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Patterns of Skin Disease Presentation, Treatment Response, and Healthcare Utilization among Elderly Patients in Rural Bangladesh

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Abstract
Background: *Skin diseases are common causes of morbidity worldwide, and older adults in low- and middle-income countries are especially vulnerable because of age-related skin changes, multimorbidity, and poor access to specialist care. This study aimed to describe the patterns of skin disease presentation, treatment response, and healthcare utilization among elderly patients in a rural area of Bangladesh.*
Methods: *This cross-sectional descriptive study was conducted over 12 months among elderly residents (≥50 years) of selected rural communities in Bangladesh. Using consecutive sampling during household visits and community outreach, 175 participants were enrolled; 160 with at least one clinically diagnosed skin disease formed the analytic sample. Data were collected using a pre-tested structured questionnaire and focused clinical examination by a physician with dermatology experience, covering sociodemographic, comorbidities, lifestyle, environmental and hygiene factors, clinical pattern and severity of skin disease, and healthcare-seeking, treatment, and adherence.*
Results: *In a cohort of 160 elderly rural participants with skin disease, the mean age was 66.8 years. Slightly more than half were female, and the majority had normal or overweight body mass index, low educational attainment, and high rates of unemployment. Fungal infections (38%) and scabies (31%) were the most common diagnoses, primarily affecting the legs and other extremities. Many patients initially sought care from informal providers rather than dermatologists. Topical therapy constituted the primary treatment modality. Approximately two-thirds of patients demonstrated at least 50% clinical improvement, while about 10% exhibited minimal or no response. Treatment adherence was suboptimal in a significant minority of cases.*
Conclusion: *Skin disease is very common among elderly people in rural Bangladesh, mainly due to infectious conditions like fungal infections and scabies in the context of frequent hypertension and diabetes. Delayed care, reliance on informal providers, and suboptimal adherence mean that a notable minority do not respond well to treatment, underscoring the need for stronger primary-care dermatology and better community education for timely, appropriate management.*
Keywords: *Geriatric dermatology, Skin diseases, Rural area, Health-seeking behaviour, and Healthcare utilization*

I. INTRODUCTION

Skin diseases are among the most common health problems worldwide, accounting for a significant share of non-fatal morbidity and disability, and are recognized as a global public health priority [1,2]. Global Burden of Disease analyses show that skin and subcutaneous diseases contribute about 1.7 % of total disability-adjusted life years and rank among the top ten causes of years lived with disability [2-4]. Fungal skin diseases, dermatitis, pruritus, scabies, and other inflammatory dermatoses affect hundreds of millions of people, with the burden increasing especially in low- and middle-income countries [3,4]. The global acceleration of population ageing, including in South Asia, has led to a higher proportion of older adults living with multiple chronic conditions, driven by increased life expectancy [1,5]. Age-related structural and functional changes in the skin, together with multimorbidity and polypharmacy, increase older individuals' susceptibility to xerosis, pruritus, eczematous conditions, infections, and ulcers [5-7]. Large hospital-based studies from India and other countries consistently report that more than three-quarters of geriatric patients present with at least one significant dermatosis, with infections, eczemas, and papulosquamous diseases being most common [7-9]. Foundational studies on geriatric dermatoses have demonstrated that the spectrum and frequency of these conditions vary by geography and ethnicity, highlighting the need for context-specific data [6,9]. Recent studies have begun to systematically

characterize dermatological morbidity in older adults. A scoping review of community-dwelling older people identified a wide range of age-related dermatoses but also found significant gaps in evidence for prevention and management, especially in primary care and home settings [5]. Research from rural and semi-urban South Asian centers reports high rates of infections, infestations, dermatitis, and eczemas among older dermatology patients, often alongside hypertension, diabetes, and other systemic illnesses [8-10]. In Bangladesh, outpatient studies have described overall patterns of skin disease in adults and mixed-age groups, with infectious and eczematous dermatoses consistently among the most common [10,11]. However, most data come from urban tertiary hospitals and rarely focus specifically on elderly patients. The clinical and public health significance of geriatric skin disease extends beyond visible lesions. Multiple studies demonstrate that chronic dermatoses significantly impair quality of life, resulting in persistent itch or pain, sleep disturbances, psychological distress, social withdrawal, and reduced functional capacity [12,13]. In older patients, even conditions considered relatively benign can lead to falls, functional decline, and behavioural symptoms, particularly when pruritus and discomfort are inadequately managed [10,14]. Research on quality of life among older dermatology patients indicates that socio-demographic factors, disease severity, comorbidities, and access to specialist care all influence this burden [12,14,15]. These challenges are especially pronounced in rural areas, where access to dermatologists is limited, and older adults often rely on informal providers, pharmacies, or traditional healers for care. Despite these concerns, limited information exists regarding the presentation of skin disease among older adults in rural Bangladesh, the most prevalent conditions, the treatments administered, and patterns of healthcare navigation throughout the course of illness. Existing studies from Bangladesh rarely examine treatment response, adherence, or healthcare utilization patterns among older patients [10,11]. This lack of data constrains the development of age-appropriate primary care, rational referral systems, and targeted health education in rural communities. This study aims to describe patterns of skin disease presentation, treatment response, and healthcare utilization among elderly patients in a rural area of Bangladesh.

II. METHODS

This cross-sectional descriptive study was conducted among elderly residents in selected rural communities of Bangladesh over a defined 12-months period, from (start) to (end). Elderly individuals were operationally defined as those aged 50 years or older, based on local demographic and functional considerations. Consecutive sampling was used to identify all eligible adults residing in the selected villages during household visits and community health outreach sessions. Exclusion criteria included critical illness, severe cognitive impairment, or refusal of skin examination. In total, 175 participants were enrolled, of whom 160 were identified as having at least one dermatological condition. These 160 cases comprised the analytic sample for assessment of skin disease patterns, treatment response, and healthcare utilization.

Data collection involved a pre-tested, structured questionnaire and a focused clinical examination. Trained interviewers gathered information on sociodemographic characteristics, comorbidities and medications, lifestyle factors such as smoking and alcohol use, environmental and hygiene variables, and healthcare-seeking behaviour. A physician with dermatology experience conducted a systematic skin inspection under natural light, documenting the presence and type of skin diseases according to clinical diagnostic criteria, as well as anatomical sites, duration, and severity (graded as mild, moderate, or severe). For participants with skin disease, additional data included time from symptom onset to first provider contact, type of first provider consulted, treatment modalities used, perceived improvement, and adherence to prescribed therapy. The clinician-rated response was recorded at the time of evaluation.

Data were entered into a spreadsheet and analyzed using standard statistical software (SPSS, V-26.0). Continuous variables were summarized as means and standard deviations, while categorical variables were presented as frequencies and percentages. The prevalence of different skin conditions, patterns of presentation, and distributions of treatment and healthcare utilization variables were described for the 160 cases with skin disease. Ethical approval was obtained from the Institutional Review Board of the host institution, and written informed consent was obtained from all participants.

III. RESULTS

Among the 160 elderly participants with skin disease, most were aged 60–69 years (46.25%), with a mean age of about 67 years. Females were slightly more represented than males (53.13% vs 46.88%). Over half had a normal BMI (54.38%), while around one-third were overweight (30.63%), and 11.25% were underweight, with a mean BMI of 23.24 kg/m². Almost all were married (99.38%), the majority were jobless (63.75%), and educational attainment was low, with over half having no formal education (53.13%) and only 1.25% reaching higher education.

Table 1. Sociodemographic and anthropometric characteristics of elderly participants with skin disease in rural Bangladesh (n = 160)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	50–59	25	15.63
	60–69	74	46.25
	70–79	39	24.38
	≥ 80	22	13.75
	Mean ± SD	66.81 ± 10.40	
Gender	Male	75	46.88
	Female	85	53.13
BMI category	Underweight (<18.5)	18	11.25
	Normal (18.5–24.9)	87	54.38
	Overweight (25.0–29.9)	49	30.63
	Obese (≥30.0)	6	3.75
	Mean ± SD (kg/m²)	23.24 ± 4.13	
Marital status	Married	159	99.38
	Widowed	1	0.63
Occupation	Jobless	102	63.75
	Housewife	26	16.25
	Farmer	18	11.25
	Business	12	7.50
	Retired	2	1.25
	Teacher	0	0.00
Educational level	No formal education	85	53.13
	Primary education	49	30.63
	Secondary education	24	15.00
	Higher education	2	1.25

About one-third of patients had hypertension (32.50%), and a similar proportion had diabetes (33.13%), while 14.38% reported cardiovascular disease and 7.50% chronic kidney disease; other chronic conditions were present in 41.25%. Nearly three-quarters were on regular medication (71.88%), and just over one-third reported a family history of skin disease (36.25%). Most participants had never smoked (71.25%), though more than a quarter were current smokers (26.88%). Alcohol use was very uncommon, with 93.75% reporting no consumption.

Table 2. Comorbidities, medication use, and lifestyle factors among elderly participants with skin disease (n = 160)

Variable	Category	Frequency (n)	Percentage (%)
Hypertension	Present	52	32.50
Diabetes	Present	53	33.13
Cardiovascular disease	Present	23	14.38
Chronic kidney disease	Present	12	7.50
Other chronic conditions	Present	66	41.25
Any immunosuppressive condition	Present	47	29.38
Regular medication use	Present	115	71.88
Family history of skin disease	Present	58	36.25
Smoking history	Never smoker	114	71.25
	Current smoker	43	26.88
	Former smoker	3	1.88
Alcohol consumption	No	150	93.75
	Yes	10	6.25

Fungal infections were the most frequent diagnosis (38.13%), followed by scabies (30.63%), dermatitis (10.63%), and eczema (10.00%), which formed smaller but notable proportions, while psoriasis and vitiligo were relatively rare. Lesions most commonly involved the legs (83.75%), with frequent involvement of the arms (63.75%), back (58.75%), and hands (53.75%). The chest was affected in nearly half of the cases (46.88%), whereas scalp and facial involvement were less frequent.

Table 3. Types and anatomical distribution of skin diseases among elderly participants with skin disease (n = 160)

Variable	Frequency (n)	Percentage (%)
Type of skin condition		
Fungal infection	61	38.13
Scabies	49	30.63
Dermatitis	17	10.63
Eczema	16	10.00
Other skin conditions	19	11.88
Psoriasis	8	5.00
Vitiligo	3	1.88
Skin ulcers	0	0.00
Location of skin condition		
Legs	134	83.75
Arms	102	63.75
Back	94	58.75
Hands	86	53.75
Chest	75	46.88
Scalp	25	15.63
Face	19	11.88
Other location(s)	12	7.50

Just over a third of patients sought care within 7 days of symptom onset (36.25%), while the largest group presented between 8 and 30 days (41.88%); more than one-fifth delayed care for over 30 days (21.88%). Initial contact was predominantly with informal or non-specialist providers: village doctors/quacks (29.38%) and pharmacy/drug sellers (27.50%) were consulted more often than MBBS doctors (23.75%). Dermatologists were the first providers in only 6.25% of cases, and a smaller proportion relied on traditional healers or self-medication.

Table 4. Health-seeking behaviour at the onset of skin disease among elderly participants with skin disease (n = 160)

Variable	Category	Frequency (n)	Percentage (%)
Time from onset to first provider contact	≤ 7 days	58	36.25
	8–30 days	67	41.88
	> 30 days	35	21.88
First provider consulted	Dermatologist	10	6.25
	MBBS doctor (non-dermatology)	38	23.75
	Village doctor / quack	47	29.38
	Pharmacy / drug seller	44	27.50
	Traditional healer	14	8.75
	Self-medication	7	4.38

Almost half of the patients were managed with topical therapy alone (48.75%), reflecting a firm reliance on creams and ointments. About one-quarter received a combination of topical and systemic treatment (26.25%), while 14.38% received systemic agents only. Procedural or minor surgical interventions were uncommon (3.13%), and 7.50% received only referral or advice without active pharmacologic treatment.

Table 5. Treatment modalities used for the current skin condition among elderly participants with skin disease (n = 160)

Treatment modality	Frequency (n)	Percentage (%)
Topical only	78	48.75
Systemic only	23	14.38
Both topical and systemic	42	26.25
Procedure / minor surgery	5	3.13
Referral only / advice only	12	7.50

From the patient perspective, nearly half reported being “much improved” (49.38%) and a further 22.50% “slightly improved”, while 13.13% felt completely recovered; 15.00% perceived no change or worsening. Clinician assessment showed complete clearance in 11.25% and ≥50% improvement in just over half of cases (51.25%), with 26.88% showing <50% improvement and 10.63% judged as non-responders or deteriorated. Adherence was generally acceptable, with 58.75% classified as having good adherence and 23.75% moderate; however, 11.25% had poor adherence and 6.25% had stopped treatment on their own.

Table 6. Treatment outcomes and adherence to therapy among elderly participants with skin disease (n = 160)

Variable	Category	Frequency (n)	Percentage (%)
Self-reported improvement	Completely recovered	21	13.13
	Much improved	79	49.38
	Slightly improved	36	22.50
	No change / worse	24	15.00
Clinician-rated response	Complete clearance	18	11.25
	≥ 50 % improvement	82	51.25
	< 50 % improvement	43	26.88
	No response / deterioration	17	10.63
Adherence to treatment	Good (≥ 80 %)	94	58.75
	Moderate (50–79 %)	38	23.75
	Poor (< 50 %)	18	11.25
	Stopped on own	10	6.25

IV. DISCUSSION

This study demonstrates a substantial burden of skin disease among elderly residents in rural Bangladesh, with over 90% of screened older adults presenting at least one clinically evident dermatosis. Infectious conditions were predominant: dermatophyte and other fungal infections accounted for 38.1% of cases, and scabies for 30.6%. Eczematous and dermatitis-type disorders represented a smaller but significant proportion. This distribution aligns with findings from geriatric dermatology series, where infections and eczematous conditions are frequently reported as leading diagnoses in older adults, although non-infective disorders such as pruritus, xerosis, and eczema often predominate in hospital-based cohorts [7,6,8]. In contrast, the community-based rural sample in this study reveals a greater prevalence of communicable dermatoses, likely reflecting increased exposure to crowding, limited water access, shared bedding, and contact with domestic animals. Bangladeshi hospital studies also report mixed profiles of infective and non-infective skin diseases. Sattar et al. found that non-infective dermatoses slightly outnumbered infective conditions among adults attending a tertiary dermatology outpatient department, although scabies and tinea infections remained prominent within the infective group [10]. The higher proportions of fungal infection and scabies among the rural elderly suggest that age, environment, and care-seeking behaviors influence the case mix, with older individuals in agrarian communities experiencing greater exposure to chronic moisture, minor trauma, and shared living spaces. Community-based research from rural Laos similarly identified high frequencies of eczema, dermatophyte infections, and scabies in low-income, agricultural settings, highlighting the significance of communicable dermatoses in rural South and South-East Asia [16]. The age and sex distribution of the cohort, with most patients between 60 and 69 years and a slight female predominance, is consistent with several Indian geriatric studies, where the sixth and seventh decades account for the largest proportion of cases and women often outnumber men in clinic populations [6-8]. Coexisting non-communicable diseases were common; approximately one-third of patients had hypertension or diabetes, and over 40% reported other chronic conditions. Similar clustering of cardiometabolic morbidity with geriatric dermatoses has been observed in Indian tertiary centers, where diabetes, hypertension, and cardiovascular disease are prevalent among older dermatology patients [17,18]. Such multimorbidity may increase susceptibility to fungal infections, impair skin barrier repair, and complicate treatment decisions, particularly when systemic antifungals or corticosteroids are considered. Lesions were predominantly located on the legs and other extremities, with more than 80% of patients reporting lower limb involvement and over half reporting lesions on the hands and arms. This anatomical distribution is consistent with occupational and environmental exposures typical of rural life, such as barefoot walking, prolonged immersion in waterlogged fields, and friction from simple footwear [16]. Healthcare utilization patterns observed in this study are notable. Only about 30% of participants initially consulted a qualified MBBS doctor or dermatologist, while nearly 60% first sought care from village doctors, unregulated drug sellers, or traditional healers, and an additional proportion self-medicated. This reliance on informal providers reflects broader trends in Bangladesh, where the informal sector, particularly pharmacies and village practitioners, plays a dominant role in primary care for common illnesses despite the availability of formal services [19,20]. Qualitative research from rural Bangladesh indicates that traditional healers and home-based remedies remain integral to local health cultures and are used for a range of physical and spiritual complaints [19]. These findings indicate that skin disease in the elderly is primarily managed within this pluralistic system, with implications for diagnostic accuracy, rational use of topical steroids and antifungals, and timely referral for severe or atypical conditions. Treatment patterns and outcomes were generally favorable but not optimal. Approximately three-quarters of patients received topical therapy alone or in combination with systemic regimens, and nearly two-thirds reported complete recovery or significant improvement, which is consistent with hospital-based reports of moderate to good short-term response in common geriatric dermatoses [17,18]. However, 15% of patients reported no improvement or worsening, and clinicians identified about 10% as non-responders. Approximately 40% of

patients demonstrated poor adherence, including those who discontinued treatment prematurely, a challenge widely recognized in chronic dermatological conditions. Indian and Bangladeshi studies emphasize that pruritic, chronic, and cosmetically distressing dermatoses can significantly impair quality of life and require sustained, often complex regimens, which are difficult to maintain in low-resource rural settings [17,18].

Limitations of the study: Skin diseases were diagnosed clinically without routine laboratory or histopathological confirmation, and information on health-seeking behaviour, treatment use, and adherence was based on self-report, which is subject to recall and reporting bias.

V. CONCLUSION

The findings indicate that skin disease is highly prevalent among elderly individuals in rural Bangladesh, with the majority presenting with infectious conditions such as fungal infections and scabies, primarily affecting the lower limbs and other exposed areas. Multimorbidity was frequently observed, particularly hypertension and diabetes. A significant proportion of patients sought care from informal providers, pharmacies, or traditional healers, often following delays in seeking treatment. While many participants reported moderate to good clinical improvement, a notable minority experienced poor response and suboptimal adherence to therapy. Collectively, these results underscore a substantial yet under-recognized burden of geriatric dermatoses in rural communities and emphasize the necessity to strengthen primary-care dermatology, enhance early recognition and referral, and implement community-based education on skin hygiene, appropriate treatment, and timely consultation for dermatological complaints among older adults.

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