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Original Research Article

Comparative study of topical steroid misuse in urban and rural patients: public health implications

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ABSTRACT

Background: Topical corticosteroids are widely used for a variety of dermatological conditions, but their irrational and unsupervised use has become a major public health concern, particularly in low- and middle-income countries. Misuse can lead to adverse effects such as tinea incognito, steroid-induced acne, skin atrophy, and other cutaneous complications. This study aimed to compare the prevalence, patterns, sources, potency, duration, and adverse effects of topical steroid misuse between urban and rural patients.
Methods: This cross-sectional comparative study was conducted from July 2025 to December 2025, in the dermatology outpatient department at Mymensingh Medical College Hospital, Mymensingh, Bangladesh to assess topical steroid misuse in urban and rural populations. A total of 102 patients were enrolled, divided into urban (n=52) and rural (n=50) groups.
Results: Urban patients mainly misused topical steroids for acne (34.6%), while rural patients primarily used them for fungal infections (44%, $p<0.05$). Pharmacists were the leading source of recommendation, particularly in rural areas (48% vs. 34.6%, $p=0.04$). Moderate-potency steroids were more common in urban patients, whereas super-potent steroids and longer duration of use (>3 months) were significantly higher in rural patients (36% and 68%, respectively, $p<0.05$). Adverse effects differed by setting, with tinea incognito more frequent in rural patients (44%, $p=0.01$) and steroid-induced acne more common in urban patients (30.8%, $p=0.048$); other complications showed no significant differences.
Conclusions: Topical steroid misuse is common across both urban and rural populations, with rural patients tending to use steroids for longer periods, depending more on pharmacists, and experiencing more fungal-related complications, whereas urban patients primarily misuse them for acne treatment and cosmetic purposes.

Keywords: Steroid misuse, Rural patient, Pharmacists

INTRODUCTION

Topical corticosteroids (TCS) are widely prescribed in dermatological practice because of their potent anti-inflammatory, immunosuppressive, and antiproliferative properties. When used rationally under medical supervision, they are effective in managing various inflammatory skin disorders such as eczema, psoriasis, and contact dermatitis. However, the misuse and overuse of topical steroids have emerged as a significant public health

concern, particularly in developing countries, where these medications are often available over the counter without prescription.[1,2] In recent years, inappropriate use of topical steroids for non-indicated conditions such as acne, pigmentation disorders, fungal infections, and cosmetic skin lightening has increased alarmingly.[3] Easy accessibility, lack of awareness regarding adverse effects, aggressive marketing of fixed-dose combination creams, and advice from non-medical personnel contribute substantially to this growing problem.[4] Prolonged and irrational use of potent steroids can lead to various adverse cutaneous effects, including skin atrophy, telangiectasia, steroid-induced acne, perioral dermatitis, tinea incognito, and steroid rosacea, often complicating the clinical presentation and delaying accurate diagnosis.[5,6]

The public health implications of topical steroid misuse are considerable. Steroid-modified dermatophytosis has become increasingly prevalent, posing therapeutic challenges and contributing to antifungal resistance.[7] Furthermore, the chronicity of steroid-induced dermatoses increases healthcare utilization, economic burden, and psychological distress among affected individuals. These consequences highlight the need for improved surveillance, regulation, and education regarding topical steroid use.[8] Urban–rural differences in healthcare access, literacy levels, cultural beliefs, and healthcare-seeking behaviour may influence patterns of topical steroid misuse. Urban populations often have greater access to healthcare facilities and dermatologists, but are also more exposed to cosmetic pressures and marketing strategies promoting fairness creams containing potent steroids.[3] Conversely, rural populations frequently rely on pharmacists, traditional healers, or informal healthcare providers due to the limited availability of specialist care, leading to unsupervised and prolonged use of topical steroids.[7] Several studies from South Asia have documented a higher prevalence of topical steroid misuse in rural settings compared to urban areas, with rural patients often presenting at later stages and with more severe complications.[7-9] Lack of awareness regarding adverse effects, lower educational status, and poor regulatory enforcement in rural areas further exacerbate the problem. However, urban misuse is also substantial and often driven by cosmetic misuse, particularly among young adults and adolescents.[3-5]

Despite growing literature on topical steroid misuse, comparative studies assessing differences between urban and rural populations remain limited. Understanding these differences is crucial for designing targeted public health interventions. Identifying population-specific drivers of misuse can aid policymakers in implementing stricter drug regulations, educating pharmacists and primary care providers, and developing community-based awareness programs.[8,9] Therefore, this study aims to compare the patterns, indications, sources, and adverse effects of topical steroid misuse among urban and rural patients and to assess its public health implications.

METHODS

This cross-sectional comparative study was conducted from July 2025 to December 2025, in the dermatology outpatient department at Mymensingh Medical College Hospital, Mymensingh, Bangladesh to assess topical steroid misuse in urban and rural populations. A total of 102 patients were enrolled, divided into urban (n=52) and rural (n=50) groups. Patients aged ≥15 years with a history of inappropriate topical steroid use were included, while those using steroids under dermatological supervision or with incomplete histories were excluded. Data were collected using a structured questionnaire covering demographics, indications, source, potency, duration of use, and adverse effects, which were also confirmed clinically. Steroid potency was classified as moderate, potent, or super-potent, and duration as ≤3 months or >3 months. Adverse effects such as tinea incognito, steroid acne, skin atrophy, telangiectasia, and steroid rosacea were recorded. Ethical approval was obtained, and informed consent was taken from all participants. Data were analyzed using SPSS 25.0; categorical variables were expressed as numbers and percentages, continuous variables as mean±SD, and comparisons between urban and rural groups were performed using the Chi-square test and independent t-test, with $p < 0.05$ considered significant.

RESULTS

The mean age of urban patients was 27.8±6.4 years compared to 29.6±7.1 years in rural patients, with no statistically significant difference (p=0.18). Male patients constituted 53.8% of the urban group and 62.0% of the rural group (p=0.39). Literacy was significantly higher among urban patients (88.5%) compared to rural patients (62.0%), and this difference was statistically significant (p=0.003) (Table 1). Acne was the most common indication among urban patients (34.6%) compared to rural patients (18.0%), and this difference was statistically significant (p=0.048). In contrast, fungal infections were significantly more common in rural patients (44.0%) than urban patients (19.2%) (p=0.006). Misuse for hyperpigmentation was observed in 23.1% of urban and 12.0% of rural patients (p=0.14), while eczema or itching accounted for 13.5% of urban and 20.0% of rural cases (p=0.36). Use for skin lightening was relatively low in both groups (9.6% urban vs 6.0% rural; p=0.49) (Table 2).

Table 1: Socio-demographic characteristics of the study population (n=102).

Variable	Urban	Rural	P value
Mean age (years)	27.8±6.4	29.6±7.1	0.18
Male sex (%)	53.8	62.0	0.39
Literacy (%)	88.5	62.0	0.003

Pharmacists were the most common source of topical steroid recommendation in both groups, reported by 34.6% of urban and 48.0% of rural patients, with the difference

being statistically significant (p=0.04). Dermatologists accounted for 17.3% of recommendations in urban patients and 8.0% in rural patients (p=0.16). Recommendations from friends or relatives were reported by 21.2% of urban and 28.0% of rural patients (p=0.41), while self-medication was noted in 26.9% of urban patients compared to 16.0% of rural patients (p=0.18) (Table 3).

Table 2: Indications for topical steroid misuse (n=102).

Indications	Urban (%)	Rural (%)	P value
Acne	34.6	18.0	0.048
Fungal infection	19.2	44.0	0.006
Hyperpigmentation	23.1	12.0	0.14
Eczema/itching	13.5	20.0	0.36
Skin lightening	9.6	6.0	0.49

Table 3: Source of recommendation for topical steroid use (n=102).

Sources	Urban (%)	Rural (%)	P value
Dermatologist	17.3	8.0	0.16
Pharmacist	34.6	48.0	0.04
Friends/relatives	21.2	28.0	0.41
Self-medication	26.9	16.0	0.18

Moderate-potency topical steroids were used by 32.7% of urban patients and 16.0% of rural patients, with a statistically significant difference (p=0.04). Potent steroids were used by 40.4% of urban and 48.0% of rural patients, without a significant difference (p=0.43). Super-potent steroids were used significantly more often in rural patients (36.0%) compared to urban patients (26.9%) (p=0.03) (Table 4).

Use of topical steroids for ≤3 months was reported by 57.7% of urban patients compared to 32.0% of rural patients, showing a statistically significant difference (p=0.01). Conversely, prolonged use exceeding 3 months was significantly higher among rural patients (68.0%) than urban patients (42.3%) (p=0.008) (Table 5).

Table 4: Potency of topical steroids used (n=102).

Potencies	Urban (%)	Rural (%)	P value
Moderate	32.7	16.0	0.04
Potent	40.4	48.0	0.43
Super-potent	26.9	36.0	0.03

Tinea incognito was observed in 21.2% of urban patients and 44.0% of rural patients, with the difference being statistically significant (p=0.01). Steroid-induced acne occurred more frequently in urban patients (30.8%) than rural patients (16.0%), also reaching statistical significance (p=0.048). Skin atrophy was noted in 17.3% of urban and 20.0% of rural patients (p=0.72).

Table 5: Duration of topical steroid use (n=102).

Durations	Urban (%)	Rural (%)	P value
≤3 months	57.7	32.0	0.01
>3 months	42.3	68.0	0.008

Table 6: Adverse effects observed (n=102).

Adverse effects	Urban (%)	Rural (%)	P value
Tinea incognito	21.2	44.0	0.01
Steroid acne	30.8	16.0	0.048
Skin atrophy	17.3	20.0	0.72
Telangiectasia	15.4	12.0	0.62
Steroid rosacea	15.4	8.0	0.24

Telangiectasia occurred in 15.4% of urban and 12.0% of rural patients (p=0.62), while steroid rosacea was observed in 15.4% of urban and 8.0% of rural patients (p=0.24), with no significant differences for these outcomes (Table 6).

DISCUSSION

In the present study of 102 patients with topical steroid misuse, the mean age was 28.7 years, with most patients in the 26–40 age group, and males slightly predominated (57.8%). Literacy was significantly higher among urban patients (88.5%) than rural patients (62.0%, p=0.003). Similar demographic trends have been observed in other settings where misuse predominates in young adults, although many previous studies report a female preponderance. In a large observational study of topical steroid misuse, Saraswat et al found that 85% of the 200 patients were female, with the majority in the 21–50 age range, indicating that misuse affects young populations across settings, though gender distribution may vary by region and cultural factors.[1]

The pattern of indications for misuse in our study showed a significant urban–rural difference: acne was more frequent among urban subjects (34.6% vs. 18.0%, p=0.048), whereas rural patients had a higher proportion of fungal infection misuse (44.0% vs. 19.2%, p=0.006). These findings are consistent with a cross-sectional study in New Delhi, where fungal infection (38%) and acne (29%) were the leading indications for steroid misuse among 250 patients presenting with adverse effects, indicating that fungal infections are a common driver of irrational use, especially in contexts where over-the-counter access is easy.[10] However, cosmetic use, including fairness or pigmentation concerns, also frequently motivates steroid misuse; Chaudhary reported acne and cosmetic purposes among significant indications in Indian dermatology outpatients.[11] The variation in indications between urban and rural settings in our study underscores the influence of local health-seeking behaviours and accessibility of care. Regarding the source of recommendation, our study found

that pharmacists were a significantly more common source in rural patients (48.0%) compared with urban patients (34.6%, p=0.04).

Self-medication and advice from friends or relatives were also frequent. This aligns with previous work demonstrating that non-professional recommendation is a major factor in steroid misuse: in a prospective study in Jammu, pharmacists accounted for 34.5% of recommendations, with friends and relatives contributing 30.5%.[12] In terms of potency, the present study showed that moderate-potency steroids were more common in urban patients, while rural patients used super-potent steroids to a greater extent (p=0.03).

Similar concerns about high-potency steroid abuse have been identified in multiple studies: in a tertiary care survey, betamethasone and clobetasol preparations were among the most commonly abused steroids.[1-12]

The duration of misuse in our study was significantly longer in rural patients, with 68.0% using steroids for more than three months (p=0.008). Long duration of use has been widely reported; in a large prospective observational cohort, duration ranged from one month to three years among patients misusing topical steroids daily.[1]

Prolonged misuse increases the risk of adverse effects, and our rural cohort's extended use likely contributed to the higher rate of infections and complications. Our adverse effect findings demonstrated that tinea incognito was significantly more common among rural patients (44.0% vs. 21.2%, p=0.01), whereas steroid acne was more frequent among urban patients (30.8% vs. 16.0%, p=0.048). Previous studies have similarly identified tinea incognito and steroid acne as frequent complications; in the New Delhi cohort, tinea incognito (26.4%) and facial acne (25.6%) were the predominant adverse events, and in a South Rajasthan study, tinea incognito accounted for nearly half of the presentations, followed by acne.[10-13]

Limitations

The study was conducted at a single center with a relatively small sample, relied on patient self-reporting for steroid use, and did not include long-term follow-up to assess persistent complications.

CONCLUSION

Topical steroid misuse is highly prevalent in both urban and rural populations, with rural patients showing longer duration of use, greater reliance on pharmacists, and higher rates of fungal complications, while urban misuse is more often for acne and cosmetic purposes.

Recommendations

Strict regulation of over-the-counter topical steroids, pharmacist and community education on safe use, and targeted public awareness campaigns are urgently needed to reduce misuse and prevent adverse dermatological outcomes.

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