg/m<sup>2</sup>; p<0,01), depressivos (= 31,23 kg/m<sup>2</sup>; p=0,04) e outros transtornos de humor (= 31,09 kg/m<sup>2</sup>; p=0,01) quando comparados ao grupo sem transtornos mentais (= 25,51 kg/m<sup>2</sup>). **Conclusão:** Evidencia-se a superioridade de excesso de peso na população psiquiátrica, especialmente em esquizofrênicos e depressivos, quando comparada à população sem transtornos mentais.

**Descritores:** Sobrepeso; Obesidade; Transtornos Mentais; Saúde Pública.



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## RESUMEN

**Objetivo:** Determinar la prevalencia de exceso de peso de individuos con y sin trastornos mentales. **Métodos:** Estudio cuantitativo, transversal y analítico realizado con 167 adultos voluntarios, de ambos los sexos, con o sin trastornos mentales y más de 18 años de edad en el período entre octubre y diciembre de 2015. Los participantes fueron reclutados del Centro de Atención Psicossocial y de una Unidad Básica de Salud de Teresina, Piauí, Brasil. Se utilizó un formulario estructurado con las variables sociodemográficas (edad, sexo, escolaridad, estado civil y renta) y antropométricas (peso y altura). El diagnóstico antropométrico se dio según el índice de masa corporal y el psiquiátrico según la Clasificación Internacional de Enfermedades (CIE 10). El análisis de los datos fue de manera descriptiva, utilizándose la prueba de Chi-cuadrado de Independencia ( $\chi^2$ ) para evaluar las asociaciones. Para el análisis de la variancia se aplicó la prueba ANOVA seguida de la de Tukey con el 5% de significación. **Resultados:** Del total de participantes, el 77,2% (n=129) tenían el diagnóstico de trastornos mentales y el 22,8% (n=38) no. El exceso de peso ha sido identificado en el 73,1% (n=122) de los investigados con mayor prevalencia en la población psiquiátrica (89,4%, n=109). Las medias del IMC entre los grupos mostraron diferencias significantes entre los que sufren de esquizofrenia (= 31,62 kg/m<sup>2</sup>; p<0,01), depresión (= 31,23 kg/m<sup>2</sup>; p=0,04) y otros trastornos del humor (= 31,09 kg/m<sup>2</sup>; p=0,01) comparados con el grupo sin trastornos mentales (=25,51 kg/m<sup>2</sup>). **Conclusión:** Se evidencia la superioridad de exceso de peso en la población psiquiátrica, especialmente en los esquizofrénicos y depresivos comparados con la población sin trastornos mentales.

**Descriptor:** Sobrepeso; Obesidad; Trastornos Mentales; Salud Pública.

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## INTRODUCTION

The excess weight of the population and its consequences, such as the increased risk of developing various chronic diseases, including arterial hypertension, type II diabetes mellitus, hypercholesterolemia and coronary diseases, are one of the greatest challenges to public health in Brazil and worldwide, because of its high prevalence rate<sup>(1,2)</sup>. In Brazil, excess weight and obesity affect approximately 52.5% and 11.7% of men over 20 years of age; and 58.4% and 20.6% of women in this same age group, respectively<sup>(1)</sup>.

Another disorder that has aroused the concern of researchers in proportions similar to excess weight is related to mental disorders, whose prevalence evidences that approximately 20 to 56% of the adult population present some type of psychiatric diagnosis, mainly depression and anxiety<sup>(3)</sup>.

Faced with important health problems, whose isolated impacts are already well established, studies have revealed the existence of an association between excess weight and mental disorders, verified in both directions. Mental disorders appear favoring the development of excess weight, while the opposite is also true<sup>(4,5)</sup>.

However, studies involving both health conditions are scarce and controversial. In addition, one should consider that both the excess weight and the mental disorders may result from a set of risk or protective factors that accumulate in the course of life, which renders that association quite complex. Among the factors that constitute determinants and can mediate that relationship, the social and cultural context, the exposure time, and biological aspects stand out<sup>(6,7)</sup>.

In this context, the care of psychiatric patients depends on an in-depth knowledge of their health history and their living conditions, with a view to the proper therapeutic planning of the mental disorder and its comorbidities, which are generally accountable for interferences and complications in the treatment, in addition to increased mortality rates in these patients<sup>(8,9)</sup>.

Given the importance of these health problems, with an alarming increase in prevalence in the past decades, the objective of the present study is to determine the prevalence of excess weight among individuals with and without mental disorders.

## METHODS

A quantitative, cross-sectional and analytical study carried out from October to December 2015, with adult individuals of both sexes and aged between 18 and 65 years.

To compose the sample, patients with mental disorders, who attended at least once a week the Psychosocial Care Center (*Centro de Atenção Psicossocial - CAPS*) in the southeast area of Teresina, Piauí, Brazil, and participants without mental disorders, recruited at a Basic Health Unit (BHU) of the same region, were selected. The sample, selected through a simple randomization procedure, had as exclusion criteria the pregnant patients, the physically disabled and those cared for at household visits.

For calculation of the sample size of the psychiatric population, a total of 149 patients were considered, based on a margin of error of 5% for a 95% confidence interval<sup>(10)</sup>, resulting in an ideal sample of at least 109 patients for the development of the study. The final sample of the group of patients with mental disorders was composed of 129 patients, allocated according to the psychiatric diagnosis established in medical records: 59 schizophrenics, 23 depressives, 34 with other mood disorders, and 13 with other psychiatric disorders.

To compose the comparison group (group without mental disorders), the study considered 42 individuals from a database of the referenced BHU, totaling an ideal sample of 38 individuals. All the participants were selected by simple random process, by means of a random draw mechanism.

A structured form was used to record sociodemographic data (sex, age, family status, schooling, professional status and income) and anthropometric data (weight and height). To measure the weight, an electronic scale with a capacity of 150 kilograms (kg) and an accuracy of 100 grams (g) was used. Height was measured with an anthropometer of the said scale, graduated in centimeters, with a maximum limit of 200 cm. During the measurements, the participants were instructed to be in light clothes, barefoot, to stand in an upright posture and with a fixed stare forward<sup>(11)</sup>.

The anthropometric diagnosis was determined by the body mass index (BMI) and classified according to cut-off points proposed by the World Health Organization<sup>(12)</sup>. Excess weight was considered when BMI>25 kg/m<sup>2</sup>, including pre-obesity and the different degrees of obesity.

The psychiatric diagnosis was classified into four groups, according to the International Classification of Diseases - ICD 10<sup>(13)</sup> cited in the medical record, namely: schizophrenic disorders, depressive disorders, other mood disorders and other mental disorders.

Data was processed and analyzed using the software Statistical Package for Social Sciences (SPSS), version 20.0. Descriptive analyses were performed by calculating absolute and relative frequencies. To verify the existence of association between variables, the Chi-square Independence Test ( $\chi^2$ ) was used. For analysis of variance, the ANOVA test was applied, followed by the use of Tukey's test for identification of specific differences between the variables in which the values were significant. The significance level of 5% ( $p<0.05$ ) was adopted for all calculations.

The research was approved by the Research Ethics Committee of the Federal University of Piauí, under Approval No. 985.376. The data collection was conducted after having the Informed Consent Form signed by the participants who accepted to participate in the research, according to Resolution 466/12 of the National Health Council, Ministry of Health<sup>(14)</sup>.

## RESULTS

The study participants were 167 patients, 129 belonging to the psychiatric population and 38 to the population without disorders. Considering the total number of participants, it was observed a predominance of women (59.9%, n=100), age group between 36 and 55 years (59.3%, n=99), with high school level (57.5%, n=96), who lived with relatives and without partners (74.2%, n=124), and family income of 1 to 3 minimum wages (62.8%, n=105) (Table I).

Table I - Sociodemographic profile of research participants with mental disorder monitored by the Psychosocial Care Center and without mental disorder of a Basic Health Unit. Teresina, Piauí, 2015.

Variables	Psychiatric Population				Population without any MeD n (%)	Total n (%)
	ESQ n (%)	DEP n (%)	MoD n (%)	MeD n (%)		
<b>Sex</b>						
Male	21 (35.6)	3 (13.0)	14 (41.2)	9 (69.2)	20 (52.6)	67 (40.1)
Female	38 (64.4)	20 (87.0)	20 (58.8)	4 (30.8)	18 (47.4)	100 (59.9)
<b>Age group</b>						
18 to 35 years	17 (28.8)	0 (0.0)	10 (29.4)	5 (38.5)	21 (55.2)	53 (31.7)
36 to 55 years	37 (62.7)	18 (78.3)	21 (61.8)	6 (46.2)	17 (44.8)	99 (59.3)
> 56 years	5 (8.5)	5 (21.7)	3 (8.8)	2 (15.3)	0 (0.0)	15 (9.0)
<b>Schooling</b>						
Can not read, write	4 (6.8)	0 (0.0)	3 (8.8)	0 (0.0)	0 (0.0)	7 (4.2)
Literate	1 (1.7)	0 (0.0)	0 (0.0)	1 (7.6)	0 (0.0)	2 (1.2)
Middle School	17 (28.8)	8 (34.8)	6 (17.6)	6 (46.2)	9 (23.7)	46 (27.5)
High school	36 (61.0)	15 (65.2)	22 (64.8)	6 (46.2)	17 (44.7)	96 (57.5)
Higher education	1 (1.7)	0 (0.0)	3 (8.8)	0 (0.0)	12 (31.6)	16 (9.6)
<b>Family Situation</b>						
Living with a partner; with or without children	4 (6.8)	6 (26.0)	6 (17.7)	0 (0.0)	23 (60.5)	39 (23.4)
Living with relatives, without a partner	53 (89.8)	17 (73.9)	26 (76.5)	13 (100.0)	15 (39.5)	124 (74.2)
Lives with other people without marital bonds/lives alone	2 (3.4)	0 (0.0)	2 (5.8)	0 (0.0)	0 (0.0)	4 (2.4)

<b>Professional Status</b>						
Active	3 (5.1)	2 (8.7)	3 (8.8)	1 (7.7)	35 (92.1)	44 (26.3)
Inactive	45 (76.3)	19 (82.6)	23 (67.6)	5 (38.5)	0 (0.0)	92 (55.1)
Has never worked	11 (18.6)	2 (8.7)	8 (23.5)	7 (53.8)	3 (7.9)	31 (18.6)
<b>Income</b>						
Up to 1 MW	18 (30.5)	12 (52.1)	12 (35.3)	3 (23.1)	1 (2.6)	46 (27.6)
More than 1 to 3 MW	39 (66.1)	10 (43.4)	16 (47.1)	9 (69.3)	31 (81.6)	105 (62.8)
More than 3 to 5 MW	2 (3.4)	1 (4.3)	4 (11.8)	1 (7.7)	4 (10.5)	12 (7.2)
More than 5 MW	0 (0.0)	0 (0.0)	2 (5.9)	0 (0.0)	2 (5.3)	4 (2.4)
Total	59 (35.3)	23 (13.8)	34 (20.4)	13 (7.8)	38 (22.8)	167 (100)

SM: Minimum Wage; ESQ: Schizophrenics; DEP: Depressive; MoD: Mood disorders; MeD: Other mental disorders.

The excess weight was evidenced in 73.1% (n=122) of the total participants. When comparing the groups, the highest percentages were presented by individuals with schizophrenia (84.4%, n=51), depression (87.0%, n=20), and with other mood disorders (88.20%, n=30), as shown in Table II.

Table II - Excess weight in participants with mental disorder monitored by the Psychosocial Care Center and without mental disorder of a Basic Health Unit. Teresina, Piauí, 2015.

Groups of individuals	Yes		No		Total		p value
	n	%	n	%	n	%	
<b>With mental disorders</b>							
Schizophrenics	51	84.4	8	13.6	59	100	<0.01
Depressive	20	87.0	3	13.0	23	100	
Other MoD	30	88.2	4	11.8	34	100	
Other MeD	8	61.5	5	38.5	13	100	
<b>Without mental disorders</b>							
Total	122	73.1	45	26.90%	167	100	

MeD: Mental disorders; MoD: Mood disorders. Statistical analysis performed with use of the Chi-Square test.

When comparing the average BMI between the groups, significant differences were observed between individuals presenting schizophrenia ( $=31.6$ ,  $p<0.01$ ), depression ( $=31.2$ ,  $p<0.01$ ), and other mood disorders ( $=31.0$ ,  $p<0.01$ ) in relation to the population without disorders (Table III).

Table III - Average body mass index (BMI) between the groups of individuals with mental disorder monitored by the Psychosocial Care Center and without mental disorder of a Basic Health Unit. Teresina, Piauí, 2015.

Variables	Average BMI	p value	95% CI
Without MeD	25.5		23.57 - 27.45
Schizophrenics	31.6*	< 0.01	29.84 - 33.42
Depressive	31.2*	< 0.01	28.92 - 33.54
Other MoD	31.0*	< 0.01	29.17 - 33.03
Other MeD	26.0	0.876	22.87 - 29.21

MeD: Mental disorders; BMI: Body mass index; MoD: Mood disorders. Statistical analysis using ANOVA followed by Tukey, \* p value <0.05 in comparison to the group without mental disorder.

## DISCUSSION

The present study pointed to a higher frequency of mental disorders among women, which may be justified by the greater demand for health care by this group<sup>(15)</sup>. Moreover, the psychiatric population presented lower level of education and lower economic level when compared to the general population, as has been pointed out in other studies<sup>(16-18)</sup>. The low educational level is related to the greater difficulty of insertion in the labor market, as well as the lower remuneration, which can influence the psychic well-being of the individual<sup>(19)</sup>.

Some determinants related to the high prevalence of mental disorders include unemployment, poor housing conditions and difficulty in accessing consumer goods<sup>(3)</sup>. In the present study, higher family income was shown to be a protective factor against symptoms of mental depression.

In relation to age, individuals between 25 and 54 years are the most vulnerable to the occurrence of mental disorders, which causes great impact on the economy, since they constitute the majority of the economically active population<sup>(3)</sup>.

The isolated relevance of excess weight and mental disorders to public health are known; these clinical conditions have presented an alarming increase in their prevalence along the past decades. Furthermore, despite some controversies, the literature shows the bilateral relationship between these two conditions<sup>(8,20)</sup>, a fact that may indicate a worrying prognosis<sup>(7)</sup>.

The present study showed a higher prevalence of excess weight in the psychiatric population (84.4% in schizophrenics, 87% in depressives and 88.2% in those with other mood disorders) when compared to the population without mental disorders (34.2%), corroborating other investigations<sup>(21,22)</sup>. These disorders favor the development of obesity, as this increases the frequency of mental disorders as well. The main mechanisms for such correlation include fails in the regulation of the hypothalamic-pituitary-adrenal axis and the use of antipsychotics<sup>(8,23)</sup>.

Obesity, by deregulating the hypothalamic-pituitary-adrenal axis, leads to an increase in cortisol secretion, causing mood swings, altered self-image and body dissatisfaction<sup>(23)</sup>. Additionally, despite the absence of satisfactory genetic or physiological explanations for the large variability among individuals regarding the ability to gain weight through the use of medications<sup>(24)</sup>, the use of antipsychotics may increase weight and cause other adverse effects, demonstrating the involvement of psychotropic drugs in the metabolic disorders<sup>(8)</sup>.

The effect on weight gain in individuals using antipsychotics may be explained by these drugs stimulating appetite and preference for sweet or fatty foods, acting directly on metabolic systems and nerve centers linked to satiety and weight control. Furthermore, medication can generate sedation, thus favoring a sedentary lifestyle, and can also promote the recovery of weight loss caused by mental disorder<sup>(25)</sup>.

Mental disorder itself is considered a risk factor for comorbidities such as excess weight and abdominal obesity, since it involves a complex set of risk factors, and these individuals are more susceptible to develop other diseases<sup>(8)</sup>.

Schizophrenia, evidenced as the most frequent mental disorder in the present study, is actually regarded as the most serious and intriguing one, and has been related to the susceptibility to many cardiovascular risk factors, such as hypertension, obesity, atherogenic dyslipidemia and diabetes<sup>(26)</sup>.

This relationship can be justified by the fact that schizophrenic patients present a vulnerability associated with genetic polymorphisms regulating eating behavior and satiety, and are exposed to the use of multiple medications that promote body weight gain<sup>(27)</sup>.

The superiority of the BMI observed among the schizophrenic individuals in the present study may be associated with the high intake of calories, sodium and cholesterol, and the low consumption of  $\alpha$ -tocopherol and phytosterols<sup>(27)</sup>. Although the study did not address the assessment of the participants' dietary intake, it is assumed that the increase in body weight is also related to changes in eating behavior.

Certainly, changes in the personality and behavior of schizophrenic individuals occur at the most different levels. Modifications in social behavior, lack of interest in activities and hobbies, neglect of self-care, and existence of delusional ideas are some factors that, coped with a lack of motivation and lack of adherence to the therapeutic regimen, render it even more difficult to treat the disorder and its comorbidities, given the family dependency to which these patients are submitted<sup>(28)</sup>.

Moreover, individuals with mental disorders develop a strong dependence on health services, which reveals the importance of specialized services and the need for continuous attention provided by the professionals who work in them<sup>(29,30)</sup>.

It is crucial that the incentive to promote health for these patients be prioritized vigorously, due to high morbidity and mortality rate. Based on these results, it stands out the need for comprehensive care, which must go beyond the disorder itself, thus responding to other health, social, environmental and family demands, as well as planning of mental health actions in order to favor the reduction in risks of morbidity and mortality, which are so increasing in this public<sup>(8)</sup>.

Measures to control and prevent modifiable risks, particularly improved eating and encouragement of a healthy lifestyle, are important strategies that should be adopted in order to reduce the effects of the bilateral relationship between excess weight and mental disorders. Some limitations may be pointed out in the present study, such as the impossibility of making specific observations of excess weight conditioning factors, such as food consumption, use of antipsychotics and length of use. It is also worth noting that the study did not assess life habits, such as physical activity, use of alcohol and other drugs.

## CONCLUSION

The superiority of excess weight in the psychiatric population is evidenced when compared to the population without mental disorders, especially in schizophrenic and depressive individuals, suggesting the need for improvements in the early monitoring of the general clinical condition of these patients.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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