Original Article

Assessment of Dietary Habits of Undergraduate Students with Acne

Fuad Hameed Rai[1], Zahra Hussain[2], Ayesha Niazi[2], Mahliqa Maqsud[3], Shifa Akmal[2] and Aliezeh Fatima Rai[4]

[1]Akhtar Saeed Medical and Dental College, Rawalpindi, Pakistan
[2]Akhtar Saeed College of Allied Health Sciences, Lahore, Pakistan
[3]Servies Institute of Medical Sciences, Lahore, Pakistan
[4]CMH Medical College, Lahore, Pakistan

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ABSTRACT

Acne vulgaris is one of the most widespread and distressing chronic skin diseases worldwide. It affects about 9.4% of the world's population during a specific period of their life. Several underlying risk factors like poor dietary habits, family history and poor hygiene are known for acne development. **Objective:** To assess the dietary habits of undergraduate students with acne. **Methods:** It was a cross-sectional study including 173 undergraduate students from 3 colleges of Akhtar Saeed Group located at Canal Campus, Lahore. A self-designed questionnaire was used to assess dietary habits of acne participants after getting their written consent. The collected was analyzed by SPSS. **Results:** The results of this study showed that 54% of selected respondents had acne, with the majority having oily skin and females. The consumption of high glycemic index fruits, junk foods, oily foods, sugary foods, especially dark chocolates, sweetened beverages and milk was found to very high among the acne respondents. They consumed vegetables and whole grains very occasionally. **Conclusions:** This study concluded that diet has a very high impact in causing acne. Further studies are needed to be done in order to find a more comprehensive link between acne and diet.

INTRODUCTION

Skin is the outermost layer of the body and acts as a protective barrier against environmental pathogens [1]. Acne vulgaris is one of the most widespread and distressing chronic skin diseases worldwide. It affects about 9.4% of the world's population during a specific period of their life [2]. According to a study held in Pakistan, 64.7% of its student population suffer from acne vulgaris, most of which were females with oily skin type [3]. The most common contributing factors to acne development are follicular hyper keratinization, presence of *Propionibacterium acnes* in the ducts, increased production and excretion of sebum, and building up of inflammation that further leads to obstruction as a result of which inflammatory lesions (open and closed comedones, which are black and white heads respectively) and inflammatory lesions (papules, pustules, nodules) are formed. Other factors like obesity and diet also case acne vulgaris [4]. The acne grading scale is used to classify acne into 4 grades. Grade 1, with few inflammatory papules and pustules including open and closed comedones (blackheads or whiteheads), grade 2, with papules and pustules, mainly on face, grade 3, with numerous papules

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and pustules, and occasional inflamed nodules, also on chest and back and grade 4 with many large, painful nodules and pustules [5]. A strong association with high consumption of dairy products is linked with acne formation due to the presence of starch content, which results in a rapid rise in insulin production resulting in increased IGF-1(insulin-like growth factor-1) concentrations bringing about skin inflammation seriousness [6]. Recent studies have found an association between the consumption of high fat foods or fried food items with acne vulgaris formation. Saturated fats are linked with acne formation by increasing IGF-1 concentrations while the intake of low-fat foods lead to low concentrations of IGF-1 and hence decreasing acne severity [7]. As the consumption of dark chocolates is considered to be very health beneficial, but many studies have proved its association with the formation of acne and also aggravating its severity in youngsters. Dark chocolates result in hyper cornification and the advancement of bacterial colonization on the surface of the skin thus resulting in skin inflammation [8]. The consumption of dairy products, chocolates, nuts, fast foods and oily foods is found to be strongly associated aggravating acne vulgaris[9].

METHODS

This cross-sectional study was conducted among 173 undergraduate students studying in 3 colleges of Akhtar Saeed Group located at Canal Campus, Lahore from July to September, 2021. Sample size was calculated using Fisher's formula of sample size calculation. Students between the age of 18-25 were included in this study and those with any chronic disease and females with PCOS (polycystic ovarian syndrome) were excluded from this study. Self-designed questionnaire was used to collect the data after getting the consent of the willing participants. The classification used in the questionnaire was standardized. (5) The questionnaire included demographic profile including age, weight, height and BMI. Questions about type of meal skipped mostly, type of chocolate mostly consumed, acne causing foods, servings of milk consumed per day, sleeping hours and skin type were also included in the questionnaire. FFQ (food frequency questionnaire) was also used to assess the consumption of different foods. The data collected were analyzed by using version-25 of SPSS (Statistical Package for Social Sciences) and results were presented by percentages and frequencies in the form of tables.

RESULTS

This cross-sectional study included 173 participants of age 18-23. Acne was found in 93(54%) individuals and 80 participants (46%) were without acne as shown in table 1.

This table also shows that 9% of the acne participants were underweight, 73% were of normal weight and 18% were overweight. 45% of the acne participants did not skip any meal, 40% skipped breakfast, 11% skipped lunch and 4% dinner.

Table 1: Presence of Acne, gender, BMI and meal skipping of acne Respondents

Presence of Acne	Frequency (%)
yes	93(54)
no	80(46)
Gender	
Male	34(37)
Female	59(63)
BMI	
Under weight	8(9)
Normal weight	68(73)
Over weight	17(18)
Meal Skipping	
None	42
Breakfast	37
Lunch	10
Dinner	4

Table 2 shows that the consumption of vegetables was none by majority (53%) of acne respondents and 47% took < 2 servings of vegetables in a week. 33% of the participants were not consuming any kind of whole grain products, 60% took < 2 servings and only 7% took > 3 servings in a week. The intake of high glycemic index fruits (watermelon, grapes, banana, raisins, kiwi, papaya) was very high (> 3 servings per week) by majority of acne participants (61%), while 32% consumed < 2 servings per week and only 7% took none. 68% of the respondents consumed > 3 servings of sweetened beverages (tea, fruit juices, soft drinks), 23% < 2 servings and only 9% took none in a week. The consumption of sugary foods was none only by 1% of the participants, 19% took < 2 servings and majority (80%) took > 3 servings in a week. The intake of oily and fried food items was none by 11% of the respondents, 35% took and < 2 servings and 54 % took > 3 servings in a week. The consumption of junk foods was none by only 2% of the respondents, 30% took < 2 servings and 68% took > 3 servings in a week.

Table 2: Frequency of Consumption of Specific Foods by Acne Respondents Consumption

Food	None F (%)	(Low consumption) < 2 serving/ week F (%)	(High Consumption) > 3 servings/ week F (%)
Vegetables	49(53)	44(47)	–
Whole Grains Products	31(33)	56(60)	6(7)
High Glycemic Index Fruits	6(7)	0(32)	57(61)
Sweetened Beverages	8(9)	22(23)	63(68)
Sugary Foods	1(1)	18(19)	74(80)

Oily Foods	10(11)	33(35)	50(54)
Junk Foods	2(2)	28(30)	63(68)
Milk	5(5)	62(67)	26(28)
Chocolates	26(28)	17(18)	50(54)

DISCUSSION

The present study results showed that the percentage of acne among the student population was 54%, which is similar to a study held in Pakistan, according to which 64.7% of its student population suffer from acne vulgaris [3]. This study showed a more predominance of acne among the female gender probably due to higher rates of oil production. According to the results, 63% females had acne that is similar to the previous studies held in Pakistan with female predominance of 73% in a Skin OPD of Allied Hospital, Faisalabad [10]. A study conducted in Quetta, Pakistan showed that 68% of the female population had acne due to an increased rate of sebum production as compared to the males of the same age group, while another study conducted in Nigeria showed male prominence [11, 12] The current study found no significant association between high BMI (body mass index) values and acne, which is similar to a previous case control study in which no relationship was found between acne and high BMI [13]. However, some of the previous studies show a strong correlation between a higher BMI and a risk for acne [14]. In this study a strong association was found between meal skipping (especially breakfast) and acne, 40% of the acne respondents mostly skipped breakfast. According to a study done by Jung the prevalence of skipping breakfast was higher in the acne patients [15]. According to the results of this study majority (68%) of acne individuals were taking 2 or more servings of milk per day which is similar to a study by Chalyk *et al.,* concluding that the individuals who consume more servings of milk (about 3 per day) suffer from more skin breakouts than those with less servings (about 1 per day) of milk intake [8]. According to this survey it was found that acne was strongly linked with the intake of dark chocolates however some of the individuals with acne were also consuming white chocolates. According to the results of an experimental study the intake of dark chocolates leads to acne lesions [9]. Another study concluded that only white chocolates were linked with acne and no association between dark chocolates and acne was found [16]. The high consumption of fruits was found as a triggering factor in the formation of acne due to their higher glycemic response. The results showed that 61% of the acne patients were taking more than 3 servings of fruits in a week, whereas, 53% of the population did not take vegetables at all. The results are pretty much similar to the results of a previous study, which concluded that 94% of the acne patients were consuming excess quantities of high glycemic index foods like pineapple and watermelon [17]. However, in other studies the intake of both fruits and vegetables was very low in the acne group [14]. This survey found a strong association between the consumption of sweetened beverages and acne. 69% of the acne participants consumed sweetened beverages in excess. This is similar to a study conducted in China in which soft drinks, or any form of sugar sweetened beverage was directly linked with acne occurrence [18]. This study showed that 67% of the respondents were consuming junk foods and 54% oily foods The results are similar to a previous study in which majority of the acne patients were consuming a lot of junk foods and oily foods [19]. A strong association was found between acne and oily skin because it's linked with more sebum production, 61% of the acne respondents had oily skin. The results are similar to a previous study in which the prevalence of acne was 80% in oily skin [20]. A similar study by Contassot and French proved that majority of acne individuals had oily skin type [1]. Majority of the acne respondents (54%) had less than 6 hours of sleep at night. The results of multiple studies prove the link between acne and lack of sleep [10, 20].

CONCLUSIONS

Acne vulgaris is highly prevalent in the student population, particularly in females as compared to males. People with oily skin have more prevalence rate as compared to dry and normal skin. It was concluded that dietary habits have a very strong impact on acne formation. Dairy products especially milk stimulate the release of androgens and inflammatory hormones that result in acne lesions. A very high intake of sugary foods, oily foods, junk foods, and high glycemic index fruits was seen in the acne patients and their intake of vegetables and whole grains was very low. The consumption of dark chocolates and sweetened beverages was found to trigger acne. This was a cross sectional study so further studies should be conducted on large scale to estimate all other factors associated with prevalence of acne vulgaris in Pakistan.

Authors Contribution

Conceptualization: LM, MA
Methodology: FJM, IA
Formal Analysis: MA
Writing-review and editing: M I, NAS, OW, WT, ZZ

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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