Original Article

A Cross-Sectional Study On Prevalence And Associated Risk Factors Of Scabies In School Children Of Pakistan

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Abstract

Scabies is an endemic and contagious skin disease caused by Sarcoptes scabiei in many tropical countries including Pakistan. It is estimated that more than 175 million people were infested with scabies throughout the world. It can have a significant impact on general health, causing illness and death not only as a direct result of its infestation, but also as a result of secondary bacterial infection. A cross sectional survey was conducted from August 2021 to December 2021 in private and government schools of KPK, Pakistan. The overall prevalence of scabies was 26.3%. Middle class male children were highly infested with scabies than primary and matric class female children. Overall, maximum prevalence was recorded on males than females. Children from villages (44.01%) were more likely to have scabies than those living in cities (26.85%). Lesions were usually distributed on more than one body region and most infested body part was finger. Scabies prevalence was higher among 9–12-year-olds compared to 5-8 and 13-16 years olds. The statistically significant difference between the presence of scabies and some sociodemographic characteristics (area of residence, age, and sex (p=0.01, p=0.006, and p=0.013, respectively). There was no statistically significant difference was recorded between scabies, the number of households and the family type (p=0.636, and p=0.462, respectively). The respondents which frequently washed their cloth and body found least affected by scabies than those who don't care about their health and cleanliness. This is a significant scabies burden, which we believe justifies health-care intervention.

Keywords: Sarcoptes scabiei; Scabies, School children; Neglected Tropical Disease; Prevalence; Climate change

Introduction

Having healthy skin is one of the most important indicators of a child's general health because it is the largest organ of the human body. One of the most common health problems among children is skin disorders (Altraide et al., 2011; Worth et al., 2015; Amro and Hamarshed, 2012; Emeka, 2021**)**. Children and their families may experience psychological and emotional stress due to skin disorders. Human scabies is a skin parasitic disease caused by the

infestation of a mite, Sarcoptes scabies. It can burrow under the various tissues and organs of the human body, especially in the skin (Engelman et al., 2013, 2019; Ugbomoiko et al., 2018).

Itching can occur due to mite infection which ultimately caused a bacterial infection in the heart and kidney. The burden of scabies has been reported in developed and developing countries. All age of people is infected by scabies throughout the world. Approximately, 46-65% prevalence of scabies has been reported throughout the globe, especially in African countries (Mason et al., 2016; Marks et al., 2019; Thomas et al., 2020).

Scabies is considered endemic in most tropical and subtropical countries of the globe. Many surveys on the prevalence of scabies have been conducted in several areas of a limited number of countries such as Turkey, Africa, and Fiji (Thornley et al., 2018; Özden et al., 2020; Kutlu and Aktaş, 2020; Ural et al., 2022). No cross-sectional study on the prevalence and associated risk factors of scabies has generally been conducted in Pakistan, particularly in current study areas. Children 5-15 years of age have reported victim of scabies and mostly infection caused in school because children belonging to different families and age contact with each other during playing, and studying (Romani et al., 2015; Tunje et al., 2020; Sekhar et al., 2016; Naik et al., 2020). There is a limited study done on scabies in school children, so insufficient data and pieces of information regarding scabies are available to adopt control measures and control strategies. Taking into account the highly endemic status of scabies and impetigo in KPK, Pakistan, we conducted a cross-sectional study to provide comprehensive information.

Material and methods

Study area and duration

A cross-sectional study was conducted in rural and urban schools of KPK, Pakistan to find out the prevalence and associated risk factors of scabies from August 2021 to December 2022.

Sample size/participants

The research team visited 10 government schools and 10 private schools in rural and urban areas. A total of 550 students out of which 240 were from the government and 310 students from private schools participated in this survey. The age of participants was in between 5-16 years.

Data collection

Data were collected by dermatologists using the face-to-face interview technique.

Ethical approval and permission

Ethical approval was obtained from the institutional ethics committee of KPK by written consent and verbal consent from patients. Permission was taken from the school principal for conducting the study.

Statistical analysis

Collected data were put on a Microsoft Excel sheet and the Chi-square test was used in the binary analysis. The variables that were statistically significant ($p<0.05$) in the Chi-square test were taken into Backward LR logistic regression analysis.

Results and discussion

Table 1. Socio-demographic characteristics of the participants.

Sex		Age in year			Education level			School	
Male	Female	5-8	9-12	13-16	Primary	Middle	Matric	Government	Private
297	253	94	232	224	105	261	184	227	273

Scabies can affect people of all socioeconomic backgrounds, while cases have seen sporadically in developed countries, it spreads as epidemics in developing countries. A total of 550 children from private and government schools participated in the survey. Out of 550, 297 were male and 253 were females whose age was in between 5-16 years. Data were collected from primary, middle, and matric students. The majority of the students were from the middle, and private institutes (Table 1). Education level wise data shown in figure 1.

Table 2. Dispersion of sociodemographic characteristics over scabies in the study area.

Independent variables	Dependent variable		Total Number (%)	Chi-square X^2	p
	Scabies present Number (%)	Scabies absent Number (%)			
Sociodemographic characteristics					
Sex					
Male	122 (41.07)	175 (58.92)	297 (54.00)	5.762	0.013
Female	83 (32.80)	170 (67.19)	253 (46.00)		
Age					
5-8	35 (37.23)	59 (62.76)	94 (17.09)	4.847	0.006
9-12	92 (39.65)	140 (60.34)	232 (42.18)		
13-16	78 (34.82)	146 (65.17)	224 (40.72)		
Family type					
Upper class	11 (7.97)	127 (92.02)	138 (25.09)	0.785	0.462
Middle class	77 (41.62)	108 (58.37)	185 (33.63)		
Lower class	117 (51.55)	110 (48.45)	227 (41.27)		
Area of residence					
City	58 (26.85)	158 (73.14)	216 (39.27)	13.643	0.001
Village	147 (44.01)	187 (55.98)	334 (60.72)		
Number of family members					
≤4	64 (28.57)	160 (71.42)	224 (40.81)	0.099	0.638
≥5	141 (43.25)	185 (56.74)	326 (59.27)		
Number of rooms					
2	18 (13.13)	119 (86.86)	137 (24.90)	0.065	0.884
4	71 (38.37)	114 (61.62)	185 (33.63)		
≥5	116 (50.87)	112 (49.12)	228 (41.45)		
Education level					
Primary	51 (48.57)	54 (51.42)	105 (19.09)	0.587	0.04
Middle	112 (42.91)	149 (57.08)	261 (47.45)		
Matric	42 (22.82)	142 (77.17)	184 (33.50)		
School type					
Government	113 (43.17)	129 (56.82)	227 (41.27)	o.798	0.054
Private	76 (27.83)	197 (72.16)	273 (49.70)		

Age-wise data showed that males were highly (41.07%) infected by scabies than females (32.80%) as shown in figure 2. The significant difference was recorded in infection of scabies in both sexes ($\chi 2 = 5.762$, df = 2, $p < 0.013$). The

statistically significant difference between the presence of scabies and some sociodemographic characteristics (area of residence, age, and sex (p=0.01, p=0.006, and p=0.013, respectively). There was no statistically significant difference was recorded between scabies, the number of households and the family type (p=0.636, and p=0.462, respectively). Children in between the age of 9-12 years were recorded highly infested with the disease followed by 13-16 years and 5-8 years. The children belonging to the lower-class family were highly affected by scabies followed by the middle and upper class. Children living in the villages were found infected with scabies as compared to children living in cities. Haar et al. (2014) reported that the village is the hotspot of human scabies due to a lack of awareness and hospital facilities. Our survey findings are almost similar to the findings of many early scientists working on human scabies in the world (Collinson et al., 2020; Middleton et al., 2018; Ural et al., 2022). The high prevalence of diseases especially scabies in the villages than in cities may be due to a lack of awareness among the villagers than the citizen.

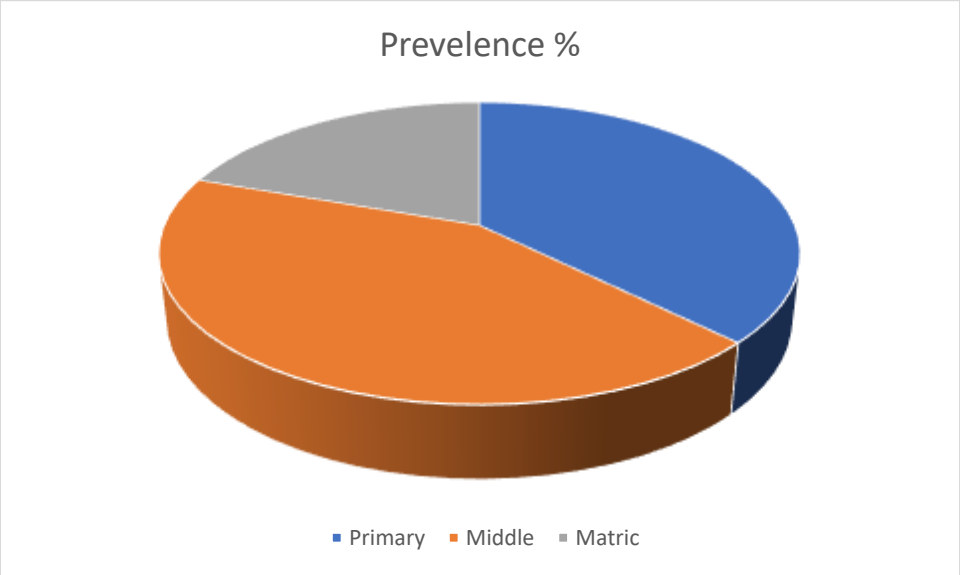

Figure 1. Education level-wise prevalence

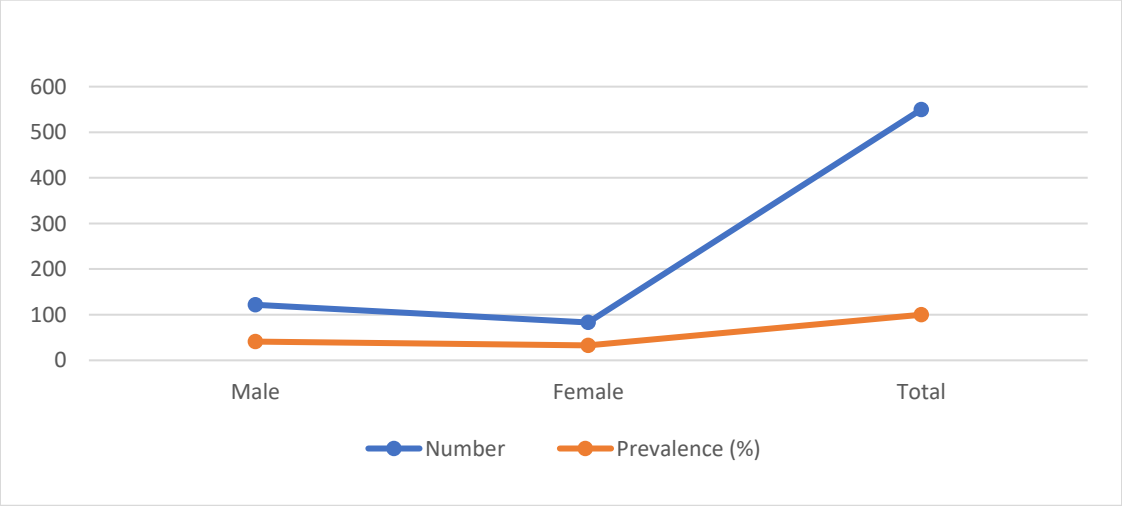

Figure 2. Sex-wise prevalence of scabies.

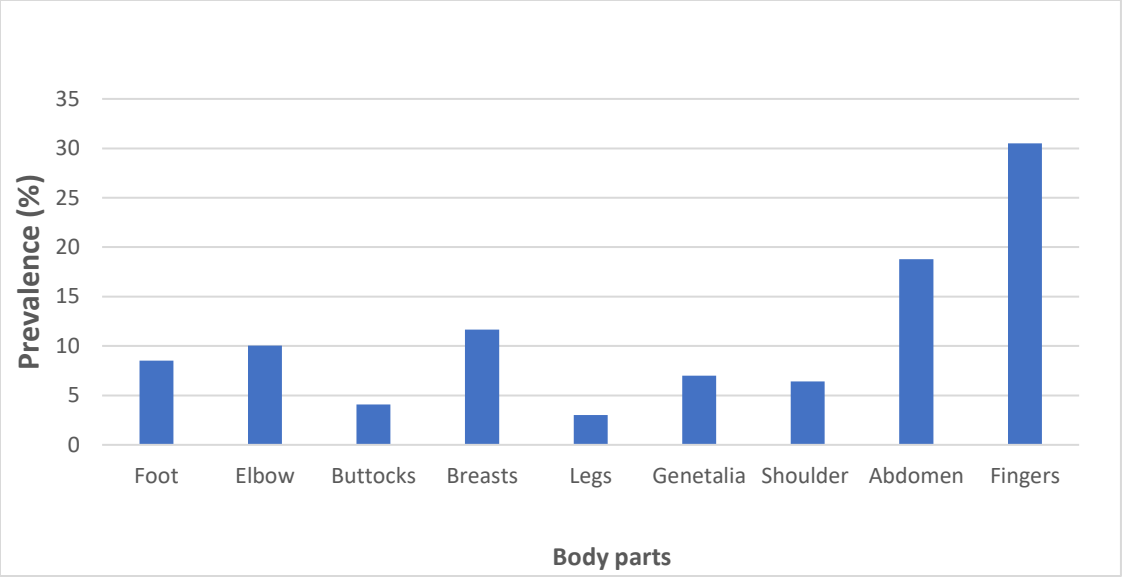

Figure 3. Prevalence percentage (%) of scabies on different body parts

The prevalence percentage of human scabies ranged from 7.97 to 50.32% while in many other studies, it had been reported as almost 4.1-35% (Aynalem, 2017; Alebachew et al., 2019). The prevalence rate can vary according to geographical variations and climatic conditions. The maximum prevalence rate was observed in the fingers and the minimum in the lower legs of the children as shown in figure 3.

Table 3. Hygiene characteristics of the school children in the study area.

Variables	Category	Number	%
Bodies washing	Frequently	241	43.81
	Infrequently	309	56.18
Clothes washing	Frequently	253	46
	Infrequently	297	54
Clothes changing	Frequently	261	47.45
	Infrequently	289	52.54

The respondents which frequently wash their cloth and body were found least affected by the scabies than those who did not care their health and cleanliness. In the study area 56.18, 54, and 52.54% of respondents infrequently washed their bodies, washed clothes, and changed their cloth, respectively (Table 3). Little difference in our study and previous studies related to personal hygiene has been reported, for example, Hosseini-Shokouh et al. (2010) reported that 85.8 and 14.2% of respondents washed their bodies frequently and infrequently, respectively. The difference may be due to geographical variations, and sociodemographic and socioeconomic characteristics in current study areas.

Table 4. Environment factors of the participants associated with scabies.

Variables	Bed share		Light		Pet		House		Water source	
	Yes	No	Electricity	Solar	Yes	No	Soft brick	Hard brick	Tap	Pond/river
Frequency	211	339	452	98	387	163	250	300	396	154
Percentage	38.36	61.63	82.18	17.81	70.36	29.63	45.45	54.54	72.00	28

The majority of the participants did not share their beds with each other, mostly involved in animal raising and rearing in their homes. The houses of the participants were built with hard (54.54%) and soft bricks (45.45%). Tap water was the main source of personal hygiene. The maximum (72.00%) of participants used tap water while 28% of respondents used pond or river water (Table 4). Our current study findings were not in line with Girma et al. (2020), who reported river or pond water as the main source of respondents' personal hygiene. About 90% of respondents had water sources near their residences. Over all prevalence of scabies in school children was 26.3%, which is almost similar to the previous studies (Thean et al., 2019; Korte et al., 2019; dos Santos et al., 2010), while Matthews et al. (2021) reported 30.6% prevalence of scabies.

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