# Relation Between Acne and Different Body Weight

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**Abstract**

Background: Our Our knowledge of the mechanisms that cause acne vulgaris is constantly developing. Acne pathophysiology is known to be influenced by a myriad of variables, including environmental, hormonal, genetic, and inflammatory aspects. The topic of weight has persisted in discussions about acne for decades due to the role it plays in several of these variables. Several studies have looked at the role of weight and food in acne sufferers, and the results show that people who are normally weighted and eat a low-glycemic-load diet are less likely to have acne than those whose diets are high-glycemic-load. Our goals are: Here we summarize what is known about the link between various body weights and acne, as well as how this variable may affect both the condition and its treatment. Final thoughts: According to our results, there is a correlation between acne and varying body weights. Acne was more often diagnosed in those who were overweight or obese.

**Key words:** acne, weight, obesity, BMI.

## 1. Introduction

Acne Inflammation of the pilosebaceous unit, medically known as acne vulgaris, often strikes teenagers. The development of acne vulgaris has been linked to obesity and body mass index (BMI), among other variables, and researchers are showing a growing interest in exploring this relationship [1].

In the industrialized world, obesity is on the rise, and with it comes a host of skin issues, such as hirsutism, hyperandrogenism, keratosis pilaris, and androgenetic alopecia. Extreme acne is a consequence of the skin's increased sebum production, which is exacerbated by obesity. Some research has linked obesity to an increased likelihood of acne breakouts [2-5]. There seems to be no correlation between the two, according to other research [5].

Obesity is now twice as common as it was before [6]. Many metabolic diseases are associated with obesity, including diabetes, metabolic syndrome, and polycystic ovarian syndrome (PCOS) [7,8]. A worsening of acne can be the result of the hyperandrogenism that obesity causes in the body. Researchers found that hyperandrogenism and severe acne were associated with higher body mass indexes [9]. Another rationale for the inclusion of some oral contraceptives that block androgen activity in the updated acne treatment protocols is [10]. The overproduction of androgens is not associated with acne, according to a research [11]. The majority of the studies that looked at the link between obesity and acne found that a body mass index (BMI) of 25 kg/m2 or above was significantly associated with an elevated risk of acne [12].

Dietary intervention is important for acne treatment since one research found a high correlation between obesity and insulin-like growth factor production, which in turn causes acne to be more severe [13]. Acne that is both inflammatory and comedonal is more common in children with a higher body mass index (BMI) [5]. Reducing body weight improves acne treatment regimens by lowering inflammatory bacterium lipolysis on fascial skin [14]. One study found no correlation between body mass index and acne that appeared after puberty [5].

## 2. Acne vulgaris

Acne vulgaris affects an alarmingly high proportion of the population, with 8% of those aged 11–30 and 5% of those aged 65 and older suffering from it. Excess sebum production, androgen receptor activation, bacterial activity, inflammatory responses to neutrophils and macrophages, follicular hypercornification, and lymphocytes are some of the mechanisms that lead to acne [15]. Scars, nodules, comedones, and papules are the hallmarks of acne vulgaris. The procedure typically leaves scars on those who are already prone to them. As many as 90% of acne patients who see a dermatologist may notice scarring when illuminated with strong light; 22% of those individuals may exhibit really severe scarring. Keloid, rolling, superficial macular, boxcar, and hypertrophic scars are among the many types of scars that may develop as a result of acne [16].

## 3. Demographics of Patients with Acne

Worldwide, an estimated 9.4% of people suffer from acne. Adolescents and young adults have the greatest prevalence, which declines beyond the age of 30 [17, 29, 30]. Acne is still more frequent in women than in males even after puberty ends; over 50% of women have it in their twenties, 33% in their thirties,

and 25% in their forties [31]. Acne is the leading skin concern seen by dermatologists in the United States [32, 33]. Acne affects more adolescent boys than girls, yet women still make up almost two-thirds of acne sufferers who see a dermatologist [34].

**How Acne Develops**

The excessive production of sebum, the hyperproliferation of the acne-causing bacteria acnes (C. acnes, previously known as Propionibacterium acnes), the hyperkeratinization of the sebaceous follicles, and inflammatory processes are the four main components considered to be responsible for acne pathogenesis [17–19]. The elevated activity of androgen hormones and IGF-1 leads to an overproduction of sebum [20]. The mammalian target of rapamycin complex 1 is activated when insulin-like growth factor-1 reduces nuclear levels of the metabolic forkhead box class O transcription factor 1 (FoxO1) [21].

The mammalian target of rapamycin complex 1 induces changes in both the development of cells and their metabolic processes. There are three factors that contribute to acne: lipid synthesis, keratinocyte hyperplasia, and mTORC1-mediated hyperproliferation of sebaceous glands [11]. L-Leucine, which is found in a variety of meat and dairy proteins, is yet another amino acid that promotes mTORC1 [21]. An increase in sebum production is the result of a positive feedback loop that is created when insulin-like growth factor-1 causes a rise in androgen levels, which then causes an increase in endogenous IGF-1 levels [20]. Due to the fact that it raises circulation levels of insulin-growth factor-binding protein-3 and insulin-growth factor-1, hyperinsulinemia has a direct impact on the processes of keratinocyte hyperplasia and apoptosis [10]. Additionally, IGF-1 increases the expression of sterol response element-binding protein-1, which in turn boosts the production of sebum by sebocytes [22]. Inflammatory mediators and growth hormones are two additional factors that have been linked to the development of acne [22, 23]. Considering that acne is caused by a multimodal pathogenesis, there are numerous potential avenues for pharmaceutical intervention in the treatment of acne [17].

The Treatment of Acne

In the first place, there are topical therapies for acne, such as antibiotics, benzoyl peroxide, dapsone, retinoids, or azelaic acid. On the other hand, there are oral treatments, such as isotretinoin, hormonal medications, or antibiotics. Finally, there are physical treatments, such as peels, laser therapy, and light therapy. There are a number of different approaches that acne treatments can take in order to battle the four primary factors that lead to acne [19, 24-27]. Isotretinoin taken orally is the only medication that treats all of the known pathogenic components of acne, either directly or indirectly [27]. Isotretinoin has been the therapy of choice for severe acne ever since it was first introduced in the 1980s [19, 28]. Worldwide clinical practice guidelines and the American Academy of Dermatology both recommend various therapies for varying degrees of acne severity.

An analysis of the body mass index (BMI) in relation to different weights

Based on a person's height and weight, the body mass index (BMI) is a statistical measure that provides an estimate of the percentage of fat that is present in their body. The evaluation can be carried out on both males and females of any age. By dividing a person's weight (in kilograms) by their height (in meters squared), the body mass index (BMI) may be calculated. The formula for calculating the BMI is as follows: BMI = weight (in kilograms)/ height squared (in meters squared). It is possible to determine a person's body mass index (BMI) by using the formula specified here [35]. When it comes to determining whether a person is underweight, normal weight, overweight, or obese, the National Institutes of Health (NIH) no longer uses the traditional height-weight charts but rather use the body mass index (BMI). These body mass index (BMI) classifications are used by the National Institutes of Health (NIH) and the World Health Organization (WHO) for individuals who are classified as White, Hispanic, and Black [35].

Body mass index (BMI) is calculated by taking a person's weight in kilograms and dividing it by the square of their height in meters. The body mass index (BMI) was further defined as follows, as per the findings of the research: underweight individuals (with a weight below 18.5 kg/m2), normal weight individuals (with a weight between 18.5-22.9 kg/m2), overweight individuals (with a weight of at least 23 kg/m2), and obese individuals (with a weight between 24 and 30 kg/m2) Four.

An analysis of the relationship between the diagnosis of acne and body mass index

The relationship between weight and acne has not been shown to be significantly correlated; nonetheless, both disorders have become increasingly prevalent among teenagers over the course of the last several decades. Those children and adolescents who are overweight or obese in general, as well as those who fall into subgroups that are characterized by insulin resistance or milk consumption, are more likely to suffer from acne [36–38]. Acne and a higher body mass index (BMI) have been linked to each other, according to research [39, 40]. A high body mass index (BMI) has been associated to the beginning of acne in a number of studies that have been conducted on acne risk factors in adolescents and young adults.

These studies contribute to the increasing body of evidence that suggests a connection between obesity and acne vulgaris. It has been shown via research that maintaining a low body mass index (BMI) may assist in the prevention of acne vulgaris [41, 42, 43]. When compared to adolescents who were underweight, thin, or of normal weight, those who were overweight or obese had a higher likelihood of having the inflammatory type of acne, which may be papulo-pustular or nodulo-cystic [44]. The frequency of moderate-to-severe acne was significantly lower among patients who were underweight (body mass index (BMI) less than 18.5 [45]. One of the causes that has been associated between obesity and acne vulgaris is the development of non-alcoholic fatty liver disease [46]. Other factors that have been related include higher levels of homocysteine, leptin, and resistin; reduced serum adiponectin; and increased levels of testosterone. On the other hand, the precise mechanism is still up for debate.

In addition, there is a higher association between metabolic syndrome, obesity, and acne. This is due to the fact that individuals with acne have increased mTORC1 signaling activity, which is also related with peripheral insulin resistance, type 2 diabetes, and obesity [47]. The presence of a high body mass index is one of the variables that might lead to the development of acne. When it comes to acne vulgaris, children who have a low body mass index are protected from the condition. On the other hand, children who have a high BMI are more likely to have an elevated insulinlike growth factor-1, which has been linked to the aetiology of acne [48, 49].

## 4.    Conclusion

Based on our findings, there seems to be a connection between acne and being overweight or obese. This association has significant repercussions for acne therapy since it shows the need of taking into consideration the patient's eating habits, degree of physical activity, and, if necessary, weight reduction as part of the overall treatment plan. The association between weight and the severity of acne, as well as referrals to dermatologists, are both potential ideas for study that may be conducted in the future.

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