# FACIAL ACNE INSIGHTS: A CASE STUDY APPROACH

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## ABSTRACT

Acne is a multifactorial skin condition impacting millions globally, often leading to emotional distress and long-term scarring. Despite various treatments, many patients experience limited efficacy and relapse. This project utilizes a dataset of 500 individuals from Phaltan Tehsil, Maharashtra, to apply data-driven approaches in identifying patterns and predictors of acne development, progression, and treatment outcomes. These insights reveals that Acne is most common among individuals aged 15–25, with a higher incidence in females. Hormonal changes and dietary habits are significant contributors to acne development. Home remedies are perceived as more effective than medical treatments and the acne issue does not significantly affect self-confidence, possibly due to the rural or semi-urban setting.

**KEYWORDS:** Acne Appearance, Graphical representation, Statistical techniques.

## INTRODUCTION

Acne is a complex and multifactorial skin condition that affects millions of people worldwide. Despite significant research, several gaps in current knowledge exist, including a limited understanding of acne pathophysiology, a lack of personalized treatment approaches, and a limited availability of effective treatments for severe acne. This case study aims to address these gaps in knowledge by using data-driven approaches to gain insights into facial acne.

Acne can have a profound impact on an individual's quality of life, causing emotional distress, anxiety, and depression. The physical symptoms of acne, such as inflammation, scarring, and post-inflammatory hyperpigmentation (PIH), can also lead to long-term damage and disfigurement. Furthermore, acne can have significant economic and social implications, affecting an individual's self-esteem, relationships, and career prospects.

Despite the availability of various treatments, including topical and oral medications, acne remains a challenging condition to manage. Current treatment options often have limited efficacy, and many patients experience treatment failure or relapse. Moreover, the complexity of acne pathophysiology, combined with the heterogeneity of the patient population, makes it difficult to develop effective and personalized treatment strategies.

To address the challenges in acne management, there is a pressing need for data-driven insights that can inform the development of effective and personalized treatment strategies.

## MATERIALS AND METHODS

The Primary dataset is utilized for this case study. Data of 500 individuals from Phaltan Tehsil is collected through Questionnaire using an online Google form. The Google form consists of a series of questions designed to gather information on facial acne, including demographic details, acne severity, and treatment experiences. By leveraging datasets and analytics tools, it is possible to identify patterns and predictors of acne development, progression, and treatment outcomes.

The following statistical tools are used for the data analysis:

**Distribution of Causes of Acne.**

| Causes of Acne | No. of Respondents |
|---|---|
| Stress | 74 |
| Wrong Dietary Habits | 141 |
| Hormonal changes | 156 |
| Menstruation Phase | 104 |
| Irregular M.C. | 25 |
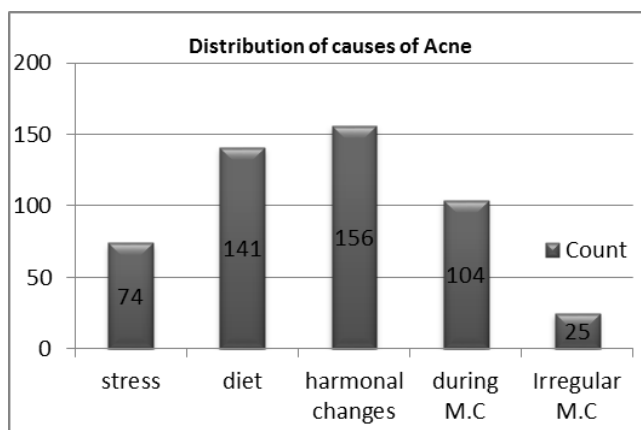
Here we observe that main causes of appearance of Acne are Wrong Dietary Habits and Hormonal imbalance in body.

**Distribution of Appearance of Acne According to Age Group.**

| Age group | No. of Respondents |
|-----------|--------------------|
| 10-15     | 12                 |
| 15-20     | 121                |
| 20-25     | 106                |
| 25-30     | 35                 |
| 30-35     | 23                 |
| 35-40     | 18                 |
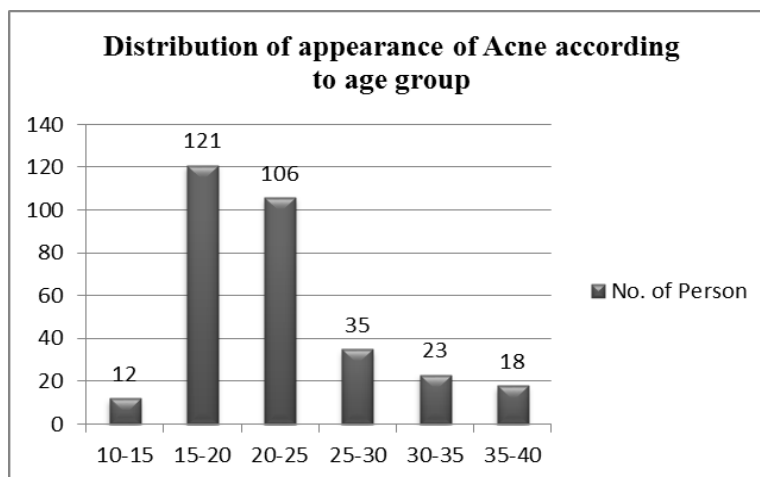


According to study, acne problems are most prevalent among teenagers and are also commonly observed in young adults.

**IMPACT OF ACNE ON SELF CONFIDENCE**
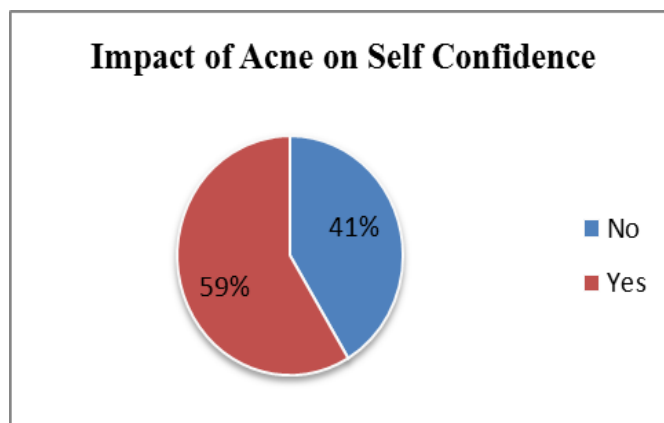


The survey reveals a significant impact of Acne on Self-confidence, with 59% of respondents affirming its effect.

**Association between Skin type of respondent and Appearance of Acne on face.**

| Skin type | Yes | No |
|-----------|-----|-----|
| Normal | 65 | 96 |
| Dry | 50 | 38 |
| Oily | 200 | 51 |

By Pearson's Chi-squared test, p-value is 3.172e-15. We conclude that Acne prevalence and severity are significantly influenced by skin type.

**Association between Daily Skincare routine and Acne appearance.**

| Daily Skincare routine | Yes | No |
|-------------------------|-----|-----|
| Taking steam | 29 | 8 |
| Moisturizer & Sunscreen | 87 | 37 |
| Only Sunscreen | 37 | 16 |
| No any Skincare routine | 162 | 124 |

By Pearson's Chi-squared test, p-value is 0.005868. We conclude that Acne prevalence and severity are significantly influenced by Daily Skincare routine.

**CONCLUSIONS**

A significant proportion of individuals in the Phaltan region exhibit oily and normal skin types, with a considerable prevalence of acne among this population. The majority of acne cases are observed in the 15-25 age group, with females being disproportionately affected, particularly with regards to pimples and scars. Our observations suggest a notable association between acne appearance and various factors, including Skin type (oily/normal)**,** Frequency

of face washing per day, Adherence to a daily skincare routine**,** Utilization of home remedies**,** Daily water consumption**,** Sleep duration**.** Furthermore, our findings indicate that home remedies may be more effective than medical treatments in reducing acne severity among this population.

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