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The prevalence and risk factors associated with scabies cases among schoolchildren at Alember Secondary School, South Gondar, Ethiopia

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Abstract

Introduction: *this study investigates the prevalence and associated risk factors of scabies infestation among school children in Alember, South Gondar Zone, Ethiopia.* ***Methods:*** *a cross-sectional study was conducted with a total of 340 participants, achieving a 100% response rate. A questionnaire, prepared in English and translated into Amharic, was administered to gather data on potential risk factors. Data collectors were trained, and quality control measures ensured data integrity. Analysis was performed using Epi-Info version 7 and SPSS version 20.0, utilizing bivariate and multivariate logistic regression.* ***Results:*** *the overall prevalence of scabies among participants was 20.6%. Key risk factors identified included: lack of knowledge about scabies (21.1 times higher risk), sleeping on the floor (6.23 times higher risk), infrequent bathing (85.7 times higher risk), and having affected family members (9.87 times higher risk). Additionally, children with pet animals at home were 41.27 times more likely to be infected compared to those without.* ***Conclusion:*** *the findings highlight significant associations between scabies infection and various socio-demographic factors. This study underscores the need for targeted health interventions to educate families and improve hygiene practices to reduce scabies prevalence among school children in Alember, ultimately enhancing public health outcomes in the region.*

Introduction

Scabies is a highly contagious skin infestation caused by the mite *Sarcoptes scabiei var. hominis,* which spreads easily through direct skin contact with an infected person. These mites burrow into the outer layer of the skin, laying eggs that lead to intense itching and skin lesions [1,2]. This ectoparasite is a significant cause of morbidity globally, affecting approximately 200 million people each year, with over 400 million cases reported annually. The prevalence of scabies is particularly high in tropical regions, especially in Pacific countries [3,4]. In Ethiopia, the prevalence of scabies is estimated at 14.5%, making it a major public health concern, particularly among vulnerable populations such as the poor and migrants [4,5].

Although scabies can occur worldwide, its impact is most severe in developing countries and tropical climates, disproportionately affecting infants, children, and the elderly. Notably, children exhibit higher rates of infestation compared to adolescents and adults [6]. Various risk factors contribute to scabies transmission, including overcrowded living conditions, inadequate personal hygiene, sharing bedding or clothing, younger age, socioeconomic status, education level of caregivers, and limited access to clean water [7-9]. The condition causes significant discomfort, particularly at night, with symptoms manifesting as severe itching in areas like the hands, wrists, and genitalia, resulting from an allergic reaction to the mites and their waste. Scratching may lead to secondary infections and skin damage, with visible signs such as red bumps and burrow-like lines appearing weeks after infestation. Diagnosis is primarily clinical, often supplemented by microscopic examination for mites or their eggs. Treatment generally involves topical agents like permethrin cream, with oral medications considered for more severe cases [3].

To prevent scabies spread, effective hygiene practices are essential, including avoiding close contact with infected individuals and laundering clothing and bedding in hot water. Public health interventions may be necessary during outbreaks, particularly in high-risk environments such as healthcare facilities, nursing homes, and correctional institutions. Timely diagnosis and treatment are crucial to curtail the transmission of scabies and mitigate associated health complications [3,10]. Assessing scabies prevalence across various regions and districts in Ethiopia is critical for identifying specific risk factors, developing effective treatment strategies, and optimizing resource allocation. Currently, there is a lack of documented studies on scabies and its

related factors among school children in the study area. Thus, this study aims to evaluate the prevalence of scabies and its associated factors among school children in this context, utilizing a school-based approach to include children attending school.

Statement of the problem: the prevalence of scabies among school children in South Gondar, Ethiopia, is an urgent concern that necessitates immediate investigation. The absence of comprehensive data on scabies prevalence and its associated risk factors hampers the development of effective intervention strategies to control and prevent its spread within school settings. Therefore, a thorough study is required to assess the prevalence and identify the risk factors linked to scabies among school children.

Objective of the study

General objective: to determine the prevalence and risk factors for scabies among school children at Alember Secondary School, South Gondar, Ethiopia.

Specific objectives: to assess the prevalence of scabies among students at Alember Secondary School and to identify the risk factors associated with scabies infestations among the students.

Significance of the study: this study aims to provide essential epidemiological data on the prevalence of scabies among school children in Alember. Identifying associated risk factors will assist in developing targeted intervention and prevention strategies. The findings will contribute to the existing knowledge base and may inform public health policies regarding scabies control and prevention. Furthermore, understanding the impact of scabies on the educational and social aspects of affected students can lead to the creation of support mechanisms within school settings. By addressing the prevalence and risk factors of scabies among school children, this study seeks to enhance public health interventions and improve the overall well-being of the student population at Alember Secondary School.

Methods

Study design and period: this school-based cross-sectional study was conducted at Alember Secondary School from May 1 to 15, 2018, to determine the prevalence of scabies and its associated factors among school children.

Source of population: the source population consisted of all children enrolled at Alember Secondary School.

Target population: the target population included schoolchildren attending Alember Secondary School.

Study population: the study population comprised all identified cases and selected controls among the students at Alember Secondary School.

Sample size determination: the sample size was determined using a single population proportion formula. The prevalence of scabies infection in Alember Secondary School was not reported in a previous study. The sample size was calculated by taking a prevalence (P) = 0.5, 95% confidence interval (CI) and 5% (d=0.05) margin of error [11].

$$n = \frac{z^2 p(1-p)}{d^2} = \frac{(1.96)^2 \, x \, 0.5(1-0.5)}{(0.05)^2} = 324$$

By adding 5% of the non-response rate, the total sample size was 324x5%+324 = 340

Study variables

Dependent variable: the prevalence of scabies infestation.

Independent variables: independent variables: socio-demographic factors (age, sex, occupation, marital status, religion, family size), travel history, contact history, adequacy of water for personal

hygiene, sharing clothes, sleeping arrangements, and overcrowding conditions.

Inclusion criteria

Cases: any resident of the school exhibiting signs and symptoms of scabies (specifically itching and rash) during the investigation period.

Controls: any resident without signs and symptoms of scabies during the investigation period.

Exclusion criteria

Cases: individuals who refused to participate in the study.

Controls: individuals who refused to participate and family members from the same household.

Data collection tool and procedure:a semi-structured, pre-tested questionnaire in Amharic was utilized to collect socio-demographic characteristics of students and their parents, knowledge about scabies, environmental and behavioral factors, and information on the school´s water and sanitation systems. The questionnaire was initially prepared in English and translated into Amharic. Data collectors received orientation on the questionnaire, and the collected data were checked for completeness and consistency before data entry. Diagnosis of scabies was conducted through a history and physical examination by two experienced medical practitioners.

Data quality control: to ensure data quality, data collectors were oriented on the questionnaires. Each questionnaire was checked daily for completeness and consistency. A standard case definition was employed to classify cases, and all completed questionnaires were verified for accuracy before data entry.

Data processing and analysis: data were entered using Epi-Info version 7 and analyzed with the SPSS statistical package for Windows, version 20.0. All assumptions for binary logistic regression were checked. To identify predictor variables for scabies, a binary logistic regression model was fitted, including variables with a p-value < 0.2 from the bivariate analysis in the multivariable analysis. Finally, variables with a p-value < 0.05 in the final model were declared significant predictors. Crude odds ratios (COR) and adjusted odds ratios (AOR) with 95% confidence intervals were reported in the results.

Ethical consideration: ethical approval was obtained from the institutional review board (IRB) of the University of Kabridahar. Aproval number Ref: KU/CNCS/RPTT/001/18. This study was conducted in accordance with ethical principles for research involving human subjects.

Results

Socio-demographic characteristics of the respondents: in this study, 340 participants were enrolled, with a response rate of 100% (Table 1). The majority of participants were males (56.2%), aged 5-14 years (72.9%), practicing Christianity (83.2%), belonging to families of 4 or higher members (53.8%), and having no formal education (51.2%) (Table 1).

Prevalence of scabies infection across personal and hygiene-related characteristics of the respondents: among the 340 study participants, the majority exhibited no sleeping with scabies patients (60.3%), no cloth sharing with others (76.2%), did not share bedding or cloth with scabies patients (91.2%), knew scabies (76.2%), practices of frequency of cloth washing for monthly (45.9%), detergent of showering only water (87.9%), no sleeping with scabies patients (73.2%), and no travel to scabies endemic area (90.9%). And also, sleeping place on floor (61.2), family members with itching signs (81.5%), frequency of bathing infrequently (51.8), having family members affected (51.5), frequency of showering weekly (78.2%), did not have toilet availability (57.1), pet animals at home (65.3%),

and having practice of cleaning house every day (90.9%) (Table 2).

Bivariate logistic regression analysis of risk factors associated with STH infections: bivariate and multivariate logistic regression analyses were conducted to identify the factors associated with scabies infections. Notable factors, including sleeping with scabies patients, knowledge about scabies, sleeping place, frequency of bathing, family members affected, and pet animals at home, were found to be significantly associated with scabies prevalence (P < 0.05) (Table 3, Table 3.1). Participants who were not educated or were illiterate had 0.132 times higher odds of scabies infection compared to those who were literate [AOR = 0.132; 95% CI: 0.018, 0.94; P < 0.04]. The participants who did not know about scabies were 37.1 times [AOR = 37.1; 95% CI: 5.29,258.7; P < 0.00] more likely to be infected than those who had knowledge.

The participants of the study who had slept with scabies patients were 23.89 times more likely to be infected with scabies infection compared to those who had not slept with patients [AOR = 23.89; 95% CI: 2.1, 271.6; P < 0.01]. The study participants who slept on the floor were 8.26 times more at risk of scabies infection compared to those who slept on the bed [AOR = 8.26; 95% CI: 1.04, 65.5; P < 0.04]. The study participants who had taken baths infrequently were 209.4 times more at risk of scabies infection compared to those who had taken baths frequently [AOR = 209.4; 95% CI: 13.9, 3149.6; P < 0.01]. And also, in bivariate analysis, the study participants who did not have pet animals at home were 103.4 times less infected with scabies infection compared to those who had pet animals at home [AOR = 103.4; 95% CI: 13.9, 767.1; P < 0.01].

Multivariate logistic regression analysis of selected variables: in the bivariate logistic regression analysis, risk factors with a p-value less than 0.25 were selected and included in the multivariate logistic regression analysis to identify the most significant factors associated with scabies infection. The final multivariate model revealed that educational status, sleeping with scabies patients, knowledge about scabies, sleeping place, frequency of bathing, family members affected, and pet animals at home were identified as independent and explanatory risk factors for scabies infection in the study area.

The participants of the study who had not experienced sleeping with scabies patients were 0.056 times less at risk of scabies infection than those who slept [AOR = 0.056; 95% CI: 0.001, 0.321; P < 0.01]. Additionally, participants who lacked knowledge about scabies were 21.1 times more infected than those who had knowledge [AOR = 21.1; 95% CI: 4.33, 102.7; P < 0.001]. The participants of the study who had slept with scabies were 4.86 times more at risk of scabies infection compared to those who had not slept [AOR = 4.86; 95% CI: 0.91, 25.98; p = 0.06]. The participants of the study who had slept on the floor had a 6.23 times greater risk of scabies infection compared to those who had slept on the bed [AOR = 6.23; 95% CI: 1.28, 32.68; p = 0.03].

The study participants who had infrequently washed their bodies were 85.7 times more likely to be infected with scabies infection compared to those who had frequently bathed [AOR = 85.7; 95% CI: 11.5, 642.5; p ≤0.001]. The multivariate logistic regression model revealed that the study participants who had no affected family members were 9.87 times less at risk of scabies infection compared to those who had [AOR = 9.87; 95% CI: 2.11, 46.13; p = 0.004]. More than ever, the participants who had pet animals at home were 41.27 times more likely to be infected with scabies infection compared to those who had no pet animals at home [AOR = 41.27; 95% CI: 10.03, 169.6; p ≤0.001].

Discussion

Epidemiological research on the burden and associated factors of scabies offers useful insights into the disease and constitutes the basis for

prevention, control, and management efforts. Therefore, this study was carried out to evaluate the prevalence and associated risk factors of scabies infestation among school-age children in Alember, South Gondar zone, Ethiopia. According to the findings, the overall prevalence of scabies among school-age children in Alember was 20.6%, a rate similar to that reported in Arba Minch Zuria District (16.5%) [12] and in urban Lucknow, India (23.33%) [13]. The prevalence observed in this study was higher than that in the Dabat district (9.3%) [9], Raya Alamata District (12.9%) [14], Central Armachiho district (10.9%) [15], and the overall prevalence of scabies infestation in Ethiopia (14.5%) [4].

Variations in the frequency of scabies among school-age children in different locations may be explained by factors such as socioeconomic situations, hygiene practices, access to healthcare services, living conditions, climate, and population density. Lower socioeconomic status, poor hygiene practices, limited access to healthcare, overcrowded living conditions, and environmental factors like climate and population density can all influence the transmission and prevalence of scabies in a given area. These factors contribute to the observed differences in scabies infestation rates among school-age children across various regions.

This shows that scabies infestation among school-age children in Alember may be more substantial and require specialized treatments for prevention and control compared to other areas evaluated. The present study showed various characteristics strongly related to scabies infections, including sleeping with scabies patients, awareness about scabies, sleeping place, frequency of bathing, family members affected, and the presence of companion animals at home. Sleeping with a scabies patient showed a significant association with scabies infection.

Sleeping with a scabies patient indicated a substantial connection with scabies infection. The odds of individuals who sleep with scabies patients were 0.056 times more likely to be infected with scabies compared to those who do not sleep with a person who has scabies (AOR: 0.056, 95% CI: 0.01, 0.321, $p < 0.001$*). This odds ratio was lower than those reported in the studies conducted in Raya Alamata District, Tigray, Ethiopia, and in Gumbichu District, East Shewa Zone, Central Ethiopia [14,16]. The lower odds ratio in the present study, compared to those reported in the studies conducted in Raya Alamata District, Tigray, Ethiopia, and in Gumbichu District, East Shewa Zone, Central Ethiopia, may be attributed to differences in the study populations, methodologies, or other contextual factors. Further analysis and comparison of the study designs, sample sizes, and demographic characteristics may provide insights into the reasons behind in the differences.

The study indicated that those lacking awareness of scabies were 21.1 times more likely to be infected compared to those with expertise (AOR: 21.1, 95% CI: 4.33, 102.7, $p < 0.001$*). This risk was higher than that reported in a study conducted in Arba Minch Zuria District, Southern Ethiopia [12]. The higher risk observed in the current study compared to the study in Arba Minch Zuria District may be due to differences in the study populations, environmental factors, healthcare access, or other variables that were not accounted for in the analysis. Participants in the study who slept on the floor were shown to have a 6.23 times higher risk of scabies infection compared to those who slept on a bed (AOR: 6.23, 95% CI: 1.28, 32.68, p=0.03*). This finding aligns with a study conducted in the Central Armachiho district, Northwest Ethiopia [15], which is also consistent with research from a Northern Ethiopian Town [17]. The consistency of these findings with prior studies may show a consistent link between sleeping on the floor and an elevated risk of scabies infection throughout different locations in Ethiopia. This could indicate the importance of sleeping surfaces in the transmission or susceptibility to scabies.

The study indicated that respondents who infrequently cleaned their bodies were 85.7 times more likely to be infected with scabies compared to those who washed regularly (AOR: 85.7, 95% CI: 11.5, 642.5, p < 0.001*). This risk was higher than that reported in studies conducted in Southern Ethiopia [18], North Mecha District, West Gojjam Zone [19], and in the Nata Catchment Areas of Tutume District, Botswana [20]. The higher risk observed in this study compared to the studies in Southern Ethiopia, North Mecha District, and the Nata Catchment Areas of Tutume District, Botswana, could be due to various factors such as differences in hygiene practices, environmental conditions, genetic predispositions, or other unaccounted variables.

The study revealed that participants with no family history of scabies infection were 9.87 times less at risk of scabies infection compared to those with affected family members (AOR: 9.87, 95% CI: 2.11, 46.13, p = 0.004*). This risk was higher than that reported in Cox's Bazar district of Bangladesh and in Takusa district of Amhara Region [21,22] and as well as higher than the study in Dabat district, northwest Ethiopia [9]. However, it was similar to the findings reported in the Gumbichu District, East Shewa Zone, and in Addet town, West Gojjam Zone, respectively [16,23]. The higher risk observed in this study compared to some other studies, along with the similarity to findings from Gumbichu District, East Shewa Zone, and Addet town, West Gojjam Zone, could be attributed to differences in sample sizes, demographic characteristics, environmental factors, and variations in healthcare infrastructure. These factors may contribute to differing levels of risk and could explain both the discrepancies and similarities observed across the studies.

The study indicated that respondents who had no pet animals at home were 41.27 times less at risk of scabies infection compared to those who had pet animals at home (AOR: 41.27, 95% CI: 10.03, 169.6, p < 0.001*). This risk was higher than that reported in studies conducted in Wadila district, Northern Ethiopia, and in the Cox's Bazar district of Bangladesh, respectively [21,24].

Conclusion

The findings of this study provide valuable insights into the burden and associated risk factors of scabies among school-age children in Alember, South Gondar Zone, Ethiopia. These insights can inform targeted interventions for the prevention and control of scabies in the area. The study's results also contribute to the existing knowledge base and could potentially inform public health policies related to scabies control and prevention. Understanding the impact of scabies on the educational and social aspects of affected students can lead to the development of support mechanisms within school settings. By addressing the prevalence and risk factors associated with scabies among school children, this study aims to contribute to the improvement of public health interventions and the overall well-being of the student population at Alember Secondary School, South Gondar, Ethiopia.

What is known about this topic

- *Prevalence of scabies: scabies is a common skin infestation, particularly among children, and is known to be prevalent in low-resource settings;*
- *Risk factors: previous studies have identified various risk factors for scabies, including poor hygiene, overcrowding, and lack of awareness about the disease;*
- *Public health impact: scabies can significantly affect children's health and well-being, leading to school absenteeism and increased healthcare costs.*

What this study adds

- *Specific prevalence rate: this study reports a 20.6% prevalence of scabies among school children in Alember, South Gondar Zone, Ethiopia;*

- *Identified risk factors: it highlights specific risk factors, such as lack of knowledge about scabies, sleeping on the floor, infrequent bathing, and having affected family members, with quantifiable odds ratios;*
- *Need for targeted interventions: the findings emphasize the necessity for targeted health education and hygiene improvement initiatives to mitigate scabies infestation and enhance public health outcomes in the region.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Mengesha Wasie: participated in the conception, design, data collection, analysis and interpretation and facilitated the data collection and management, drafted, analysis and critically reviewed the manuscript. Sisay Shuramo and Tesfalem Asnake: developed data collection tools, entered the data into Epi-info, supervised the data collection process and reviewed the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1: prevalence of scabies infection across socio-demographic characteristics of study participants at Alember School Children, South Gondar Zone, Amhara Region, Northwest Ethiopia (n = 340)

Table 2: prevalence of scabies infection across personal hygiene and sanitation-related characteristics of the study participants

Table 3: association of Risk Factors with scabies infections among school children at Alember, South Gondar Zone, and Amhara Region, Northwest Ethiopia

Table 3.1: association of Risk Factors with scabies infections among school children at Alember, South Gondar Zone, and Amhara Region, Northwest Ethiopia

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Table 1: prevalence of scabies infection across socio-demographic characteristics of study participants at Alember School Children, South Gondar Zone, Amhara Region, Northwest Ethiopia (n = 340)

No	Variables		Frequency	Case (%) N= 70	Control (%) N= 270	χ^2	P - valve
1	Sex	Male	191 (56.2)	43(61.4)	148 (54.8)	0.988	0.32
		Female	149 (43.8)	27 (38.6)	122(45.2)		
2	Age	<5 years	63 (18.5)	15 (21.4)	48(17.8)	0.505	0.77
		5-14	248 (72.9)	49 (70)	199(73.7)		
		>14	29 (8.5)	6 (8.6)	23 (8.5)		
3	Religion	Christian	283 (83.2)	60 (85.7)	223 (82.6)	0.38	0.53
		Muslim	57 (16.8)	10 (14.3)	47 (17.4)		
	Family size	<4	157 (46.2)	33 (47.1)	124 (45.9)	0.33	0.86
		≥4	183 (53.8)	37 (52.9)	146 (54.1)		

Table 2: prevalence of scabies infection across personal hygiene and sanitation-related characteristics of the study participants at Alember School Children in the South Gondar zone, Amhara region, Northwest Ethiopia (n = 340)							
1	Sleeping with scabies patients	No	205 (60.3)	44 (62.9)	161 (59.6)	0.24	0.62
		Yes	135 (39.7)	26 (37.1)	109 (40.4)		
2	Cloth sharing with others	No	259 (76.2)	57 (81.4)	202 (74.8)	1.34	0.247
		Yes	81 (23.8)	13 (18.6)	68 (25.2)		
3	Sharing bedding or clothes with a scabies patient	No	310 (91.2)	63 (90)	247 (91.5)	0.15	0.69
		Yes	30 (8.8)	7 (10)	23 (8.5)		
4	Knowledge about scabies	No	81 (23.8)	47 (67.1)	34 (12.6)	91.5	< 0.001*
		Yes	259 (76.2)	23 (32.9)	236 (87.4)		
6	Frequency of cloth washing	Weekly	39 (11.5)	11 (15.7)	28 (10.4)	2.605	0.27
		Every two weeks	145 (42.6)	32 (45.7)	113 (41.9)		
		Monthly	156 (45.9)	27 (38.6)	129 (47.8)		
7	Detergent for showering	only water	299 (87.9)	65 (92.9)	234 (86.7)	2.09	0.156
		Water and soap	41 (12.1)	5 (7.1)	36 (13.3)		
8	Sleeping with scabies patients	No	249 (73.2)	62 (88.6)	187 (69.3)	10.6	0.001
		Yes	91 (26.8)	8 (11.4)	83 (30.7)		
9	Traveled to a scabies endemic area	No	309 (90.9)	68 (97.1)	241 (89.3)	4.28	0.04
		Yes	31 (9.1)	2 (2.9)	29 (10.7)		
10	Sleeping place	On floor	209 (61.2)	66 (94.3)	143 (53)	40.16	<0.001
		On bed	131 (38.5)	4 (5.7)	127 (47)		
11	Family members with itching signs	Yes	277 (81.5)	66 (94.3)	211 (78.1)	9.6	0.002
		No	63 (18.5)	4 (5.7)	59 (21.9)		
12	Frequency of bathing	Infrequently	176 (51.8)	68 (97.1)	108 (40)	72.6	<0.001
		Frequently	164 (48.2)	2 (2.9)	162 (60)		
13	Family members affected	No	165 (48.5)	55 (78.6)	110 (40.7)	31.9	<0.001
		Yes	175 (51.5)	15 (21.4)	160 (59.3)		
14	Frequency of showering	Week	266 (78.2)	60 (85.7)	206 (76.3)	2.89	0.89
		Month	74 (21.8)	10 (14.3)	64 (23.7)		
15	Toilet availability	No	194 (57.1)	44 (62.9)	150 (55.6)	1.21	0.27
		Yes	146 (42.9)	26 (37.1)	120 (44.4)		
16	Pet animals at home	No	118 (34.7)	65 (92.9)	53 (19.6)	131.5	<0.001
		Yes	222 (65.3)	5 (7.1)	217 (80.3)		
17	Cleaning house every day	Yes	309 (90.9)	69 (98.6)	240 (88.9)	6.38	0.012
		No	31 (9.1)	1 (1.4)	30 (11.1)		

Table 3: association of risk factors with scabies infections among school children at Alember, South Gondar Zone, and Amhara Region, Northwest Ethiopia

Variables		Case status		COR (95% CI)	AOR (95% CI)
		Case (%) N= 70	Control (%) N= 270		
Sex	Male	43	148	0.804 (0.14, 4.607), p= 0.81	
	Female	27	122		
Age	<5 year	15	48	1.73 (0.319, 9.37), p= 0.25	
	5-14	49	199		
	>14	6	23		
Religion	Christian	60	223	0.11 (0.011, 1.08), p= 0.58	
	Muslim	10	47		
Family size	<4	33	124	0.602 (0.117, 3.12), p= 0.54	
	≥4	37	146		
Sleeping with scabies patients	No	44	161	0.53 (0.003,1.11), p= 0.053	0.056(0.01,0.321),p=0.001*
	Yes	26	109	56) p= 0.095	
Clothes sharing with others	No	57	202	0.12 (0.009, 1.1.	
	Yes	13	68		
Sharing bedding or clothes with a scabies patient	No	63	247	2.57 (0.255,24.6) p= 0.43	
	Yes	7	23		
Knowledge about scabies	No	47	34	37.1 (5.29, 258.7), p= <0.001*	21.1 (4.33,102.7), p= <0.001*
	Yes	23	236		
Frequency washing clothes	Weekly	11	28	0.125 (0.001, 14.19) p= 0.39	
	Every two week	32	113		
	Monthly	27	129		
Detergent for showering	Only water	65	234	2.86 (0.205,40.1) p= 0.43	
	Water and soap	5	36		

Sleeping with a scabies case	No	62	187	23.89(2.1,271.6), p= 0.01*	4.86 (0.91, 25.98), p= 0.06)
	Yes	8	83		

Table 3.1: association of risk factors with scabies infections among school children at Alember, South Gondar Zone, and Amhara Region, Northwest Ethiopia

Variables		**Case status**		**COR (95% CI)**	**AOR (95% CI)**
		Case (%) N= 70	**Control (%) N= 270**		
Traveled to a scabies endemic area	No	68	241	0.038 (0.018, 5.2), p= 0.41	
	Yes	2	29		
Sleeping place	On floor	66	143	8.26 (1.04,65.5), p= 0.04*	6.23 (1.28, 32.68) , p=0.03*)
	On bed	4	127		
Family members with itching signs	Yes	66	211	11.36 (0.82, 157.4), p= 0.07	
	No	4	59		
Frequency of bathing	Infrequently	68	108	209.4 (13.9,3149.6), p= <0.001*	85.7 (11.5,642.5), p≥0.001*
	Frequently	2	162		
Family members affected	No	55	110	20.5 (2.32,179.7), p= 0.006*	9.87(2.11,46.13), p=0.004*
	Yes	15	160		
Frequency of showering	Week	60	206	0.93 (0.095, 9.08), p= 0.94	
	Month	10	64		
Toilet availability	No	44	150	27.7 (0.39,194.6), p= 0.13	
	Yes	26	120		
Pet animals at home	No	65	53	103.4 (13.9, 767.1), p= <0.001*	41.27 (10.03,169.6), p≥0.001*
	Yes	5	217		
Cleaning house every day	Yes	69	240	28.3 (0.18,45.19)	
	No	1	30		