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Prevalence of skin diseases in a dermatological outpatient department in north Kerala: A cross-sectional retrospective study

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Abstract
Skin diseases significantly impact global health, with prevalence influenced by intrinsic factors (age, gender, genetics) and extrinsic factors (geography, climate, socioeconomic conditions). In tropical regions like North Kerala, understanding these patterns is critical for healthcare strategies.
Objective: This study aims to determine the overall prevalence of skin diseases in the outpatient population, investigate the distribution of skin diseases across age groups, including children (0–14 years), adolescents and young adults (15–30 years), middle-aged adults (31–50 years), and older adults (51+ years), and assess any disparities in the prevalence of different skin conditions between males and females.
Methods: A retrospective analysis of 13,737 cases from the Government Homoeopathic Medical College Kozhikode (June 2023–June 2024) was conducted. Diagnoses were classified using ICD-10 criteria. Statistical tools such as chi-square tests and ANOVA were used to analyze demographic patterns, prevalence rates, and seasonal trends.
Results: The most common conditions were dermatitis and eczema (20.93%), dermatophytosis (16.31%), hairfall (10.93%), and pigmentation disorders (9.53%). Females comprised 53.74% of patients, with gender distribution varying significantly by age ($\chi^2 = 1.56 \times 10^{-114}$, $p < 0.001$). Seasonal peaks occurred in March-April 2024. Adolescents (10–19 years) and young adults (30–39 years) were the largest patient groups. ANOVA showed marginal age-related differences in prevalence ($F = 1.91$, $p \approx 0.071$).
Conclusion: Dermatitis and eczema are the leading dermatological conditions in North Kerala. Variations by gender, age, and season highlight the need for tailored strategies. While valuable, the study's retrospective design and single-institution scope limit generalizability, necessitating broader and prospective research.

Keywords: Skin diseases, prevalence, North Kerala, retrospective study, seasonal trends, gender distribution, age-specific patterns

Introduction
In healthcare systems, skin disorders account for a significant portion of the disease burden and are a major global public health concern. Multiple factors contribute to the genesis of dermatological disorders. These factors include intrinsic variables like age, gender, genetic predisposition, and immunological response[1,2], as well as extrinsic factors like geographic location, climatic conditions, socioeconomic level, and hygiene practices[3,4]. These elements play a role in the regional differences in the frequency and distribution of skin conditions.
With their high humidity, warm temperatures, and fluctuating socioeconomic conditions, tropical places such as North Kerala can have a much different range of dermatological diseases than other regions of the world[5,6]. Comprehending these trends is essential for enhancing healthcare tactics and allocating resources optimally. This study intends to evaluate the incidence of skin illnesses in a dermatological outpatient department (OPD) in the North Kerala, emphasizing the role that environmental and demographic factors have in the distribution of diseases.

Materials and Methods
This study involved a retrospective evaluation of the outpatient clinic data from the Government Homoeopathic Medical College Kozhikode's Dermatology department, dating from June 1, 2023, to June 30, 2024.

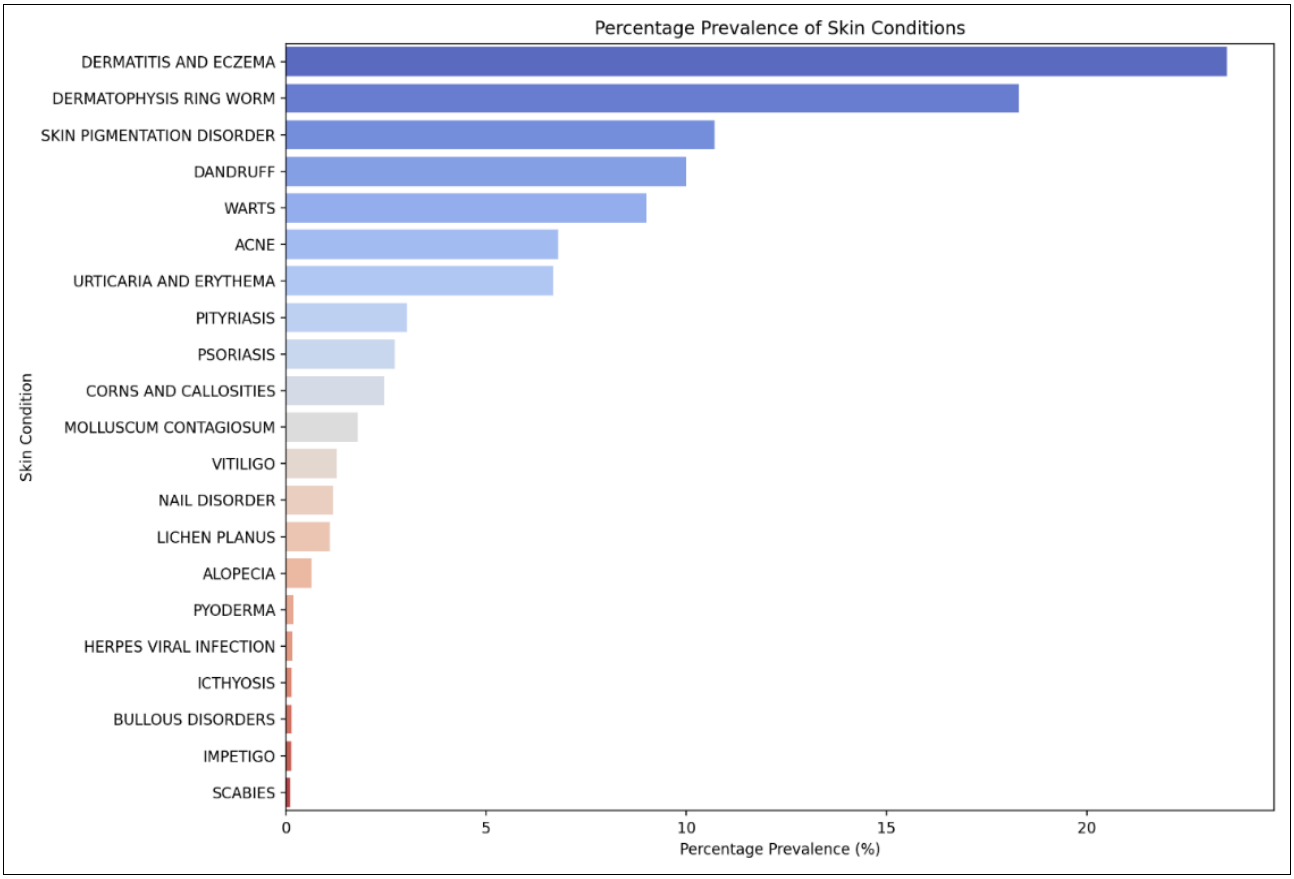
The study included patients who applied to the outpatient dermatological clinic.

Anamnesis and clinical symptoms were used to make the diagnosis of the patients. In the right patients, laboratory tests (such as a fungal direct examination) and histological analyses were carried out. The International Classification of Diseases (ICD-10) was used to categorize the diagnosis.

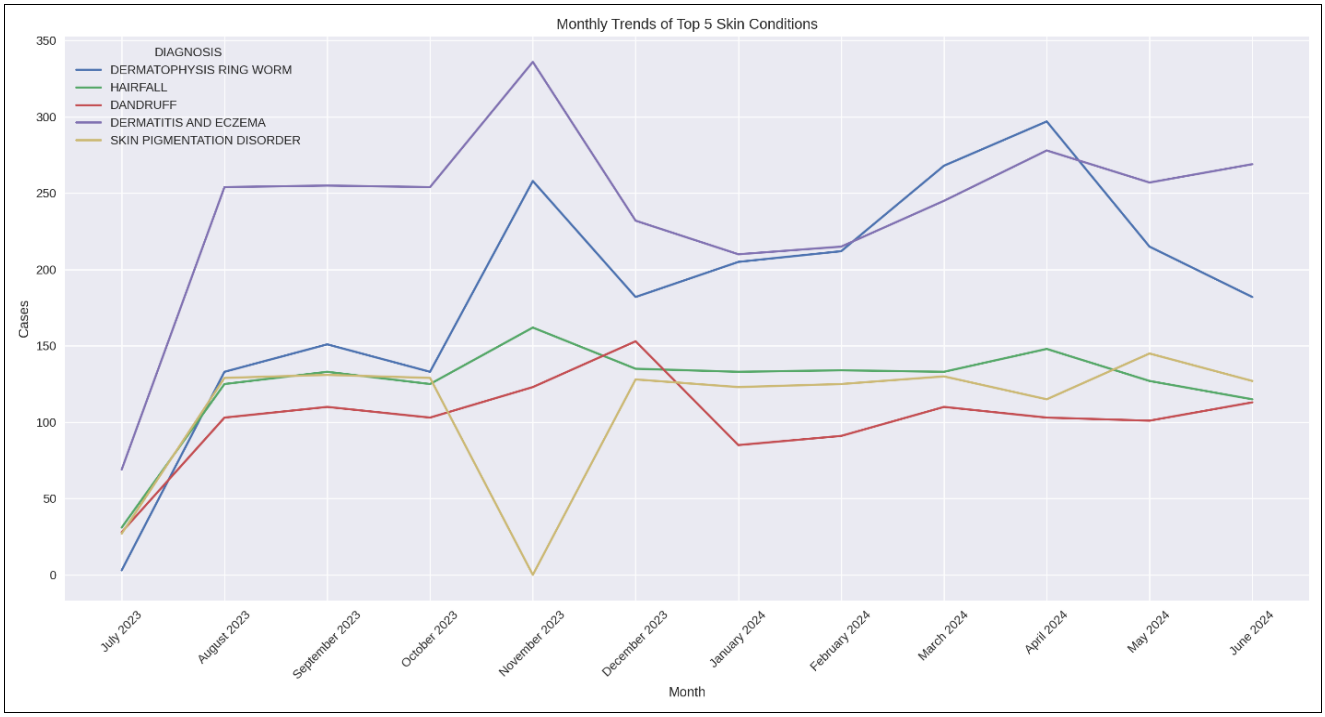
Statistical Results

a) Prevalence based on total number of cases under each diagnosis

Diagnosis	Total Cases	Prevalence Rate (%)
Dermatitis and Eczema	2874	20.93074
Dermatophysis Ring Worm	2239	16.30617
Hairfall	1501	10.93147
Skin Pigmentation Disorder	1309	9.533173
Dandruff	1223	8.906853
Warts	1102	8.025635
Acne	831	6.051999
Urticaria And Erythema	816	5.942757
Pityriasis	369	2.68735
Psoriasis	333	2.425169
Corns And Callosities	300	2.184837
Molluscum Contagiosum	219	1.594931
Vitiligo	155	1.128833
Nail Disorder	143	1.041439
Lichen Planus	134	0.975894
Alopecia	78	0.568058
Pyoderma	23	0.167504
Herpes Viral Infection	19	0.138373
Icthyosis	18	0.13109
Bullous Disorders	17	0.123807
Impetigo	16	0.116525
Scabies	12	0.087393



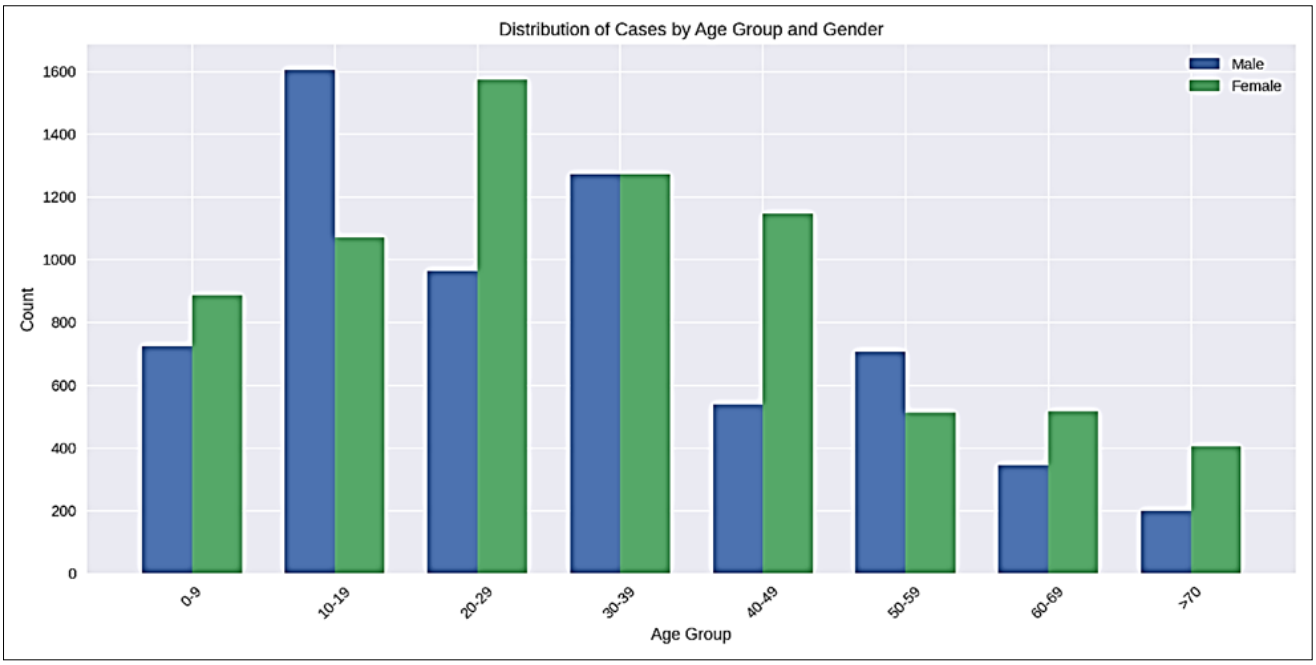
The results indicate that inflammatory skin conditions like Dermatitis and Eczema are the most prevalent in North Kerala, likely due to environmental and genetic factors. Fungal infections such as Dermatophysis are also highly common, reflecting the tropical climate's role in fostering such conditions. Pigmentary disorders and scalp conditions like dandruff highlight cosmetic and lifestyle concerns, while rare conditions like Scabies and Impetigo suggest good hygiene and healthcare access in the region.



The line graph highlights significant monthly variations in the top 5 dermatological conditions, with an upward trend from July 2023 to March 2024 and peaks in March-April 2024. Dermatitis/eczema and dermatophytosis exhibited pronounced fluctuations, while case numbers were lower in the early study months. Among the 13,737 cases, prevalence rates ranged from less than 1% to 20.93%, with a median of 5.97%. Seasonal trends were evident, and the top 5 conditions accounted for 65.71% of cases. Less common conditions, like Impetigo and Herpes infections, showed rates below 1%. These findings underscore the need for resource prioritization and seasonal preparedness.

b) The distribution of cases according to age and gender

Age Group	Male (%)	Male Count	Female (%)	Female Count
0-9	45%	724	55%	886
19-Oct	60%	1606	40%	1071
20-29	38%	964	62%	1575
30-39	50%	1272	50%	1272
40-49	32%	539	68%	1146
50-59	58%	707	42%	513
60-69	40%	344	60%	515
>70	33%	199	67%	404



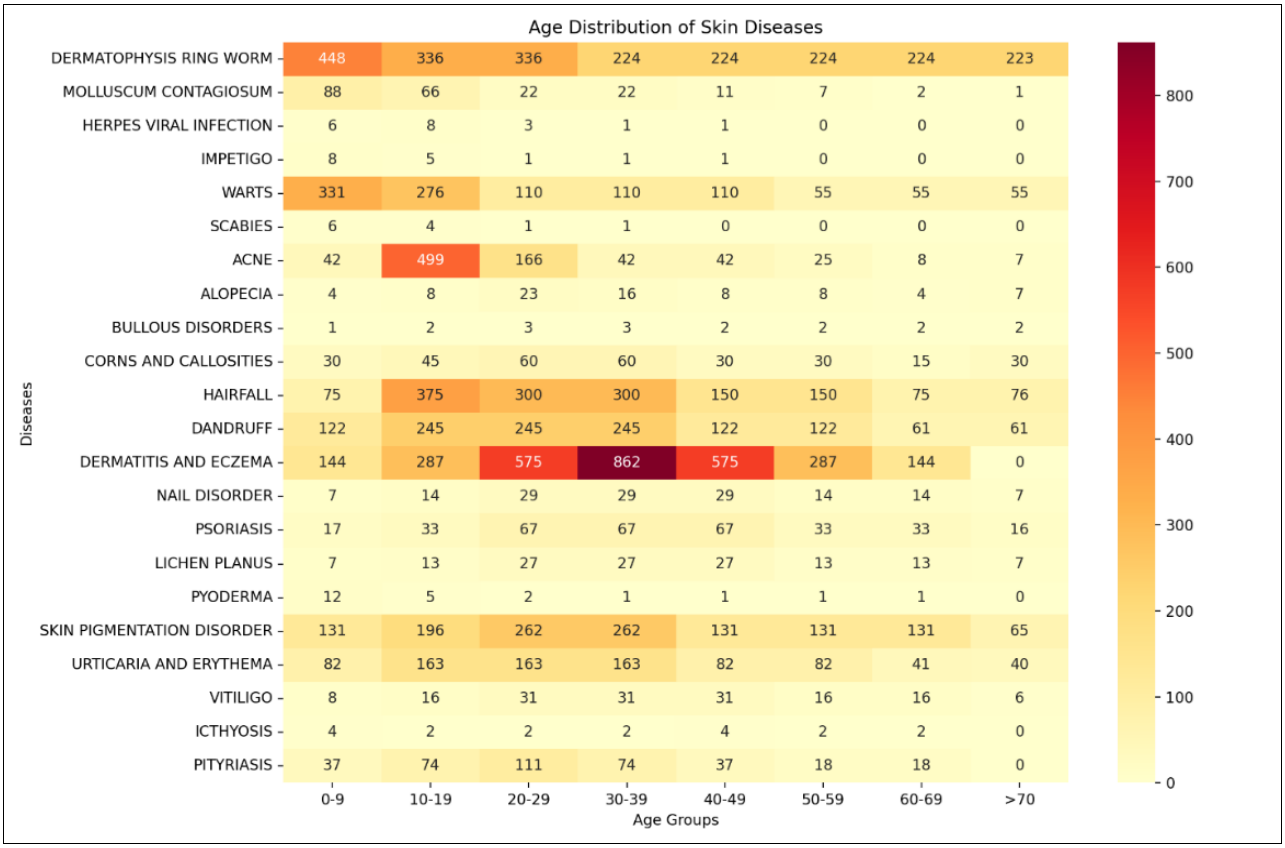
The study analysed 13,737 dermatological cases from a North Kerala outpatient department, revealing key patterns in age and gender distribution. Females constituted a slightly larger proportion of patients, making up 53.74% (7,382 cases), while males accounted for 46.26% (6,355 cases). Adolescents (10–19 years) and young adults (30–39 years) were the largest patient groups, with 2,677 and 2,544 cases, respectively.

Gender distribution varied notably across age groups. Adolescents (10–19 years) showed a clear male predominance (60% males vs. 40% females). This pattern reversed in young adults (20–29 years), where females significantly outnumbered males (62% females vs. 38% males). The 40–49 age group showed the highest female predominance, with females constituting 68% of cases. Among the elderly population (>70 years), females also dominated, making up 67% of cases. Interestingly, the 30–39 age group was the only category with an equal gender distribution (50% each).

A chi-square test confirmed the statistical significance of these findings, yielding a highly significant p-value (1.56e-114), indicating these trends reflect genuine demographic patterns in dermatological consultations at this facility.

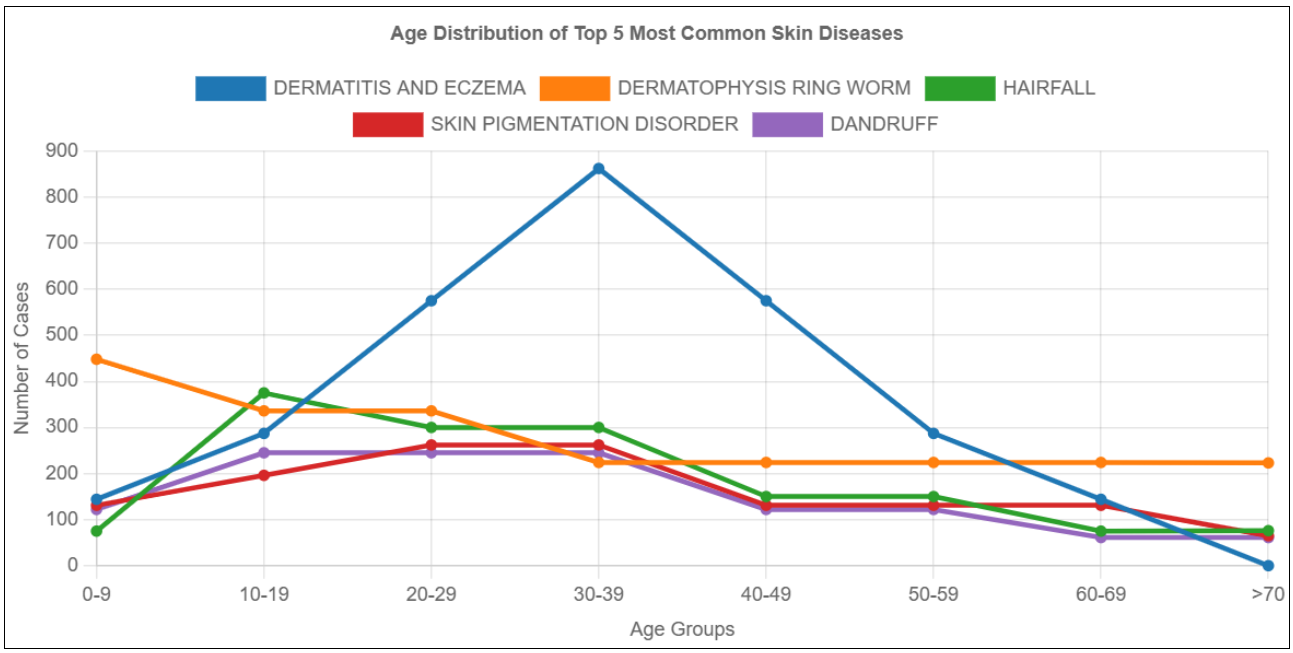
c) Age distribution of most common skin disease

Disease	0-9	10-19	20-29	30-39	40-49	50-59	60-69	>70	Total
Dermatophysis Ring Worm	448	336	336	224	224	224	224	223	2239
Molluscum Contagiosum	88	66	22	22	11	7	2	1	219
Herpes Viral Infection	6	8	3	1	1	0	0	0	19
Impetigo	8	5	1	1	1	0	0	0	16
Warts	331	276	110	110	110	55	55	55	1102
Scabies	6	4	1	1	0	0	0	0	12
Acne	42	499	166	42	42	25	8	7	831
Alopecia	4	8	23	16	8	8	4	7	78
Bullous Disorders	1	2	3	3	2	2	2	2	17
Corns And Callosities	30	45	60	60	30	30	15	30	300
Hairfall	75	375	300	300	150	150	75	76	1501
Dandruff	122	245	245	245	122	122	61	61	1223
Dermatitis And Eczema	144	287	575	862	575	287	144	0	2874
Nail Disorder	7	14	29	29	29	14	14	7	143
Psoriasis	17	33	67	67	67	33	33	16	333
Lichen Planus	7	13	27	27	27	13	13	7	134
Pyoderma	12	5	2	1	1	1	1	0	23
Skin Pigmentation Disorder	131	196	262	262	131	131	131	65	1309
Urticaria And Erythema	82	163	163	163	82	82	41	40	816
Vitiligo	8	16	31	31	31	16	16	6	155
Ichthyosis	4	2	2	2	4	2	2	0	18
Pityriasis	37	74	111	74	37	18	18	0	369



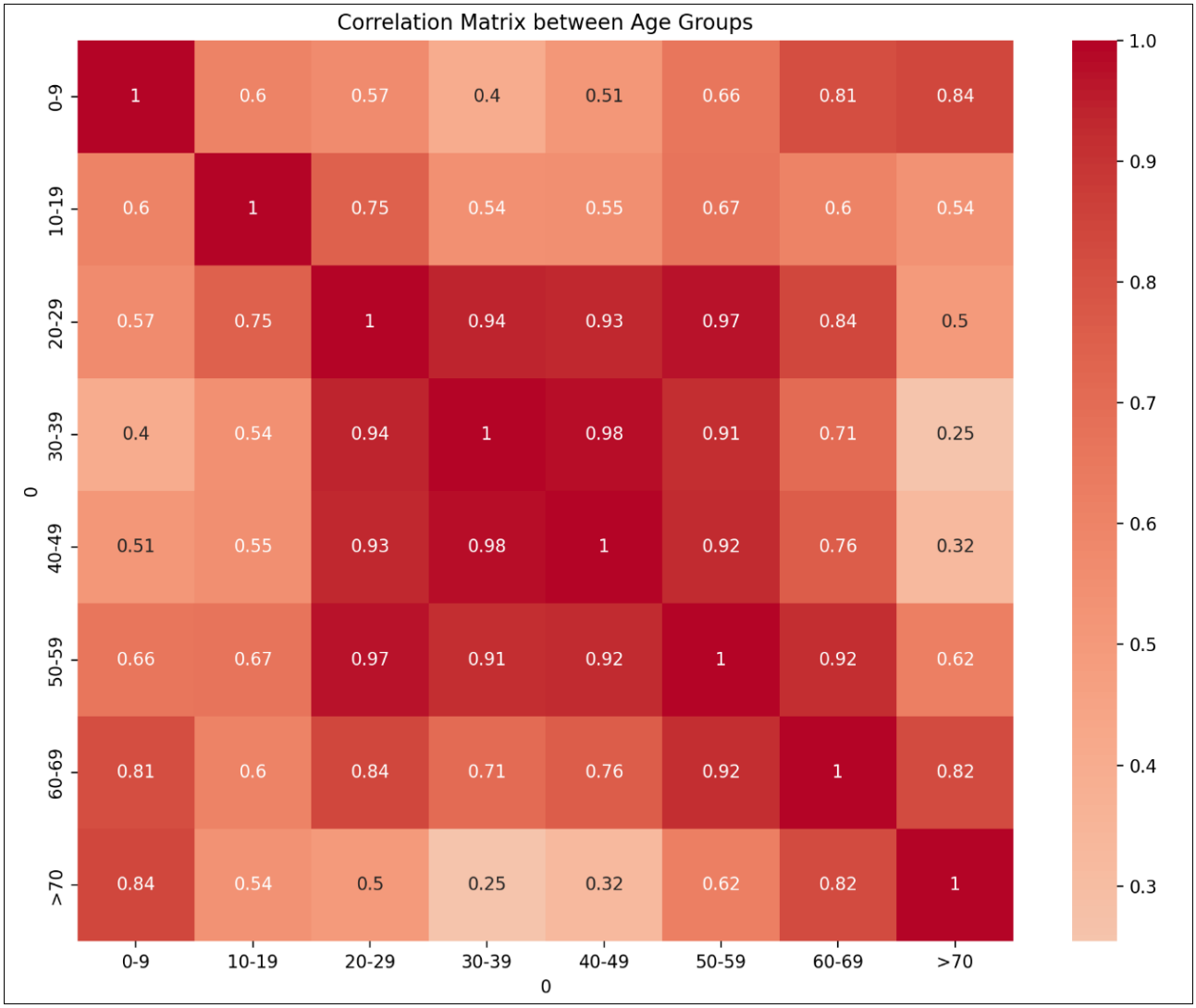
The statistical analysis involved calculating the total prevalence of diseases, the mean and standard deviation of cases across age groups and performing a chi-square test to determine the association between diseases and age groups. The heatmap visualized the distribution, and the chi-square test revealed a significant relationship (p-value = 0.0).

d) Distribution of Top 5 Diseases Across Age Groups



This graph shows how the most prevalent skin diseases vary across different age groups, allowing us to see peak occurrences and patterns.

Correlation Between Age Groups



This heatmap shows how different age groups correlate with each other in terms of disease occurrence. The darker red indicates stronger positive correlations, while darker blue indicates negative correlations.

Statistical Tests for disease occurrence across age group:

- **One-way ANOVA Results: F-statistic: 1.9106201938043699**

P-value: 0.0707058177959211

The ANOVA test suggests a marginally significant difference in disease occurrence across age groups (p-value ≈ 0.07), indicating some variation in disease prevalence across different age groups, though not strongly significant at the conventional 0.05 level.

Discussion

The statistical analysis of 13,737 dermatological cases highlights the significant burden of skin diseases in North Kerala. Dermatitis and eczema emerged as the most prevalent conditions, with a prevalence rate of 20.93%, followed by dermatophytosis at 16.31%. These findings are supported by robust statistical evidence, with gender distribution patterns revealing significant disparities validated by a chi-square test ($\chi^2 = 1.56 \times 10^{-114}$, $p < 0.001$). Seasonal fluctuations in the data, with peaks observed during March-April 2024, emphasize the role of environmental factors in disease occurrence.

Age-wise analysis demonstrated that adolescents and young adults formed the largest patient groups, with dermatitis and eczema peaking in the 30–39 age range. Gender patterns showed a marked predominance of females in most age groups, except among adolescents where males outnumbered females (60%). The ANOVA test ($F = 1.91$, $p \approx 0.071$) indicated marginal differences in disease prevalence across age groups, reflecting varying susceptibilities due to age-specific factors.

Despite these strengths, the study has limitations. The retrospective design relies on existing records, which may introduce reporting bias or inaccuracies. Laboratory confirmation was not uniformly applied, potentially affecting diagnostic precision. Additionally, environmental data, such as humidity and temperature, were not integrated into the analysis. These omissions limit the ability to establish causal relationships between environmental factors and disease prevalence.

The study scope is also confined to a single institution, potentially limiting the generalizability of findings to broader populations. Further, socioeconomic and lifestyle factors were not evaluated, which could provide additional context to the observed trends.

Conclusion

This cross-sectional study highlights the prevalence of skin diseases in North Kerala, with dermatitis, eczema, and dermatophytosis accounting for over one-third of cases. Significant gender and age patterns underscore the need for demographic-specific interventions. Seasonal trends call for preventive measures during high-incidence periods, while the low prevalence of scabies and impetigo reflects improved hygiene and healthcare access.

Limitations and Future Directions

Limitations include the study's retrospective design and single-centre data, suggesting the need for multi-centre, prospective research. Future studies should incorporate environmental and socioeconomic data, explore causal factors using advanced statistical models, and evaluate healthcare interventions to improve dermatological care.

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