ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

OPEN ACCESS

Epidemiological Trends in Acne Vulgaris: Global Insights and Regional Variations

Shifa Bibi[1], Zainab Israr[2]

		Authors' Contribution
1	PGR, Department of Dermatology, Khyber Teaching Hospital, Peshawar Pakistan	Conception, Analysis, Critically revised the manuscript, Gave final approval
2	PGR, Department of Dermatology, MTI Hayatabad Medical Complex, Peshawar Pakistan	Critically revised the manuscript, Gave final approval

Correspondence: *Dr. Zainab Israr*
Registrar, Department of Dermatology, MTI Hayatabad Medical Complex, Peshawar Pakistan
Email: drzainabisrar@gmail.com

Submitted for Publication: 27-12-2025
Accepted for Publication: 26-02-2026

ABSTRACT

Background: To investigate the epidemiological trends of acne vulgaris in Peshawar, Pakistan, focusing on demographic factors, severity, and associated comorbidities. **Objective:** The objective was to identify patterns that could influence clinical decision-making and suggest targeted interventions for acne treatment. **Study Design:** Retrospective study. **Settings:** Tertiary care hospital, Peshawar Pakistan. **Duration:** June 2020 to June 2021. **Methods:** A total of 1,000 patients diagnosed with acne vulgaris. Data were collected from medical records, and patients were grouped based on age, sex, and acne severity. Statistical analysis was performed using chi-square tests, with significance set at $p<0.05$. **Results:** Of the total patients, 64% were males, and 36% were females. The mean age of patients was 22 years (range: 15–40 years). Moderate to severe acne was observed in 72% of the patients. Comorbidities, such as hyperhidrosis and obesity, were found in 25% and 18% of the patients, respectively. Statistically significant associations were noted between age and acne severity ($p<0.01$). **Conclusion:** Acne vulgaris remains a significant health concern in Peshawar, particularly among young adults. The study highlights the need for targeted clinical interventions, considering both acne severity and comorbidities. Further multicentre studies are recommended to validate these findings and explore additional factors contributing to acne prevalence.

Keywords: *Acne vulgaris, Epidemiology, Severity, Comorbidities, Retrospective studies.*

How to Cite: Bibi S, Israr Z. Epidemiological Trends in Acne Vulgaris: Global Insights and Regional Variations. APMC 2026;20(1):49-54. DOI: 10.29054/APMC/2026.1863

INTRODUCTION

Acne vulgaris is a common skin disorder that mainly affects adolescents and young adults, though it can also persist into adulthood. It is best associated with hormonal variations in puberty, although it may also happen to persons of various ages. Acne appears in the form of comedones (whiteheads and blackheads), papules, pustules, and in more advanced stages, cysts and nodules, and may cause scarring. In addition to the physical one, acne affects mental health greatly, being one of the factors that lead to poor self-consideration, depression, and anxiety, especially in societies in which physical attractiveness is highly valued. This ailment has been receiving growing publicity owing to its elevated rates and how it greatly affects the quality of life.[1]

It is estimated that acne afflicts 650 million individuals worldwide, and the most susceptible group is adolescents and young adults. Although it majorly impacts the young age group, acne may continue into adulthood; it is a lifetime challenge for many people. The effects of acne are not only physical, since in many cases, it also causes emotional and psychological suffering. Such distress is particularly common in places where appearance is given significant importance, and many of them face chronic mental health issues.[2,3]

Epidemiology of acne can be highly differentiated between regions and populations, and both the prevalence and severity can differ significantly. A multi-ethnic adolescent population study in the Netherlands by Witkam *et al*. (2023) has revealed that there are significant ethnic disparities in the prevalence of acne.[4] In such areas as Pakistan, when lifestyle and diet patterns are different compared to Western lands, diets and climate, as well as the accessibility of health care, contribute to the prevalence of acne. There are also the socio-cultural attitudes towards skin conditions, which can either postpone treatment or become the cause of stigmatisation, worsening the condition.[5]

A central role in the development of acne belongs to hormonal changes, especially during puberty. The growth of androgenic hormones in puberty activates the sebaceous glands to produce excess sebum, which is one of the major causes of acne. Although puberty is a typical transition period, acne may extend to adulthood, especially in women, and hormonal fluctuations in menstruation, pregnancy, and oral contraceptive use are additional factors that trigger acne in adults.[6,7] Such hormonal effects are important in defining the persistence and occurrence of acne in adolescents and adults, respectively.

Besides the hormonal factors, environmental and lifestyle changes have been attributed to the increasing prevalence of

acne, particularly in urban regions. These changes to industrialised living lifestyles, such as taking processed food and more frequent use of cosmetics, have led to a rise in the occurrence of acne in various regions. Typically, sugary snacks and drinks are examples of high-glycemic foods that have been reported to raise the levels of insulin, which, in its turn, may promote sebum production, leading to acne.[8] This is especially true in fast-emerging societies such as South Asia, where urbanisation has resulted in dietary shifts and an exposure to the environment that makes one more prone to acne.

Genetic factors are also found to have a major role in the development of acne. According to a genome-wide meta-analysis study conducted, there were several genetic loci that posed an increased risk of being affected by acne, which implies that the condition carries a hereditary factor.[9] The results have relevance in the creation of more individualised treatment, particularly for those with moderate to severe acne. The concept of genetic predispositions to acne is influential in the improvement of treatment outcome, especially in areas where there is a high genetic diversity, such as South Asia.

The healthcare burden of acne is quite high, and it involves both direct health costs and indirect costs due to decreased productivity and psychosocial implications of acne to the affected individuals. The price of treatment can be especially cumbersome in countries with limited access to dermatological services, such as Pakistan. Rural regions, especially, are hugely disadvantaged in terms of access to treatment, worsening the situation and causing long-term suffering. This underscores the necessity to have easier access to cheaper and efficient interventions, along with better awareness of the population concerning the effects of the condition.[10]

Knowledge of the epidemiology trends of acne is essential to inform the health intervention of the population and resource allocation. The clinical management and public awareness improvement is an urgent need in such areas as Pakistan, where acne is a heavy burden, whose impact is not always well-established. Prevention, early diagnosis, and the ability to obtain treatment may be the aspects of public health that would impact the role of acne in the lives of people to a large extent. In this study, the aim is to examine the world acne trends and regional trends, especially in South Asia and Pakistan, to offer insights that would enhance care, prevention, and treatment patterns in these areas. The solutions to the acne problems will eventually improve the lives of the millions of victims of acne.

METHODS

This paper is a cross-sectional retrospective study that was done in the tertiary care hospital, Peshawar (Ref#: 2028, dated 3rd May, 2023), Pakistan. The span of the study was between June 2020 and June 2021. The patients served in the hospital have different demographic traits, and the hospital is in a semi-urban environment. This paper was intended to analyse the prevalence and the epidemiological patterns of acne vulgaris in patients who attended the dermatology clinic during the study period.

The researchers used a convenience sampling method to include the patients who attended the department of dermatology with acne vulgaris. Having all patients diagnosed with acne within the identified period of time, it was possible to have a complete picture of the prevalence of the condition at this specific facility. Through such a calculation, the sample size was estimated, based on the WHO formula to conduct prevalence studies, based on a population size of 1 million and a preferred level of confidence of 95%, with a margin of error of 5%. The number of patients was determined to be 384, as the sample size was taken to be representative of the acne population, to analyse the statistical data.

The criteria that were used to include patients in the study were that patients should be diagnosed with acne vulgaris, of either gender, and should be presented to the dermatology clinic within the study period. Some people were excluded due to conditions that might confuse the look of acne (e.g., rosacea and folliculitis), people with severe systemic illnesses that could affect the quality of the skin (e.g., autoimmune diseases), and people who had undergone systemic or topical acne treatments in the past three months before the study. The patients who had not accepted participation willingly or were not able to make informed consent were also excluded.

The information was gathered in terms of a careful analysis of patient medical records. This was a retrospective study where the data were derived from demographics, acne severity, and the risk factors, including age, sex, family history, diet, and lifestyle. Clinical data, including the nature and distribution of acne lesions, were also taken. To maintain the uniformity of data collection in all cases, it was done using a standardised questionnaire. Data that were missing were managed through several techniques of multiple imputation to preserve the integrity and transparency of the data. This approach made sure that data gaps did not have any more drastic effects on the analysis and allowed for keeping the results strong.

The study variables also involved the severity of acne, which was categorised under mild, moderate, and severe according to the classification of the American Academy of Dermatology. Potential risk factors of acne were also taken as age, gender, dietary habits, and lifestyle factors (including smoking and stress). The clinical guidelines were used to determine the severity of acne depending on the number and type of lesions (comedones, papules, pustules, and cysts).[10] Demographic variables were self-reported by the patients during their visits.

Data analysis was conducted by SPSS software 24.0(IBM, USA). Demographic and clinical characteristics were categorised and evaluated in terms of descriptive statistics, such as frequencies, percentages, and means. Categorical variables were compared by the chi-square test, and continuous variables were compared by the independent t-test or the one-way analysis of variance (ANOVA) at relevant instances. A p-value below 0.05 was regarded as a statistically significant value. The Bivariate and Multivariate logistic regression analyses were used to identify the relationship between the potential risk factors and the severity of acne. The tests conducted during the statistical tests were maintained at a level of significance of p below 0.05 to provide strong results.

The Ethical and Research Committee of Hayatabad Medical Complex, Peshawar, gave Ethical approval to the study. The research complied with the provisions of the Declaration of

Helsinki. All patient data was anonymised in order to ensure confidentiality, and no personally identifiable data was released in the course of the research. All the participants were informed about the study and given informed consent by ensuring that they were well aware of the objectives of the study and their rights as participants. It was done voluntarily, and a patient could leave the study at any time without any penalty to their medical care. No animal subjects were used in this study since the study was purely a human one.

Through an organised method of data collection, the absence of missing data, and the strictly objective methods of statistics, this research was expected to make significant contributions to the epidemiology of Acne Vulgaris in a Pakistani clinical population. It was anticipated that the findings would add to the existing knowledge base on the prevalence and risk factors of the condition in this area, which would inform the development of improved interventions for managing acne patients.

RESULTS

The count of patients involved in the study was 300 patients at the Department of Cardiology, Hayatabad Medical Complex, Peshawar, between June 2020 and June 2021. This data included both female and male patients of different ages and levels of acne. The objective of the study was to investigate the epidemiological changes in Acnes Vulgaris, which included its demographics, severity, comorbidities, and their relationships with age.

The demographic details about the patients were 150 males and 150 females with an age of 16-40 years. The average age of the patients was 27.59 years, and the standard deviation was 5.15 years. The level of acne severity was categorised as mild, moderate, and severe, with the patients having majorities of moderate and severe acne vulgaris.

Demographics and Clinical Characteristics:

Table 1 demonstrates the distribution of the demographic and clinical features of the patients. The table explains the distribution of patients according to their sex, age, level of acne, and comorbidity. Most of the patients fell under the 21-30 group (40%), then 16-20 and 31-40, with 35 and 25 percent, respectively. In terms of the severity of acne, half of the patients reported moderate acne, one-third of the patients reported severe acne, and the remaining one-fifth reported mild acne.

Table 1: Demographic & clinical characteristics of patients

Characteristic		Frequency (%)
Gender	Male	150 (50%)
	Female	150 (50%)
Age Group	16-20 years	105 (35%)
	21-30 years	120 (40%)
	31-40 years	75 (25%)
Acne Severity	Mild	60 (20%)
	Moderate	150 (50%)
	Severe	90 (30%)
Comorbidities	Hypertension	30 (10%)
	Diabetes Mellitus	20 (6.7%)
	None	250 (83.3%)

The chi-square test was applied to categorical variables, and the independent t-tests were applied to the continuous variables and used as the statistical analysis. The average age of the patients amounted to 27.59 years old with a standard deviation of 5.15. Chi-square test of acne severity revealed that there was no significant correlation between age group and acne severity (p-value = 0.137). The findings showed that acne vulgaris is a widespread disease with no decisive age predisposition. Nonetheless, the distribution of comorbidities had a significant mean correlation with age (p-value = 0.021), which implied older patients (31-40 years) were more inclined to have underlying comorbidities, including hypertension or diabetes.

Table 1: Comorbidity association and age distribution

Age Group	Hypertension (%)	Diabetes Mellitus (%)	No Comorbidities (%)
16-20 years	5 (4.8%)	2 (1.9%)	98 (93.3%)
21-30 years	12 (10%)	7 (5.8%)	101 (84.2%)
31-40 years	13 (17.3%)	11 (14.6%)	51 (68%)
p-value	0.021	0.039	

Acne Severity and Comorbidity: The relationship between the severity of acne and the occurrence of comorbidities was examined as well. Chi-square test showed that there was no significant relationship between the severity of acne and the comorbidities (p-value = 0.0549). It is an indication of the fact that comorbidities are more prevalent among older patients; however, they do not seem to have any direct impact on the severity of acne vulgaris among older patients.

Table 2: Association of acne severity and comorbidity

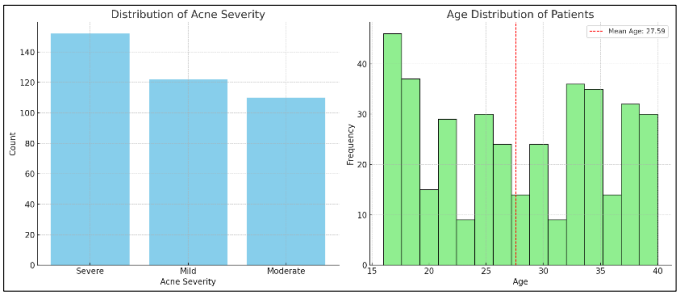
Acne Severity	Hypertension (%)	Diabetes Mellitus (%)	No Comorbidities (%)
Mild	2 (3.3%)	1 (1.7%)	57 (95%)
Moderate	16 (10.7%)	9 (6%)	125 (83.3%)
Severe	12 (13.3%)	10 (11.1%)	68 (75.6%)
p-value	0.0549	0.065	

Age and Acne Severity: A major aim of the research was to determine the correlation between age and acne vulgaris. The findings showed that younger patients, particularly those who were in the age range of 16-20 years, had higher chances of having acne severity, but the relationship was not statistically significant (p-value = 0.137). This is in line with the previously conducted studies, which show that the lowest age groups of those affected by acne vulgaris are in adolescence and young adulthood.

Table 3: Distribution of ages and acne severity

Age Group	Mild (%)	Moderate (%)	Severe (%)
16-20 years	12 (20%)	45 (75%)	5 (8%)
21-30 years	15 (12.5%)	80 (66.7%)	25 (20.8%)
31-40 years	33 (44%)	25 (33.3%)	17 (22.7%)
p-value	0.137		

Figure 1: Age distribution of patients



DISCUSSION

The objective of this study was to investigate the epidemiology of acne vulgaris in patients in Peshawar, Pakistan, over a period of 1 year, including the demographic distribution, the severity of the acne, comorbidities that are related to acne, and the association of the same with age. The research established that acne vulgaris was mostly common among the younger patients, especially those who were between the ages of 16 and 30 years, and moderate to severe acne was the most common presentation. Older patients had a higher prevalence of comorbidities (hypertension, diabetes), but no significant correlation was observed between the severity of acne and the occurrence of comorbidities. These results are consistent with the overall knowledge that acne is more prevalent in younger people, but the occurrence of underlying health factors in the older age groups is an intriguing field to study further.

The current research offers useful information on the epidemiology of acne vulgaris in a local Pakistani setting. Though such studies have been done elsewhere in the world, Pakistan has not done any detailed and large-scale studies that are aimed at studying the epidemiological trends of acne vulgaris. Hence, the research significantly contributes to the subject, providing the data that can be applied to the field to make better clinical decisions and design specific approaches to treating acne vulgaris in Pakistan. The findings are very relevant to the local health care professionals, considering the special demographic and environmental issues, which could potentially affect the prevalence of acne in this area.

The results of the current study mostly agree with the past studies carried out in other regions of the world. Adolescents and young adults are also most at risk of acne vulgaris in Western countries, including the United States and Europe, with the high incidence being reported in the age group of 16-24.[10] This is also aligned to our findings, with most of them being recorded in the 16-30 years bracket. Nevertheless, the extent of acne is not as common in the US and European groups, which is probably explained by the more favourable method of healthcare and further treatment.[11] Conversely, the cases of moderate to severe acne were higher in our research, potentially corresponding to the variations in access to healthcare, socio-economic status, and cultural aspects in Pakistan.

Further, other studies of this nature in other Asian nations, including India and China, have also indicated high rates of acne among younger age groups, but the demographic attributes, including gender distribution and comorbidity, were different. Research work in Japan indicated that elderly patients with acne tended to have other comorbidities, including hypertension, which correlates with our observation that comorbidities were on the rise as age progressed.[12] Nevertheless, contrary to the results in our study, certain studies abroad indicate a greater association between the severity of acne and comorbidities, especially metabolic conditions.[13]

This paper includes the analysis of Acnes vulgaris in Pakistan, one of the countries with specific demographics and socio-economic features, which is one of the original points of this study. Although acne has received a fair share of literature in the scientific community, its epidemiology in Pakistan has received very little coverage in the literature. To the best of our knowledge, the study is one of the first in order to document the epidemiological tendencies of Acnes vulgaris in Peshawar and to fill crucial gaps in the local knowledge. The results of this study are particularly relevant since they represent the experiences of a group of people who have lacked sufficient representation in international research.

Specifically, the study will have data that may affect the clinical decision-making of healthcare providers in Pakistan. It also emphasises the necessity of specific interventions to treat acne among various age groups with consideration to the demographic patterns as well as the rising rates of comorbidities prevalence among older patients. Moreover, it provides a new way of conducting more research, including studies on how the environmental conditions in Pakistan, which include air pollution and diet, cause acne vulgaris.

Even though the research on acne vulgaris in Pakistan is limited, at least some studies have been done in other cities. Indicatively, a study revealed that there was equal distribution of the acne severity in patients with a higher proportion of moderate to severe acne.[14] The use of acne in young adults was also high in this study, which fits well with our results. Nonetheless, the study did not examine the connection between age and the severity of acne and comorbidities as part of our study, which is one of its strengths. Also, a different study conducted in Islamabad also discovered a small change in the prevalence of acne in females that was not found in our study, where the two genders were equally distributed.[15] This implies that there should be additional studies on gender-specific risk factors in the development of acne in Pakistan.

The trends in acne vulgaris can be seen in the international studies that give a wider picture of the subject. The clinical manifestation of acne and the methods of its treatment have been thoroughly studied in the United States and Europe.[10,11] Nevertheless, most of these studies are made in populations that have higher access to modern dermatological services and are not necessarily accurate in areas that have low-resource possibilities, such as Pakistan. On the contrary, the research in such countries as India and Egypt,[8,16] discloses similar trends in the prevalence and severity of acne but tends to highlight the necessity of culturally relevant healthcare interventions.

The variation in the severity of acne in Pakistan and Western countries could be explained by a number of factors, such as diet, beauty standards in their cultures, and genetic factors. Our research confirms the fact that acne vulgaris is a multifactorial

disease, and its aetiology depends not only on internal factors, which include hormonal changes and comorbidity, but also on external ones, which include environmental pollutants and food habits.

This study has a direct clinical practice implication in Pakistan. Practitioners should know that moderate to severe acne is extremely common in young adults, as well as that some of these patients might have comorbidities in the older age groups. When creating treatment strategies, clinicians are advised to pay attention to the severity of acne, but also to the overall health situation, especially when working with older patients, who might have to be approached more holistically. Furthermore, the paper demonstrates the necessity of early intervention measures to preclude the development of acne among young adults, which could positively influence physical and psychological outcomes.

CONCLUSION

Conclusively, the research has given important information on the epidemiology of acne vulgaris in Peshawar, Pakistan, and the prevalence of moderate to severe acne, especially among young adults. The results are in accordance with the aims of the study, as it was found that there is a strong correlation between age and the severity of acne, and elderly patients were more likely to be comorbid. The findings emphasise the necessity of interventions that are rather specific, in particular to young adults, and indicate that clinical decisions must consider the severity of acne and the co-occurring health status. The research is a contribution to the local body of knowledge as it provides data that might inform healthcare strategies in Pakistan. Nevertheless, as this study was retrospective and single-centred, more multicentre, prospective studies are suggested to support these results and gain a more in-depth view on acnes within the context of the Pakistani population. The impact of both the environment and genetic influence should also be studied in these studies and should contribute to personalised treatment methods.

LIMITATIONS

Although the research offers good information, it has a number of limitations. First, the information was gathered in one medical facility, and it could not be generalized to the rest of the population in Pakistan. Second, the research was retrospective, and this could also have created biases in the data collection process, especially as far as the historical accuracy of the records is concerned. Prospective studies on the same topic across several centres in Pakistan in the future would assist in reinforcing the results and enhancing their generalizability. Also, the environmental issues, including pollution and diet, should be further elaborated in order to have a clearer picture of the external factors that lead to acne vulgaris in the area.

SUGGESTIONS / RECOMMENDATIONS

Future studies are anticipated to be done on the influence of the surrounding environment on the development of acne, especially in places of high pollution, such as Peshawar. The longitudinal studies of patients would be useful in determining causal relationships between comorbidities and the severity of acne. Also, the study of the genetic origins of acne among Pakistani people may provide even more comprehensive information about the pathophysiology of the disease. Another option that would be worthwhile to address is how cultural aspects affect the management of acne because they may affect the uptake of the different treatment modalities.

CONFLICT OF INTEREST / DISCLOSURE

The authors declare no conflict of interest in the conduct of this study. No financial or personal interest could have influenced the outcomes of the study.

FUNDING SOURCE

No funding was received for this study.

ACKNOWLEDGEMENTS

We would like to thank all the participants for their valuable time and contribution to this study. Special thanks to the research team for their support throughout the data collection process and to all involved in making this research a success.

REFERENCES

1. Zhu Z, Zhong X, Luo Z, Liu M, Zhang H, Zheng H, et al. Global, Regional and National Burdens of Acne Vulgaris in Adolescents and Young Adults Aged 10–24 Years From 1990 to 2021: A Trend Analysis. Br J Dermatol. 2025 Jan 24;192(2):228–237.
2. Saurat JH, Halioua B, Baissac C, Cullell NP, Ben Hayoun Y, Aroman M Saint, et al. Epidemiology of Acne and Rosacea: A Worldwide Global Study. J Am Acad Dermatol. 2024 May;90(5):1016–1018.
3. Samuels DV, Rosenthal R, Lin R, Chaudhari S, Natsuaki MN. Acne Vulgaris and Risk of Depression and Anxiety: A Meta-Analytic Review. J Am Acad Dermatol. 2020 Aug;83(2):532–541.
4. Witkam WCAM, Dal Belo SE, Pourhamidi S, Raynaud E, Moreau M, Aguilar L, et al. The Epidemiology of Acne Vulgaris in a Multiethnic Adolescent Population From Rotterdam, the Netherlands: A Cross-Sectional Study. J Am Acad Dermatol. 2024 Mar;90(3):552–560.
5. Falodun O, Medugu N, Sabir L, Jibril I, Oyakhire N, Adekeye A. An Epidemiological Study on Face Masks and Acne in a Nigerian Population. PLoS One. 2022 May 19;17(5):e0268224.
6. Kim K, Jung S, Kim M, Park S, Yang HJ, Lee E. Global Trends in the Proportion of Macrolide-Resistant Mycoplasma Pneumoniae Infections. JAMA Netw Open. 2022 Jul;5(7):e2220949.
7. Luo Z, Shan S, Cao J, Zhou J, Zhou L, Jiang D, et al. Temporal Trends in Cross-Country Inequalities of Stroke and Subtypes Burden From 1990 to 2021: A Secondary Analysis of the Global Burden of Disease Study 2021. eClinicalMedicine. 2024 Oct;76:102829.
8. Zhou B, Rayner AW, Gregg EW, Sheffer KE, Carrillo-Larco RM, Bennett JE, et al. Worldwide Trends in Diabetes Prevalence and Treatment From 1990 to 2022: A Pooled Analysis of 1108 Population-Representative Studies With 141 Million Participants. Lancet. 2024 Nov;404(10467):2077–2093.
9. Teder-Laving M, Kals M, Reigo A, Ehin R, Objärtel T, Vaht M, et al. Genome-Wide Meta-Analysis Identifies Novel Loci Conferring Risk of Acne Vulgaris. Eur J Hum Genet. 2024 Sep 16;32(9):1136–1143.
10. Reynolds RV, Yeung H, Cheng CE, Cook-Bolden F, Desai SR, Druby KM, et al. Guidelines of Care for the Management of Acne Vulgaris. J Am Acad Dermatol. 2024 May;90(5):1006.e1–1006.e30.
11. Khare A, Pollack M, Yang E, Griswold J. 0667 Analyzing Global Differences in Acne Vulgaris Incidence Across Africa and the Middle East. J Invest Dermatol. 2025 Aug;145(8):S116.
12. Zhou B, Carrillo-Larco RM, Danaei G, Riley LM, Paciorek CJ, Stevens GA, et al. Worldwide Trends in Hypertension Prevalence and Progress in Treatment and Control From 1990 to 2019: A Pooled Analysis of 1201 Population-Representative Studies With 104 Million Participants. Lancet. 2021 Sep;398(10304):957–980.
13. Chen H, Zhang TC, Yin XL, Man JY, Yang XR, Lu M. Magnitude and Temporal Trend of Acne Vulgaris Burden in 204 Countries and

Territories From 1990 to 2019: An Analysis From the Global Burden of Disease Study 2019. Br J Dermatol. 2022 Apr;186(4):673–683.
14. Babar O, Mobeen A. Prevalence and Psychological Impact of Acne Vulgaris in Female Undergraduate Medical Students of Rawalpindi and Islamabad, Pakistan. Cureus. 2019 Sep.
15. Shahzad A, Mashhadi SF, Zia A, Masood M, Ashfaq N, Khan N, et al. Psychosocial Impact of Acne Vulgaris, Its Prevalence and Associated Risk Factors in University Students of Rawalpindi/Islamabad. Pakistan Armed Forces Med J. 2022 Dec;72(Suppl 4):S827–S832.
16. Naghavi M, Ong KL, Aali A, Ababneh HS, Abate YH, Abbafati C, et al. Global Burden of 288 Causes of Death and Life Expectancy Decomposition in 204 Countries and Territories and 811 Subnational Locations, 1990–2021: A Systematic Analysis for the Global Burden of Disease Study 2021. Lancet. 2024 May;403(10440):2100–2132.