



## Comparison Study on Frequency, Severity and Risk Factors of Acne among Male and Female Medical Students

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### Introduction

Acne vulgaris is one of the most common skin diseases worldwide. It is characterized by areas of blackheads, whiteheads, pimples, and greasy skin, and may result in scarring. Three skin conditions were in the top 10 most prevalent diseases globally in 2010—fungal skin diseases (4th global prevalence=984,290,432), other skin and subcutaneous diseases (5th), and acne vulgaris (8th global prevalence=645,499,136).<sup>1</sup> In 2011, in a study conducted in a medical school in Portugal, prevalence of acne was reported to be 62.2%.<sup>2</sup> A study conducted in 2010 compared the prevalence of acne amongst Caucasian, Asian, Continental Indian and African American, Asian women ranked second with a prevalence of 30%.<sup>3</sup> Acne has always been attributed to teenagers but research proved otherwise, and a significant number of people either continue to experience acne or develop new-onset acne after the teenaged years.<sup>4</sup> The number of family members with acne history provides significant information as per the risk of acne and its severity, with the mother's acne being the most important prognostic indicator.<sup>5</sup> In subjects with a positive family history of acne, males with acne tend to have earlier onset than females do.<sup>6</sup>

For many years it was believed that chocolates had no role in worsening acne but recent studies

suggest otherwise, in a recent study dark chocolate when consumed for four weeks was found to exacerbate acne in male subjects with acne prone skins.<sup>7,8</sup> Increasing pubertal age, premenstrual phase, oily and sweet foods are all recognized risk factors for moderate to severe acne.<sup>5</sup> Emotional and educational stress and depression are all significantly associated with the onset of acne.<sup>5,9,10</sup> although acne is found to be more common in adolescent boys but gender play no role in the severity of acne.<sup>5,11</sup> Students frequently face worsening of their acne during their examination periods.<sup>10</sup> Acne patients believe that hot weather and sweating aggravate their acne.<sup>12</sup> A study conducted in Karachi regarding the beliefs and perception of acne among a sample of medical students pointed out that diet, soft drinks (29.2%) were considered the major exacerbating factor.<sup>13</sup> In a study conducted in 2002 winter season did not affect the severity of acne in majority of patients.<sup>14</sup> Oily skin type in particular is linked to acne.<sup>15</sup>

Acne is a very common skin condition which can be seen in most young people in our communities. This study aims to compare the prevalence, severity and risk factors of acne between male and female medical students. Despite being such a common skin condition in our country, no research has been conducted yet to compare the

incidence and severity of acne between the two sexes.

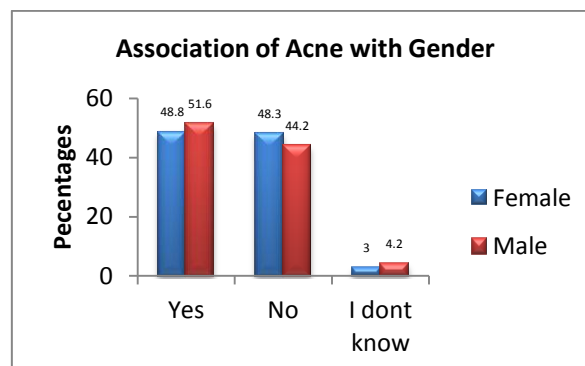
**Subjects and Methods**

This cross-sectional study was carried out at Dow Medical College, Karachi, and included 298 medical students. Permission to carry out the study was granted by the Principal of the college and the study was approved by a mentor from the faculty. A questionnaire was designed which used an acne grading scale (reference to picture of scale) that the participants used to grade their acne, the questionnaire had a total of 34 questions which included questions about various risk factors and how they affected the participants' acne. The only inclusion criteria was being a medical student, the participants were of both sexes and were chosen at random. All the participants were given an introduction to the study along with instructions to fill the questionnaire correctly. Verbal consent was obtained from all the participants. After the questionnaires had been filled, the data collected was entered and analyzed using SPSS. Chi square test and Fisher's Exact test were used to determine the significance of the association of different risk factors with gender. Results were considered significant at  $p < 0.05$ .

**Results**

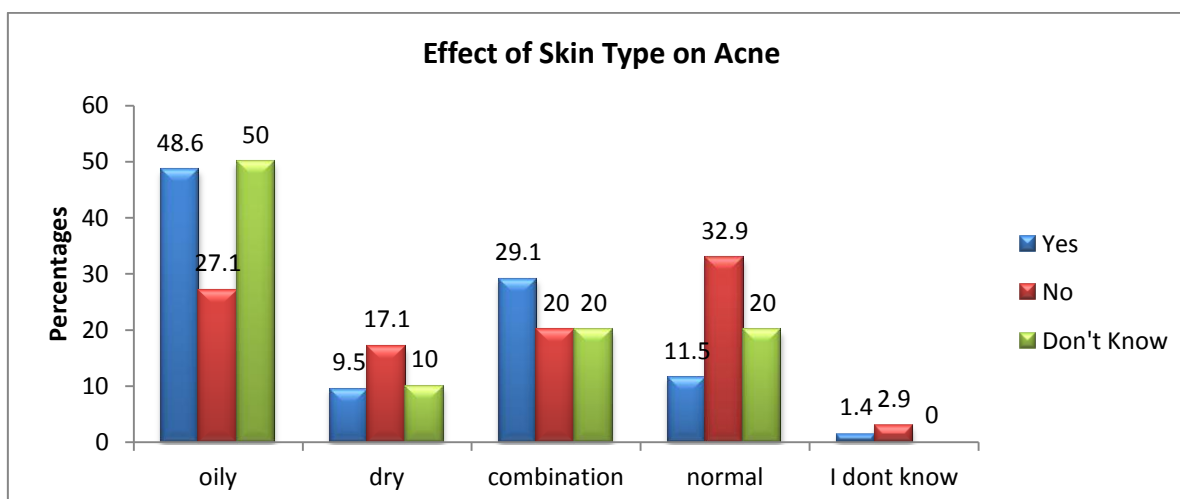
Out of the 298 participants, 203(68.1%) were females and 95(31.9%) were males. 148

participants had acne, so the prevalence overall was 49.7%. 48.8% of the females had acne whereas 51.6% of the males had acne (figure 1), however the difference between the two was not significant ( $p=0.728$ )



**Figure 1**

1.1% of the males graded their acne as very severe, 2.1% as severe, 8.4% as moderate and 23.3% as mild compared to 0% females as very severe, 1% as severe, 5.9% as moderate and 16.3% as mild. The difference between the severity of acne in the two sexes was not significant ( $p=0.218$ ). Figure 2 shows the different types of skin and their association with acne, 48.6% of the people with acne had oily skin, 29.1% had combination skin, 9.5% had dry skin, and 11.5% had normal skin whereas the rest (1.4%) did not know their skin type. In those with oily skin, 57.4% were females and 42.6% were males, the difference between the two sexes was significant ( $p=0.04$ ).



**Figure 2**

31% of the females with acne reported that their acne got worse with emotional stress compared to 14.7% males who had a similar response, the difference between the two was significant ( $p=0.01$ ). 2% of the females and 1.1% of the males with acne reported that it gets worse with

fasting, the difference between the two was found to be significant ( $p=0.04$ ). There was also a significant difference ( $p=0.027$ ) between the females (33%) and males (25.3%) whose acne got worse in humid weather. The association of various risk factors with acne is shown in table 1.

**Table 1**

Risk Factors		Gender				p-value
		Female		Male		
		n	%	N	%	
How is your acne affected by emotional stress?	it gets worse	63	31.0	14	14.7	<0.01*
	it gets better	2	1.0	-	-	
	there is no change	18	8.9	17	17.9	
	I don't know	28	13.8	27	28.4	
	I don't have acne	92	45.3	37	38.9	
Does your acne get worse by sweet foods?	Yes	7	3.4	4	4.2	0.60
	No	98	48.3	51	53.7	
	I don't have acne	98	48.3	40	42.1	
Does your acne get worse by nuts?	Yes	9	4.4	4	4.2	0.58
	No	96	47.3	51	53.7	
	I don't have acne	98	48.3	40	42.1	
Does your acne get worse by chocolates?	Yes	25	12.3	8	8.4	0.22
	No	80	39.4	47	49.5	
	I don't have acne	98	48.3	40	42.1	
Does your acne get worse by oily foods?	Yes	40	19.7	23	24.2	0.54
	No	65	32.0	32	33.7	
	I don't have acne	98	48.3	40	42.1	
Does your acne get worse by spicy foods?	Yes	10	4.9	2	2.1	0.23
	No	95	46.8	53	55.8	
	I don't have acne	98	48.3	40	42.1	
How is your acne affected by fasting?	it gets worse	4	2.0	1	1.1	0.04*
	it gets better	12	5.9	14	14.7	
	No change	50	24.6	16	16.8	
	I don't know	39	19.2	24	25.3	
	I don't have acne	98	48.3	40	42.1	
Is your acne worse in dry weather?	Yes	12	5.9	8	8.4	0.51
	No	93	45.8	47	49.5	
	I don't have acne	98	48.3	40	42.1	
Is your acne worse in dusty weather?	Yes	26	12.8	19	20.0	0.25
	No	79	38.9	36	37.9	
	I don't have acne	98	48.3	40	42.1	
Is your acne worse in humid weather?	Yes	67	33.0	24	25.3	0.027*
	No	38	18.7	31	32.6	
	I don't have acne	98	48.3	40	42.1	
How is your acne affected by sun exposure?	it gets worse	49	24.1	26	27.4	0.91
	it gets better	3	1.5	2	2.1	
	there is no change	23	11.3	12	12.6	
	I don't know	31	15.3	15	15.8	
	I don't have acne	97	47.8	40	42.1	

\* $p<0.05$  was considered significant using Pearson Chi Square test

There was a family history of acne among 60% of the participants with acne compared to 30.8% among those without acne, the difference between the two was significant ( $p<0.01$ ). Out of those with family history, 67.5% were females whereas 32.5% were males, the difference between the two sexes was significant ( $p=0.009$ ).

## Discussion

The objective of this community-based study is to compare the prevalence, severity and risk factors of acne vulgaris in male and female students of a public medical university in Karachi, Pakistan. Despite acne being such a prevalent condition, very few researches have been conducted on the prevalence and severity of acne on the Pakistani population and no research in particular compares these factors between the males and females. Our study is important in it that it compares severity and prevalence between the two sexes and also assesses all major risk factors of acne individually.

In this study, out of 298 subjects, 49.7% were found to have acne, with males showing a higher percentage of incidence 51.6%, than females with 48.8%, with no significant association of acne outcome with gender. The prevalence of acne observed in this study shows dissimilarity to a research conducted in another medical university in Karachi by Ghulam Ali et al.<sup>13</sup> which shows a greater prevalence of acne (55.9%) overall and a greater occurrence of acne in the female participants (78.4%) than in the males (21.6%). The differences between the results of the two studies can be attributed to a variation in the sample size used in their research, which is relatively larger than the study in hand. There is also methodological variation between other community based studies which explain the discrepancies in acne prevalence like the study of SZ Ghodsi et al.<sup>5</sup> use clinical examination to assess and classify severity of acne in their subjects. On the other hand, a study conducted in North East China reported an overall prevalence of acne (51.3%) in the Chinese population in which the difference between the two genders was observed to be significant.<sup>16</sup> Similarly, an extensive study done in Hamburg by Torsen Schafer et al., also reports a higher percentage of acne prevalence in males 29.9% than in females 23.7, supporting our findings.<sup>17</sup>

In regard to severity, our study reports higher percentage of males having severe acne than females. A study conducted in Malaysia also

supports our findings where male adolescents were observed to have a higher incidence of severe acne than female patients.<sup>18</sup> However, in the Iranian study no association with acne severity and gender was observed.<sup>5</sup>

Acne can be a very distressing condition that is usually accompanied mostly by feelings of embarrassment by those suffering this disease as observed in a study done in Pakistan.<sup>13</sup> Therefore, it is generally believed that emotional stress is significantly associated with exasperation of acne, as Jack Green et al report in their study that 67% of final medical year students identified stress as a chief aggravating factor of acne.<sup>19</sup> In regard to this, our study found emotional stress to be a major risk factor for increasing severity of acne, more so in females 31% than in males 14.7% and the difference being statistically significant between the two sexes (Refer to Table 1). Likewise, a study conducted in Stanford University School of Medicine reported a strong association with increased acne severity in response to emotional stress.<sup>10</sup> A. Smithard et al.'s study reported a greater proportion of their female participants suffering from acne as experiencing emotional and behavioral problems, analogous to our study.<sup>20</sup> Sebnem Akten et al.'s study supports our findings.<sup>11</sup>

This finding affirms the fact that response to emotional stress is a subjective phenomenon and both genders respond differently which makes them prone to different types of diseases.<sup>21</sup> The results of Polenghi's study also confirm our findings, where a link between onset of acne and emotional (30%) and educational stress (37%) was identified.<sup>9</sup>

Acne is skin pathology; therefore it is no surprise that the type of skin plays a major role in prevalence and severity of acne. Since there is substantial difference between the skins of the two sexes, it is important to investigate this as a risk factor of acne and this makes the results of this study very important.<sup>22</sup> Oily skin has been largely associated with the incidence of acne and the result of our study did not deviate from this relationship.<sup>15,13</sup> The incidence of acne we

observed in our study was highest in the participants with oily skin (48.6%) with females showing a higher percentage than males and the difference being significant between the two sexes. These findings are in contrast to the fact that male skin is generally more sebaceous than of the female which makes it more prone to coetaneous diseases like acne. The study by SZ Ghodsi et al. supports these results as their study shows association between acne severity and oily skin.<sup>5</sup> Farwa Rizvi et al.'s study conducted solely on females also showed a positive association between oily skin and acne incidence, analogous to our study.<sup>23</sup>

Similarly, the weather has been known to influence acne prevalence and severity. Our research provides sufficient evidence to show that humid weather to have a positive link with acne. 33% of females reported to have experienced an increase in acne severity and 25.3% of males reported similar experiences. A study conducted in India reported 80.62% of participants observed their acne to increase in severity during hot and humid weather, in agreement with the results of the study in hand.<sup>14</sup> This similarity can be attributed to the climate of Southeast Asia which is generally humid most of the year.

Diet/dietary factors and their association with acne have been extensively researched but there is no concrete evidence showing a positive link between the two.<sup>24</sup> Our results also did not establish any relationship between acne and diet. However, fasting was observed to be an aggravating factor of acne. The difference between the males and females was found to be significant, with 2% of females and 1.1% of males being affected. This is a new finding of our study, since there are no research works currently present which identify the positive link between acne and fasting.

Quite many studies have been conducted on the relationship of acne with family history. Our study also identified family history to have affirmative association with acne and difference being significant between the two sexes. These results are strongly supported by the study in Iran in

which a positive family history was associated with increasing severity of acne.<sup>5</sup> Further compatible with our findings, a large twin study conducted on 458 pairs of monozygotic and 1099 pairs of dizygotic twins reported 81% of acne variance to be associated with genetic factors and the remaining by environmental factors.<sup>25</sup>

Contrary to the common belief, no positive relationship between chocolate and acne was observed (reference to table) in this study. Similarly, sun exposure was observed to have a positive association with increase in severity of acne, but this difference was not found to be significant between the two sexes. Despite some studies claim that cigarette smoking is a risk a factor for acne our study did not show any positive relation between the two.<sup>18</sup>

### Conclusion

In conclusion, acne is quite a prevalent condition in the Pakistani population, and is associated with both genders. There is still lack of sufficient evidence regarding the risk factors of acne prevalence and severity which affect the males and females separately. These risk factors should be further researched upon regarding each gender individually because then the treatment plans could be tailored accordingly and better therapeutic methods could be developed for each sex. More comparison studies need to be done to create a better understanding of the pathophysiology of acne.

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