



Research Article

Prevalence of scabies and associated factors among Governmental Elementary School Students in Gondar town Northwest Ethiopia

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Abstract

Background: Scabies is an infestation of the skin by the human itch female mite. Scabies infestation provides an important portal of entry for bacteria and complement inhibitors from scabies mites. The most common clinical symptoms suggestive of Scabies i.e. insomnia due to severe itching at night, rashes, irritability leading to school absenteeism and poor quality of life.

Objective: The objective of this study is to assess prevalence of scabies and associated factors among governmental elementary school students in Gondar town, northwest Ethiopia.

Methods: A Quantitative cross-sectional study was conducted. Data was collected by using structured self-administered questionnaire. The analysis was done using statistical package for social sciences (SPSS) version 20. Association was determined by using p-value; p-value of <0.05 will be consider as statistically significant.

Result: Among the total participants, 354(56.9%) of them were males and 197 (31.7%) were grade seven students followed by

188(30.1%) grade six students. The overall prevalence of scabies was found to be 55(8.8%) in our study. A total of 70 (11.3%) of the students in elementary school in Gondar town had skin rashes within the last 2 weeks; out of which, 55 (78.6%) of the skin rashes were associated with skin itching. About 47 (67.1%) of the skin rashes were at the finger webs in distribution

Conclusion: Scabies prevalence among Gondar town governmental elementary students needs great attention. Grade, Frequency of cloth wash and sharing cloth with family were significantly associated with scabies prevalence.

Keywords: Governmental Elementary School; Infestation; Scabies; Student

List of Abbreviations

EC:	Ethiopia Calendar
SNERC:	School of nursing ethical review committee
SPSS:	Statistical Package for Social Sciences
USD:	United Nation Development
WHO:	World Health Organization

Background

Skin disorders are the most frequent diseases among the school children in both developing and industrialized countries. Scabies is a highly contagious skin disease caused by tiny burrowing mite called *Sarcoptes scabiei* var *hominis* [1-4]. And it is one of the most common public health problems of skin in many developing countries more common where overcrowded conditions prevail [1,4]. The most common clinical symptoms suggestive of Scabies i.e. insomnia due to severe itching at night, rashes, irritability leading to school absenteeism and poor quality of life. The rash can be anywhere on the body but is most common on the hands, breasts, elbows, knees, wrists, armpits, genital area, and waistline. Symptoms begin 2 to 6 weeks after the first exposure to scabies, or 1 to 4 days after re-exposure [2]. Scabies should be confirmed (gold standard) diagnosis relies on the visualization of ova, feces, or the mites themselves using light microscopy by identifying the mite, mite eggs, or mite fecal matter [4].

Scabies is a common condition found worldwide and affects people of all races and social classes. The most common source of transmission is prolonged skin-to-skin contact. Scabies can spread quickly in crowded situations where there is frequent skin-to-skin contact with an infected individual hand-holding (such as hospitals, nursing homes, extended-care facilities, prisons and child care centers) [3-5].

An estimated 660,000 incident cases of invasive *S.pyogenes* occur globally each year, leading to more than 160,000 deaths, and the numbers are probably at least as great for *S. aurous* [5].

According to World Health Organization, worldwide there are over 300 million cases of scabies each year. Crusted scabies can be easily confused with severe dermatitis or psoriasis because

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widespread, crusted lesions appear with thick, hyperkeratosis scales over the elbows, knees, palms, and soles [6-8]. The infection was closely linked to skin sores, and scabies was identified as the principal cause. The real possibility exists that the renal damage that occurs after a primary attack of scabies with secondary infection may persist for years afterwards, with the potential to cause long-term glomerular damage [9, 10].

On clinic records and patient profiles was conducted in Pakistan; it shows that approximately half of the cases (48%) were less than or equal 20 years of age. Disease occurrence was significantly higher among children aged ≤ 10 years (27%) compared to the other age groups in the study [11, 2, 4].

A community based cross-sectional study was done amongst the school children in Hyderabad city in Telangana state of India showed that 29.54% have suffered from various skin disorders. Out of all skin Infections, majority was found to be Scabies with the prevalence of 16.9% among school children's the students, followed by Pediculosis 10.7% [12].

Institutional based comprehensive study was conducted in Rawalpindi-Pakistan shows factors associated with scabies indicated that sarcoptes infestation is largely prevalent in the area. Scabies was more prevalent in winter and relatively rare in summer, and 98.49% patients reported infection in close contacts. The patients admittedly sharing household accessories (beds, towels, clothes) were more frequently affected than patients who were not used to share them [13].

Rates of scabies occurrence vary in the recent literature from 0.3% to 46%. In the developed world, outbreaks in health institutions and vulnerable communities contribute to significant economic cost in national health services [14]. However, in resource-poor tropical settings, the sheer burden of scabies infestation, as well as their complications, imposes a major cost on health-care systems [14-17].

Objectives

General Objectives

To assess the prevalence of scabies and its associated factors among governmental elementary school students in Gondar town, northwest Ethiopia.

Specific Objectives

1. To determine the prevalence of scabies among governmental elementary school students.
2. To identify factors associated with scabies among governmental elementary school students.

Methods

Study Design: Institution based quantitative cross-sectional study was conducted.

Study Setting and Period: The study was conducted at selected governmental elementary schools, Gondar Town from June 04, 2021 to June 15, 2021. There are forty governmental elementary schools in Gondar Town with a total number of 48,250 students. Gondar Town is located 175kms and 735kms northwest of Bahir Dar, capital city of the Amhara National Regional State and Addis Ababa, the capital city of Ethiopia respectively. The town is situated at an average elevation of 2000 meters above sea level.

Population: All governmental elementary school students in Gondar town were the source population and selected schools were the study population.

Inclusion and exclusion Criteria: All the students who are present on the period of data collection and willing to participate were included in the study. Those students who were seriously ill during data collection time were excluded from the study.

Operational Definition

Scabies: A student with signs and symptoms of a scabies infection include superficial burrows, itching especially at night, a generalized rash and secondary infection on the head, face, neck, armpit, elbow, wrist, palms, buttocks and soles [18].

Sample Size, Sampling Technique, data collection tool and procedure: Sample size was determined by using single population proportion formula. Since there is no similar study in the area we took 50% proportion to obtain maximum sample size at 95% certainty and maximum discrepancy of 5% between the sample and the population, an additional 10% non-response rate and design effect was added and the final sample size was 635 students. Eight governmental elementary schools were selected by using lottery/simple random method.

Data collection tool which was used by previous studies to determine the prevalence of scabies among elementary school students was used to collect the data. The questionnaire were first prepared in English and then translated into the local language (Amharic), and back to English to ensure consistency. Data quality was assured by conducting a pretest among 32 students at Hidar-16 elementary school to assess the appropriateness and comprehensiveness of the research instrument. The collected data was entered into EPI Info-7 and exported to SPSS (Statistical Package for the Social Sciences) version 20.0 statistical package for analysis. Model fitness were checked by using Hosmer and Lemeshow and it were >0.05 . Variables with P-value < 0.05 were identified on the basis of Odds Ratio with 95 % confidence interval. Frequencies, percentage frequencies, and cross tabulations were used to summarize descriptive statistics and the result are presented with tables.

Result

Socio-demographic characteristics of the study participants: Out of 635 randomly selected students, 622 were participated with response rate of 98%. Among the total participants, 354(56.9%) of them were males and 197 (31.7%) were grade seven students followed by 188(30.1%) grade six students. The mean age was 14.32 year with ranges from 12year to 19 years. Majority of students were living with less than five family members. Regarding their family occupation, majority 293(47.1%) of their mothers were house wives followed by 155(24.9%) merchants (Table 1).

Characteristics of skin rashes study participant: The overall prevalence of scabies was found to be 55(8.8%) in this study. A total of 70 (11.3%) of the students in elementary school in Gondar town had skin rashes within the last 2 weeks; out of which, 55 (78.6%) of the skin rashes were associated with skin itching. About 47 (67.1%) of the skin rashes were at the finger webs in distribution, 41 (58.6%) had ulnar border of the hand distribution followed by 39 (55.7%) had at ankle area. Among those that exhibited classical features of scabies 41 (74.5%) of them sought for treatment.

Variables	Number	Percent (%)
Age		
12-15	481	77.3
16-19	141	22.7
Sex		
Male	354	56.9
Female	268	43.1
Religion		
Orthodox	483	77.7
Muslim	104	16.7
Protestant	26	4.2
Other	9	1.4
Grade (class)		
5th	153	24.6
6th	188	30.2
7th	197	31.7
8th	84	13.5
Mothers educational status		
Illiterate	71	11.4
Read and write only	265	42.6
Primary school	189	30.4
Secondary school	66	10.6
College/University	31	5
Mothers occupation		
Housewife	293	47.1
Merchant	155	24.9
Government employee	125	20.1
Other	49	7.9
Fathers educational status		
Illiterate	45	7.2
Read and write only	255	41
Primary school	193	31
Secondary school	87	14
College/University	42	6.8
Fathers occupation		
Farmer	193	31
Merchant	132	21.2
Government employee	198	31.8
Unemployed	57	9.2
Other	42	6.7
Family size		
<5	434	69.8
>5	188	30.2

Table 1: Socio-demographic characteristics of elementary school students in Gondar town, northwest Ethiopia, 2021 (n=622).

Home environment and personal hygiene: According to this study finding, majority 525 (84.4%) of respondents use pipe sources of water. The highest number 268 (43.1%) of respondent wash their body once a week and more than half 323 (51.9%) of study participants wash their clothes every four weeks frequency. Among the study subjects 194(31.2%) had reported that they share close with their family members. Twenty three (3.7%) of participants had contact history with scabies cases and 283 (45.5%) of the participants sleep with another one person or shared bed when they sleep. Regarding animal contact, 18 (2.9%) of respondents had reported that having animal inside the house, while 27 (4.3%) of the respondents dealing with animals outside house (Table 2).

Factors associated with scabies: Concerning risk factors; variables such as sex, age, grade, religious, family size, contact history with scabies cases within the last 2 weeks, frequency of body and cloth wash, animal contact, sleeping with scabies cases and water source

Variables	Number	Percent (%)
Frequency of body wash		
Every week	268	43.1
Two times per week	40	6.4
Every two week	262	42.1
Every month	52	8.4
Frequency of cloth wash		
<4 weeks	323	51.9
>4 weeks	299	48.1
Sharing cloth with family		
Yes	194	31.2
No	428	68.8
Contact history with scabies case		
Yes	23	3.7
No	599	96.3
With whom sleeping at night		
Alone	103	16.6
With one person	283	45.5
With two persons	236	37.9
Having animals inside house		
Yes	18	2.9
No	604	97.1
Dealing with animals outside house		
Yes	27	4.3
No	595	95.7
Source of water for daily bases		
Pipe Water	525	84.4
Spring	80	12.9
Pond	4	0.6
River	13	2.1

Table 2: Home environment and personal hygiene of elementary school students in Gondar town, northwest Ethiopia, 2021(622).

for daily bases were entered into binary logistic regression model. Factors with p-value ≤ 0.2 in Bivariable analysis were entered into multivariable analysis. In multivariable analysis student's grade AOR (95% CI) =3.793(1.58, 9.24), Frequency of cloth wash AOR (95% CI) =10.26 (0.19, 0.36) and sharing cloth with family AOR (95%CI) =2.76(1.58, 9.24) were significantly associated with scabies infestation (Table 3).

Discussion

In this study the overall prevalence of scabies was 8.8%. This finding is lower than other study conducted in Reduit, University of Mauritius reported 22% [15], in Yaoundé; Camroon reported 17.8% (16), study conducted in India 16.9% [12] and previous study conducted in Ethiopia 11%. The possible explanation for this lower prevalence observed in our study could be due to the fact the study population mostly were in urban residences, where as other studies include rural dwellers. And most of studies showed that students live in rural areas affected more than urban students because of poor socio economical status, lack of water and education [7, 10, 14].

However, the finding in this study is higher than other studies conducted in Nigeria and Egypt which have reported scabies prevalence 2.9 % and 4.4% [17,18] respectively. The possible reason for this variation might be socioeconomic factors that had a direct impact on infection, such as parents' education, housing conditions, number of rooms and personal hygiene.

Characteristics	Scabies		COR (CI 95%)	AOR (CI 95%)	P
	Yes N (%)	No N (%)			
Grade			1		
5th	18(11.8)	135(88.2)		3.79(1.58, 9.24)	0.003
6th	17(9)	171(91)	2.60 (1.86–3.64)	0.02(0.48, 1.98)	0.47
7th	180(91.4)	17(8.6)	1.35 (0.86–2.16)	1.76(0.743, 4.24)	0.20
8th	3(3.6)	81(96.4)	1.07 (0.83–1.37)	1	
Family size					
<5	34(7.8)	400(92.2)	1	1	0.43
>5	21(11.2)	167(88.8)	0.728(0.54,1.89)	1.98(0.62, 3.85)	
Fathers education					
Illiterate	4(8.9)	41(91.1)	1	1	
Read and write	21(8.2)	234(91.8)	8.28(1.52, 61.21)	1.43(0.54,2.56)	0.42
Primary school	14(7.3)	179(92.7)	14.30(3.39,59.85)	2.37(0.43,8.01)	0.38
Secondary school	7(8)	80(92)	2.95 (1.50-5.79)	0.89 (0.45, 1.73)	0.52
College/University	9(21.4)	33(78.6)	1.43(0.63-3.22)	1.35 (0.86–2.16)	0.44
Sharing cloth with family					
Yes	12(13.3)	78(86.7)	1.84(1.09,3.57)	2.76(1.361,5.21)	0.03
No	43(8.1)	489(91.9)	1	1	
Frequency of cloth wash					
<4 weeks	27(8.4)	296(91.6)	1	1	
>4 weeks	55(8.8)	271(90.6)	10.26(0.19, 0.34)	10.26 (0.18,0.36)	0.001

Table 3: Bi-variable and multivariable analysis of Scabies among elementary school students in Gondar town, northwest Ethiopia, 2021.

This study is line with WHO report 0.3%-46 % [14]. The possible explanation for this similarity is the report from WHO showed that the global prevalence of scabies composed from different literatures. Concerning the risk factors for scabies, there is statistically significant associations between frequency of cloth wash and scabies infestation. The odds of developing scabies infestation was 10.26 times among students who wash their cloth greeter than four weeks compared to those who wash their cloth four weeks and less with AOR (95% CI) =10.26 (0.19, 0.36). This finding is consistent with study done Egypt [18]. This might be due to creating of favorable condition for the spreading of mites. It is well known that scabies can spread easily with unclean closes and person who have poor personal hygiene.

Another factor showing association is sharing of clothes with other families. Thus, the odd of acquiring scabies was about 2.76 among students sharing cloth than their counterparts, AOR (95%CI) =2.76(1.58, 9.24). Hence, the odds of acquiring scabies were found 2.76 among students sharing cloth than their counterparts. This result is in line with a study conducted in Cameroon, India and Ethiopia [16, 12]. This is supported by a body of science that mites of scabies can be frequently transmitted by skin to skin contacts, as well as through infected closes and bedding.

In this study grade five students were 3.79 times more likely to develop scabies with AOR (95% CI) =3.793(1.58, 9.24) compared with grade Eight students. This result supported by different studies [4, 16,17] which reported that lower grade and younger students were more likely to develop scabies infestation than their counterparts. The possible explanation for this difference might be socioeconomic, cultural difference and awareness of children's. When they become more educated the student may able to keep their personal hygiene.

Limitation and strength

The strength of this study might be the use of large sample size. The limitation of this study was the study conducted based on only a clinical signs and symptoms while, lacking laboratory confirmation, ascertainment of cases could be a problem.

Conclusion

In this study the prevalence of scabies among primary school students may need special attention. Students' grade, Frequency of cloth wash and sharing cloth with family were significantly associated with scabies prevalence. Strong and continuous active case search should be strengthened at all levels.

Declaration

Ethical considerations: Ethical clearance was obtained from Ethical Review Committee of Department of Nursing, College of Medicine and Health Sciences, University of Gondar. Informed consent was obtained from each study participant and parents for age below sixteen and the involvement was after their full voluntariness. Anyone not willing to participate in the study was have full right not to participate or withdraw at any time during the data collection and the data obtained was kept confidential.

Availability of data and materials: All relevant data were within the manuscript.

Competing interest: The authors declare that they have no competing interests.

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Author's contribution

TA carried out the study starting from conception, analysis and interpretation of data and drafting of the manuscript.

AJ participated in organizing of introduction part, data analysis and interpretation of the finding and review of the manuscript.

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