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## OBESITY AND ITS CHANGES IN MENTAL, BIOCHEMICAL AND SOCIODEMOGRAPHIC HEALTH: MEDICINAL PLANTS AND PHYTOTHERAPY FOR HEALTH PROMOTION

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**Abstract:** This scientific research is a rapid response to tackling obesity in people of different genders, taking into account morbidity in the mental health of the obese and physiological alterations in the biochemical values of the human organism. Its alternative treatment measures include complementary integrative practices, medicinal plants and phytotherapy. **Research objectives:** To investigate serum biochemical alterations in obese people. Determine the social prevalence of obesity in race/color as white, black, brown, male, female and in the LGBTQIA+ community. To research the main medicinal plants and herbal medicines for the promotion and prevention of obesity. **Justification:** This scientific research is justified by the increase in obesity among Brazilian people of different socio-demographic characteristics. **Methodology:** This research is a qualitative, argumentative investigation, with secondary data collected from electronic scientific journals, Google Scholar, Scielos Brazil, university repositories and scientific sites related to obesity, such as the obesity map. The results of the research were analyzed using content analysis. **Results:** This research shows an increase in obesity among different genders, races and colors, in the following sociodemographic characteristics: black, brown, female and lesbian, and those with a low level of education. Its biochemical alterations include cholesterol, triglycerides, glycemia, body deformation and hormones above physiological limits. As a result, mental illnesses associated with obesity appear, such as anxiety and depression, because these illnesses increase the feeling of hunger, triggering a systemic inflammatory process as a result of the increase in blood glucose caused by excess serum cortisol in obesity. There is infertility, diabetes mellitus, cardiovascular problems due to physiological alterations in sex hormones, insulin resistance and excess hypertriglyceremia. **Conclusion:** The research

concludes that phytomedicines and herbal medicines are an intervention measure in the treatment obesity, regardless of gender, biochemical alteration and mental illness. Medicinal plants and phytotherapy show weight loss results over a long period of treatment and their biological effects contribute to weight reduction and normalize the biochemical increase of obesity, being a low-cost health promotion practice.

**Keywords:** Obesity, mental health, biochemistry, phytomedicines.

## INTRODUCTION

According to the World Health Organization (WHO, 2022), obesity is a chronic, non-communicable disease and one of the most serious public health problems. By 2025, it is estimated that 2.3 billion adults around the world will be overweight, as 700 million individuals with obesity have a body mass index (BMI) above 30 kg/m<sup>2</sup> (Brazilian Association for the Study of Obesity and Metabolic Syndrome, 2023). Of the forty-one million annual deaths attributed to chronic non-communicable diseases (CNCDS), five million are driven by high BMI ( $\geq 25$  kg/m<sup>2</sup>). Three quarters of these deaths from these diseases are preventable. Most people who die from NCDs have a high body mass index (BMI) and most of these deaths from NCDs occur among people in resource-limited settings and developing countries. Based on current trends, by 2035, more than 750 million children (aged between 5 and 19) are expected to live with overweight and obesity as measured by body mass index. This is equivalent to two out of every five children globally, and most of them will be living in middle-income countries (Leach et al, 2024; Maracini, 2024).

In Brazil, approximately 60% of Brazilian adults are already overweight, which represents around 96 million people, i.e. one in four people are obese, out of a total more than

41 million people, according to the Brazilian Ministry of Health (Brasil, 2022). In 2021, 9.1 million adults treated in primary health care (PHC) were already diagnosed with overweight and more than four million with obesity, with 624,000 having severe or grade III obesity (Ministry of Health, 2022). According to Damacena et al (2021) in their studies on the prevalence of obesity in Brazil between 2013-2019 there was a 48% increase in obese people in Brazil, because obesity whatever its etiology, genetic or due to bad eating habits does not choose color, race, gender, level of education or socioeconomic life, it can affect everyone, including domestic animals (dog, cat). Souza (2023) states that obesity is a social and public health issue, as it has sociological characteristics in terms of race and color, where non-white people have a higher prevalence of obesity than white people and children and adolescents of school age have been gaining excessive weight due to errors in their eating habits.

The study by Damacena (2021) found that the prevalence of obesity increased significantly in Brazil between 2013 and 2019. The greatest increases occurred among men in the 40-59 age group and in the median income bracket, and among women with low schooling and non-white. Obesity has been shown to be associated with various health problems for both sexes. Thus, Maraccini (2024) cites work carried out by Eduardo Nilson, a researcher at the Oswaldo Cruz Foundation (Fiocruz), who estimates that the prevalence of overweight and obesity among Brazilian adults will increase from 57% in 2023 to 75% in 2024. As a result, it is estimated that 10.9 million new cases of chronic diseases associated with overweight and obesity will be developed over the next 20 years, and 1.2 million deaths attributable to overweight and obesity during this period. On the other hand, obesity has consequences for people's mental health, as the excessive desire

to lose body weight can lead to anxiety and depression, which increases the frequency of, leading to excess weight or social isolation due to body and racial discrimination, which can cause neurosis, attempted or actual suicide (Pessoa and Taroso, 2020).

Thus, this research has the problem of investigating the accelerated increase in obese and overweight people in Brazil in terms of social and biomedical aspects, taking into account gender, color and race, since obesity has increased 72% in the last thirteen years, from 11.8% in 2006 to 20.3% in 2019. According to estimates, it is expected that Brazil will have more than 29.7% of the adult population with obesity by 2030 ((Vigitel Brazil, 2006 to 2021). Of this total, 33.2% will be women and 25.8% will be men (Vigitel Brasil, 2006 to 2021). Therefore, the objectives of this research are to determine and analyze the sociodemographic characteristics human obesity Correlate the chronic comorbidities of obesity with people's mental disorders. To investigate biochemical changes in obese people. Research the main medicinal plants and herbal medicines for the promotion and prevention of obesity.

The justification for this research is to find out the reason for the increase in obese people in Brazil and their main morbidities associated with mental health in different socio-demographic characteristics correlated with biochemical changes, and to learn about the problem of obesity in Brazil in order to monitor weight loss through the use of medicinal plants and phytotherapy to reduce the consumption of ultra-processed foods. Research on this topic is justified by the need to encourage the population to practice healthy eating habits, to encourage physical activity during leisure time, taking into account the economic, social, cultural and environmental aspects (Pavanelli and Povh, 2021) that are fundamental for a good diet and specialized monitoring in primary health care.

Thus, the methodology of this research is qualitative, with bibliographic and reflective content. Data was collected from academic repositories, scientific journal articles, publications of electronic articles on Google Scholar, SCIELO, and the electronic journal of the sociology of health. The question formulated for this research is carried out with the help of the PICO acronym strategy, delimiting a population of Brazilian adults, with the following questions: What morbidity is associated with obesity and people's mental health? Which sociodemographic characteristics are most affected by obesity? What therapeutic intervention using medicinal plants can be applied to combat obesity? What are the biochemical changes in obesity? Thus, the goal set by the World Health Organization (WHO) is to stop the increase in obesity in society by 2025, but experts on the subject say that this goal will be achieved if there is a major task force of all government officials, health professionals, health managers, social programs and funding to develop research, promote health and promote measures to reduce body mass index (2022; Vigitel Brazil, 2006 to 2021).

## **OBESITY AND ITS CHANGES IN MENTAL HEALTH, SOCIAL, PHYSIOLOGICAL-BIOCHEMICAL AND COMPLEMENTARY INTEGRATIVE PRACTICES, USE OF MEDICINAL PLANTS AND PHYTOTHERAPY IN HEALTH PROMOTION**

### **MAIN COMORBIDITIES IN MENTAL AND BODILY HEALTH ASSOCIATED WITH OBESITY IN ADULTS**

Considered an epidemic public health problem, obesity is becoming increasingly prevalent. This increase has been attributed to multiple processes that determine and condition health, such as biopsychosocial factors in which political, economic, social, cultural and

environmental scenarios influence individuals, groups and their respective eating practices, which are stimulated by mental alterations that lead to anxiety, depression and even suicide, marked by social problems related to racial bullying (Araújo et al 2023).

People with obesity suffer not only from the morbidity and mortality associated with obesity, but are also fragile in the face of a wide range of psychological problems, such as passivity and submission, excessive preoccupation with food, compulsive food and drug intake, addiction and infantilization, non-acceptance of the body schema, fear of not being accepted or loved, indicators of difficulties in social adaptation, blocking of aggression, difficulty absorbing frustration, helplessness, insecurity, intolerance and guilt (Antunes et al, 2022, p. 1).

According to Bernardes et al (2023), obesity and overweight are factors in the development of psychological illnesses such as depression and anxiety. Furthermore, it has been observed that there is a bilateral relationship between obesity/overweight and psychological illnesses, such as depression and anxiety, due to bullying, based on body deformation and conformation. At the same time, racial bullying can lead to social exclusion, resulting in a feeling of loneliness, which ultimately fosters psychological disorders. The authors Antunes et al (2022) cite that Western culture aesthetically values the thin body, leading to discrimination against the obese body, so the criteria of beauty in the West in relation to obesity can cause competitiveness, rejection, anorexia and other social changes in behavior.

The aesthetic of the slim body emerged at the end of the 19th century and gained momentum throughout the 20th century and the beginning of the 21st century, becoming stronger between the 1980s, 1990s and the beginning of the 2000s. Obesity is only seen as a favorable condition in situations in which the thinness is related to patterns

of illness, hunger and deprivation. There has been a despotism against the obese body since the thin body became a priority condition for a full social life. Nowadays, there is a cultural imposition to lose weight and control weight, a condition that ratifies the lipophobic feeling. And it is precisely this overvaluation of the thin, "trained" body that links fatness to a symbol of moral bankruptcy, due to the lack of control over the body, reinforcing the stigma suffered by the obese individual (Antunes et al, 2022).

Depression due to obesity is considered a multifactorial disorder and is a public health problem with a high incidence, characterized by sadness and irritability, low esteem, fatigue, anxiety, sleep and appetite disorders, lack of interest, among other symptoms. It has several risk factors that affect routine, daily life, interpersonal functioning and social interaction. It is estimated that more than three hundred million people suffer from this condition. Depression due to obesity, when undiagnosed, can be associated with possible suicide attempts or consummation and other manifestations of suffering that affect not only the individual but also the family environment, work environment and marital ties (Amado et al, 2020). According to Amado et al (2023) anxiety can become pathological and is a common mental disorder, causing damage to psychic (mental) and somatic (bodily) functioning with physical consequences, for example: uncomfortable and unpleasant feelings, feelings of fear, exaggerated tension, intense behavioral disturbances. Damage and impact on quality of life and work activities are one of the main causes of absence from work among mental and behavioral disorders, as well as the desire to lose body weight. According to Barbosa (2024), anxiety and binge eating are often interlinked in a feedback loop. Anxiety can lead to binge eating episodes as a form of emotional self-regulation. However, binge eating can increase anxiety, creating a vicious cycle that is difficult to break. The feedback loop occurs as follows: Anxiety leads

to binge eating: Anxiety leads to binge eating as an attempt to relieve emotional discomfort. As for the impact on mental health, obesity can trigger: a) Increased Anxiety: Binge eating can exacerbate anxiety symptoms, creating a constant state of worry and stress. b) Decreased Self-Esteem: Binge eating can lead to feelings of inadequacy and low self-esteem, increasing the risk of depression and other mental disorders. Therefore, binge eating stimulates anxiety which leads to binge eating episodes which consequently increase feelings of guilt and shame, intensifying anxiety, stress, worry and social disorders in the environment in which they live (Amado et al 2023).

According to the Federal Council of Nutritionists (2020), eating disorders combined with obesity are risk factors for suicide. From a psychiatric and psychological perspective, eating disorders are also risk factors for suicidal ideation and behavior, predisposing those affected to end their own lives, especially young people aged 12 to 18 and women aged 12 to 35. These illnesses involve deviant patterns of conduct, diverging from the usual, which negatively affect physical and/or psychological health. Anxiety disorders, depression, alcohol and/or psychoactive drug abuse are frequent in individuals with eating disorders.

## **SOCIAL CHARACTERISTICS OF OBESE PEOPLE IN BRAZILIAN SOCIETY**

Filho (2024) reports that in the last Brazilian census carried out by the Brazilian Institute of Geography and Statistics (IBGE), the percentage of people who identify themselves as black (10.2%), brown (45.3%), and white (43.5%). When analyzing the race/color statistical data, Filho (2024) argues the ecosocial theory with obesity, developed by social epidemiology, which provides for the embodiment of external factors, producing patterns health, illness, disability and death. In this theory, it

is understood that racism is biologically embodied, since the stress generated in the body causes corticotrophic hormonal changes that increase the likelihood of fat accumulation in the body mainly for race/color, since black and brown people are constant victims racial bullying, i.e. because of their color and obesity. According to Cercato et al (2007), a stressed person, regardless of the external cause, stimulates the adrenal gland to produce glucocorticosteroid hormones which are responsible for stimulating the liver (neoglycogenesis) to produce sugar in the body and lead to the accumulation of fat in the body. According to the ecosocial theory, external stimuli such as racial discrimination, via the internet (social networks, messaging apps), in the workplace and at school, the stress generated by these social inequities stimulates an increase in the serum production of anxiety and hunger hormones (adrenaline, ghrelin and leptin) in black and brown people, leading these races to eat more than whites who don't suffer this type of stress due to racism. Therefore, black and brown-skinned people are more obese than white-skinned people because they are under constant stress caused by racism. We have to remember that eating a lot does not mean eating well, being well-nourished or eating a balanced diet. Therefore, eating foods that are harmful to health can be linked to poverty, to a lack of economic resources to buy good quality food.

According to Filho (2024) race/color and gender should be considered in health promotion and protection strategies, especially in actions to reduce obesity. Race, understood as phenotypical differences used socially to classify and rank individuals, is one of the determinants of health status. It therefore a product of social relations, in addition to biological differences. Social disparities show that race is an important predictor of socioeconomic status, since blacks are at a disadvantage most

social indicators. According to Faustino et al (2020), black women were more overweight/obese at all levels of education, while white women showed an inverse association between obesity and education over time. There seems to be greater internalization of the ideal of thinness and more frequent practice of dietary restriction among white women than among African-American women (Faustino et al., 2020 apud Jackson et al., 2013).

According to Vigitel (2023) in Brazil in 2023, the frequency of obese adults was 48.6%, with women (24.8%) and men (23.8%). The frequency of obesity tended to be higher in the age groups up to 54 years in the total population and for men, and up to 64 years for women. For the entire population and for women in Brazil, the frequency of obesity decreased as the level of schooling increased.

In the LGBTQIA+ community, there is also concern about obesity from a social and mental health perspective. According to Reuters and Online (2007) apud Boehmer (2009), Homosexual women are twice as likely to be overweight or obese as heterosexual women, which puts them at great of obesity-related health problems and even death. Ulrike Boehmer, from Boston University School of Public Health, conducted her research in a national analysis of almost 6,000 women in 2009, and found that lesbians were 2.69 times more likely to be overweight and 2.47 times more likely to be obese. Boehmer (2009) links social factors such as racism, social discrimination, difficult access to health care for people from the LGBTQIA+ community to obesity treatment, facts that condition disappointment, stress and hormonal changes in cortisol that lead to fat accumulation, diabetes, hypercholesterolemia, hypertension, anxiety, depression, stimulation of inflammatory cytokines and obesity (LGBTQ+Spacey, 2023).

The hormone therapy used by trans women, gays and lesbians can affect the health of this population with the appearance of cardiovascular diseases and weight gain, obesity, reduced lean mass and muscle strength, reduced bone density and even death (Costa 2021). According to Cecotti (2021), an endocrinologist, in overweight people, the tension of not being accepted for being gay is added to the fear of not being accepted for being fat. This constant threat greatly increases the rates of low self-esteem, depression and eating disorders. In general, gay men fear weight gain more than straight men. Lesbian and bisexual women, on the other hand, are more satisfied with their bodies than straight women. The prevalence of obesity among lesbians is up to 14% higher and yet some studies show that they tend to more accepting of heavier bodies.

Therefore, the search to solve the problem of social obesity is a challenge that depends on government efforts, cultural education, good comprehensive health care for all obese people so that their weight is reduced to the body mass index (BMI) considered healthy by the health organization, BMI 18-25 kg/m<sup>2</sup>.

### **PHYSIOLOGICAL AND BIOCHEMICAL CHANGES IN OBESITY**

Ribeiro (2008) describes that the hypothalamic-pituitary-adrenal axis is hyper-responsive in obese individuals. There is an increased cortisol response to stimulation with ACTH (corticotrophin, adrenocorticotrophic hormone) and CRH (corticotropin-releasing hormone). There is a greater frequency in the release of ACTH pulses, with a lower pulse amplitude, but the basal level is normal. The study showed that women with central obesity showed a significant increase in cortisol and ACTH after stimulation with CRH in relation to non-obese women, or women with peripheral obesity. Chronic anovulation and infertility are associated with obesity. PCOS (polycystic ovary syn-

drome) is responsible most cases of infertility. In some obese women, lower than expected levels of gonadotropins are observed after the menopause due to the lack of negative estrogen feedback. Men with severe obesity have low free testosterone levels, suggesting a state of hypogonadotrophic hypogonadism. The changes are reversible with weight loss. Sex hormone binding globulin (SHBG) is decreased in obese individuals, causing a major impact on the metabolism and action of sex steroids. There is a greater amount free (bioactive) testosterone in women. In moderately obese men, total testosterone is low due to the reduction in SHBG, but free testosterone is normal. Ribeiro (2008) and Gomes et al (2021) agree that free testosterone may be reduced in severely obese people (BMI>40) due to the reduction in LH pulse frequency and amplitude in these individuals. In women, abdominal obesity is strongly associated with hyperandrogenemia, and adrenal and ovarian production is high. In men, however, testicular androgen production is reduced, showing an inverse correlation with the degree of abdominal obesity.

There are also biochemical changes in sexual disorders related to obesity, reflected in disturbances in sexual desire (hypoactive sexual desire and sexual aversion), disturbances in sexual arousal (disturbed sexual arousal in women and erectile dysfunction in men). When female sexual problems predominate in obesity, we are dealing with a psychological genesis, as the endocrinological explanation reveals that adult obese women produce excess sex hormones, which promotes increased sexual desire and functioning. However, when this doesn't happen (increased desire), it is an indicator of a psychogenic syndrome, revealing the social factors, the body, the deep-rooted beliefs that are hidden behind her fatness, and which keep the woman away from any intimate / sexual contact. , if, when you start weight loss therapy and lose weight, you don't feel any difference in your sexuality, your image / self-confidence, and sexual disorders remain, sex therapy will be

advised later. Adult obese men have a deficit of sex hormones, which leads to a decrease in libido and sexual activity, which can promote hypoactive desire, although it can also promote erectile dysfunction, particularly due to diseases with a particular vascular risk (hypertension, dyslipidemia), endocrinopathies (diabetes, increased oestrogen). In this case, similar to the previous one, it is advisable to reduce weight, as it is the conflicting factor in several associated diseases. Following the suggestion to lose weight, it is necessary to control all the pathologies associated with obesity, then, with medical treatment for weight loss, the homeostasis of sexual functioning will be noticeable. If this doesn't happen, sex therapy will be recommended in order to overcome the problems that have not been solved by medical care. (Ribeiro, 2008, p.8).

According to Brito et al (2019), there are several pathophysiological mechanisms in obesity that participate in the regulation of appetite and food intake, the increase in adipose tissue and the consequent resistance to insulin, altering the metabolic and endocrine functions of this tissue. Obese people have high levels of pro-inflammatory adipokines (cytokines), such as angiotensinogen, tumor necrosis factor (TNF- $\alpha$ ), interleukin-6 (IL-6), leptin, monocyte chemoattractant protein-1 (MCP-1) and resistin. Leptin, a hormone produced by adipose tissue, is responsible for regulating hunger, signaling satiety to the central nervous system (CNS), and regulating body's long-term storage and use of energy to maintain its balance. However, obese people have altered leptin signaling in appetite control, due to resistance to this hormone, even in high amounts. Another appetite-regulating hormone is ghrelin, which is responsible for inducing hunger. Its target is the hypothalamic nucleus and the brainstem, forming part of the sympathetic nervous system (SNS)<sup>10</sup>. It is synthesized to a greater extent in the gastric fundus by the oxyntic glands, and to a lesser extent in the body of the stomach.

Other factors involved in the genesis of obesity are cholecystokinin (CCK), ghrelin, neuropeptide Y (NPY) and peptide YY, which are substances involved in controlling food intake<sup>24,26</sup>. CCK and peptide YY are released by the gastrointestinal tract and at brain level inhibit food intake, promoting satiety after a meal. NPY is synthesized in the CNS and stimulates intake. A reduction in insulin and leptin levels activates NPY-producing neurons in the hypothalamus, and leptin inhibits their synthesis. Ghrelin is a gastrointestinal hormone that stimulates appetite and is part of the body weight regulation systems. Excessive production of ghrelin can lead to obesity. Alterations in the control of the release of these and other substances involved in the regulation of energy balance, thus causing dysfunctions in the body weight regulation systems through feedback, can lead to obesity (Ferreira and Wanderley, 2010).

The main biochemical alterations in obesity (hyperlipidemia, hypertriglyceremia, hyperglycemia) are considered risk factors for the appearance of comorbidities such as disease, type 2 diabetes mellitus, hypertension, metabolic syndrome, joint pain (conical pain in the lumbar and sacral spine, chronic pain in the knee, hip and legs) due to not being able to support the weight of one's own body. The health risk factors for obesity are: 1) a large amount of abdominal fat: in men, a waistline of more than 102 cm and in women, more than 88 cm; 2) low HDL ("good cholesterol"): in men, less than 40mg/dl and in women less than 50mg/dl; 3) high triglycerides (level of fat in the blood): 150mg/dl or higher; 4) high blood pressure: 135/85 mmHg or higher or if you are using any medication to reduce the pressure; 5) high glucose: 110mg/dl or higher (Varela, 2017).

In obese people, there is an immune system response, activated in response to inflammation, whose macrophages increase due to their recruitment and exhibit a pro-inflammatory scenario, thus expressing inflammatory cy-



tokines. This increase in macrophages is due to inflammation of adipose tissue that moves along with obesity, developing insulin resistance (IR) and metabolic disease. Obese individuals have a higher secretion of pro-inflammatory adipokines (TNF- $\alpha$ , IL-6, IL-8, IL-1) and a lower secretion of anti-inflammatory adipokines (IL-10 and AdipoQ), characterizing obesity as chronic inflammation that has a major impact on various bodily functions and causes the development of cardiovascular diseases (CVD), IR, hypertriglyceridemia and hypercholesterolemia and cancer (Brito et al, 2019).

Obese transgender and intersex people who have had their gonads removed and transgender women who use isolated testosterone blockers (spironolactone, cyproterone acetate or GnRH antagonists) without estrogen should be monitored to prevent loss of lean mass and, therefore, calcium and active vitamin D levels should be monitored. Some cancers may be more common within the community, including breast, prostate, colon and rectal cancer (Gomes et al, 2021).

Ribeiro (2008) in his study based on scientific evidence reports that obese trans people who undergo hormone therapy and have a hormonal profile (estrogen, testosterone, LH, FSH) in line with their gender identity, the results of laboratory tests should be evaluated based on the corresponding parameters. They should be ordered according to the individual demands of each patient being assessed, but the tests recommended for monitoring obese trans and transvestite people undergoing hormone therapy in relation to nutritional monitoring would be: Complete Blood Count, Blood Glucose, Total Cholesterol and Fractions, TGO/TGP (ALT/AST) and Potassium (for transfeminine people using spironolactone as an anti-androgen).

Cardiovascular risk ratio / Abdominal Circumference - AC		
	Has a risk	Increased risk
Trans women without hormone therapy Transvestites without hormone therapy Cis man	94 cm - 102 cm	$\geq 102$ cm
Trans men without hormone therapy Transmaculine people without hormonization Cis women	80 cm - 88 cm	$\geq 88$ cm

BMI Classification for Adults	
< 18.5 Kg/m <sup>2</sup>	Low weight
18.5 - 24.9 Kg/m <sup>2</sup>	Eutrophy
25 - 29.9 Kg/m <sup>2</sup>	Overweight
$\geq 30$ Kg/m <sup>2</sup>	Obesity
BMI classification for the elderly	
< 23 Kg/m <sup>2</sup>	Low weight
23 - 28 Kg/m <sup>2</sup>	Eutrophy
$\geq 28$ Kg/m <sup>2</sup>	Overweight

Figure 1: Anthropometric parameters can be performed freely for trans and non-binary trans people who do not harmonize according to the parameters of the gender assigned at birth.

Source: Gomes et al (2021)

## INTERVENTION MEASURES WITH COMPLEMENTARY INTEGRATIVE PRACTICES (CIPS) IN THE USE OF MEDICINAL PLANTS AND PHYTOTHERAPY IN HEALTH PROMOTION AGAINST OBESITY

According to the Santa Catarina Telehealth Center (2016), the treatment of obesity is complex and multidisciplinary, and can include non-drug and drug interventions. Medicinal plants and phytotherapy, among others, are a low-investment non-drug treatment that leads to weight loss and can be associated with other obesity treatments. There are studies evaluating some medicinal plants for the treatment of obesity, among the which: *Caralluma fimbriata*; *Citrus aurantium*; *Ephedra sinica*; *St. John's Wort (Hypericum perforatum)*; *Garcinia cambogia*; *Ilex paraguariensis* (Yerba mate); *Ioimbina (Pausinystalia yohimbe)*; *Psyllium Plantago*.

Andrade et al (2022) reports without his study on combating obesity through the use of medicinal plants and phytotherapy that there is an increase in demand for these methods alternative (pics) in the treatment of obesity, as herbal medicines and medicinal plants end up gaining ground as an optional/complementary treatment. Thus Andrade et al (2022) and Léda et al (2016) report the main medicinal plants that prevent obesity With regard to studies with medicinal plants, the use of *Amorphophallus Konjac (Glucomanan)*, *Fucus (Fucus)*, *Garcinia cambogia (Garcinia)* *Aloe Vera*, *Baccharis Trimeria*, *Camellia Sinensis*, *Citrus Aurantium*, *Ilex paraguariensis (Yerba mate)* *Carthamus Tinctorius L*, *Spirulina máxima (Spirulina)*, *Cassia Angustifolia*, *Cymbopogon Citratus*, *Costus Spicatus*, *Cynara Scolymus*, *Cassia Nomame*, *Coleus Forskohlii*, *Cyamopsis Tetragonolobus L. Taubert*, *Hibiscus Sabdariffa*, *Phaseolus vulgaris*, *Persea Americana*, *Silybum Marianum (L.)*. They are used in the form of tea, oral suspension, oil and/or capsules.

According to Lima (2019), herbal medicines used to control obesity act on the body as appetite modulators or metabolism accelerators, promoting a reduction in food intake, lowering serum cholesterol levels, as well as antioxidant, diuretic and lipolytic actions. A huge variety of natural substances have been explored for their potential in the treatment of obesity (Brito et al, 2019). These are the main phytomedicines to help fight obesity: passion fruit dry extract (*Passiflora Edulis S*); gymnema dry extract (*Gymnema sylvestre S*); Phaseolamine (*Phaseolus vulgares*); Capsiate (*Cpaicum annum*); Guarana (*Paullinia cupana Kunth*).

Formulation: (Marques, 2017; Lima, 2019, Léda et al 2016):

1. *Amorphophallus Konjac*: glucomannan (root) ..... 200mg
2. *Citrus Aurantium* (fruit) ..... 300mg
3. *Garcinia Cambodia* (fruit) ..... 100mg

4. *Passiflora Edulis S* (leaf) ..... 50mg
5. *Chromium Picolinate* ..... 250mg
6. *Ilex paraguariensis* dry extract ... 100mg

Manipulate 90 capsules. Take 01 capsule one (1) hour before breakfast, lunch and dinner. Indications: 1. fights obesity by forming a mass in the stomach that makes the stomach feel full, slows down the digestion process, reduces cholesterol and triglyceride levels, 2. thermogenic. 3. aids in weight loss diets. 4. tranquilizer and smooth muscle antispasmodic, reduces anxiety about eating. 5. helps with binge eating . 7. decreases insulin resistance, delays gastric emptying and increases satiety.

The medicinal plant known as *Pholia magra*, whose scientific name is *Cordia ecalyculata*, originates from Brazilian regions and can be found in several states with different synonyms such as *café- de-bugre*, *louro-salgueiro* and other names. It is a plant known for being rich in high concentrations of caffeine, potassium, allantoinic acid and allantoin. The increase in the use of *Pholia magra* can be attributed to the fact that it is an herbal medicine that costs less than others and is very effective in treating weight loss. Studies show that its chemical composition includes some alkaloids such as caffeine, allantoin and allantoinic acid, as well as glycosides such as consolidin, among other types such as tannins, flavonoids, saponins, mucilages in the fluid extracts of this plant, pigments and in the part of inorganic compounds, potassium, and its slimming effect may be due to its diuretic activity this property is mainly attributed to caffeine metabolites that act by increasing renal blood flow and glomerular filtration ( Andrade et al, 2023; Brito et al , 2019)

The plant *Phaseolus vulgaris*, popularly known as white bean, is usually presented in the form of flour and acts by inhibiting the digestive enzyme alpha-amylase. Inhibiting this enzyme can prevent the digestion of complex carbohydrates, thus reducing the number of

carbohydrate calories absorbed and potentially promoting weight loss. Studies have shown that this species of bean (*Phaseolus vulgaris*) has chemical constituents that are considered to be components with functional action, such as flavonoids, including flavonols, whether glycosylated or not, anthocyanidins, proanthocyanidins and isoflavones, as well as phenolic acids. In addition, it is believed that by preventing the digestion of carbohydrates, this plant can reduce the caloric availability of simple sugars to be absorbed, thus leading to weight loss and lower blood glucose levels. It is presented as a supplement consisting of bean protein concentrates, which are known to contain high levels of  $\alpha$ -amylase inhibitor, a protein known as phaseolamine ( $\alpha$ -AI), as well as being a source of essential nutrients (Filho et al, 2015).

*Cynara scolymus*, a perennial herbaceous plant from the Mediterranean region, belongs to the Asteraceae family and has been studied by several researchers as an aid in reducing obesity. The plant contains oligosaccharides and inulin, which are considered to be soluble dietary fibers that are not digested by the enzymes in the human intestine. In this way, they reach the colon where they are used by the microbial flora, which alters intestinal transit and causes rapid elimination of the fecal bolus, which reduces the time of contact with intestinal tissue and, consequently, reduces the absorption of lipids which, in excess, contribute to obesity. *Phaseolus vulgaris* seems to provide significant weight reduction by reducing carbohydrate absorption, so its benefits have been demonstrated in individuals with diets rich in this macronutrient<sup>17</sup>. *Phaseolus vulgaris* extract can help promote weight loss by interfering with the digestion of complex carbohydrates into simple, absorbable sugars, and potentially reducing calories derived from carbohydrates. In addition, slowing down the rapid absorption of carbohydrates would favorably influence the insulin system, which in turn could lead to less fat accumulation (Vieira and Medeiros, 2019).

## METHODOLOGY

This research has a qualitative and reflexive methodology, as it describes the biopsychosocial factors of people with obesity in Brazilian society. It is a research study using secondary, bibliographic data, which draws on the scientific ideas of different authors whose scientific articles have been chosen because they are related to the theme of this research. Data was collected from university repositories, Google Scholar, the Scielo Brasil website and publications in electronic journals. As for the inclusion criteria for the scientific articles used in this research, they correspond to the selected scientific articles whose themes relate to the biopsychosocial aspects of the subject of this research, such as mental health and obesity, physiological and biochemical changes in obesity, obesity and society, and complementary integrative practices related to medicinal plants and phytotherapy for health promotion against obesity. Of the 20 articles chosen for inclusion in this study, only two were chosen using the Boolean operators AND, OR AND NOT. Thus, this research has only one reviewer for its development. The scientific articles chosen were published between 2006 and 2024. The problem identified in this research corresponds to the risk factors that obesity can cause in mental health, the biochemical changes in the human body, and the sociological nature of obesity. As an intervention measure to prevent obesity, it uses complementary integrative practices such as medicinal plants and phytotherapy to promote collective health. This research is being carried out over a short period of six months. Therefore, this research is based on scientific evidence to answer the questions related to the problems encountered in the excessive growth in the number of obese people in Brazil. Thus, the chronology of this research is characterized as follows: 1. Between November and December 2023, the topic was chosen and articles were selected to carry out this research. 2. Between

January and February 2024, the introduction of the research, objectives and justification began to be written. 3-Between March and April 2024, the research and its methodology will be developed. 4-During the month May to July the discussion and conclusion of this research is carried out. See table-01 in the appendix for the timetable of the research's methodological development.

This research question was constructed using the PICO acronym strategy, delimiting a population of Brazilian adults, with the following questions: What risk factors can obesity trigger in people's mental health? Which Brazilian ethnic group is most affected by obesity? What therapeutic intervention using medicinal plants can be applied to combat obesity?

## **ANALYSIS OF RESULTS**

This qualitative research, when its content is analyzed, meets its objectives and provides scientific evidence to answer the questions related to the problem identified during the development of the research. Therefore, content analysis was used to obtain the results. According to Bernardes et al (2023), obesity can affect mental health with the appearance of anxiety and depression. Antunes et al (2022) and Araújo et al (2023), in their studies of obesity and mental health, report the social nature of obese people. Thus, the constant desire to lose weight, the search for weight loss without the guidance of a multidisciplinary team, can lead to mental fragility and pathological biopsychosocial consequences a person's life and the emergence of anxiety and depression. Anxiety leads to insomnia, cardiac arrhythmias, changes in mood and social behavior, nervousness, increased consumption of food or compulsive eating. On the other hand, obesity can trigger depression due to social discrimination, racism and fatphobia. As a consequence of these social facts, obese people who have suffered physical, moral and psychological violence because of their obesity can become socially

isolated, feel emotionally sad, fear exposing their bodies and attempt suicide or consume their own lives by committing suicide.

As for the sociodemographic characteristics of obesity, females have a higher prevalence of obesity than males. As for the level of schooling, people with a low level of schooling are more obese, because they are unaware of healthy eating habits, are sedentary, and are unaware of help from multi-professional teams for chronic diseases in the public health system. According to Filho (2024), black, brown and LGBTQIA people are more susceptible to obesity because they are under constant stress caused by racial discrimination and social rejection due to their black and brown skin color, as the stress generated by these social factors stimulates an increase in glucose in the body and the accumulation of body fat. Black women are more susceptible to obesity than white women. Black women have unhealthy eating habits compared to white women, because the stress caused by racism, social inequality and access to specialized services for the treatment of obesity in black and brown people and the LGBTQIA+ community, generate stress and nervousness that stimulate the adrenal glands to produce more cortisol and generate an accumulation of body fat. Women of black race and color and men of black race and color have less schooling than other people of white race and skin color (Faustino et al, 2020; LGBTQ+Spacey, 2023; Boehmer 2009).

According to the Federal Council of Nutritionists (2020), the cause of this scenario is attributed to a reduction in the consumption of fruit and vegetables, especially among young people. These foods are being replaced by options that are not very nutritious, such as soft drinks, artificial juices and ultra-processed products, all of which are high in calories. To make worse, he points out that a lack of physical activity and poor sleep contribute to an increase in body weight and the onset of obesity-related diseases.

Obesity thus affects mental health, social interaction, and the physiological alterations of the human body such as anxiety, depression, inflammation, hypercholesterolemia, hypertriglyceridemia, cardiovascular diseases, hypertension, diabetes mellitus and death (Elsa Brasil, 2023; Ribeiro, 2008).

As the treatment of obesity must be multidisciplinary, and many people do not have the financial resources to buy allopathic medicines because they are expensive, there is an alternative that has given results in weight loss and at a low cost, which is the treatment with medicinal plants and phytotherapy in the fight against obesity. Because the various complementary integrative practices (pics: acupuncture, psychology, nutrition, physical activity, medical follow-up) are a proposal to be integrated together with the use of medicinal plants and herbal medicine, they have demonstrated therapeutic benefits in the prevention of obesity. The challenge for many obese people is access to specialized services, because in most health establishments in Brazil in the primary care of the single health system (sus) there is no multidisciplinary team for obesity care, because there is a lack of specialized professionals in the area of medicinal plants and phytotherapy (Andrade et al 2022; Pinto, 2013; PAVANELLI, A.S. POVH, J, A, 2021).

## **CONSIDERATIONS FINAL**

The methodology adapted to this scientific research is able to determine the objectives and answer the questions to the research problems. Depression and anxiety are associated with obesity and are two morbidities that affect the mental health of the obese, but if both diseases are left untreated they can lead to death. Obesity itself can trigger diseases such as cardiovascular disease, inflammation, infertility, sexual impotence, diabetes mellitus, hypercholesterolemia and triglyceridemia.

Therefore, the social risk factors that involve the mental health of obese people are racism, body discrimination, fatphobia because it encourages depression and anxiety and has consequences for mental health, biochemistry, the appearance of metabolic diseases and avoidance of socialization, such as social isolation and suicide.

Thus, there is a great social inequality among obese people, because obese people regardless of their color, race and gender are susceptible to obesity, but black and brown races and skin colors, female and male people, and people from the LGBTQIA+ community are more affected by obesity because they are vulnerable to good quality food, low levels of schooling, without access to quality public health care to combat obesity, are in a state of stress due to racial discrimination, fatphobia, without adequate nutritional monitoring for the maintenance of the human organism.

Therefore, due to the high cost of allopathic medication for the treatment of obesity, there is a growing search for alternative treatment, medicinal plants and phytotherapy, against obesity. Thus, this research is important for Brazilian society, because knowing about obesity in terms of mental health and biochemical, sociodemographic aspects, encourages the search for an intervention plan to combat obesity from a public health point of view and easy access to treatment, knowing that many of these plants are grown in the backyards of residents of society, facilitating access to the community and being a low-cost investment in person-centered treatment.

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