

# A Community-Based Survey on Scabies: Awareness, Prevalence and Prevention

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the degree of  
Bachelor of Pharmacy

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## **Declaration**

It is hereby declared that

1. The thesis submitted is our own original work while completing a degree at BRAC University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted or submitted for any other degree or diploma at a university or other institution.
4. We have acknowledged all main sources of help.

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## **Approval**

The thesis/project titled “A Community-Based Survey on Scabies: Awareness, Prevalence and Prevention” submitted by Razia Sultana Bushra (ID-22146042), Nawshin Jahan (ID-22146062) of Summer-2025 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy.

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**Ethics Statement**

No animals or humans were harmed during this study. We promised to maintain the confidentiality and anonymity of the participants, and the participation was entirely voluntary.

## **Abstract**

Scabies is a highly contagious parasitic skin infection caused by *Sarcoptes scabiei var. Hominis*, one of the most important neglected tropical diseases, mostly affects populations living in low- and middle-income countries. The purpose of the present investigation was to assess the prevalence, knowledge, hygiene practices, treatment-seeking behaviour, and quality-of-life consequences related to scabies among those affected by the disease. A cross-sectional descriptive study was conducted among 75 participants who were reached using both online and offline structured questionnaires. Limits set the inclusion criteria to cases with physician-diagnosed cases. The instrument obtained demographic information, knowledge on scabies, personal hygiene practices, treatment modalities and environmental risk assessment. Data were subjected to a descriptive statistical analysis. The majority of the respondents were female (63%) and aged in the age group between 21 and 30 years (83.6%), with the majority of them residing in urban settings (75.3%) and living in a family unit. Overall, 83.6% of subjects correctly pointed out that scabies is a contagious disease, and 86.3% said they suffer intense itching at night. Nevertheless, 23.3% of respondents did not seek medical care, which emphasizes a deficiency in treatment-seeking behaviour. The peak period of the outbreak of this disease is in the summer (46.4%), thus showing the importance of the environmental factors. Most participants (71.2%) also reported that they were affected by scabies only once, and most were treated by permethrin (5% cream, 61.6%), which was considered affordable and well tolerated. The results show that reducing negative stigma, promoting early diagnosis, ensuring proper treatment and encouraging better hygiene practices are needed for the better effective control of scabies through educational as well as awareness programmes.

**Keywords:** *Sarcoptes scabiei var.* Scabies; Cross-sectional study; Public health.

## **Dedication**

I want to dedicate this work to my parents, who have ensured that I reach my final goal without any obstacles. They believed in me and supported me endlessly. And also one of my best friends, Punam, who encouraged me to choose this degree as my major when I was completely unsure.

~Razia Sultana Bushra (22146042)

I dedicate this project to my parents for their unwavering encouragement throughout my journey. And also thankful to my husband for his constant support, which kept me motivated through the challenges of completing this project.

-Nawshin Jahan (22146062)

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## **Table of Contents**

|                                                              |             |
|--------------------------------------------------------------|-------------|
| <b>Declaration</b>                                           | <b>ii</b>   |
| <b>Approval</b>                                              | <b>iii</b>  |
| <b>Ethics Statement</b>                                      | <b>iv</b>   |
| <b>Abstract/ Executive Summary</b>                           | <b>v</b>    |
| <b>Dedication (Optional)</b>                                 | <b>vi</b>   |
| <b>Acknowledgement</b>                                       | <b>vii</b>  |
| <b>Table of Contents</b>                                     | <b>viii</b> |
| <b>List of Tables</b>                                        | <b>x</b>    |
| <b>List of Acronyms</b>                                      | <b>xi</b>   |
| <b>Chapter 1 INTRODUCTION</b>                                | <b>1</b>    |
| 1.2 Scabies in children                                      | 7           |
| 1.2.1 Infants                                                | 8           |
| 1.2.2 Young children (ages 1-3)                              | 8           |
| 1.2.3 Children in preschool and school age (4–12 years)      | 8           |
| 1.2.4 Teenagers (ages 13 to 19)                              | 9           |
| 1.3 Complications of scabies                                 | 9           |
| 1.3.1 Secondary Bacterial Infection: Impetigo and Cellulitis | 9           |
| 1.3.2 Post-scabies eczema                                    | 10          |
| 1.3.3 Long-term skin damage                                  | 10          |



|                                                |    |
|------------------------------------------------|----|
| 1.4 Comparative Treatment Strategies           | 10 |
| 1.4.1 Topical versus Oral Therapy              | 11 |
| 1.4.2 Treatment Issues for Children and Adults | 11 |
| 1.4.3 Management of Women During Pregnancy     | 11 |
| 1.5 Rationale of the Study                     | 12 |
| 1.6 Objective of this Study                    | 12 |
| <b>Chapter 2 METHODOLOGY</b>                   | 13 |
| 2.1 : Study design and setting                 | 13 |
| 2.2 : Data Collection                          | 13 |
| 2.3 : Data Analysis                            | 14 |
| <b>Chapter 3 RESULT</b>                        | 15 |
| <b>Chapter 4 DISCUSSION</b>                    | 25 |
| <b>Chapter 5 CONCLUSION &amp; FUTURE WORK</b>  | 29 |
| 5.1 CONCLUSION                                 | 29 |
| 5.2 FUTURE WORK                                | 30 |
| <b>REFERENCES</b>                              | 32 |
| <b>Appendix A.</b>                             | 37 |

## **List of Tables**

Table 1: Demographic data of the respondents

Table 2: Distribution of respondents' knowledge level about scabies

Table 3: Environmental & hygiene factors of the respondents

Table 4: Scabies occurrence, affected area and treatment pattern

## **List of Acronyms**

|       |                                |
|-------|--------------------------------|
| NTD   | Neglected Tropical Diseases    |
| DALYs | Disability-Adjusted Life Years |
| WHO   | World Health Organization      |
| QoL   | Quality of Life                |

## **Chapter 1**

### **INTRODUCTION:**

Scabies is a significant neglected tropical disease, most common in lower- and middle-income countries of South and Southeast Asia and sub-Saharan Africa. It is a viral, infectious, dermatologic infection that is transmitted through the human itch mite, *Sarcoptes scabiei* var. *Hominis*, a pathogen that enters the epidermis and causes a characteristic clinical picture with severe pruritus and multifocal skin rashes (Chosidow, 2006). The infestation has been deemed as one of the most far-reaching and enduring public health issues on the planet, particularly in the low and middle-income nations and in the fringed communities. Although the health and social costs of poor and ineffective therapeutic modalities have been eliminated, scabies still disproportionately affects susceptible populations, which has prompted the scabies disease to be designated as a Neglected Tropical Disease (NTD) by the World Health Organization (WHO) in 2017 (WHO, 2017). The neglected status of this infection indicates the necessity of a more urgent awareness of the infection in the world, the improvement of control measures, and the enhancement of epidemiological investigations.

The non-impenetrable causative mite is only 0.2-0.4 mm long, making it almost invisible to the naked eye, but it is extremely pathogenic to the host. After copulation on the skin surface, the female mite penetrates the stratum corneum, where it digs tunnels and lays eggs (Arlian, 1989). These eggs then hatch into larvae in three to four days, where they continue to develop into nymphs and then ultimately reach adulthood, therefore continuing the life cycle of an infestation (CDC, 2023). This biological cycle and the ability of the mite to survive for two to three days away from the host are the basis of the mite's ability to be contagious and for outbreaks to occur in crowded living conditions and in institutional facilities, refugee camps and households with limited resources for hygiene (Strong & Johnstone, 2007).

There are three major types and a number of atypical variants of scabies based on the number of mites present, host immunity and clinical presentation (Chosidow, 2006; Engelman et al., 2020; bpacNZ, 2022).

### **Classic (Typical) Scabies**

This is the usual one seen among normal people and is characterized by a low number of mites, about 10-15 mites. Patients usually present with severe pruritus nocturna, erythematous papules, vesicles, and the characteristic burrows often found in the webs of fingers, the wrists, the belt line, and the genital region (Engelman et al, 2020; RACGP, 2017). There is no other mode of transmission except prolonged skin-to-skin contact.

### **Nodular Scabies**

A hypersensitivity variant characterized by firm plaques with pruritus in areas where the skin folds to conceal itself, such as the underarms, genitals, etc. It is a delayed hypersensitivity reaction to persistent mite antigens, even after topical Canada prescription (Merck Manual, 2023). The nodules are usually reddish-brown and are common in infants and people in their young adult years (bpacNZ, 2022; Merck Manual, 2023).

### **Crusted (Norwegian) Scabies**

In thousands to millions form, this is a severe, hyperinfestation form. It is mostly found in immunocompromised patients, the elderly, as well as in patients with neurological disorders or limited mobility (World Health Organization, 2023). The lesion is characterized by hyperkeratotic, crusted plaques, which often cause minimal itch, but this is due to the density of mites, which makes the condition extremely contagious (Engelman et al., 2020).

## 1.1 Atypical and Other Variants

Multiple atypical presentations have been reported, which have often been grouped under non-classic scabies or scabies surrepticius (Elgart et al., 2020). These include:

- **Bullous scabies:** Is clinically similar to bullous pemphigoid and is characterized by tense blisters (Ravichandran et al., 2023).
- **Scabies incognito:** This is disguised by corticosteroid application, and there is inadequate inflammation (Elgart et al., 2020).
- **Nail (ungual) scabies:** Infestation by the mites of the nail bed produces thickening and discoloration (Kaliyadan & Ashique, 2021).
- **Hidden or atypical scabies:** Unusual distribution or morphology which results in misdiagnosis (Engelman et al., 2020).

The global tiny mite with scabies is plentiful. According to the WHO (2020), over 200 million people have it at any given moment and over 400 million new cases are reported every year. The distribution of the disease is heterogeneous and disproportionately affects the tropical regions where environmental and socioeconomic factors are associated with maintaining transmission (Romani et al., 2015). In endemic settings, high prevalence in children is reported (>20%), reflecting the increased vulnerability because of intimate interpersonal contact and an underdeveloped immunity. (Hay et al., 2012).

The morbidity of scabies goes beyond the dermatologic to include some severe complications. Secondary bacterial infections that are caused by *Staphylococcus aureus* and *Streptococcus pyogenes* increase the burden of the disease, leading to impetigo, abscesses,

sepsis, acute post-streptococcal glomerulonephritis, and even rheumatic heart disease (Engelman et al., 2013). These sequels provide evidence that scabies is not just an irritant, and indeed, it is an entry point into some very important illnesses with systemic implications, which have long-term public health implications.

A characteristic feature of scabies is an intense pruritus, which in many cases will be worsened during the nocturnal period, this is often called the 'nocturnal crescendo' (Hay et al., 2012). This pruritic response is mainly immunologically mediated and is a type IV hypersensitivity response with delayed activation to the presence of mite antigens, fecal matter and eggs deposited within the epidermis (Walton & Currie, 2007). Due to the hypersensitivity reaction, it is why it is typically observed that individuals previously infested usually develop symptoms anywhere from one to three days after reinfestation, while those suffering from an initial infestation can remain asymptomatic for two to six weeks (Chosidow, 2006). Consequently, the mode of transmission, which is characterized by the delayed onset of symptoms in the naive host, allows for a silent spread that compromises the control of disease outbreaks.

An extreme form of the disease, called crusted scabies or Norwegian scabies, is a particularly difficult clinical and epidemiological problem. This presentation is mostly seen in immunocompromised or debilitated patients, such as HIV/Aids, with hematological malignancies, organ transplant recipients, or patients undergoing corticosteroid therapy (Roberts et al, 2005). Distinguished from classical scabies, in which (usually) there is a relatively small ectopic mite population, in crusted scabies, there is a very elevated mite burden (often million-fold) within hyperkeratotic crusts, which makes it highly contagious and difficult to control. The public-health implications are significant since a single untreated case of the disease (crusted scabies) may lead to widespread outbreaks of the disease in

institutional settings such as nursing homes, hospitals, and correctional facilities (Currie & McCarthy, 2010).

Diagnosis of scabies is still quite a challenge, especially in resource-constrained environments. While microscopic examination of skin scrapings (although with a specificity of 100% is only available at moderate sensitivity (about 56%), thus producing regularly false negative results (Walter, 2011). Dermoscopy and videodermoscopy have increased the precision of the diagnosis by allowing the characteristically described "delta -wing jet" sign of the mite within its burrow to be visualized directly (Dupuy et'al, 2007). Nonetheless, these technologies are frequently not available in endemic areas and force clinicians to rely mainly on clinical evaluation. This dependency makes it somewhat more imperative the need for affordable, sensitive, and standardized diagnostic protocols to have early detection and quick therapeutic intervention (Engelman et(Constants)Allocate, 2020).

The treatment of scabies has advanced significantly in the past 50 years; however, despite that, there are continuing difficulties with the condition. Topical permethrin 5% cream is widely accepted as 1st line therapy due to its demonstrable efficacy, favourable safety profile and tolerability in a variety of populations, including pediatric and pregnant populations (Currie & McCarthy, 2010). Alternative topical agents- benzyl benzoate, crotamiton, malathion and sulphur ointment have a sustained clinical role, especially in settings where there is suboptimal access to permethrin (WHO, 2020). The introduction of oral ivermectin has seen it prosper as an effective systemic therapy, particularly in mass drug administration and in the case of crusted scabies (Currie et al., 2004). However, because of its limited use in children under 15 kg and pregnant females, it is limited in its universal deployment (WHO, 2020). Only growing evidence of resistance to permethrin and ivermectin re-emphasizes the



need for novel pharmacological interventions and more pharmacovigilance (Pasay et al., Tychimeter, 2016).

The International Consensus on Scabies (ICS) and the International Alliance for the Control of Scabies (IACS) introduced standardized diagnostic criteria to detect scabies for methodological consistency of identification and reporting of scabies cases between clinical and study settings in 2020. The IACS system describes three levels of diagnosis (Confirmed A, Clinical B, and Suspected C) based on the level of certainty of the diagnosis. Level A (Confirmed scabies) requires direct visual observation of the mite, or its ova or fecal pellets, with light microscopy (A1), high-resolution imaging (A2), or dermoscopy (A3). This method has the best specificity at the cost of low feasibility in resource-constrained areas. Level B (Clinical scabies) is made when characteristic features such as burrows (B1), typical lesions on the male genitalia (B2) or lesions on common anatomical sites are accompanied by two core historical indicators that are the presence of pruritus (B3). Level C (Suspected scabies) Marriage of accuracy where a lesser number of diagnostic elements is present, such as typical lesions with only one historical feature (C1) or atypical lesions together with one historical feature (C2) and atypical lesions together with an additional historical feature (C2). These criteria have been validated in community-based studies and demonstrated reliable performance in studies carried out by both expert and trained non-expert examiners and are therefore of importance in the field for field surveys and in public health programmes conducted in endemic regions (Walker et al., 2020; Tsoi et al., 2021). Consequently, IACS classification allows a worldwide agreed classification aiding the standardization of diagnosis, epidemiological comparability and informing mass drug administration approaches within scabies control activities (Engelman et al., 2020; WHO, 2023).

Not only does scabies pose a medical problem, but it can also be a social and economic burden. The constant itching disrupts sleep and daily function, resulting in school absenteeism, lost workplace productivity and marginalized quality of life (Hay et al, 2012). Social stigma of the visible skin lesions and incorrect perceptions of hygiene worsen the psychological burden of affected people, especially children and women in low-income settings (Engelman et al., 2013). The overall burden on the health system is also important; scabies-related complications also contribute to higher levels of healthcare utilization, antibiotic prescriptions and the costs covered by hospitalization, especially for endemic communities (Romani et al., 2015).

The recognition of scabies as an NTD has resulted in renewed attention to the need to engage in population-level interventions, namely mass drug administration (MDA) campaigns. Cluster randomized trials in the Pacific region have shown that community-wide administration of oral ivermectin significantly reduces the prevalence of scabies and impetigo (Marks et al., 2019). Nevertheless, it is still difficult to maintain these reductions because of reinfestation from untreated populations, limited resources and environmental factors. Integration of scabies control with existing NTD programme may represent a cost-effective way to achieve improved outcomes in endemic regions, Engelman et al., 2020

## **1.2 Scabies in Children**

Scabies are usually not common in neonates, but close contact with infected caregivers can lead to scabies. In older children, lesions are less prominent on the face, scalp, palms and soles (Chosidow, 2006). Sleep problems, feeding problems and irritability can be a result of severe itching. Neonatal rashes may present with other dermatological diseases, and the diagnosis could be a challenge. Treatment must be done carefully due to the systemic treatments that are not recommended in this age group, such as ivermectin, with specific

topical medications such as permethrin being the only treatments that are considered safe (Engelman et al., 2021).

### **1.2.1 Infants**

Infants are more susceptible because of a lot of skin-to-skin contact with caregivers and other siblings. Scabies lesions are frequently found to be in the papule and nodular types, and secondary bacterial infections are very possible because of scratching. The challenge for families is great, as babies can have constant crying and discomfort. Early diagnosis and treatment of the infant and household contacts are critical to prevent reinfestation (Romani et al., 2015).

### **1.2.2 Young children (1-3 years)**

Due to the high degree of activity and proximity of their peer groups, children in a daycare or community setting, toddlers tend to have an increased susceptibility to transmission. Scratching can get impetigo started, and lesions may spread quite extensively on the body. Irritability and sleep disturbances are prevalent, and all have significant effects on general developmental trajectories. Preventive measures such as the mass treatment of populations in endemic areas and hygiene education of caregivers are therefore important (Heukelbach & Feldmeier, 2006).

### **1.2.3 Children in preschool and school age (4–12 years)**

Due to the situation of schools, where close contact facilitates the outbreak, scabies is a serious public health problem in this age range. Children's education can be affected in terms of stigma and absenteeism. Widespread, itchy lesions that are often aggravated by bacterial infections are among the clinical characteristics. Programmes for constant administration of medications such as ivermectin for older children are showing promise in reducing incidence in endemic areas (Engelman et al. 2013).

#### **1.2.4 Teenagers (13 to 19 years)**

Lesions appearing in the web spaces of fingers, wrists, and genital areas are more common patterns of scabies that are seen in adults and seen in adolescents. The related embarrassment and social stigma often lead to delayed reporting and institution of therapy. Owing to the conspicuous nature of the lesions and the interpersonal contact with peers, scabies can also play a role in the psychological distress of this age group. The successful treatment in adults is consistent with topical scabicides, and in some selected situations, with oral ivermectin (Engelman et al., 2021).

### **1.3 Complications of Scabies**

The lack of treatment of scabies or suboptimal treatment of the infestation may result in a range of sequelae beyond the primary infestation. On the part of those suffering from persistent pruritus, scratching causes these individuals to compromise the integument barrier, thus predisposing them to secondary bacterial infection. In addition, recurrent or chronic infestations can produce permanent dermatologic damage, whereas hypersensitivity reactions can lead to the development of post-scabies eczema. These considerations, like quick diagnosis and efficacious treatment, highlight the clinical significance of structuring efficient diagnoses and treatments which have broad relevance to both physical and psychological well-being (Hay et al., 2012; Engelman et al., 2021).

#### **1.3.1 Secondary Bacterial Infection: Impetigo and Cellulitis**

Prolonged scratching destroys the skin barrier and often, in turn, results in secondary infection. The most common bacterial complications are cellulitis, deeper dermatosis, and impetigo, which is usually caused by *Streptococcus pyogenes* or *Staphylococcus aureus*. If left untreated, these infections can develop the following systemic complications: sepsis or post-streptococcal glomerulonephritis (Hay et al., 2012).

### **1.3.2 Post-Scabies Eczema**

Even after successful eradication of the mites, patients can develop post-scabies eczema, which is characterized by prolonged pruritus, xerosis and cutaneous inflammation. This condition is thought to be the result of immune hypersensitivity to the antigens of the mites and the associated scratching over a long period of time. Management is usually done with the application of emollients and topical corticosteroids to attempt recovery of skin integrity (Engelman et al. 2021).

### **1.3.3 Long-term Skin Damage**

Chronic or untreated infestations of scabies may end in long-term dermatologic sequelae analogous to lichenification, hyperpigmentation and scarring. These manifestations are especially common in crusted scabies or in recurrent infestation. Long-term cutaneous damage not only contributes to physical ill-health, but it is also linked to psychosocial distress as a result of the visible nature of the skin alterations (Thomas et al., 2020).

## **1.4 Comparative Treatment Strategies**

Scabies treatment depends on the age, severity and special conditions of patients. While topical therapy is the traditional and standard form of treatment for uncomplicated cases, oral agents are reserved for logical applications (i.e. implantations that are severe in level or simply not tractable to topical). Pediatric and adult patients, as well as pregnant or lactating women, require specific regimens to ensure safety as well as efficacy (Engelman et al. 2021; Hay et al. 2012).

### **1.4.1 Topical versus Oral Therapy**

Owing to its powerful action and good safety profile, topical therapy (i.e. permethrin 5 % cream) has remained as first-line therapy for scabies. In order to ensure destruction of mites and eggs, it is applied to the entire body, and is repeated after 7–14 days. On the other hand, oral ivermectin is often used in extreme cases such as crusted scabies, institutional epidemics or cases in which topical treatment is impossible. Although oral therapy offers systemic treatment, it may be less effective against eggs and may require repeated dosing. While topical therapy is the recommended form of treatment in uncomplicated cases, comparative studies report the usefulness of both strategies (Engelman et al., 2021).

### **1.4.2 Treatment Issues for Children and Adults**

Treatment plans for pediatric populations have to consider the sensitivity of the skin, weight and age. Oral ivermectin is generally not used in children younger than 15 kg because of the lack of safety data, while permethrin cream is considered safe for newborns older than two months. In adults, the decision about which medication to use (oral or topical) depends on the severity of the disease and the compliance of the patient. Elderly patients should be given particular attention, as they may experience crusted scabies; therefore, they should also be treated with combination therapy (Hay et al., 2012).

### **1.4.3 Management of Women During Pregnancy and Breastfeeding**

The treatment of scabies in pregnant or lactating women requires a careful choice of medications to minimize fetal or neonatal risk. Permethrin cream has been deemed safe to use during pregnancy and breastfeeding, as very little is absorbed into the system. Oral Ivermectin, however, is normally not used because of insufficient safety data in pregnancy; this is considered in serious situations in which the benefits outweigh any risks. Supportive

measures, e.g. emollients and antihistamines for pruritus, may also be under medical supervision (Thomas et al., 2020).

### **1.5 Rationale of the Study**

Scabies is an important public health problem, particularly in low- and middle-income countries, because of its high prevalence rate, ease of transmission and link to poor hygiene and overcrowding. Despite being preventable and treatable, there are still gaps in public awareness, hygiene practices and treatment-seeking behaviour. Limited data at the community level further limits successful control strategies. Therefore, this research was carried out to determine the prevalence, awareness and preventive measures associated with scabies in order to identify the gaps and provide the funds for designing specific educational and public health interventions.

### **1.6 Objective of This Study:**

- To evaluate participants' knowledge about the causes, transmission, symptoms, and treatment of scabies.
- To assess attitudes toward scabies, including stigma, perceptions, and healthcare-seeking behaviour.
- To examine hygiene practices and preventive measures related to scabies among participants.
- To identify common misconceptions about scabies, such as transmission through pets or poor hygiene alone.

## **Chapter 2**

### **METHODOLOGY:**

#### **2.1: Study Design and Setting:**

A cross-sectional study was conducted to assess knowledge, measure prevalence, describe populations, generate hypotheses and preventive measures related to scabies among the populations, but it doesn't impart any cause-and-effect relationship because it doesn't track any changes over time. The data was collected using a questionnaire-based method, which is attached in the appendix.

#### **2.2: Data Collection:**

The research involved a total of 75 participants coming from different areas. Including different age groups, occupations, etc. An online survey was conducted, and an offline survey was conducted as well, and taking part was up to one's choice. Participants filled out the Google form according to their preference only if they were diagnosed by a physician. Data were collected through a structured questionnaire, which involved simple and easy language questions as well as closed-ended and multiple-choice questions. Before answering the questions, participants were given information about scabies and promised that their answers would be kept confidential. The analysis contained only those responses that were filled in.

The questionnaire contains the following:

- Demographic information ( age, sex, education, location, etc.)
- Knowledge about scabies ( cause, symptoms, mode of transmission, etc.)
- History of infection with scabies and treatment-seeking behaviour
- Personal hygiene and preventing practice



**2.3: Data Analysis:** It is descriptive analysis, as there are multiple sections present in the data which can not be generalized and analyzed by a T-test.

### Chapter 3

#### RESULTS:

Table 1 shows that most of the participants who were infected with scabies were female (63%), while males made up 37%. Looking at age, the majority were between 21 and 30 years old (83.6%), with only small numbers in the other age groups. In terms of marital status, most respondents were unmarried (87.7%), and only 12.3% were married. A large portion of them lived in urban areas (75.3%), while fewer came from rural (21.9%) or suburban (2.8%) areas. When it comes to the living situation, most participants stayed with their families (75.3%), some lived in dorms or hostels (16.4%), and only a few lived alone (8.3%). Finally, the majority were students (78.2%), while the remaining 21.8% fell into other occupations. Overall, the data suggest that the sample mainly consisted of young, unmarried female students living with their families in urban areas, as shown in Table 1.

| Variables      |           | Frequency (N) | Percentage (%) |
|----------------|-----------|---------------|----------------|
| Gender         | Male      | 27            | 37%            |
|                | Female    | 46            | 63%            |
| Age            | 11-20     | 7             | 9.6%           |
|                | 21-30     | 61            | 83.6%          |
|                | 31-40     | 2             | 2.7%           |
|                | 41 <      | 3             | 4.1%           |
| Marital status | Married   | 9             | 12.3%          |
|                | Unmarried | 64            | 87.7%          |
| Residence      | Urban     | 55            | 75.3%          |
|                | Rural     | 16            | 21.9%          |

|                         |                  |    |       |
|-------------------------|------------------|----|-------|
|                         | suburb           | 2  | 2.8%  |
| <b>Living situation</b> | With family      | 55 | 75.3% |
|                         | Alone            | 6  | 8.3%  |
|                         | dorm/hostel, etc | 12 | 16.4% |
| <b>Occupation</b>       | Student          | 50 | 78.2% |
|                         | Others           | 19 | 21.8% |

**Table 1:** Demographic data of the respondents (scabies patient)

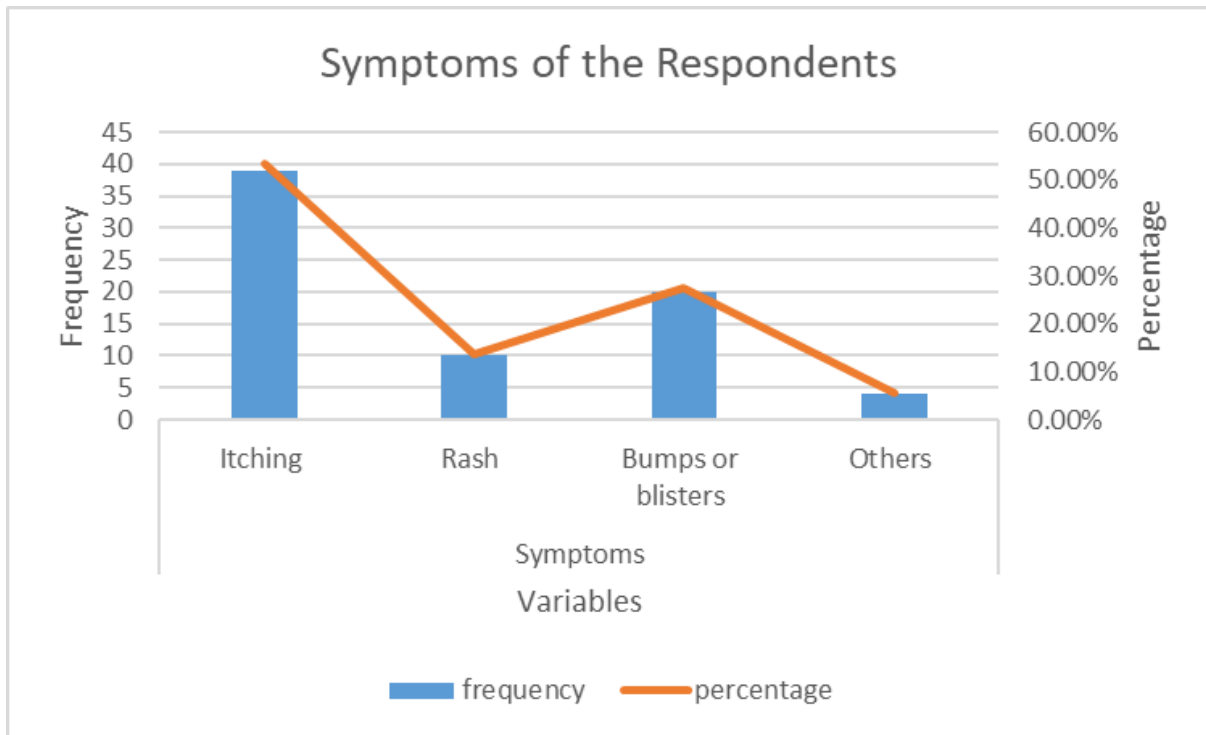
Regarding the knowledge of the participants on scabies, Table 2 shows that most participants (83.6%) believe that scabies is contagious, while a smaller group (16.4%) think it is not. When it comes to symptoms, itching was the most commonly reported (53.4%), followed by bumps or blisters (27.4%), rash (13.7%), and a few others (5.5%). In terms of seeking medical help, nearly half of the respondents (45.2%) said they would consult a doctor within a week, while 17.8% would go immediately. However, some people preferred to wait up to a month (13.7%), and about 23.3% didn't seek help at all. Additionally, a large majority (86.3%) reported experiencing intense itching at night, while only 13.7% did not. Overall, the responses suggest that most people are aware that scabies is contagious and commonly experience itching, but their approach to seeking medical care varies, as shown in Table 2.

| <b>Variables</b>             |         | <b>Frequency</b> | <b>Percentage</b> |
|------------------------------|---------|------------------|-------------------|
| <b>Scabies is contagious</b> | Yes     | 61               | 83.6%             |
|                              | No      | 12               | 16.4%             |
| <b>Symptoms</b>              | Itching | 39               | 53.4%             |

|                                 |                   |    |       |
|---------------------------------|-------------------|----|-------|
|                                 | Rash              | 10 | 13.7% |
|                                 | Bumps or blisters | 20 | 27.4% |
|                                 | Others            | 4  | 5.5%  |
| <b>Consult a doctor</b>         | Immediately       | 13 | 17.8% |
|                                 | Within a week     | 33 | 45.2% |
|                                 | Within a month    | 10 | 13.7% |
|                                 | Didn't seek help  | 17 | 23.3% |
| <b>Intense itching at night</b> | Yes               | 63 | 86.3% |
|                                 | No                | 10 | 13.7% |

**Table 2:** Distribution of respondents' knowledge level about scabies

Figure 1 shows that itching is the most common symptom, reported by over half of the participants (53.4%). Bumps or blisters were the next most frequent, experienced by 27.4% of respondents. Rash was less common, reported by 13.7% of the participants. A small number of people (5.5%) mentioned other symptoms. Overall, it's clear that itching is the main symptom most people experience, while the other symptoms are less common.



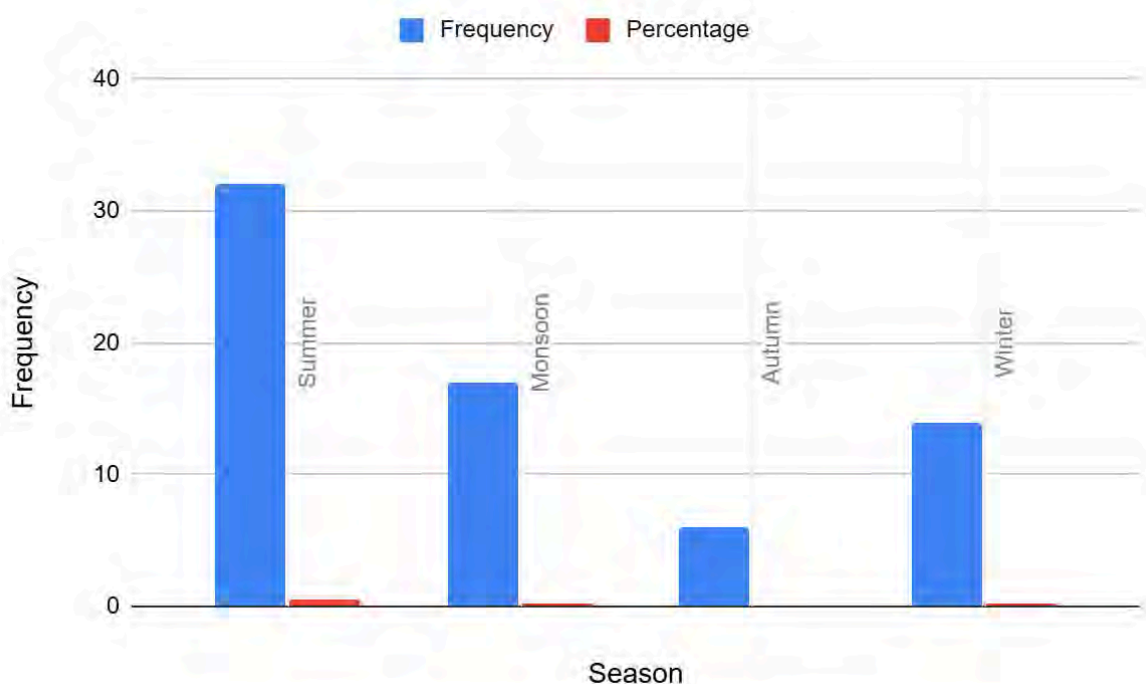
**Figure 1:** Symptoms of the respondents

In Table 3, it is mentioned that majority of respondents maintain relatively good hygiene practices, with 62.6% washing their clothes daily, while 25% do so every few days and 12.4% weekly. In terms of cleaning bedding, 43.8% wash their bedsheets and pillowcases weekly, followed by 27.4% every two weeks, 24.7% monthly, and only 4.1% rarely. Regarding sharing habits, most respondents (58.9%) reported not sharing towels or beds with others, although 32.9% do so occasionally and 8.9% share regularly. Seasonally, the highest proportion of cases was reported during summer (46.4%), followed by monsoon (24.6%), winter (20.3%), and autumn (8.7%). Additionally, a large majority of respondents (85.9%) reported having pets, while only 14.1% did not.

| Variables                       |                 | Frequency | Percentage |
|---------------------------------|-----------------|-----------|------------|
| Wash cloths                     | Daily           | 45        | 62.6%      |
|                                 | Every few days  | 18        | 25%        |
|                                 | Weekly          | 8         | 12.4%      |
| Wash bedsheet & pillowcase      | Weekly          | 32        | 43.8%      |
|                                 | Every two weeks | 20        | 27.4%      |
|                                 | Monthly         | 18        | 24.7%      |
|                                 | Rarely          | 3         | 4.1%       |
| Sharing towels, bed with others | Yes             | 6         | 8.9%       |
|                                 | No              | 43        | 58.9%      |
|                                 | Occasionally    | 24        | 32.9%      |
| Season                          | Summer          | 32        | 46.4%      |
|                                 | Monsoon         | 17        | 24.6%      |
|                                 | Autumn          | 6         | 8.7%       |
|                                 | Winter          | 14        | 20.3%      |
| Having pets                     | Yes             | 61        | 85.9%      |
|                                 | No              | 10        | 14.1%      |

**Table 3:** Distribution of Environmental & Hygiene Factors Among Respondents

The incidence of scabies in four seasons is further clarified in Figure 2, where we can see that the highest incidence of scabies is observed in summer, accounting for 32 respondents (46.4%), which represents nearly half of the total sample. This is followed by the monsoon season with 17 participants (24.6%), indicating about one-quarter of the respondents. Winter accounts for 14 individuals (20.3%), showing a moderate representation. The lowest proportion is seen in autumn, with only 6 respondents (8.7%). Overall, the data clearly indicate that most participants were associated with the summer season, while autumn had the least representation.



**Figure 2:** Incidence of scabies in four seasons

The survey results on scabies provide a clear picture of its occurrence, treatment, and patient experience which is tabulated in Table 4. Most respondents reported having scabies only once (71.2%), while 11% experienced it twice and 17.8% had multiple episodes. The most

commonly infected body part was the hands (39.6%), followed by the legs (26.2%), other areas (24.5%), and private parts (9.7%). In terms of treatment, the majority used Permethrin 5% cream (61.6%), with smaller groups relying on antihistamines (16.4%), other drugs (15.2%), or ivermectin (6.8%). Side effects were relatively uncommon, with 63% reporting none, 17.8% experiencing them, and 19.2% uncertain. Encouragingly, 81.9% of patients completed the full course of treatment, while 18.1% did not. Affordability was also positive, as 80.6% found treatment affordable compared to 19.4% who did not (Table 4).

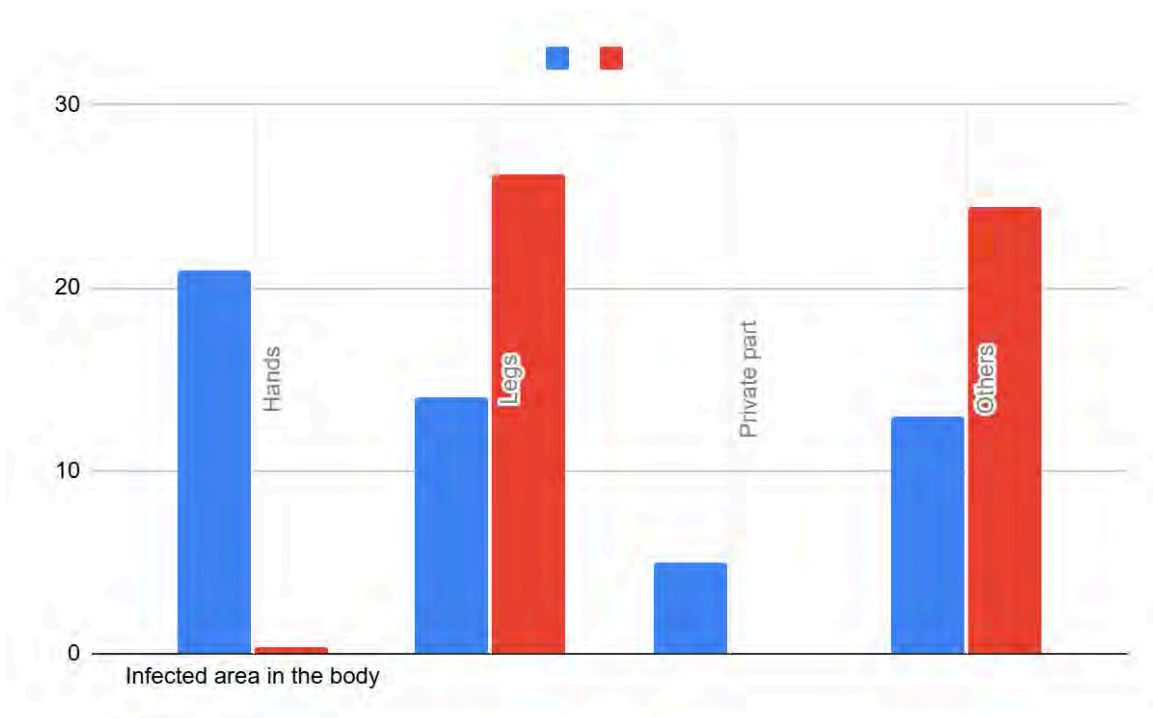
| <b>Variables</b>                 |                     | <b>Frequency</b> | <b>Percentage</b> |
|----------------------------------|---------------------|------------------|-------------------|
| <b>Scabies occurrence</b>        | Once                | 52               | 71.2%             |
|                                  | Twice               | 8                | 11%               |
|                                  | Multiple times      | 13               | 17.8%             |
| <b>Infected area in the body</b> | Hands               | 21               | 39.6%             |
|                                  | Legs                | 14               | 26.2%             |
|                                  | Private part        | 5                | 9.7%              |
|                                  | Others              | 13               | 24.5              |
| <b>Drugs used to treat</b>       | Permethrin 5% cream | 45               | 61.6%             |
|                                  | Ivermectin          | 5                | 6.8%              |
|                                  | Antihistamines      | 12               | 16.4%             |
|                                  | Others              | 11               | 15.2%             |



|                                             |       |    |       |
|---------------------------------------------|-------|----|-------|
| <b>Side effects</b>                         | Yes   | 13 | 17.8% |
|                                             | No    | 46 | 63%   |
|                                             | Maybe | 14 | 19.2% |
| <b>Complete the full course of the dose</b> | yes   | 59 | 81.9% |
|                                             | NO    | 13 | 18.1% |
| <b>Affordable treatment</b>                 | Yes   | 58 | 80.6% |
|                                             | No    | 14 | 19.4% |

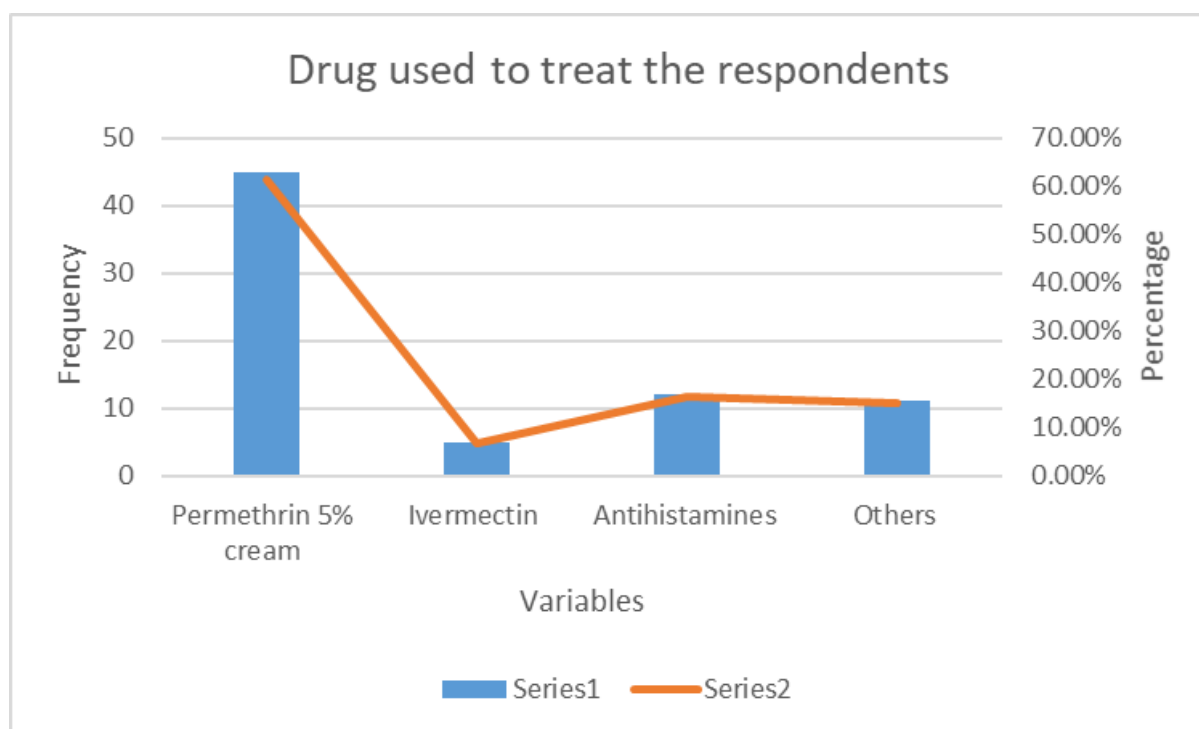
**Table 4:** Scabies occurrence, affected area and treatment pattern

Figure 4 shows how infections are distributed across different body areas, showing clear variations in frequency. The hands are the most commonly affected, accounting for 39.6% of cases (21 instances), which suggests they are the most exposed and vulnerable part of the body. The legs follow with 26.2% (14 cases), reflecting another area prone to contact and external exposure. Infections in the private part are less frequent, making up 9.7% (5 cases), but still significant due to the sensitivity of the area. Finally, the other category represents 24.5% (13 cases), covering miscellaneous regions that collectively form nearly a quarter of the infections. This distribution emphasizes the importance of hand hygiene and protective measures, as hands alone account for nearly two-fifths of all reported cases.



**Figure 4:** Infected body parts of the respondents

Figure 5 shows that the most commonly used drug for treatment is Permethrin 5% cream, accounting for 61.6% of cases (n=45), indicating it is the preferred first-line therapy. Antihistamines were used in 16.4% of cases (n=12), mainly to manage associated itching and allergic symptoms. A similar proportion, 15.2% (n=11), falls under other treatments, suggesting some variability in management approaches. In contrast, Ivermectin was used in only 6.8% of cases (n=5), making it the least commonly prescribed option among the listed drugs.



**Figure 5:** Drug used to treat the respondents

## **Chapter 4**

### **Discussion**

This study was conducted on a population of 75 scabies patients, including individuals from various occupations such as students, workers, labourers, and jobholders. This study assessed the amplitude, knowledge, affect and practice among the people. The findings from the questionnaire survey stated that participants are aware of scabies, and reveal whether there are gaps in their knowledge about transmission, prevention and treatment (WHO,2023). As we know, scabies is a parasitic infection (Centers for Disease Control and Prevention,2024). If the mites stay on the body for a long time, then the infection gets worse to the occurrence of secondary complications (Engelman et al., 2019). Patients need to maintain hygiene carefully as it is spread from one person to another (Centers for Disease Control and Prevention, 2024). The general risk factors are the immunocompromised patients, the elderly, children and those who live in overcrowded places (Centers for Disease Control and Prevention, 2024).

We conduct this survey to interpret the knowledge of each scabies patient. We mainly focus on their lifestyle, their demographic factors, as well as the living area, their hygiene factors and their steps to take the treatment. Although a high proportion of the participants correctly identified intense itching at night as a symptom of scabies, they are aware of the fact that it is contagious (Centers for Disease Control and Prevention, 2024). Moreover, some of them are not aware of the contagiousness of this disease, which ultimately causes the delay in treatment (World Health Organization, 2023). Some may think that it is a normal infection, and they didn't seek help from medical practitioners (Engelman et al., 2019). Negative stigma was found among the participants who were not willing to fill out the form, as they thought it was sort of an embarrassment to have this disease. This may hinder the control of the disease.

They, in fact, were not comfortable telling the lesion site. Some of the participants did not go to the doctors because they were self-diagnosed by listening to other patients (Centers for Disease Control and Prevention, 2024).

Among the participants, the unmarried females aged 21-30 are more vulnerable to this disease. Most of them lived with their families in an urban area and were students. Females are more affected by scabies because they wear more layers of clothes, which reduces the sunlight reaching those crucial areas of the body. which ultimately increases the number of mites and increases infections (Centers for Disease Control and Prevention, 2024). And also, women or females mostly in the urban area work daylong, so it affects their hygiene factors. It is not biologically determined; it is usually due to environmental and social factors. Women working in indoor environments or in close-contact settings, such as households or caregiving roles, may have increased exposure to infected individuals (Romani et al., 2015).

Participants used permethrin 5% and antihistamines (Centers for Disease Control and Prevention, CDC, 2024). Though antihistamines are not used to prevent or kill the mites, they are used along with other drugs to reduce the intense itching (World Health Organization, 2023). Most of the participants were careful about using a full course of medicines, which tends to limit the recurrence of the disease (CDC, 2024). That's why the majority of the participants were affected by scabies only once. Though there are participants who were affected by scabies multiple times due to their lack of knowledge about getting transmitted from person-to-person, lack of hygiene issues, not being treated correctly, etc. This leads to major secondary immunosuppression diseases. More often, we assume that having pets can spread this disease, but this survey showed that most of the participants do not have any pets (CDC, 2024). Pets do not carry the specific human mite *Sarcoptes scabiei var. hominis* responsible for scabies infestation (CDC, 2024).

Our findings are consistent with previous studies identifying nighttime itching as the primary symptom of scabies, although gaps in knowledge regarding transmission, prevention, and proper treatment still remain (World Health Organization [WHO], 2023). Similar research has also highlighted the presence of social stigma and poor hygiene practices associated with scabies (Engelman et al., 2019). However, studies with larger sample sizes have demonstrated higher levels of awareness and better healthcare-seeking behaviour among affected populations (Romani et al., 2015). Additionally, our findings are limited to urban populations, whereas other studies have included rural communities and provided a broader perspective on the disease burden (WHO, 2023).

Within this analysis, several limitations should be considered. This study highlights the need for educational awareness programmes, such as community-based health education campaigns, school health sessions, and mass drug administration programmes like those supported by the World Health Organization to improve public understanding of scabies (World Health Organization [WHO], 2023). Improving awareness can help reduce negative stigma by educating people about transmission, prevention, and effective treatment options (Engelman et al., 2019). However, the questions used in this questionnaire were limited in scope and may not have fully captured participants' actual practices and knowledge regarding scabies (Boynton & Greenhalgh, 2004). Additionally, the study relies on self-reported data, which is subject to recall bias, as participants may not accurately remember their past experiences with the disease (Althubaiti, 2016). There is also a possibility of social desirability bias, where participants may provide answers they believe are socially acceptable rather than reflecting their true knowledge or behaviours (Grimm, 2010). These biases may have negatively influenced the accuracy of the findings (Althubaiti, 2016). Furthermore, the cross-sectional design of the study limits the ability to establish causal relationships between participants' knowledge and their practices (Setia, 2016). The relatively small sample size

also limits the generalizability of the results to the wider population (Faber & Fonseca, 2014). Moreover, this study is based on reported practices rather than direct observation of behaviour, which may differ from actual practices in real-life settings (Althubaiti, 2016). Finally, misinterpretation of questionnaire items by participants may have occurred, potentially affecting the reliability of the responses (Boynton & Greenhalgh, 2004).

## **Chapter 5**

### **Conclusion and Future Work**

#### **5.1 Conclusion**

In summary, scabies is a multifactorial disease that goes beyond the boundaries of dermatologic science and has an impact on infectious disease management, public health function, socioeconomic growth and global health equity. Its global prevalence, complications, and ongoing neglect highlight the need for focused research, novel treatment approaches, and integrated public health efforts. A fuller knowledge of scabies, in biological, clinical and social terms, is critical to developing sustainable strategies with the goal of reducing the global burden of scabies.

Our study highlights the prevalence of scabies among the female students who lived in a rural area. Such other factors are included in the importance of scabies, such as demographic factors, hygiene factors, prevention and treatment. Improving awareness may improve the disease and reduce the knowledge gaps among the people.

The findings of this study come with certain limitations, particularly the small number of participants and the brief timeframe over which data were collected. These constraints mean we still lack a full picture of how widespread scabies is and how it moves through communities. Expanding future studies to include a broader range of people from different settings, both rural and urban, would make the results more meaningful and applicable.

Tracking communities over an extended period would also help reveal how the disease shifts with the seasons and shed light on the everyday circumstances that make people more vulnerable, such as crowded living conditions, poor hygiene practices, or the habit of sharing personal items like clothes and bedding.



From a diagnostic perspective, combining routine clinical evaluation with more sophisticated testing methods could improve the accuracy of identifying cases. Looking ahead, it is equally important to examine how effective current treatments are and how much impact public health campaigns and community education efforts are having. The broader aim is to reduce the toll that scabies takes on individuals and communities alike, and to work toward better health outcomes for all.

## **5.2 Future Work:**

Future research on scabies should focus on broadening the sample size and comprising more diverse populations to improve the generalizability of findings, particularly by incorporating both urban and rural communities (World Health Organization [WHO], 2023). Longitudinal studies are recommended to better understand the relationship between knowledge, behaviour, and scabies infection over time, as cross-sectional designs cannot establish such relationships (Setia, 2016). Further studies should also explore the effectiveness of targeted health education and awareness programs, such as school-based interventions, community outreach campaigns, and initiatives led by organizations like the World Health Organization, in expanding knowledge and reducing stigma associated with scabies (Engelman et al., 2019). In addition, future research could incorporate observational methods or clinical verification to complement self-reported data, thereby improving the accuracy and reliability of findings (Althubaiti, 2016). There is also a need to investigate the role of socioeconomic factors, hygiene practices, and living conditions in the transmission and recurrence of scabies, especially in resource-limited settings (Romani et al., 2015). Moreover, future studies may assess the impact of mass drug administration programs using medications such as permethrin or ivermectin on reducing disease prevalence at the community level (WHO, 2023). Finally, qualitative research approaches, including interviews and focus group

discussions, could provide deeper insights into community perceptions, stigma, and barriers to treatment-seeking behaviour (Engelman et al., 2019).

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