

## A Survey-Based Analysis of Various Available Treatments Used By the General Population for the Management of Acne

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### ABSTRACT:

**Introduction:** Acne vulgaris is an inflammatory skin disease affecting nearly 80% of people between the ages 11 - 30. Severe inflammatory outbreaks such as papules, pustules, nodules or cysts can lead to scarring, disfiguration, pigmentary changes, etc. Owing to the chronic nature and negative socio-psychological impact of acne, a traditional, cost effective and safer alternative treatment is need of the hour. Available allopathic medicines, hormonal treatments etc. though effective, are associated with numerous side-effects.

**Methodology:** In the current research work, a survey of 95 randomly selected people was carried out to evaluate the knowledge base and preferences of the general population with reference to OTC treatments and home remedies in the management of acne.

**Results:** Most severe acne infections were observed in people from 15 – 19 years of age and as the severity of the infection increased, respondents showed inclination to use allopathic medication. Using a self-graded 5-point Likert scale, it was observed that subject population found herbal medicine to be most effective (3.263±0.896), followed by allopathic medicine (3.187±0.965) and finally commercial products (2.876±1.026). Allopathic medicine was also reported to present a range of side effects.

**Conclusion:** Commercially available marketed medicines though entice with advertisements were not seen to be associated with high effectivity scores. The comparatively high number of subjects opting for these products suggest a need for spreading awareness in order to assist them to make informed choices regarding available, effective and safer treatment alternatives.

**KEYWORDS:** Acne vulgaris, Traditional and Alternative medicine, home remedies

### I. INTRODUCTION:

Acne vulgaris, commonly known as Acne is a frequently observed chronic inflammatory condition of the pilosebaceous glands with a global prevalence rate of 9.4% (1). This high incidence rate is observed mostly among post-pubescent adolescents and teenagers(2). A review article on Acne in 2020 report that among the countries surveyed, prevalence of Acne has been observed to vary from 35% to close to 100 % of the adolescent citizens of a Nation being affected by Acne at reported point in time (3).

A typical patient suffering from an acne infection presents to diagnosis with comedones, papules and pustules(4)(5). Comedones can be observed to be blackheads or whiteheads. Papules are raised lesions (smaller than 1 cm) on the skin surface whereas pustules are inflamed papules filled with pus (6). In case of severe infections, inflamed nodules, cysts and swollen lesions that are approximately 5mm large may be reported. Further, scars, erythema, hyperpigmentation has also been observed in patients suffering from severe acne infections (3)(4)(6)(7).

There are many other socioeconomic discomforts reported due to clinical indications of acne. Further, acne also commonly leads to adverse effects on social life. Reduction in self-esteem, body image has also been associated to an acne infection in addition to other psychological disorders such as depression and anxiety attacks in patients suffering from chronic bouts of acne infection(8)(5). Furthermore, reports suggest that acne treatments have been associated to an extensive financial burden with one German based study estimating the cost to add to the country's healthcare care budget by almost 400 million Euros (3). A similar study from United States reported a financial loss estimate of around three billion USD for the management of acne infections(9).

The manifestation of acne can be owed to a myriad range of factors, including changes in the hormonal levels of an individual (hyperandrogenism), onset of puberty, increased production of sebum, growth of inflammatory bacteria like *Propionibacterium acnes*, abnormal follicular keratinization, etc. (10)(11). Classical Ayurvedic texts such as *Sushruta Samhita*, *Charak Samhita*, *Sharangadhara Samhita*, *Chakra Datta* etc., discuss the pathophysiological causes and treatment regimens of an acne infection (12). Acne infection has also been described in the classical Ayurvedic works of *Madhav*, *Vagbhata* and *Yogaraj*(13). Ayurvedic School of medicine report of many uniherbal and polyherbal preparations and formulations for the management of acne infection. These include individual plants such as *Lodhra* (*Symplocos racemosa*), *Yashtimadhuka* (*Glycyrrhiza glabra*), *Shalmali* (*Salmaliamalabarica*), *Sariva* (*Hemidesmus indicus*) etc. Few polyherbal formulations reported include *Jatiphaladilepa*, *Manjisthadilepa*, *Arjunadilepa* etc. (12)(14).

In the current clinical treatment setting, topical antibiotics are most commonly used as first line treatment, but use of monotherapy has been repeatedly reported to be the cause of rapid development of antibiotic resistance within months (15). Other available allopathic medicines and hormonal treatments have been reported to be associated with numerous side effects and long-lasting drawbacks (16). Upcoming non-pharmacological interventions such as laser treatment and light-based therapies though are reported to be promising, are highly expensive and painful (17).

Thus, with reference to the above, and the virtually ubiquitous nature of acne infection, a safer and more importantly, an affordable long-term alternative has always been sought after. Several studies have been reported to prove the usefulness of Ayurvedic and herbal remedies in the treatment of acne. The significantly lesser rate of side effects of herbal and Ayurvedic medicines has been instrumental to promote its use in the management of Acne (18)(19)(20)(21)(22).

In the current research work, a survey-based approach has been implemented to assess the preferences of the general population with respect to both prescribed and over-the-counter allopathic treatments, home remedies and commercially available products such as facewashes and creams in the management of acne. One of the targets of the survey was to assess the trends in inclinations

observed in general population in India. The data obtained through the survey has been statistically evaluated and quantitatively assessed to ascertain the number of people who are actually aware of, and are using herbal treatments. Further, the results also establish how many people prefer home remedies and herbal treatments over allopathic medication and commercially available products. Microsoft excel and GraphPad Prism 5 Software has been used in the study for statistical evaluation.

## II. METHODOLOGY:

The target population for the survey included a pool of 95 individuals (both male and female) between the ages of 15 to 30 selected completely at random. The survey was short and structured with closed-ended, multiple choice questions, aimed at gathering general information about the type and severity of the acne infection suffered by the person along with details of the remedies used by them.

The questionnaire was divided into various categories enabling the respondents to navigate through the same with ease, and allowing them to answer only those questions relevant to them. Initially, trial surveys were carried out in order to weed out possible errors in the questionnaire with the help of a statistician. Additional explanations were provided at the beginning of every section and wherever necessary to enable a better understanding of the questions. Five-point Likert scales were employed to collect data on the severity of the infection and the perspective of the participants on the effectiveness of herbal treatments, allopathic medicines, and commercially available products respectively. The form was concluded with an open-ended question for the participants to provide their views on the occurrence pattern of their acne infection.

A flyer containing brief information about the project and a Google form link of the questionnaire was sent out to the participants. Obtaining the consent of each participant prior to the survey and maintaining the confidentiality of individual identities was ensured. A total of 95 responses was received and analyzed during the study. The data generated from the Google survey forms was analyzed and statistically evaluated using Microsoft Excel and GraphPad Prism 5.

## III. RESULTS AND DISCUSSIONS:

95 responses were recorded for the survey. The severity of the infection was assessed on a standard 5-point Likert scale. Figure 1 shows the infection severity as reported by the respondents. Mean severity was observed to be  $2.236 \pm 0.106$  (mean  $\pm$  S.E.) out of 5.

For the purpose of effective comparison and better evaluation, the data obtained was divided on the basis of age into three groups (15-19, 21-24

and 25 above). Under each age group, an analysis was carried out with regards to the number of people who utilized allopathic medicines, herbal remedies, and commercially available products respectively. This data was compared and correlated with the severity of infection as reported by the candidates as well as with their grading of the effectiveness of the treatment administered by them.

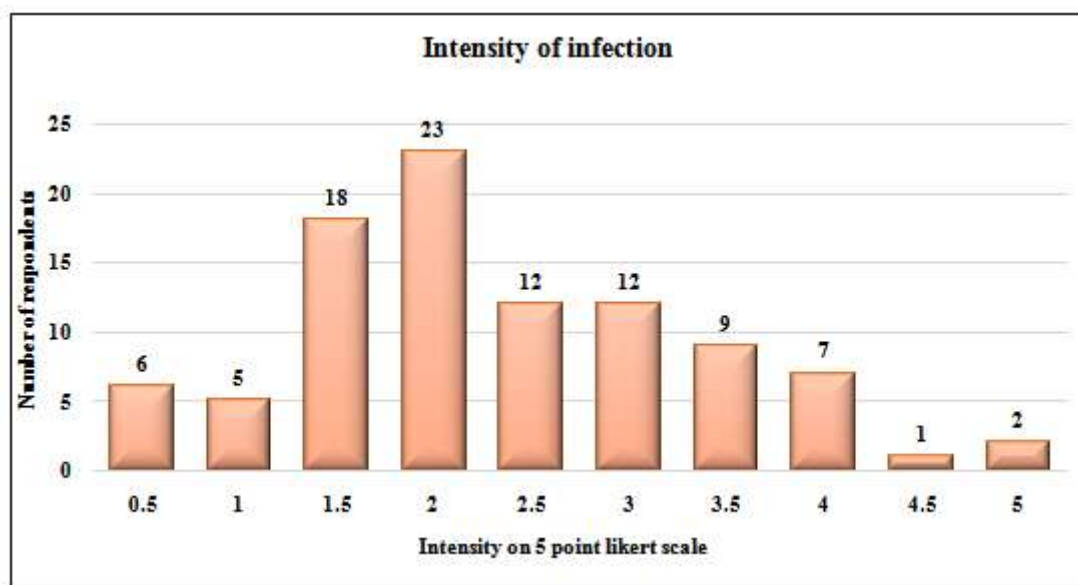
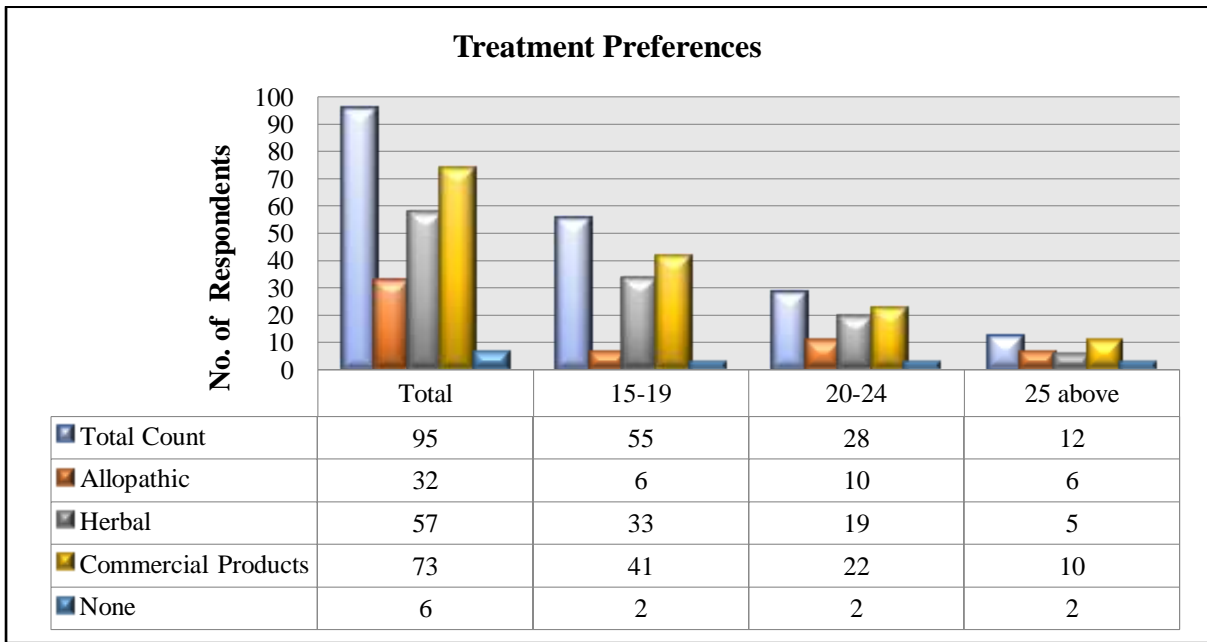


Figure 1: Severity of infection reported by the respondents

### CHOICE OF TREATMENT

From the analysis of data, it was concluded that 73 people i.e., 74.86% of the total surveyed population used commercially available products; this was more than the tally received for herbal treatments and allopathic medication. It was also observed that only 18 out of the 73 (i.e., 24.65 %) used commercial products exclusively. A similar trend was observed in each of the three age groups where commercially available products were favored over the other available treatments (Figure 2).

In case of Allopathic treatments, a total of 32 users out of 95 reported uses, but only 3 respondents (i.e., 9.37 %) used allopathic treatment exclusively. These respondents were observed to be 19 years of age and reported mild severity of infection. This suggests the inclination of respondents to combine treatment with other treatment regimens in case of allopathic medicine. Data on total respondent count in comparison to treatment preferences has been illustrated in figure 2.

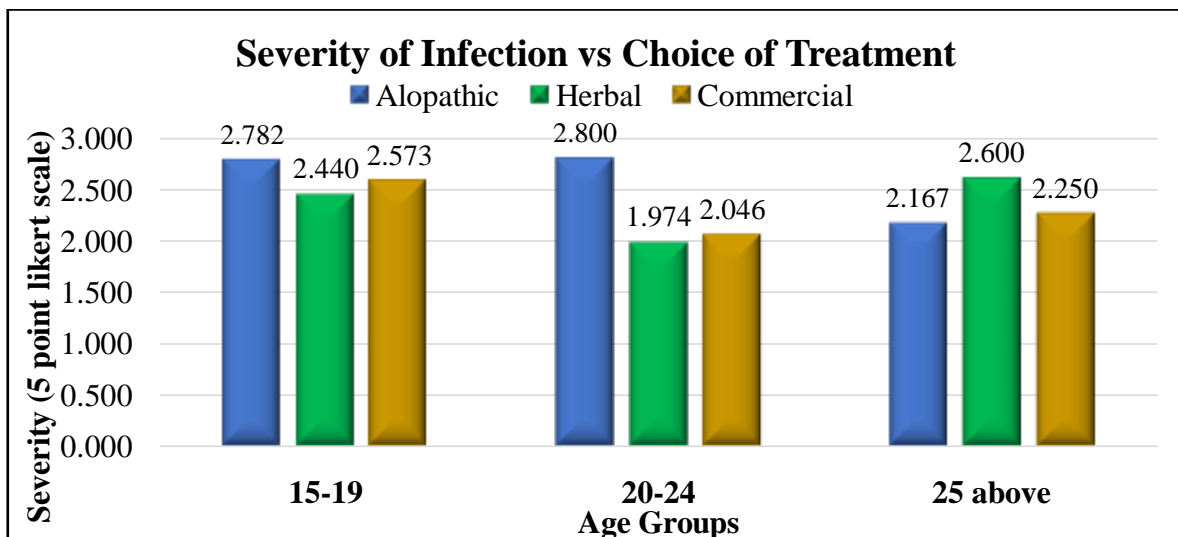


**Figure 2: Total count and treatment preference data across age groups for allopathic medicines, herbal remedies, and commercial products.**

On evaluating the ratings given for the severity of the disease through the three age groups, the mean severity was observed to be the maximum i.e.,  $2.598 \pm 0.172$  (mean  $\pm$  S.D.) on the 5-point Likert scale for those between ages 15 to 19; this was observed to be higher than the overall severity observed in the data population i.e.,  $2.403 \pm 0.157$  (mean  $\pm$  S.D.) out of 5.

Mean severity showed a decline as age of the respondent increased. The analysis of the

relation between severity of infection and choice of treatment revealed a positive correlation stating that, allopathic medicine was the most preferred mode of treatment in cases wherein the reported severity was high. The respondents who chose allopathic medicine reported mean severity levels of  $2.583 \pm 0.361$  (mean  $\pm$  S.D.) out of 5.0, followed by  $2.338 \pm 0.325$  (mean  $\pm$  S.D.) for herbal treatment users (Figure 3).



**Figure 3: Average severity of the people using Allopathic medicines, Herbal remedies, and Commercial products.**

### EFFECTIVITY OF PREFERRED TREATMENTS OF CHOICE

Even though respondents with more severe infections indicated a preference to allopathic medicines, examining the calculated mean effectiveness rating given for each of the remedies revealed that the overall average effectiveness of herbal remedies of  $3.263 \pm 0.896$  (mean  $\pm$  SD) was reportedly higher than that of both allopathic medicines and commercially available products i.e.,  $3.188 \pm 0.965$  (mean  $\pm$  SD) and  $2.877 \pm 1.026$  (mean  $\pm$  SD) respectively. Similar results were seen in the individual age groups as well. Further, the reported effectivity of commercially available products was found to be the lowest not only within the individual groups but also in the overall observation. This observation

further strengthens the hypothesis of the survey that despite commercially available treatment options being a prominent choice, the effectiveness of the same has been reported by general populace to be low (Data represented in Figure 4).

The statistical evaluation of the effectivity scores for the treatment regimens revealed that, though the t value for allopathic and herbal medicine, and between allopathic medicine and commercial medicine was found to be non-significant at  $P < 0.05$ ; the means of herbal and commercial treatments were observed to be significantly different at  $P < 0.05$ . This further suggests that the effectivity reported for herbal treatment by the respondents is significantly higher than that reported for commercial treatments.

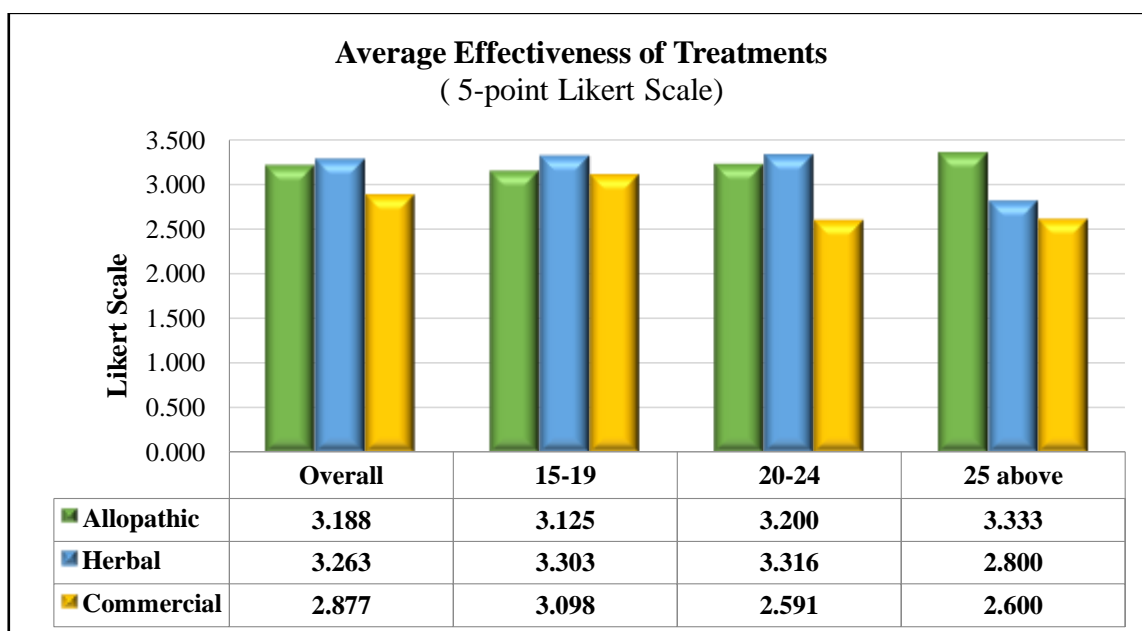


Figure 4: Average effectiveness ratings of the treatments used by all participants across the three age groups.

In case of allopathic treatment regimen, the range of side effects associated with allopathic treatment puts such means of treatments on the negative side as 53.13% of the individuals who adopted allopathic medications, topically or orally, reported experiencing significant side effects like skin peeling, itchiness, skin irritation, reddening of skin, upset stomach, dizziness, lightheadedness, etc. The possibility that the chronic use of allopathic medicine in the management of an acne infection may lead to various side effects has been supported by many authors (23)(24)(25).

The management of acne infection using antibiotics has been a cause for concern due to possible development of Multi Drug Resistant (MDR) infections due to prolonged low concentration exposure (26)(27). Studies have proved that any chronic exposure to allopathic treatment beyond 6 – 8 weeks does not provide significant increase in efficacy (28)(27). Moreover, such long-term exposures to medicines can contribute to further complications and persistent side effects (29).

But the current survey did not show any indication of such information being available with

the respondents. Thus, antibiotic treatment needs to be based on individual patients' profile and side effect which in turn increases the cost of the treatment. Though tetracyclines are most preferred treatment, use of minocycline, clotrimazole, quinolones, and ciprofloxacin are reported to present prominent side effects. The treatment by clindamycin which is reported as selective treatment by many respondents, though effective shows significant adverse effects such as pseudomembranous colitis etc.(5).

The survey showed that Clinda-Derm and Achromycin were the most popular topical and oral allopathic medicines used by the respondents respectively whereas Aloe vera and turmeric were the most commonly used herbal and home-based treatments. Based on the open-ended question, the survey also highlighted various misconceptions prevalent among the respondent regarding the cause of this disease.

In all, the results of the study shed light onto the fact that, even though mainstream allopathic medicines are preferred, they might not be the best option for the holistic management of acne as a safer and cost-effective modus operandi. Moreover, the preference of commercially available creams and facewashes, could be easily attributed to the marketing schemes and social media promotions associated with these big banner products. Nevertheless, the study and observations based on the responses of the sample population indicated that these commercial products marketed as cosmetics and not as cosmeceutical or pharmaceutical products, lack the necessary curative potential for the treatment of moderate to severe acne infections.

#### IV. CONCLUSION:

Acne vulgaris infections are one of the most prevalent skin problems. This survey highlights that general population in an age dependent manner reports that herbal remedies are more effective in reducing acne inflammations. It further suggested that in spite of the side effects experienced, people suffering from severe acne tend to use allopathic treatments to curb their infection; however, the survey also reported a lesser effectiveness for allopathic medicines in comparison to herbal remedies. Moreover, most of the general populace are unaware of treatment regimens and chronic dosage restrictions pertaining to allopathic treatment. Though Ayurvedic medicines are available for treatment as per

classical manuscripts, information about same was not sufficiently available with the respondents.

With respect to commercial products, the survey results further emphasize the necessity to spread awareness among people in order to influence them to make informed choices with respect to the available treatment regimens. This study serves as a foundation to develop a broader future study where the data obtained from the survey could be compared with available scientific literature on herbal medicine and home-based remedies to suggest a safer, cheaper, and efficient alternative for the management of acne.

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**The Author declare that there is no conflict of interest.**

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