

Original Article

Scabies Among Adolescent Girls in Residential Madrasah: Epidemiological & Socio-Economic Comparison Between Urban & Rural

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Abstract:

Background:

Scabies, a contagious parasitic skin infestation caused by *Sarcoptes scabiei* var. *hominis*, remains prevalent in low-resource settings, reportedly more among adolescent girls of densely populated Madrasahs. Poor hygiene, overcrowding, and limited awareness is responsible for scabies transmission. It remains crucial to study this issue for more effective measures against scabies.

Objective:

To compare the socio-demographic, behavioral, and environmental determinants of scabies among adolescent girls both in urban and rural Madrasahs.

Methodology:

This cross-sectional designed comparative study was conducted from June to October 2025 among 174 adolescent girls (61 urban, 113 rural) using a structured questionnaire and physical examinations. Data on hygiene behavior, nutrition, and awareness were analyzed using SPSS version 25.0 using Chi-square (χ^2) tests to assess existing associations.

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Findings:

Of the total respondents (adolescent girls) 92% were studied from rural and 16.1% from urban, madrasahs. Level of low parental education (<SSC) might have limited them in health care awareness building. Nearly 65% reportedly used combined toilets and 46% shared clothes with each other that reportedly aggravate contamination of scabies

infestation among them. With an overall scabies recurrence (>2-3 times) was high (74%), the common symptoms were blisters between fingers (67.7%) and, under-arms circular patches (27%), and lower body parts were not allowed to check since they were females. Reportedly, poor ventilation (40%) and low mineral intake (57%) might have provoked scabies infestations/ susceptibility among madrasahs girls both in rural and urban areas.

Conclusion:

Higher prevalence of scabies due to poorer hygienic practices among rural female madrasahs may aggravate BY poverty, poor hygiene-practice, bizarre sleeping, poor sanitation, added by negative influence of lower parental education may have aggravated scabies infestations yielding poor nutrition among those adolescent girls of residential Madrasahs. Addressing health education, improved sanitation, adequate ventilation, and promoting nutritional awareness deem essential for the prevention and control of scabies infestations among adolescent girls' both in urban & rural female madrasahs.

Introduction:

Scabies, caused by *Sarcoptes scabiei* var. *hominis*, remains highly contagious parasitic skin disease recognized by the World Health Organization as a neglected tropical diseases-NTD.1-5 Globally, over 200–300 million individuals are affected annually, particularly among children & adolescents in lower and middle-income countries, disproportionately impacted, highlighting the global expert consensus on scabies as a major public health priority requiring coordinated action.16 Transmission occurs through prolonged skin-to-skin contact and contaminated bedding or clothing. 2-9

Prevalence of scabies in Bangladesh particularly among Madrasa students, higher in rural areas are reported due to overcrowding, poor sanitation, and limited healthcare access.11 Institutional outbreaks have been documented by Anwar et al (2007, 2023), who highlighted role of overcrowded dormitories, shared clothing, and poor ventilation in sustaining transmission.11 Further, female students repeatedly face additional challenges, including

modesty-related barriers to treatment, shared clothing, and psychosocial stigma aligning with early findings on scabies burden and its relationship with hygiene practices in urban Bangladesh. 3,12

This study, thus, compares prevalence of scabies and its associated determinants among adolescent girls between urban and rural Madrasahs, aiming to inform culturally sensitive interventions, per se.

Methods:

This cross-sectional designed comparative study was conducted between June and October 2025 among 174 adolescent girls (aged 10–18 years). Of them, 61 were enrolled from urban Madrasahs, and 113 from rural ones. Data were collected using a structured questionnaire covering socio-demographic characteristics, hygiene practices, nutrition, and awareness, alongside physical examinations to confirm scabies symptoms and treatments, following standardized international consensus criteria (IACS) and clinical practice guidelines that emphasize characteristic lesions and pruritus.¹³⁻¹⁴

Chi-square tests were applied to assess associations between hygiene practices and scabies prevalence.⁷ Ethical approval was obtained from Bangladesh Home Economics College. The methodological framework was followed from earlier institutional scabies study conducted by Anwar.¹¹

Results:

Socio-demographic Characteristics

The majority of respondents (92%) and their parents had education below SSC level, limiting awareness about hygiene and disease prevention.³ Rural Madrasahs enrolled younger students (ages 10–13), while urban Madrasahs had older students (14 years and above). Nearly more than half of the respondents lived in villages, and resided in slums, reflecting socio-economic vulnerability.¹¹

Environmental and Behavioral Factors:

Overcrowding was a common feature, with 65% students using combined bathrooms. Sharing of clothes and towels was reported by 46% respondents, particularly from rural Madrasahs.

Bedding hygiene was poor among rural students (wash bed sheets and pillow cover only once every 2 weeks or not at all). Poor ventilation was reported by 40.2% of respondents, contributing to seasonal worsening of symptoms.²⁻⁴

Clinical Findings

Scabies recurrence was high, with 74.1% of students reporting repeated episodes. The most common symptoms included blisters (67.7%) and circular patches (26.9%). Rural students reported greater symptom severity and worsening during seasonal changes, linked to poor ventilation and limited access to clean water.^{6, 9, 11}

Nutritional Determinants

Nutritional deficiencies were evident, with low mineral intake contributing to susceptibility of scabies. Only 56.9% respondents reported adequate zinc consumption, highlighting role of diet in immune defense against scabies.

Comparative Summary:

Overall, rural Madrasahs demonstrated higher prevalence, poorer hygiene practices, and greater recurrence of scabies compared to urban madrasahs. Socio-economic disadvantages, overcrowded & bizarre living arrangements, and limited parental education were the key determinants of scabies persistence in such rural settings.^{3, 11}

Table-1: Age Specific Distribution of Adolescent Madrasah Girls across districts

Age of adolescent girls in Madrasah	District and Upazila				P-value (x ² /FET)	Comment
	Savar	Old Dhaka	Matlab	Thakurgaon		
10-11 years (n=62)	9	9	32	12	0.03	*Significant
12-13 years (n=58)	11	6	22	19		
14-15 years (n=40)	7	10	14	9		
>15 years (n=14)	2	7	4	1		
Total =174	29	32	72	41		

Table-1 describes among 174 adolescent girls, younger pupils (10–13 years) were mainly concentrated in rural districts, especially Matlab and Thakurgaon, while older pupils (≥14 years) were more common in urban centers such as Purno Dhaka. This reflects a clear rural–urban difference in age composition of Madrasah students.

Table-2: Age Specific Distribution of Adolescent Girls from Urban & Rural Residential Madrasahs

Age of madrasah pupil	Place of Madrasah		P-value (χ^2 /FET)	Comment
	Urban	Rural		
10-11 years (n=62)	18	44	0.04	*Significant
12-13 years (n=58)	17	41		
14-15 years (n=40)	17	23		
>15 years (n=14)	9	5		
Total =174	61	113		

Table-2 describes the age-specific comparison of 174 adolescent girls studying in various Madrasahs, located in 61 urban and 113 in rural areas. The age group distribution yielded a significant difference among Madrasah girls: the younger aged respondents belonging to 10-11, and, 12-13 years were more from rural areas than that of in urban ones having elderly students of >15 yrs, $p < 0.04$ (Tab-2).

Table-3: Association Between Age of Madrasah Pupils and Patient Education

Age of madrasah pupil	Patient education				P-value (χ^2 /FET)	Comment
		<5	5-SSC	SSC-HSC	0.02	*Significant
	10-11 years (n=62)	36	23	3		
	12-13 years (n=58)	18	34	6		
	14-15 years (n=40)	11	26	3		
	>15 years (n=14)	4	8	2		
Total	n=174	69	91	14		

A significant association was observed between age and patient education among pupils aged 10–11 years, where lower education levels were more frequent. No significant association was found in age groups of girls (Tab-3).

Table-4: Association Between Father's Education and Urban/Rural Residence of Pupils.

Paternal Education	Study areas (urban or rural Madrasahs)		P-value (χ^2 /FET)	Comment
	Urban	Urban		
Class <5 (n=85)	22	63	0.03	*Significant
5-SSC(n=62)	29	33		
SSC-HSC (n=27)	10	17		
Total= 174	61	113		

A significant association was observed between father's education and place of residence, with lower education levels more frequent among urban pupils. No significant association was found in the higher education categories (Tab-4).

Table-5 Association Between Duration of Stay in Madrasah & Urban/Rural Residence of Pupils.

Duration of stay in Madrasah	Urban or Rural		P-value (Chi-Sq / FET)	Comment
	Urban	Rural		
1-2 years (n=62)	18	44	0.002	**Significant
3-4 years (n=61)	19	42		
5-6 years (n=30)	7	23		
>7 years (n=21)	17	4		
Total =174	61	113		

A significant association was observed between duration of stay in Madrasah and place of residence. Pupils staying for 1–2 years were more frequently from rural areas, while those with longer stays (>7 years) were predominantly from urban settings (table-5).

Table-6 Association Between Worsening Condition and Urban/Rural Residence of Pupils.

Worsen Seasonal condition			P-value (Chi-Sq / FET)	Comment
	Urban	Rural		
Yes (n=132)	42	90	0.09	*Significant
No n=42)	19	23		
Total =174	61	113		

A significant association was observed between worsening condition and place of residence, with pupils from rural areas more frequently reporting worsening conditions compared to those from urban areas (Table-6).

Table-7 Association Between Age of Adolescent Madrasah Girls and Spread ability of Scabies.

Spread ability of Scabies mites			P-value (Chi-Sq / FET)	Comment
Age of madrasah pupil	yes	no		
10-11 years (n=62)	53	9	0.05	*Significant
12-13 years (n=58)	46	12		
14-15 years (n=40)	25	15		
>15 years (n=14)	11	3		
Total =174	135	39		

Scabies infestation spreading ability was observed to be higher among pupils aged 10–11 years, showing a significant association. No notable association was observed in older age groups (12–13, 14–15, >15 years). Younger pupils were more prone to spreadable scabies compared to older ones (table-7).

Table-8 Association Between Clothes & Towels Sharing & Urban/Rural Residence of Pupils.

Uses of clothes & Towels	Urban or Rural		P-value (Chi-Sq / FET)	Comment
	Urban	Rural		
Yes (n=94)	25	69	0.01	*Significant
No (n=70)	36	44		
Total =174	61	113		

A significant association was observed between sharing clothes and towels and place of residence. Pupils from rural areas reported of sharing clothes significantly more compared to those respondents from urban areas ($p < 0.01$), table-8.

Table-9 Socio-Demographic and Behavioral Determinants of Scabies Among Adolescent Madrasah Girls

Variables	Urban or Rural	
	Urban	Rural
Shared beds or floor		
Adolescent Girls in Madrasah		
1-10 in single Chouki	61	90
11-24 in single floor	0	23

Variables	Urban or Rural	
	Urban	Rural
Washing bed sheets/pillow covers		
1-2 days after	29	5
3-5 days after	3	13
1 week	24	38
>2 week or never	5	57
Share clothes and towels		
Own	25	59
Shared	36	44
Storing clothes		
Same wardrobe	42	64
Separate trunk	19	49
Skin disease		
Yes	52	104
No	6	8

Rural Madrasahs with younger pupils face higher scabies spread due to overcrowding and shared clothing. Low parental education limits hygiene awareness, sustaining transmission. Poor ventilation and seasonal changes worsen conditions in rural settings. Shorter stays and unstable resources increase vulnerability to outbreaks.

Daily habits were another important factor. Rural students were more likely to share clothes and towels, wash bed sheets and pillow covers less often, and sleep in crowded dormitories. Washing only once every two weeks or not at all, compared to urban students who washed more frequently. These habits create the perfect environment for scabies mites to survive and spread 4. Rural students also reported that their condition worsened during seasonal changes, likely due to poor ventilation and limited access to clean water 5.

Overall, the findings show that scabies is not just a medical issue, it is closely linked to social, educational, and behavioral conditions. Rural residence, younger age, lower parental education, overcrowded living arrangements, poor hygiene, and sharing of clothes all increase the risk of scabies. To reduce scabies among adolescent girls, especially in rural Madrasahs, targeted programs are needed. These should focus on hygiene education, better living conditions, and raising awareness among parents. Addressing these issues is key to breaking the cycle of transmission and lowering the burden of scabies in this vulnerable group 6.

Discussion:

This study findings highlight the significant burden of scabies among adolescent girls in residential Madrasahs, driven by a combination of socio-demographic, environmental, and behavioral determinants.

The observed disparities between rural and urban residential Madrasahs underline the critical role of living conditions and socio-economic factors in sustaining scabies transmission. Rural students demonstrated significantly higher rates of infection, severity, and recurrence (74.1%), which directly aligns with severe overcrowding (11–24 students sleeping on a single floor), poor ventilation (40.2%), and infrequent laundering of beddings. These environmental dynamics create an ideal reservoir for *Sarcoptes scabiei*, facilitating rapid transmission through shared sleeping spaces and clothes/towels ($p < 0.01$).

Younger age groups (10–13 years) were disproportionately affected by spread ability ($p = 0.05$), likely due to lower personal hygiene awareness and closer peer physical contact. Furthermore, low paternal education (92% below SSC) serves as a proxy for limited health literacy and delayed health-seeking behavior, compounding disease burden in economically vulnerable rural families, demonstrating the practical application of simplified diagnostic criteria for field mapping in low-resource settings.18

A notable clinical aspect observed in this cohort is the gender-specific socio-cultural barrier to diagnosis, which aligns with recent diagnostic and management updates tailored for resource-limited and institutional settings.17 Examination limitations due to modesty concerns regarding lower body parts suggest that the actual disease severity might be underestimated. Additionally, nutritional vulnerability specifically inadequate mineral intake like zinc (56.9% report adequate intake) may compromise skin barrier integrity and cellular immunity, leaving these adolescents more susceptible to recurrent infestations.

Conclusion:

Our findings yielded that scabies among adolescent girls, particularly among residential Madrasahs is shaped by socio-demographic, behavioral, and environmental factors. Rural Madrasahs face such greater risks due to more poverty, poor sanitation, overcrowding living, and limited awareness. Addressing hygiene practices, improving infrastructure, and promoting nutritional awareness are essential strategies to reduce scabies burden in this vulnerable population.

Recommendations

Targeted Health Education: Implement routine hygiene awareness programs tailored to young madrasah students and parents.

Environmental & Institutional Reforms: Enforce minimum space standards per resident, improve ventilation, and provide individual sleeping facilities to eliminate close-contact transmission, thereby supporting a public health control framework that prioritizes mapping, targeted interventions, and surveillance.¹⁵

Gender-Sensitive Clinical Screening: Deploy female healthcare providers to conduct comprehensive physical evaluations, overcoming socio-cultural modesty barriers.

Nutritional Support: Integrate essential micronutrient supplementation (e.g., zinc) into madrasah meal plans to bolster immune defense.

Highlights

(Comparing with the findings of similar other conducted earlier)

- Scabies prevalence among adolescent girls in Madrasahs remain high in Bangladesh.^{3, 10-11}
- Rural madrasahs yielded greater recurrence of scabies due to overcrowding, poor sanitation & limited awareness.^{2, 4, 11}
- Lower parental education (92% <SSC level) was evident to be a major determinant of poor hygiene practices.³
- Targeted hygiene education, infrastructure improvements, and gender-sensitive interventions are essential as other authors commented earlier, too.^{5, 9, 11}

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