

## Identify Factors Associated with Scabies Aged 6-19 Years Old in The Boarding School

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### Abstract

Scabies is a significant worldwide health problem in boarding school children with dangerous systemic complications and an increased risk of mortality because of low priority for treatment. The method uses systematic review. Data sources were collected from databases such as Pubmed and Google Scholar regarding the incidence of scabies in boarding schools indexed nationally and internationally in 2014-2019. The exhaustive literature obtained is 15 studies, totaling 2490 samples by determining the required variables. Data analysis was performed by looking at OR, R.R., and P.R. The significant risk factors for school scabies were age, gender, personal hygiene, room conditions (Room humidity, ventilation, lighting), contact history, occupancy density, risky habits (Sharing a bed, clean clothes, exchanging personal items). The highest risk factor for the incidence of scabies was occupancy density (OR= 24,200, 95% CI = 7,990-73,299). Second is the room conditions (OR= 15,000, 95% CI = 3,639-61,832); third is personal hygiene (OR= 13,714, 95% CI = 4,210-44,677). The intervention will effectively reduce risk factors contributing to scabies, namely occupancy density, room conditions, and personal hygiene. The ratio of the number of students in a room, room conditions are highly recommended to meet health requirements. Then the improvement of personal hygiene behavior for every occupant of the school. This is to reduce the high rate of spread of scabies infection, especially in boarding-based schools.

**Keywords:** Systematic Review; Scabies; Boarding School; Risk Factor

### Introduction

Scabies is a transmitted skin disease caused by *Sarcoptes scabiei* (Gilson, 2019). In developing countries, scabies is a significant health problem. More than 200 million people are infected at any time globally. The prevalence of scabies is estimated at 0,2% to 71%. In children, the prevalence of scabies is estimated at 5% to 10%. Although the incidence of scabies is very high, it is a neglected disease. (WHO, 2019). Scabies is often overlooked because it is considered that has no fatality case. It caused the priority of treatment to become low. It actually will be a dangerous systemic complication such as asymptomatic acute kidney disease that can continue to be chronic in adulthood, heart disease, rheumatism, and increases the risk of mortality (Mutiara, 2016; Sungkar, 2016; Chung, 2014).

Scabies infection often spreads rapidly among school children due to close contact and school overcrowding as risk factors (Andrews, 2009; Heukelbach, 2004; H). Following Egab (2015). In schools that have boarding houses, the prevalence of

scabies is relatively high, such as in Malaysia (31%), Turkey (33%), and Thailand (87.3%) (Zayyid, 2010; Talukder, 2013; Pruksachatkunakorn, 2003).

The data above shows that the incidence of scabies in the school environment is very high. Research on risk factors for scabies in the boarding school environment by some researchers is still limited. The results are different regarding the significance of statistical variable testing, which is significant, so it is necessary to conduct systematic review research to summarize these studies. This study aimed to determine the extent to which the variables under study, find the structure overview by previous studies regarding the factors that cause scabies as well as determine the significant variables and decide which variables contribute the greatest risk to scabies in the boarding school (6-19 years old).

### Methods

The method used in this research is a systematic review. Research data comes from the literature obtained via the internet in research results regarding

the incidence of scabies in schools. The literature search was carried out using several keywords: scabies, boarding school, risk factors for scabies, scabies in Islamic boarding schools, and scabies in schools and boarding schools. The focus of education level taken for this research study is at Primary School, Junior High School to Senior High school.

National and international indexed research results were published from 2014 - 2019. Comprehensive searches were carried out by exploring electronic databases such as Pubmed and Google Scholar so that 15 scabies studies in schools from 2014 - 2019 were successfully accessed.

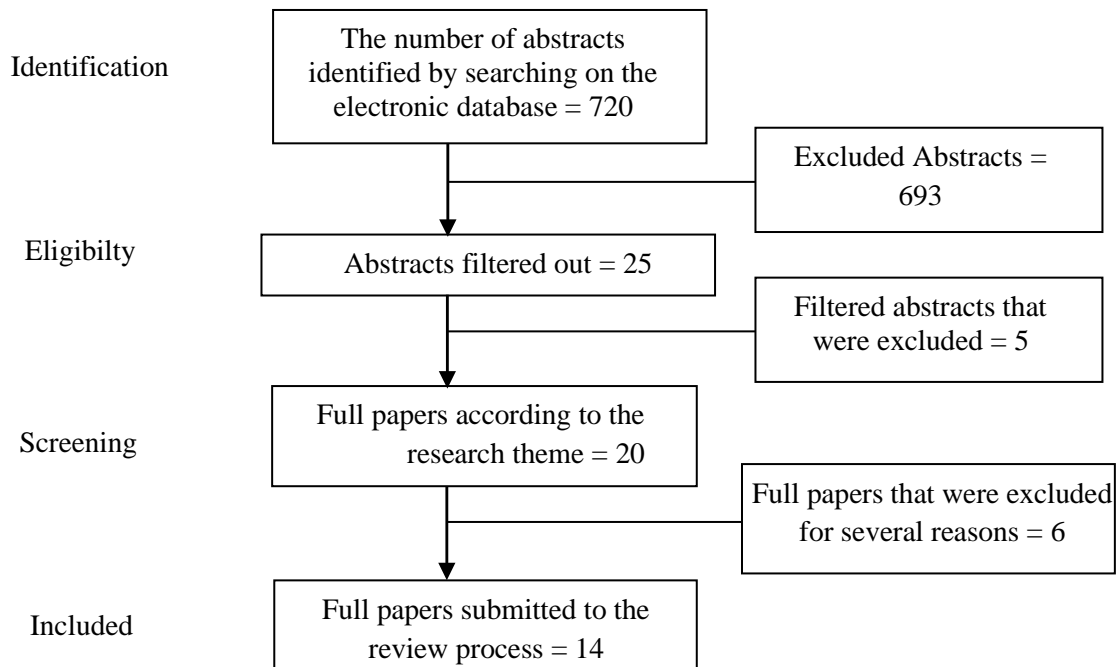


Figure 1: Selection of Research Journal

## Results

Based on previous studies that were successfully accessed, the number of variables studied ranged from 1 to 11. In terms of the number of significant variables, most studies show significance in 50-100% of the studied variables. This shows that the studies conducted have a high level of significance for each of the variables. We Found 15 risk factors for scabies studied in the school environment: age, gender, personal hygiene, room humidity, ventilation, occupancy density, cleanliness of clothes, knowledge, contact history, and hospital access exchange personal items. And lighting. Of these 15 factors, four factors are most studied: personal hygiene, gender, and occupancy density.

The systematic review that has been conducted, this study explains the factors associated with scabies in the school environment. The significant risk factors are age, gender, personal hygiene, room conditions (room humidity, ventilation, lighting), contact history, occupancy density, risky habits (sharing a bed, clean clothes, exchanging personal items). The researchers selected these risk factors as the main risk factors in the boarding school environment based on the highest proportion of significance by comparing the number of significant and insignificant risk factors and the consistency of the study.

## Discussion

This research found 14 studies that met the criteria to be studied in a systematic review. The research design used in these studies consisted of cross-sectional and case-control with a sample range of 53 - 776 samples. We know that one of the essential activities in managing scabies control is strengthening evidence-based data (Englman, 2018). Thus, these studies can describe the size of the scabies problem from the point of view of determinants.

This research focuses on a boarding school in area studies at the elementary, junior high, and high school levels. Boarding schools are educational institutions where students study and live and live together in the institution. Because living together in one building makes boarding schools a place that is vulnerable to infectious diseases, especially scabies. Based on the result, we have consistency. The significant risk factors are age, gender, personal hygiene, room conditions (room humidity, ventilation, lighting), contact history, occupancy density, risky habits (sharing a bed, clean clothes, exchanging personal items).

A person's age is very influential on knowledge, attitudes, and behavior. Regarding the incidence of scabies in a person, exposure experience plays a



significant role because those of higher age tend to have experience with scabies and have the potential to know prevention and transmission better. The prevalence of scabies tends to be high in children and adolescents with an age range of 4 to 14 years (Hay, 2018). WHO also states that the most vulnerable groups to experience scabies are children, especially in poor communities (WHO, 2017).

Ratnasari and Sungkar's (2013) study shows that the prevalence of scabies is related to gender, where the prevalence is higher in male than female respondents. This is related to the habit of male students who pay less attention to personal hygiene. In addition, a new study from Lund University in Sweden found that there is a natural difference in the immune response of men and women that affects the ability of the two sexes to fight pathogens or exposure to parasites in which the male sex has a lower ability to control the sexes. Against these pathogens (Roved et al., 2018).

Personal hygiene is the third-highest significant variable. When making contact with a person with scabies, someone who has a poor level of personal hygiene will be more at risk for suffering from scabies (Menaldi, 2015). Scabies causes itching, and the itching gets worse when sweating (Sianturi, 2014). If students bathe twice a day and use soap regularly, the agent that causes scabies on the body's surface will be removed, thereby reducing the risk of scabies infection (Sungkar, 2016). According to Robert (2019), there is no definite frequency regarding the best bathing habits. However, a sound bath is 3-4 minutes per bath and focuses on cleaning skin folds such as the armpits and groin.

Room condition is the second-highest significant factor. According to Liu (2016), humidity correlates with increased scabies. Scabies can last 1.5 days in indoor humidity. The higher the humidity, the higher the incidence rate of scabies. On a vent that is said to be eligible according to the Minister of Health Regulation No. 1077 of 2011, which is a minimum of 10% of the floor area. Ventilation is one way to keep the room atmosphere comfortable and healthy. Air circulation regulation is needed to create a comfortable, healthy room and healthy long-term for cardiovascular and respiratory complications (Anderson, 2012). Lighting is also related to existing ventilation, namely as a medium for natural light to enter the room. Indoor light that is too high can cause an increase in room temperature. The lighting in the room is made according to the needs of reading and seeing objects around with a minimum requirement of 60 Lux (MOH, 2011).

Scabies can be transmitted through direct contact with scabies and indirectly through personal items such as blankets, towels, and clothes contaminated

with the *Sarcoptes scabiei* mite (Krishna, 2015). The *Sarcoptes scabiei* mite lives on the surface of human skin. The mites burrow at predilection sites in human skin and cause itching. The place of predilection is usually in places that have a thin stratum corneum, namely between the fingers, the volar part of the wrist, the outer elbow, the forelimb fold, the areola mammae (women), the ambiguous, the buttocks, the external genitalia (men) and the lower abdomen.

Occupancy is the first highest significant variable. The occupancy density is based on international standards, including the minimum space for 2-3 people is 10.2 m<sup>2</sup> (Kilicaslan, 2013). High occupancy density, especially in school environments with dormitories, causes direct contact between students, resulting in the transmission of scabies (Audhah, 2012; Lubis, 2015). As a result of this direct contact, the risk of scabies is high (Nurohman, 2018; Yunita, 2018; Imartha, 2017).

Exchanging personal items can raise a risk factor. The habit of borrowing and borrowing items such as soap, towels, and clothes that can increase the risk of infectious diseases must be avoided because these items can act as intermediaries for mites to move from one place to another (Ubaidilah, 2010). Adult mites can emerge from the stratum corneum, adhere to clothing, bedding, and live outside the human body for about three days; this period is enough to transmit scabies. Therefore, students should not borrow clothes and personal equipment used and unwashed (Susilo, 2014).

## Conclusion

There are seven significant risk factors and two insignificant factors for the incidence of scabies. Based on these factors, the highest risk factors for the incidence of scabies were occupancy density (OR= 24,200, 95% CI= 7,990-73,299); second is the room conditions (OR= 15,000, 95% CI= 3,639-61,832); third is personal hygiene (OR= 13,714, 95% CI= 4,210-44,677). The ratio of the number of students in a room, room conditions are highly recommended to meet health requirements. Then the improvement of personal hygiene behavior for every occupant of the boarding school. This is to reduce the high rate of spread of scabies infection, especially in boarding-based schools.

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## Authors Contribution

This research was completed with teamwork. The first author contributes as a drafter, data curation, data analysis, methodology, supervision. The second, third, and fourth authors contributed to the data analysis methodology. The fifth author contributes as a data curator, supervision. All writers play a role in visualizing, writing, and drafting.

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