

Epidemiology of *Sarcoptes Scabiei* in General Population of District Karak, Khyber Pakhtunkhwa, Pakistan

Sadia Norin

Department of Zoology, Faculty of Biological Sciences, Kohat University of Science and Technology, Kohat, 26000, Khyber-Pakhtunkhwa, Pakistan. sadianoreen635@gmail.com

Ahmad Ali *

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. Corresponding Author Email: ahmadalik1@gmail.com

Asad Rehman

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. asadrehman5944@gmail.com

Miraj Muhammad

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. mirajmuhammad425@gmail.com

Muhammad Akhlaq Ahmad

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. muhammadakhlaqahmad3@gmail.com

Junaid Shahid

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. shahidjunaidk1@gmail.com

Zahib Ullah

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. zahidullah80@gmail.com

Aman Ullah

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. amankhattak001@gmail.com

Ahmad Amowr

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. amowr53@gmail.com

Abdul Khaliq

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. abdulkhaliq2525601@gmail.com

Muhammad Haseeb

Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. haseebk1212@gmail.com

Zeenat Akhtar
Department of Zoology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. zeenatakhtar456@gmail.com

Muhammad Ibrahim
Department of Psychology, Khushal Khan Khattak University Karak, Khyber Pakhtunkhwa, Pakistan. khattakibrahim54@gmail.com

Author Details	Abstract
Keywords: Scabies, Skin Disease, Epidemiology, Gender, Age Group, Winter, Awareness, Risk Factors, Relatives, Clothes, Prevention, Karak, Pakistan. Received on 12 Aug 2025 Accepted on 08 Sept 2025 Published on 10 Sept 2025 Corresponding E-mails & Authors*: Ahmad Ali ahmadaliktk1@gmail.com	<i>Sarcoptes scabiei</i> is a common ectoparasite of skin that is contributed to globally endemic skin parasitic infections. In current study, 273 samples were collected from August 2023 to July 2024 in various hospital and dermatology clinics of District Karak. Current study was accomplished to evaluate the prevalence and associated risk factors of scabies in three different Tehsils of District Karak, Khyber Pakhtunkhwa, Pakistan. Out of 273 scabies samples, 107 showed positive result and prevalence of scabies in District Karak was 39.19% recorded. The current study show that children (51.4%) were most affected, more ever the infection was more common in male (60.7%) as compared to female (39.3%). In District Karak, scabies was more frequent in Tehsil Karak (42.1%) as compared to Tehsil Takhti Nasrati (34.58%) and Tehsil Banda Daud Shah (23.36%). In this study, the close contact of patients were also reported scabies (78.5%) which is significant risk factor for spreading of scabies disease. Scabies is a common contagious skin disease that has a high infection rate with seasonal variation pronounced more during winter season (53.3%). In current study, Majority of respondents (83.2%) share clothes, bed sheets and other fabric materials with family members while most of scabies patients (87.9%) were unaware about scabies transmission and prevention from its infestation. Current study suggests that scabies is prevalent (39.19%) in studied population and there is a need to promote mass scale deworming and health promotion campaigns to create awareness about health and hygienic environment.

INTRODUCTION

Human scabies is a common ectoparasitic infestation of the skin, which is caused by the mite *Sarcoptes scabiei* (var. *hominis*) (Anderson and Strowd, 2017). Worldwide, scabies is responsible for 0.07% of the total burden of the disease (Karimkhani *et al.*, 2017), and it is estimated that every year more than 400 million peoples suffer from scabies (WHO. 2023). The prevalence of scabies ranges from 0.2% to 71.4% in the world, and prevalence of scabies has been reported as 10% in the under developing countries (Ali *et al.*, 2013; Liu *et al.*, 2017). The prevalence of scabies in Pakistan is 45.55% (Majeed *et al.*, 2023). Scabies is also prevalent in province Khyber Pakhtunkhwa, there was study conducted in school children of Khyber Pakhtunkhwa (Tahira *et al.*, 2023), Hayat Abad Medical Complex (HMC), Peshawar (Naheed *et al.*, 2023) and Ayub Teaching Hospital, Abbottabad, reported a high prevalence of scabies (Alam *et al.*, 2020). There are studies from many countries reporting that scabies incidence has increased with time (Vos *et al.*, 2016). Scabies mites can be transmitted directly through person-to-person contact, and indirectly through sharing of bedsheets, clothing, or other fabric materials of scabies patients (CDC. 2010). Transmission of scabies is common between family members, sexual partners and within institutional settings of scabies patients (Walton and Currie, 2007).

The scabies peaks in winter season throughout the world but often seen mostly in poor communities and overcrowded areas (Hay *et al.*, 2012). The characteristic clinical feature of scabies is intense itching especially at night, generalized rash on skin, superficial burrows on epidermis (Raza *et al.*, 2009). The most commonly affected areas are the hands, feet, inner part of the wrists, areas around the breasts, genitals, umbilical cord and buttocks (Rathi *et al.*, 2001). The primary factors in spreading of scabies seems

to be poor hygiene, sharing of fabric materials with relatives, low socioeconomic conditions, poverty, illiteracy, frequent population movements, social attitudes, lack of access to health care facilities and inadequate treatment (Alsamarai. 2009). The rationale of current study is to determine the prevalence of scabies and its associated risk factors in three Tehsil of District Karak, Khyber Pakhtunkhwa, Pakistan.

MATERIALS AND METHODS

This study was conducted in the different Tehsils of District Karak, Khyber Pakhtunkhwa, Pakistan. The samples of *Sarcoptes scabiei* were collected from patients visiting to DHQ hospital Karak, Women and children hospital Karak, Type-D hospital Sabirabad, Basic Health Units (BHUs) of District Karak and dermatology clinics. Patients who had symptoms of itching, rashes on the skin and positive contact history of scabies, were included in this study. For diagnosis of scabies skin scraping was done in which a drop of mineral oil was placed at the end of a burrow with the help of a dropper and the lesion was gently scraped with a sterile surgical blade number 15 to microscopic glass slides and cover glass slides with a cover slip (Walter *et al.*, 2011). Potassium hydroxide (KOH) and glycerin in ratio of 1:1 was applied to the specimens to dissolve excess keratin debris and examined after 15 to 20 minutes in microscope (Micheletti *et al.*, 2017). Data collected from respondents was entered in the software, SPSS version 21, and data was cleaned, coded, and analyzed with SPSS software.

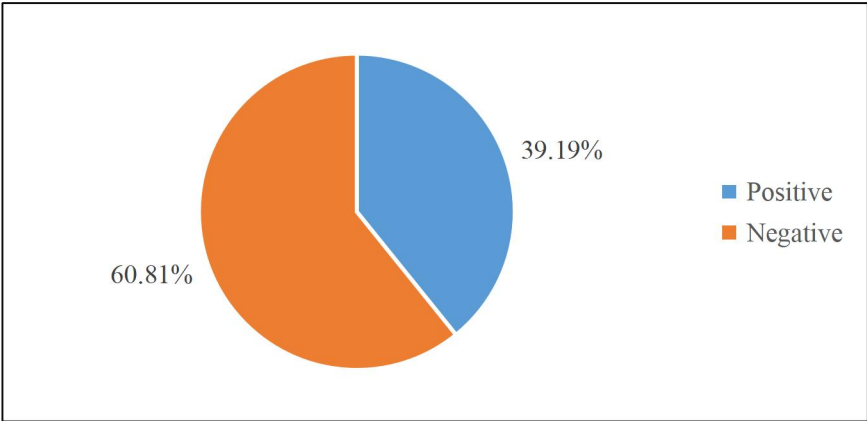
RESULTS

During the study, a total of 273 samples were collected in which 107 show positive result, overall prevalence of scabies in District Karak was 39.19% as describe in **Table 1.1**

TABLE 1.1: SHOW PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

Scabies status	Prevalence
Positive	107 (39.19%)
Negative	166 (60.81%)

FIGURE 1.1: SHOW PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

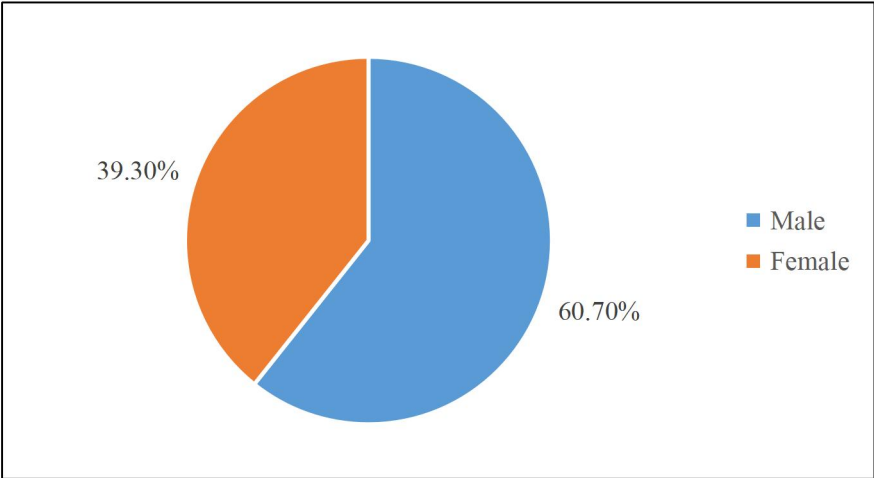


The demographic data of the study participants showed that majority of patients were male (60.7%) as compared to female (39.3%).

TABLE 1.2: GENDER WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

Gender	Prevalence
Male	65 (60.7%)
Female	42 (39.3%)

**FIGURE 1.2: GENDER WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER
PAKHTUNKHWA, PAKISTAN**



Children were commonly suffered from scabies, in current study age group 1 to 20 years were 51.4% followed by age group 21 to 40 years (25.2%), 41 to 60 years (17.8%) and above 61 years (5.6%).

**TABLE 1.3: AGE WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER
PAKHTUNKHWA, PAKISTAN**

Age group	Prevalence
Below 20 years	55 (51.40%)
21 to 40 years	27 (25.2%)
41 to 60 years	19 (17.8%)
Above 60 years	6 (5.6%)

FIGURE 1.3: AGE WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER

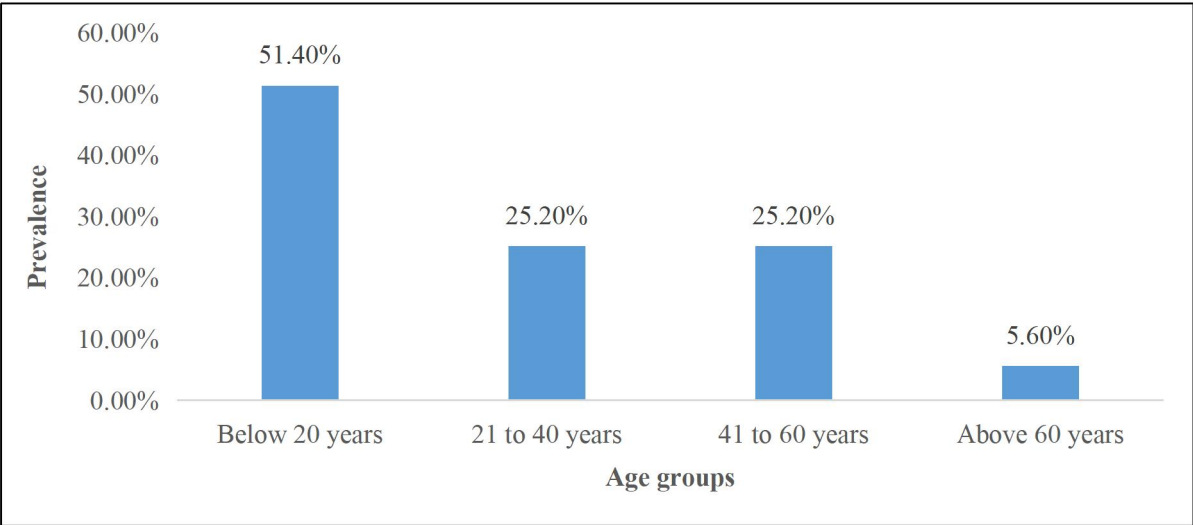
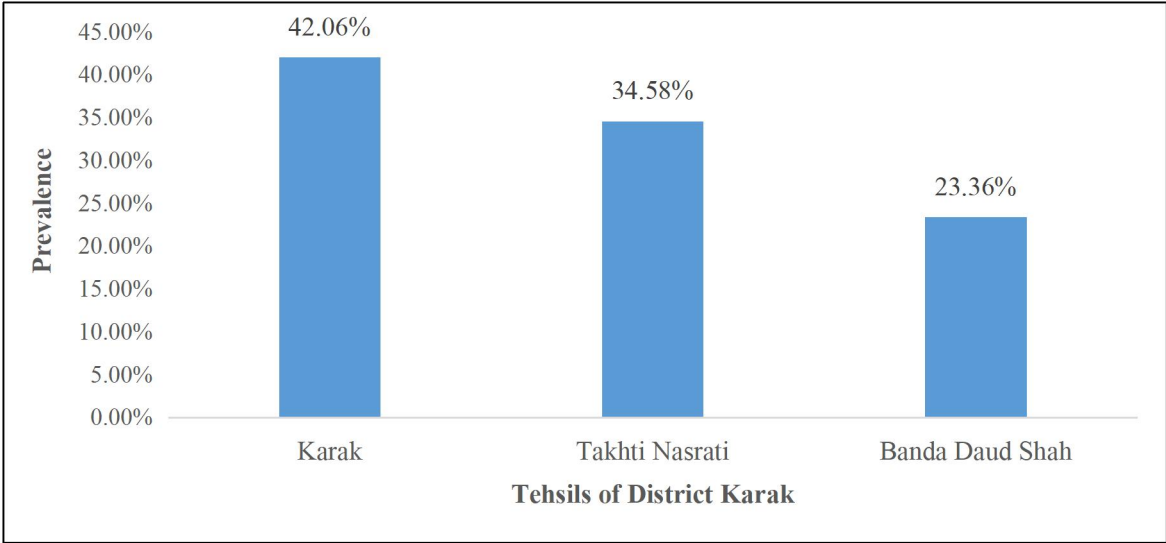


TABLE 1.4: TEHSIL WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

Tehsil	Prevalence
Karak	45 (42.06%)
Takhti Nasrati	37 (34.58%)
Banda Daud Shah	25 (23.36%)

In District Karak, the prevalence of scabies were more in Tehsil Karak (42.1%) followed by Tehsil Takhti Nasrati (34.8%) and Tehsil Banda Daud Shah (23.3%).

**FIGURE 1.4: TEHSIL WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER
PAKHTUNKHWA, PAKISTAN**



**TABLE 1.5: PREVALENCE OF SCABIES IN CLOSE RELATIVES OF SCABIES PATIENTS IN
DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN**

Response	Scabies in close relatives
Yes	84 (78.5%)
No	23 (21.5%)

In current study, majority of scabies patient (78.5%), family members and other close relative also report scabies which was a significant risk factor for scabies transmission.

FIGURE 1.5: PREVALENCE OF SCABIES IN CLOSE RELATIVES OF SCABIES PATIENTS IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

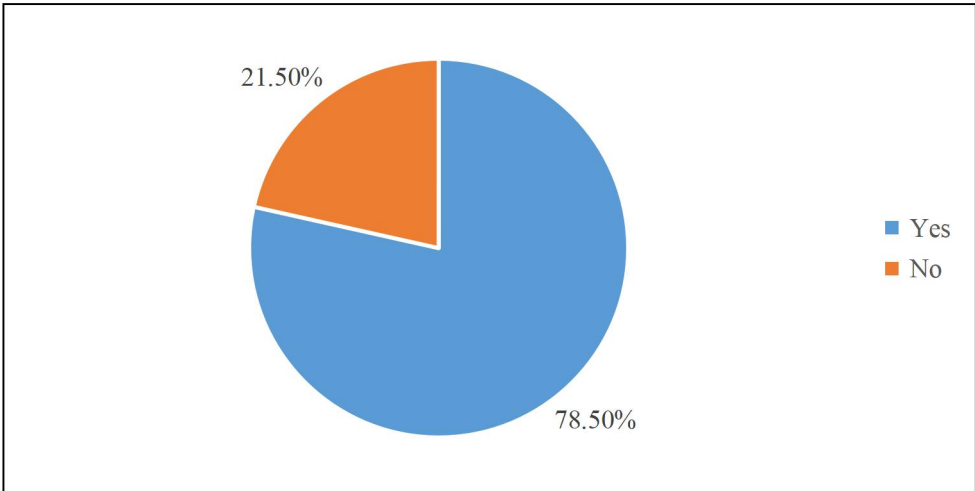
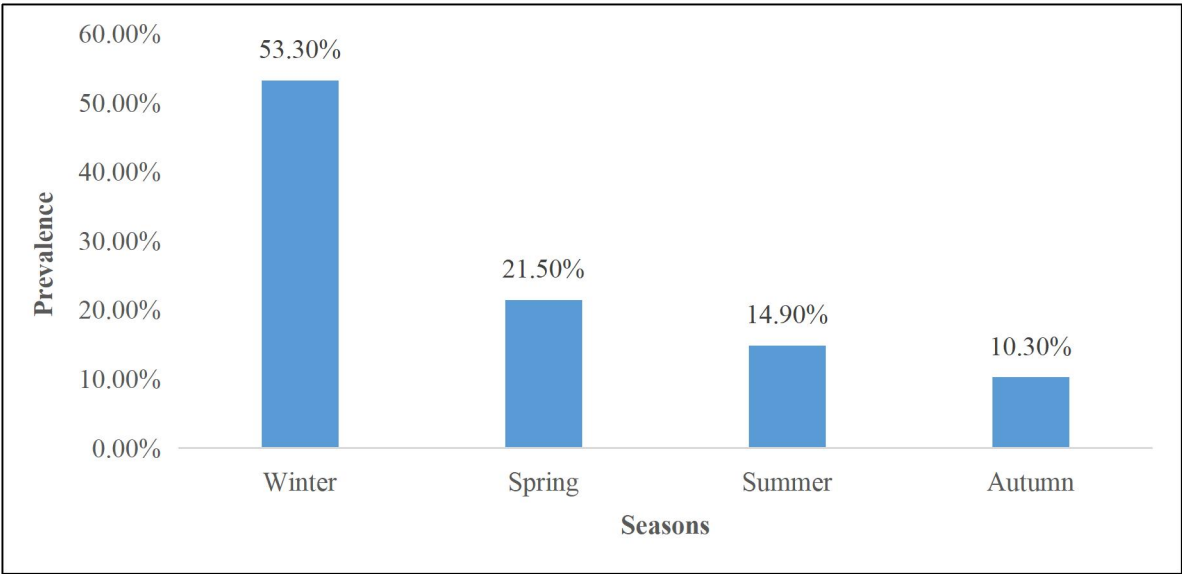


TABLE 1.6: SEASON WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

Season	Prevalence
Winter	57 (53.3%)
Spring	23 (21.5%)
Summer	16 (14.9%)
Autumn	11 (10.3%)

From current study, we found that scabies was more prevalent in winter (53.3%) followed by spring (21.5%), summer (14.9%) and autumn (10.3%) season.

**FIGURE 1.6: SEASON WISE PREVALENCE OF SCABIES IN DISTRICT KARAK, KHYBER
PAKHTUNKHWA, PAKISTAN**

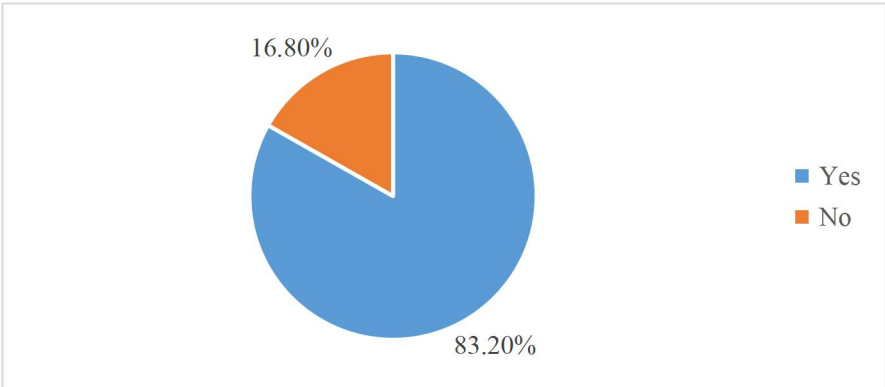


Majority of respondents (83.2%) share clothes, bed sheets and other fabric materials with family members, which contribute a significant risks factor for scabies prevalence.

TABLE 1.7: SCABIES PATIENTS SHARING OF FABRIC MATERIALS WITH FAMILY MEMBERS

Response	Sharing of fabric materials with family members
Yes	89 (83.2%)
No	18 (16.8%)

FIGURE 1.7: SCABIES PATIENTS SHARING OF FABRIC MATERIALS WITH FAMILY

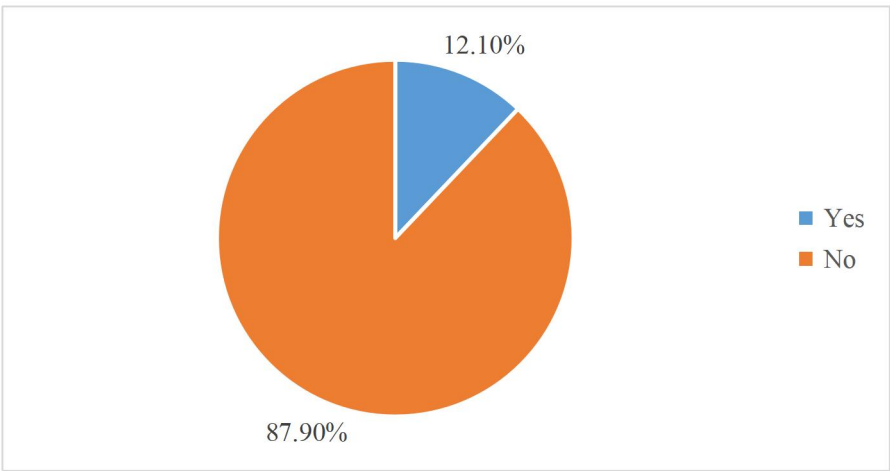


In current study, majority of patient had no information about scabies mites, its transmission and prevention, which a significant risk factor of its prevalence with in family members and other close contacts.

TABLE 1.8: KNOWLEDGE ABOUT SCABIES AMONG SCABIES PATIENTS IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

Response of scabies patients	Knowledge about scabies
Yes	13 (12.1%)
No	94 (87.9%)

FIGURE 1.8: KNOWLEDGE ABOUT SCABIES AMONG SCABIES PATIENTS IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN



DISCUSSION

Scabies is a common disease of skin, which affect mostly the poorest and destitute communities in low-income and middle-income countries of tropical and sub-tropical regions (Ursani and Baloch, 2009). The primary factors in spreading of scabies seems to be poverty, poor hygiene, inadequate access to clean water, sharing of contaminated clothes, low socioeconomic condition, lack of education, frequent population movement,

lack of access to health care facilities, inadequate treatment, and social attitudes of peoples (Alsamarai. 2009). Pakistan is a developing country with a low middle-income economy with health discrepancies in villages or suburban areas and the lack of healthcare facilities makes treating diseases ineffective. The prevalence of scabies in Pakistan is also high, 45.55% (Majeed *et al.*, 2023). The overall prevalence of scabies in the current study was found as 39.19% which was highest than the one reported from Nawab Shah, 22.4% in Pakistan (Khoso *et al.*, 2019) while lowest than the one reported from Sindh, 47.6% in Pakistan (Zeba *et al.*, 2014). The difference in this study might be due to the hygienic practices, society awareness toward this ectoparasite and difference in socioeconomic status of peoples (Walton and Currie, 2007).

In current study, Children were most affected from scabies mites, 51.40% which was highest than the one report from Peshawar, 32.2% in Pakistan (Tufail and Khan, 2021), and lowest than the one report from Lahore, 58% in Pakistan (Farooq *et al.*, 2018). Children was more exposed to scabies because in school, children are setting in groups, in which students with different epidemiological background are in close contact and share supplies as well as equipment, as result children mostly suffer from scabies mites (Chaudhry *et al.*, 2018).

In this study prevalence of scabies found in both male and female, in which males were 60.7% suffer from scabies which was similar to a study conducted in Sindh, 63% in Pakistan (Ursani and Baloch, 2009), and highest than the one reported from Lahore, 31.8% in Pakistan (Farooq *et al.*, 2018). Female were 39.3% suffer from scabies, which was highest than a report from Lahore, 26.4% in Pakistan (Farooq *et al.*, 2018), and lowest than a report from Azad Kashmir, 58.5% in Pakistan (Ali. 2019). The higher prevalence of scabies in males has been previously attributed to different lifestyle,

implying greater exposure to potential mite sources, due to more intense social life in the community and the working periods far from their households (Al-Musawi *et al.*, 2018).

The prevalence of scabies in different Tehsils of District Karak were different. The highest prevalence was report in Tehsil Karak 42.1%, followed by Tehsil Takhti Nasrati, 34.5% and less prevalent in Tehsil Banda Daud Shah, 23.4%. The difference in prevalence rates of scabies in different Tehsils of District Karak was due to geographic distribution and overcrowded in Tehsil Karak.

The current study determines that the scabies patient, family members and other close contact was also reported scabies, the positive family history of scabies patients were 78.5% which was higher than the one reported from Khyber Pakhtunkhwa, 55.9% in Pakistan (Tufail and Khan, 2021) and lower than the one report from Peshawar, 85% in Pakistan (Naheed *et al.*, 2023). The history of itching in the family was a significant risk factor because prevalence of the scabies disease within a family is an important risk factor in scabies epidemiology (Arlian *et al.*, 1988).

In this study prevalence of scabies found in all seasons of year but scabies were reported highly prevalent in winter seasons, 53.3% which was higher than a reported from India, 44% (Gupta *et al.*, 2021) and lower than a reported from Rawalpindi, 63.75% in Pakistan (Farhana *et al.*, 2020). The prevalence of scabies in different season was varied because of scabies mites, *Sarcoptes scabiei*, can easily transmitted through clothes sharing and unhygienic condition of body in winter season while in summer, clothes was frequently changed and take proper bath thus scabies was less prevalent in summer seasons (Chosidow. 2006; Scott and Chosidow, 2011).

In this study scabies was reported more prevalent in those patients who shared clothes with their family members and other close contacts. There were 83.2% patients reported clothes sharing with their close contacts, which was similar to a study conducted in Sindh, 85% in Pakistan (Zeba *et al.*, 2014) and less than a report from Lahore, 47% in Pakistan (Akram *et al.*, 2020). The mites of scabies, *Sarcoptes scabiei*, can easily transmitted from one person to another person by sharing of clothes, bed sheets and others fabric materials thus scabies was prevalent in those patients who shared clothes with their close contacts. The prevalence of scabies knowledge, its transmission was significantly associated with the education level of the peoples (Arlian *et al.*, 1988).

CONCLUSION

The prevalence of scabies were high in all three Tehsils of District Karak, Khyber Pakhtunkhwa, Pakistan. Children are at high risk of scabies and scabies mites transmission is common in winter season as compared to other seasons of year. The study found that lack of education, sharing of contaminated fabric materials were associated with higher frequency of scabies. The family members and other close contact of scabies patients are at high risk of scabies infection. Therefore, there is need to promote mass scale deworming and health promotion campaigns to create awareness about scabies and from its prevention.

RECOMMENDATIONS

1. Awareness on scabies infestation, its preventive and control measures should be created at community level through mass media, so that to limited the spread of scabies.

2. Special health education program on scabies should be conducted for people attending first level health care facilities and aware the people about importance of hygienic body, cleanliness of clothes, bed sheets as well as environment.
3. Health education about mode of transmission and prevention against scabies should be imparted to school children.
4. To make a proper strong plan, to decreased and minimize the scabies in the region.
5. Further research should be conducted to understand better the factors contributing to the prevalence of scabies.

REFERENCES

1. Akram, M., Riaz, M., Noreen, S., Shariati, M. A., Shaheen, G., Akhter, N and Zainab, R. (2020). Therapeutic potential of medicinal plants for the management of scabies. *Dermatologic Therapy*, 33(1), e13186.
2. Alam, S., Khan, H., Orakzai, S. A., Ahmad, R., Ullah, M., & Naveed, M. M. (2020). Frequency of scabies with relation to season in patients attending The outdoor patient department of a tertiary care hospital. *Advances in Basic Medical Sciences*, 4(2).
3. Ali, W. K., Koyee, Q. M. K., Ahmed, R. K., & Abdullah, S. M. (2013). Prevalence of some medical insects and arachnids (lice and scabies) depending on records from the ministry of health in kurdistan region, Iraq. 89-93.
4. Ali, Z., Alaithan, A., Almubarak, K., Alibrahim, H., Almansour, A., Albalawi, T. & Mohiuddin, S. S. (2019). A Comprehensive Review Study on Scabies and its Associated Impact on PsychoSocial Health of an Individual. *International Journal of Contemporary Research and Review*, 10(2), 20700-20708.

5. Al-Musawi, N. D., Al-Bayati, N. Y., & Hussain, M. (2018). Evaluation of some interleukins and immunomodulatory factors in Iraqi scabies patients. *Journal of Garmian University*, 5(2), 30-40.
- Alsamarai, A. M. (2009). Frequency of scabies in Iraq, survey in a dermatology clinic. *The Journal of Infection in Developing Countries*, 3(10), 789-793.
6. Anderson, K. L., & Strowd, L. C. (2017). Epidemiology, diagnosis, and treatment of scabies in a dermatology office. *The Journal of the American Board of Family Medicine*, 30(1), 78-84.
7. Arlian, L. G., Estes, S. A., & Vyszynski-Moher, D. L. (1988). Prevalence of *Sarcoptes scabiei* in the homes and nursing homes of scabietic patients. *Journal of the American Academy of Dermatology*, 19(5), 806-811.
8. Chaudhry, F. R., Naz, S., Rizvi, D. A., & Ismail, M. (2018). Genetic characterization of *Sarcoptes scabiei* var. *hominis* from scabies patients in Pakistan. *Trop Biomed*, 35(3), 796-803.
9. Chosidow O. (2006), Scabies. *New England Journal of Medicine*, 354(16), 1718-1727.
10. Farhana, S. (2020). The impact of gender diversity in the boardroom on banks performances. *Jurnal Keuangan dan Perbankan*, 24(4), 434-448.
11. Farooq, B., Iqbal, R. S., & Akhtar, H. S. (2018). Prevalence and Knowledge of Scabies among the rural area of Lahore. *Children*, 20(22.0), 41-48.
12. Gupta, D. K., Singh, R. P., Agrawal, A. K., Kumar, A., & Gava, U. (2021). Study of prevalence and determinants associated with scabies in rural area of Bareilly. *Indian Journal of Community Health*, 33(1), 169-174.

13. Hay, R. J., Steer, A. C., Engelman, D., & Walton, S. (2012). Scabies in the developing world—its prevalence, complications, and management. *Clinical microbiology and infection*, 18(4), 313-323.
14. Karimkhani, C., Colombara, D. V., Drucker, A. M., Norton, S. A., Hay, R., Engelman, D., & Dellavalle, R. P. (2017). The global burden of scabies: a cross-sectional analysis from the Global Burden of Disease Study 2015. *The Lancet infectious diseases*, 17(12), 1247-1254.
15. Khoso, M. A. H., Nadeem, M. K., Chachar, B., Bashir, M. S., Pirzado, M. B. A., & Khan Khoso, J. (2019). Prevalence of Scabies at dermatology Department PMCH Hospital Nawabshah. *Asian Pacific Journal of Nursing and Health Sciences*, 2(2), 1-6.
16. Liu, J. M., Hsu, R. J., Chang, F. W., Yeh, C. L., Huang, C. F., Chang, S. T., ... & Lin, C. Y. (2017). Increase the risk of intellectual disability in children with scabies: a nationwide population-based cohort study. *Medicine*, 96(23), 7108.
17. Majeed, A., Mahmood, S., Tahir, A. H., Ahmad, M., Shabbir, M. A. B., Ahmad, W., & Ramish, W. (2023). Patterns of Common Dermatological Conditions among Children and Adolescents in Pakistan. *Medicina*, 59(11), 1905.
18. Micheletti, R. G., Dominguez, A. R., & Wanat, K. A. (2017). Bedside diagnostics in dermatology: parasitic and noninfectious diseases. *Journal of the American Academy of Dermatology*, 77(2), 221-230.
19. Naheed, N., Rehman, N., Manan, A., Ziaullah, Z., Afridi, I. U., Asghar, M., & Aziz, A. (2023). Epidemiology and clinical profile of scabies patients presenting to dermatology OPD, Hayat Abad medical complex, Peshawar. *International Journal of Health Sciences*, 6(S8), 6897–6903. <https://doi.org/10.53730/ijhs.v6nS8.14056>

20. RAMCHURN, J. S. M., BILAL, M. A., AHMAD, U. R., MUSHTAQ, A., SAJJAD, K., KEENOO, U and WALTER, V. (2005). A study about the General Awareness of Scabies in a Chinese population.
21. Rathi, S. K., Rathi, H. S. K., Lakhani, H., & Hansotia, M. F. (2001). Awareness about scabies among general medical practitioners (GPs) of Karachi, Pakistan. *Journal-Pakistan Medical Association*, 51(10), 370-372.
22. Raza, N., Qadir, S. N. R., & Agha, H. (2009). Risk factors for scabies among male soldiers in Pakistan: case-control study. *EMHJ-Eastern Mediterranean Health Journal*, 15 (5), 1105-1110.
23. Scott, G. R., & Chosidow, O. (2011). European guideline for the management of scabies, 2010. *International journal of STD & AIDS*, 22(6), 301-303.
24. Tahira, U., Jan, D. A. W., Memon, Q., Ullah, S., Jabeen, N., Zafar, H., & Ali, M. (2023). A Cross-Sectional Study on Prevalence And Associated Risk Factors Of Scabies In School Children Of Pakistan. *Journal of Pharmaceutical Negative Results*, 216-222.
25. Tufail, M. and Khan, (2021). Risk factors and diagnostic criteria for scabies in a population of Khyber Pakhtunkhwa, Pakistan: Unmatched Case-Control study. *Journal of Pakistan Association of Dermatologists*, 31(3), 459-463.
26. Ursani, N. M., & Baloch, G. H. (2009). Scabies epidemic at Tando Muhammad Khan, Sindh. *Journal of Pakistan Association of Dermatologists*, 19(2), 86-89.
27. Vos, T., Allen, C., Arora, M., Barber, R. M., Bhutta, Z. A., Brown, A., & Boufous, S. (2016). Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The lancet*, 388(10053), 1545-1602.

28. Walter, B., Heukelbach, J., Fengler, G., Worth, C., Hengge, U., & Feldmeier, H. (2011). Comparison of dermoscopy, skin scraping, and the adhesive tape test for the diagnosis of scabies in a resource-poor setting. *Archives of dermatology*, 147(4), 468-473.
29. Walton, S. F., & Currie, B. J. (2007). Problems in diagnosing scabies, a global disease in human and animal populations. *Clinical microbiology reviews*, 20(2), 268-279.
30. World Health Organization. (2023). *Report of a WHO meeting on skin-related neglected tropical diseases in West Africa, Geneva, 3-5 October 2022*. World Health Organization.
31. Zeba, N., Shaikh, D. M., Memon, K. N., & Khoharo, H. K. (2014). Scabies in relation to hygiene and other factors in patients visiting Liaquat University Hospital, Sindh, Pakistan. *Age (years)*, 9, 10-19.