



Original Article

## Examining the Factors Affecting Scabies Incidents: A Case Study of Pondok Pesantren X at Karimun Regency, Indonesia

Hengky Oktarizal <sup>a</sup>, Norhayati Ab Manaf <sup>b,\*</sup>, Yuyun Marlianti <sup>a</sup>, Ahmadi Ahmadi <sup>a</sup> and Nurul Aisyah Awanis A Rahim <sup>c</sup>

<sup>a</sup> Faculty of Health Science, Universitas Ibnu Sina, Lubuk Baja, 29444 Batam City, Riau Islands, Indonesia; [hengky.oktarizal@uis.ac.id](mailto:hengky.oktarizal@uis.ac.id) (H.O.), [anisfirdaus2211@gmail.com](mailto:anisfirdaus2211@gmail.com) (Y.M.), [ahmadi@uis.ac.id](mailto:ahmadi@uis.ac.id) (A.A.)

<sup>b</sup> Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu Malaysia.

<sup>c</sup> Operation Research & Management Sciences Research Group, Faculty of Business and Management, Universiti Sultan Zainal Abidin, 21300 Kuala Nerus, Terengganu, Malaysia; [awanisrahim@unisza.edu.my](mailto:awanisrahim@unisza.edu.my) (N.A.A.A.R.)

\* Correspondence: [yati.manaf@umt.edu.my](mailto:yati.manaf@umt.edu.my) (N.A.M.)

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**Abstract:** Scabies, caused by the *Sarcoptes scabiei* mite, is a significant global health issue, especially in tropical and subtropical areas. This study examines factors affecting scabies incidents at Pondok Pesantren X at Karimun Regency, Indonesia, in 2023. Data from 106 participants, including 37 scabies cases, were analyzed using a cross-sectional design and quantitative analysis. The results indicated a significant relationship between scabies and knowledge, attitudes, practices, and perceptions of humidity. Lower knowledge, attitudes, and practices increased the risk of scabies, as did perceptions of humidity. Effective health post-management at the boarding school also significantly influenced the incidence of scabies. These findings highlight the need for interventions to improve knowledge, attitudes, practices, and environmental conditions to prevent better and manage scabies. There is a clear link between knowledge, attitudes, practices, humidity perceptions, Health Post management, and the occurrence of scabies. To address scabies among students at Pondok Pesantren X, targeted interventions are essential, including education on prevention, good hygiene practices, and timely provision of medical help. Maintaining optimal room humidity and improving health management are critical. Collaboration with local health authorities and ongoing monitoring and evaluation is recommended for effective implementation. Islamic boarding schools can reduce scabies incidents and enhance students' well-being by fostering partnerships and collective action.

**Keywords:** Scabies; Student health; Environmental factors; Disease prevention; Healthcare management.



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### 1. Introduction

Scabies are among the infectious skin conditions that pose a health concern in the community. It is caused by the *Sarcoptes scabiei* mite, transmitted to humans through animals. In both children and adults, the occurrence is equal for both males and females. The transmission of scabies mites usually happens through prolonged, direct skin-to-skin

contact with an individual who has scabies (Nuraini & Wijayanti, 2016). In 2020, the International Alliance for the Control of Scabies (IACS) reported that the prevalence of scabies is estimated to affect 150 to 200 million people worldwide, with annual cases reaching 455 million (Nuraini & Wijayanti, 2016). According to the World Health Organization (WHO), the most recent projections in 2020 suggest that scabies prevalence varies from around 0.2% to 71%, impacting over 200 million individuals at any given time (Faidah, 2022). It is more commonly observed in hospitals and among vulnerable groups in developed countries, attributed to inadequate socioeconomic conditions. This disease is also prevalent in developing countries (Majid et al., 2020). The global prevalence records approximately 300 million cases, indicating that there is still a relatively high incidence of scabies each year. Scabies are endemic in tropical and subtropical regions, such as Africa, South America, the Caribbean, Central and Southern Australia, and Asia. In industrialized nations like Germany, scabies happen sporadically or exhibit a prolonged endemic nature.

According to Baur's report 2013, scabies in India are recorded at 20.4%. Furthermore, research conducted by Onayemi revealed a prevalence of scabies in Nigeria of 28.6% (Anggreni & Indira, 2019). Simultaneously, the Ministry of Health of the Republic of Indonesia (MoH) identified that the prevalence of scabies in Indonesia ranged from 4.60% to 12.95% in 2000. In 2016, the MoH documented an incidence rate for scabies falling from 5.60% to 12.96%. This suggests that Indonesia ranks third globally in the occurrence of scabies among the 12 most prevalent skin conditions (Kadri & Fitrianti, 2021). Common predisposing factors for the infestation include insufficient personal hygiene, high room humidity, malnutrition, limited understanding, a negative attitude towards scabies, and adopting an unhealthy lifestyle. Moreover, various environmental sanitation factors associated with scabies include lighting, ventilation, room humidity, temperature, and water supply (Emmett Grames, 2020). A report from the Karimun Regency Health Department in 2022 showed that scabies affected 1,312 people in the region. This was a slight increase from the previous year when 1,304 cases of scabies were recorded (Health Department Report, Karimun Regency, 2022).

One of the oldest Islamic boarding schools in the region is Hidayatullah Islamic Boarding School, situated in Pasir Panjang Village, West Meral District. The institution houses a community of 106 students who live together within the boarding school. In 2021, the school witnessed twenty-three of its students' experiencing scabies; in 2022, the number increased to thirty-six students. The cases included both historical and newly reported incidents. A preliminary investigation involving observations and interviews with the caretakers and several students at Hidayatullah Islamic Boarding School in Pasir Panjang Village, West Meral District, revealed that the boarding school environment had sanitation issues. Moreover, the students lacked awareness and compliance with hygiene standards for personal and environmental cleanliness. The boarding school area was exposed to various disease vectors, and scabies were a recurrent problem. Based on the interview with the Health Center Officer, cases of scabies are frequently ignored by students who adopt incorrect treatment methods. Students affected by scabies often self-medicate without proper supervision.

Moreover, in instances of transmission to other students, the medication is sometimes shared without a doctor's prescription. Failure to address this issue could adversely affect the educational setting at the Islamic Boarding School, posing a potential threat to the health of the learning community. Therefore, given the preliminary observations and interviews, the local Health Center strongly supports conducting additional research at Hidayatullah Islamic Boarding School in Pasir Panjang Village, West Meral District. Consequently, the researcher is eager to explore the correlation between student behaviour, humidity, and the Health Post of the Islamic Boarding School Management's role in scabies at the school in the year 2023.

## 2. Literature Review

### 2.1. Understanding Scabies: Causes, Risks, and Transmission

Scabies is a skin disease resulting from an infestation and sensitization by the *Sarcoptes scabiei* var. *hominis* mite. This condition falls within the phylum Arthropoda, Class-Arachnida, Order-Acarina, Family-Sarcoptidae (Moerdino Adi Prasetyo, 2021). It also has various locals, such as Kudis, Gudig, Budukan, and Agogo Gatal. The risk of contracting scabies is not limited by socioeconomic status, gender, or age (Wardhana et al., 2016). Scabies serves as a predisposing factor for superficial bacterial skin infections, predominantly attributed to *staphylococcus aureus* and *streptococcus pyogenes*, which can consequently result in significant complications, such as severe skin and soft tissue infections, sepsis, glomerulonephritis, and the potential development of acute rheumatic fever (Yankes Kemkes, 2022). One risk factor for scabies is a weakened immune system. The lower an individual's immune system, the higher the chances of being affected or contracting the disease. Yet, it is believed that immunity builds up following an infection. Those who have experienced a previous infection show greater resistance to recurring infections, although they may still be vulnerable compared to individuals who have never encountered scabies.

Several factors can lead to scabies, such as poor living conditions, lack of hygiene, risky sexual behaviors, misdiagnosis, and the development of dermatophytosis or etiological factors. The transmission of scabies can occur through 1) Direct contact, which involves skin-to-skin contact with an individual with scabies, such as handshakes, sexual contact, or sharing a bed, and ii) Indirect contact (via objects), such as sharing beds and borrowing clothes, towels, and other personal items (Sungkar & Park, 2016). According to the Kamus Besar Bahasa Indonesia (the

authoritative dictionary of the Indonesian language), behaviour is how an individual acts or responds to stimuli or the environment. It is a manifestation of how one responds to stimuli and is greatly influenced by the situation in which the stimuli occur. Individuals seem unable to control their behaviour, causing stimuli and responses to appear mechanistic.

## 2.2. Individual knowledge about scabies

Scabies, a global health concern caused by the *Sarcoptes scabiei* mite, underscores the critical importance of individual knowledge for prevention, early detection, and effective management. Notably, studies by Burkhart & Burkhart (2020) and Karimkhani et al. (2017) emphasize the prevalence of scabies across diverse populations and its profound impact on public health. Recognizing symptoms of scabies is paramount for early diagnosis, as highlighted by research from Hay et al. (2018), stressing the need for comprehensive education on the varied clinical presentations—from typical burrows to atypical manifestations. Comprehensive prevention hinges on an understanding of scabies transmission. Mounsey et al.'s (2018) study delves into community perceptions, revealing misconceptions that may impede preventive efforts. Engelman et al. (2019) and related research underscore sociodemographic factors influencing scabies knowledge, stressing the necessity of addressing awareness disparities for targeted educational interventions. Critical to successful management is knowledge about scabies treatment. Thomas et al. (2020) and Andrews et al. (2019) explore treatment efficacy and the impact of individual knowledge on compliance, emphasizing the pivotal role of informed patients. As assessed by Bhat et al. (2018) and Romani et al. (2021), public health interventions and educational programs play a vital role in enhancing individual knowledge. These initiatives, often directed at schools, communities, and healthcare settings, contribute to a broader strategy for scabies awareness. Despite progress, persistent knowledge gaps underscore the need for ongoing effective prevention and management efforts. To comprehensively address these challenges, future research should concentrate on targeted interventions, accounting for sociodemographic factors and cultural contexts.

## 2.3. Individual attitudes towards scabies

Behavior is the sum of an individual's perceptions and actions, influenced by various internal or external factors. Internal factors include the individual's characteristics, such as knowledge level, gender, etc. External factors cover physical, social, cultural, political, and other aspects of the environment. These factors tend to influence individual behaviour. Benjamin Bloom is an educational psychology expert, classified behaviour into three domains: cognitive, affective, and psychomotor domains (Basuki, 2019). Knowledge is an outcome of awareness, which occurs after an individual observes a particular object. The levels of knowledge within the cognitive domain, as outlined by Notoatmodjo (2012), encompass the following: 'Knowing' involves recollecting previously stored memories after observing something. This level of knowledge includes recalling specific information from the material learned or stimuli received. 'Comprehension' is accurately explaining and interpreting a known object. Meanwhile, 'Application' is interpreted as the ability to apply learned material in real or actual situations. 'Analysis' entails elaborating on or explaining an object or material within its organizational structure while maintaining its interconnections. 'Synthesis' is the skill to link parts within a new overall form. 'Evaluation' is the understanding of assessing a material or object (Notoatmodjo, 2012).

An attitude is a person's internal evaluation or response to something or someone. The attitude is not directly observable, but it can be inferred from the visible behavior of the person. Newcomb, a social psychologist, asserted that attitude is the preparedness to act and does not necessarily involve the execution of a specific motive. Basically, an attitude is not a specific action, but a tendency to act in certain ways. It has four levels: acceptance, response, appreciation, and responsibility (Notoatmodjo, 2012). Assessing attitudes can be conducted through direct or indirect means. The direct approach may involve interviewing respondents about their opinions or statements regarding a particular object. Indirect measurement can be achieved using hypothetical statements and seeking respondents' opinions. For instance, an example statement could be, "I will not reside with my parents at the age of 27," with response options ranging from strongly agree to disagree (Notoatmodjo, 2012). To achieve this, supportive factors are essential, and these include facilities. Besides facility-related factors, support from others is also required.

## 2.4. Practice patterns towards of scabies occurrences

Practice patterns towards scabies occurrences encompass a multifaceted approach involving individual and community-level strategies. At the individual level, these patterns may include maintaining personal hygiene practices, such as regular handwashing with soap and water, trimming fingernails to reduce the risk of scratching and spreading the mites, and avoiding sharing personal items like clothing, towels, and bedding. Furthermore, individuals may adopt preventive measures such as wearing protective clothing, particularly in crowded or high-risk environments, and seeking timely medical treatment if symptoms of scabies arise. Additionally, community-level interventions play a crucial role in addressing scabies occurrences. These may include educational campaigns to raise awareness about scabies transmission, prevention, and treatment options and improve access to healthcare services for diagnosis and management. Collaborative efforts between health authorities, educational institutions, and community leaders are

essential for implementing and sustaining effective practice patterns to mitigate scabies occurrences and promote overall well-being (Sungkar & Park, 2016).

In addition to individual hygiene practices, environmental factors play a significant role in shaping practice patterns towards scabies occurrences. Implementing measures to maintain a clean and hygienic living environment can help reduce the risk of scabies transmission. Regular cleaning of living quarters, bedding, and clothing can help eliminate mites and prevent their spread. Furthermore, maintaining proper ventilation and controlling humidity levels in living spaces may also reduce the risk of scabies infestation, as mites thrive in warm and humid conditions. Community-based interventions, such as sanitation campaigns and improvement of housing conditions in vulnerable areas, can have a positive impact on reducing the prevalence of scabies. These efforts address the immediate risk of scabies transmission and contribute to overall community health and well-being (Wardhana, 2016).

## **2.5. The relationship between environmental humidity and scabies occurrences**

Air humidity refers to the presence of water vapor in the atmosphere. The water vapor in the air constitutes only a small fraction of the entire atmosphere (Abujamin Ahmad Nasir, 2017). Chapter 3 of the Minister of Health Regulation No. 1077/ Menkes/ PER/ VI/ 2011, which provides guidelines for indoor air health in homes, states that microorganisms can grow more easily when the humidity level is too high or too low. The recommended humidity range should be maintained between 40 – 60% Rh. According to Depkes RI (2007), a Poskestren is an institution that has the readiness, capability, and willingness to prevent and handle health problems independently, within its capacity, in an Islamic boarding school. The function of the Poskestren within an Islamic boarding school involves acting as a platform for community empowerment. It delivers fundamental health services through promotive, preventive, curative, and rehabilitative efforts and serves as a space for educating individuals about the values and teachings of Islam within the realm of health issues. The objective is to improve the health conditions of its residents.

## **2.6. Health Post of the Islamic Boarding School management in the prevalence of scabies disease**

Recent studies by Burkhart & Burkhart (2020) and Karimkhani et al. (2017) highlight the widespread prevalence of scabies in diverse populations, highlighting its significant impact on public health. This underscores the urgency for comprehensive preventive measures. Early diagnosis hinges on individuals recognizing scabies symptoms, as emphasized in the research by Hay et al. (2018), which stresses the need for educating individuals about the diverse clinical presentations, ranging from typical burrows to atypical manifestations. To develop a comprehensive approach to prevention, understanding scabies transmission is crucial. Mounsey et al. (2018) delve into community perceptions, revealing potential misconceptions that could impede preventive efforts. This underscores the importance of accurate transmission education. As highlighted by Engelman et al. (2019) and related studies, sociodemographic factors play a pivotal role in scabies knowledge. Addressing awareness disparities becomes crucial for effective prevention, emphasizing the need for targeted educational interventions.

Effective management of scabies is contingent on individuals' knowledge about treatment. Studies by Thomas et al. (2020) and Andrews et al. (2019) explore treatment efficacy and the impact of individual knowledge on compliance, underscoring the pivotal role of well-informed patients. Recent literature points to the emerging role of health posts in schools or hostels such as Poskestren as integral components of scabies prevention strategies. Initiatives evaluated by Smith et al. (2022) exemplify the effectiveness of health posts in providing education, early detection, and access to treatment within a school setting. In conclusion, the literature reviewed emphasizes the critical role of individual knowledge in both scabies' prevention and management. Recent studies highlight the evolving importance of health posts in schools as key players in implementing comprehensive strategies against scabies. Future research should continue to explore innovative approaches within school environments, ensuring the effective dissemination of information and resources for enhanced scabies control.

## **3. Materials and Methods**

The research utilized a cross-sectional design coupled with quantitative analysis to investigate the relationship between various factors and the occurrence of scabies. Conducted in 2023 at Pondok Pesantren X, Karimun Regency, Indonesia, the study involved 106 participants, known as Santri, selected through a total sample approach to ensure representation of the entire population. Among the participants, only 37 were afflicted with scabies. Through interviews and questionnaires, data on knowledge, attitudes, practices, humidity perceptions and Health Post of the Islamic Boarding School management were collected simultaneously. The collected data underwent processing, including editing, coding, data entry, cleaning, and storage. Subsequently, both univariate and bivariate analyses were performed to present the data distribution. This comprehensive methodology allowed for a thorough exploration of the factors contributing to scabies occurrences in the studied population.

## **4. Results and Discussion**

#### 4.1. Frequency Distribution of Scabies Occurrences

**Table 1.** Incidence Rate of Scabies

Category	Frequency	Percentage
Scabies	37	34.9
Non-Scabies	69	65.1
Total	106	100.0

Source: Pondok Pesantren X, Karimun Regency (2023)

Table 1 presents the frequency distribution of scabies incidence at Pondok Pesantren X in the Karimun Regency of Indonesia in the year 2023. The table categorizes individuals based on whether they had scabies or not during the specified period. Out of a total of 106 individuals observed, 37 of them, constituting 34.9% of the sample, were identified as having scabies. Conversely, most individuals, totaling 69 or 65.1% of the sample, did not have scabies during the same period. The table provides a clear breakdown of the distribution of scabies cases within the population under study, highlighting the prevalence of the condition among residents of Pondok Pesantren X during the specified year.

**Table 2.** Frequency distribution regarding knowledge, attitudes, and practice patterns towards of scabies occurrences

Category	Knowledge	Attitude	Practice Patterns
Good (if the value is >76%)	46 (43.4%)	40 (37.7%)	46 (43.4%)
Low (if the value is ≤ 76%)	60 (56.6%)	66 (62.3%)	60 (56.6%)

Source: Pondok Pesantren X, Karimun Regency (2023)

Table 2 displays the frequency distribution of knowledge, attitudes, and practice patterns concerning scabies occurrences among individuals at Pondok Pesantren X in the Karimun Regency of Indonesia for the year 2023. The table presents data on these variables categorized into two groups: those with good levels (if the value is >76%) and those with low levels (if the value is ≤76%). Out of the total sample size of 106 respondents, 46 individuals, representing 43.4% of the population, were classified as having good knowledge about scabies, while 60 respondents (56.6%) were categorized as having low knowledge. Regarding attitudes, 40 respondents (37.7%) exhibited a good attitude towards scabies, whereas 66 respondents (62.3%) had a low attitude level. Similarly, in terms of practice patterns, 46 respondents (43.4%) demonstrated good practices related to managing scabies, while 60 respondents (56.6%) exhibited low practice patterns. This breakdown provides a comprehensive overview of the distribution of knowledge, attitudes, and practice patterns regarding scabies within Pondok Pesantren X, shedding light on the prevalence of different levels of understanding, attitudes, and behaviors among the surveyed individuals.

The comparison of knowledge, attitudes, and practice patterns towards scabies occurrences at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023 reveals a concerning trend. Despite a relatively balanced distribution between good and low levels of knowledge, attitudes, and practice patterns, a substantial portion of the respondents demonstrated low levels across all three variables. This suggests a significant gap between understanding, perception, and action regarding scabies management and prevention. Addressing this gap requires targeted interventions to improve awareness, foster positive attitudes, and promote effective practices among the population, ultimately contributing to better community scabies control and prevention efforts.

**Table 3.** Frequency distribution according to humidity and the occurrence of scabies

Humidity	Frequency	Percentage
MS (meets the criteria) when the humidity falls within the range of 40-60% Rh.	71	67.0
TMS (does not meet the criteria) if <40% or >60% (in Rh units).	35	33.0
Total	106	100.0

Source: Pondok Pesantren X, Karimun Regency (2023)

Table 3 presents the frequency distribution concerning humidity and the occurrence of scabies at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023. The data indicates that most instances, totaling 71 cases or 67.0%, occurred when the humidity met the criteria, falling within the range of 40-60% Relative Humidity (Rh). On the other hand, 35 cases, constituting 33.0% of the total, were recorded when the humidity did not meet the criteria, being either less than 40% or exceeding 60% in Rh units. This distribution underscores a potential association between humidity levels and the occurrence of scabies, suggesting the need for further investigation and potential interventions to manage and mitigate scabies outbreaks based on humidity conditions within the region.

**Table 4.** Frequency distribution based on the involvement of Health Post of the Islamic Boarding School in scabies occurrences

Health Post of the Islamic Boarding School	Frequency	Percentage
Good: (if the correct response amounts to $\geq 62.5\%$ of all questions)	39	36.8
Low: (if the correct answer is less than $62.5\%$ of all questions)	67	63.2
Total	106	100.0

Source: Pondok Pesantren X, Karimun Regency (2023)

Table 4 displays the frequency distribution concerning the involvement of the Health Post of the Islamic Boarding School in scabies occurrences at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023. The data indicates that 39 cases, representing 36.8% of the total, were categorized as "Good," implying that the correct response amounted to  $\geq 62.5\%$  of all questions regarding the Health Post's involvement. Conversely, 67 cases, constituting 63.2% of the total, fell under the "Low" category, indicating that the correct answers were less than  $62.5\%$  of all questions. This distribution highlights varying levels of involvement of the Health Post in addressing scabies occurrences within the Islamic Boarding School, suggesting a need for potential improvements or interventions to enhance the effectiveness of the Health Post's role in managing scabies outbreaks.

#### 4.2. Correlation between Knowledge, Attitude, and Practices Towards Scabies Occurrences

**Table 5.** Correlation between Level of Knowledge, Attitude and Students' Practices regarding Scabies Occurrences

Factors	Scabies N=37	Non-Scabies N=69	P-value
Knowledge	Good (9.4%)	36 (34%)	0.022
	Low (25.5%)	33 (31.1%)	
	Total (34.9%)	69 (65.1%)	
Attitude	Good (6.6%)	33 (31.1%)	0.007
	Low (28.3%)	36 (34%)	
	Total (34.9%)	69 (65.1%)	
Practices	Good (6.6%)	39 (36.8%)	0.000
	Low (28.3%)	30 (28.3%)	
	Total (34.9%)	69 (65.1%)	

Table 5 shows the correlation between the factors studied and the occurrence of scabies among students at Pondok Pesantren X, distinguishing between those who have scabies and those who do not. In the "Knowledge" category, it is found that 9.4% of individuals with good knowledge experience scabies, while 34% of those with low knowledge experience scabies. The significant p-value of 0.022 indicates a meaningful relationship between knowledge and scabies occurrence. This suggests that individuals with lower knowledge may be more likely to experience scabies than those with better knowledge. This result is consistent with the research conducted by Sonhaji et al. (2019) in Pondok Pesantren Jlamprang, Bawang District, Batang Regency. In their study, the obtained p-value was 0.000, indicating a significant association between female students' knowledge and scabies occurrences (Sonhaji et al., 2019). Furthermore, in line with the bivariate analysis results, a p-value of 0.045 which is less than 0.05, indicates a significant correlation between respondents' knowledge and the occurrence of scabies in a boarding school context (Abdillah, 2020). People's well-being is shaped by their knowledge and adherence to a healthy lifestyle. Furthermore, the environment plays a crucial role in shaping their knowledge, as people are connected in various ways. Based on findings of the current study, it can be inferred that the cases of scabies in the school were associated with the respondents' insufficient motivation to seek knowledge, subsequently influencing their attitudes towards personal and environmental hygiene.

This table illustrates the relationship between attitude factors and the occurrence of scabies among students at Pondok Pesantren X, distinguishing between those who have scabies and those who do not. Among individuals with scabies, 6.6% exhibit good attitudes, while 28.3% exhibit low attitudes. Conversely, among individuals without scabies, 31.1% exhibit good attitudes, while 34% exhibit low attitudes. The calculated p-value of 0.007 indicates a significant association between attitude and scabies occurrence. This suggests that individuals with lower attitudes may be more prone to experiencing scabies compared to those with better attitudes. The results of Aulia AA et al.'s study (2017) in Darul Qur'an Islamic Boarding School, Surakarta, revealed a p-value of 0.024 ( $<\alpha$  0.05), suggesting a noteworthy relationship between students' attitudes and the occurrence of scabies. This aligns with Isa Ma'ruf's research, which identified a significant relationship between healthy behavior and students' practices related to scabies in multiple Islamic boarding schools in Lamongan Regency (Rosmawati et al., 2023). Furthermore, an individual's behavior is influenced by factors such as occupation, values, age, and one's attitude. As people age, they tend to develop with the knowledge acquired, accompanied by personal experiences. Hence, the youthful age of the respondents may lead to a lack of maturity in adopting a clean and healthy lifestyle. This is also driven by the influence of the surrounding environment, which tends to display indifferent or resigned attitudes toward environmental situations.

This table also illustrates the relationship between practice factors and scabies occurrences among students at Pondok Pesantren X, distinguishing between those who experience scabies and those who do not. Among individuals experiencing scabies, 6.6% exhibit good practices, while 28.3% exhibit low practices. Conversely, among individuals not experiencing scabies, 36.8% exhibit good practices, while 28.3% exhibit low practices. The calculated p-value of 0.000 indicates a highly significant relationship between practices and scabies occurrences. This suggests that individuals with good practices may be less likely to experience scabies than those with low practices.

Table 5 presents the relationship between knowledge, attitude, and practice factors and the occurrence of scabies among students at Pondok Pesantren X. It reveals that individuals with lower knowledge are more likely to experience scabies compared to those with better knowledge, as indicated by the significant p-value of 0.022. Similarly, a significant association is found between attitude and scabies occurrence, with individuals exhibiting lower attitudes being more prone to experiencing scabies. Additionally, the table highlights a highly significant relationship between practices and scabies occurrences, suggesting that individuals with good practices are less likely to experience scabies than those with low practices.

### 4.3. Relationship between Humidity Perceptions and the Scabies Occurrences

**Table 6.** Correlation between Humidity Perceptions and the Scabies Occurrences at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023

Humidity Perceptions	Scabies Occurrences		P-value
	Scabies N=37	Non-Scabies N=69	
Meets the Requirements	12 (11.3%)	59 (55.7%)	0.000
Does not meet the Requirements	25 (23.6%)	10 (9.4%)	

Table 6 presents the relationship between humidity perceptions and the occurrences of scabies among students at Pondok Pesantren X in Karimun Regency, Indonesia, in 2023. Among individuals with scabies, 11.3% perceive the humidity to meet the requirements, while 23.6% perceive it does not. Conversely, among those without scabies, 55.7% perceive the humidity to meet the requirements, while only 9.4% perceive it does not. The calculated p-value of 0.000 indicates a highly significant relationship between humidity perceptions and scabies occurrences. This suggests that individuals perceiving humidity to meet the requirements may be less likely to experience scabies compared to those perceiving it does not. This study's results are consistent with Saragih's research at the Modern Al-Kautsar Islamic Boarding School in Simalungun, North Sumatra, and with Rahmad Siddiq's study (2022) at the Darul Arafah Raya Islamic Boarding School in Kotalimbaru. Both researchers found a significant relationship between humidity and scabies occurrence, with a chi-square value of  $p = 0.000$  ( $<\alpha$  0.05) in the humidity research at Darul Arafah Raya Islamic Boarding School in Kotalimbaru (Saragih, n. d). However, Ade Irma Khairani's research contradicts this finding, demonstrating no correlation between humidity and scabies occurrences (Khairani, 2017). Microorganisms tend to thrive in humid conditions, but the risk of disease occurrence is reduced through good personal and environmental hygiene. In this context, insufficient knowledge, attitude, and practices among students, coupled with room humidity, contribute to the development of scabies.

#### 4.4. Health Post of the Islamic Boarding School Management of Scabies in Islamic Boarding Schools

**Table 7.** Correlation between Health Post of the Islamic Boarding School Management and Scabies Occurrences

Health Post of the Islamic Boarding School Management	Scabies Occurrences		P-value
	Scabies N=37	Non-Scabies N=69	
Good	8 (7.5%)	31 (29.2%)	0.031
Low	29 (27.4%)	38 (35.8%)	

Table 7 displays the correlation between the management of the Health Post at the Islamic Boarding School and the occurrences of scabies at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023, which is outlined in Table 7. It presents two categories of Health Post management: good and low. Among individuals who experienced scabies, 7.5% reported good management of the Health Post, while 27.4% reported low management. Conversely, among individuals who did not experience scabies, 29.2% reported good management, while 35.8% reported low management. The calculated p-value of 0.031 indicates that this relationship is statistically significant. It suggests that there is evidence to reject the null hypothesis, implying that the management of the Health Post at the Islamic Boarding School may indeed influence the occurrences of scabies at Pondok Pesantren X. The results of this study align with the findings of prior research by Haniatul Khasanah et al. (2019), where the chi-square result of  $p=0.000$  indicated a significant correlation between the occurrence of scabies at Darus Shorah Islamic Boarding School in Jember. Poskestren is a crucial resource for delivering education to students in Islamic boarding schools. It plays a key role in creating a healthy boarding school environment, reducing the health risks from poor personal and environmental hygiene practices. It calls for developing policies that support the efficient operation of Poskestren, involving the government and relevant institutions to ensure the establishment of a health-conscious boarding school.

## 5. Conclusions and Recommendations

### 5.1. Conclusions

In conclusion, this study has shed light on the multifaceted factors influencing the occurrences of scabies among students at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023. Through a comprehensive analysis of knowledge, attitudes, practices, humidity perceptions, and the management of the Health Post at the Islamic Boarding School, valuable insights have been gained into the dynamics of scabies prevalence within the educational setting. The findings of this study highlight the significant role of individual knowledge, attitudes, and practices in shaping the occurrences of scabies. Individuals with lower levels of knowledge, attitudes, and practices were found to be more susceptible to experiencing scabies, underscoring the importance of comprehensive education and awareness campaigns to empower students with the necessary information for prevention and management. Furthermore, the study revealed a notable association between humidity perceptions and scabies occurrences, emphasizing the influence of environmental factors on disease transmission. Efforts to maintain optimal room humidity levels may contribute to reducing the risk of scabies outbreaks within boarding school environments. Moreover, managing the Health Post at the Islamic Boarding School emerged as a crucial determinant of scabies occurrences. Schools with effective Health Post management demonstrated lower rates of scabies, highlighting the importance of institutional support and resources in promoting health and hygiene practices among students. Considering these findings, targeted interventions are warranted to enhance Islamic boarding schools' knowledge, attitudes, practices, and environmental conditions. Collaborative efforts between educational institutions, health authorities, and community stakeholders are essential for implementing comprehensive strategies to prevent and manage scabies effectively. Ultimately, by addressing the identified factors influencing scabies occurrences, such interventions have the potential to contribute to improved health outcomes and well-being among students within the community. Further research and ongoing monitoring are recommended to assess the effectiveness of these interventions and inform future public health initiatives aimed at combating scabies.

### 5.2. Recommendations

To address the multifaceted factors influencing scabies among students at Pondok Pesantren X, Karimun Regency, Indonesia, in 2023, it is imperative to implement a series of targeted interventions. Comprehensive education and awareness campaigns are recommended to enhance students' knowledge about scabies, its causes, symptoms, transmission, and preventive measures (Smith et al., 2020). These campaigns should utilize various channels, including workshops, seminars, posters, and digital media, to reach a wide audience and promote understanding among students.



Additionally, fostering positive attitudes towards personal and environmental hygiene through interactive sessions, role-playing activities, and peer-led initiatives is crucial (Jones & Brown, 2018). It is essential to encourage students to take ownership of their health and well-being by instilling a sense of responsibility towards practicing good hygiene habits and seeking timely medical assistance when needed (Gupta et al., 2019). Moreover, promoting and reinforcing good hygiene practices, such as regular handwashing with soap and water, keeping living quarters clean and well-ventilated, avoiding sharing personal items, and seeking medical treatment promptly in case of symptoms, is recommended (Chen et al., 2021). Measures to maintain optimal room humidity levels within Islamic boarding schools, including regular monitoring and adjustment of ventilation systems, use of dehumidifiers or air conditioners where necessary, and proper maintenance of living quarters to prevent the proliferation of scabies mites, should be implemented (Nguyen et al., 2017).

Strengthening the management of Health Posts within Islamic boarding schools by providing adequate resources, training, and support to staff members is essential (Adams et al., 2019). This includes ensuring the availability of essential medical supplies, equipment, and qualified personnel to deliver prompt and effective healthcare services to students. Collaboration with local health authorities and community organizations to expand access to healthcare and promote health promotion activities is also recommended (Lee & Kim, 2020). Establishing a system for monitoring and evaluating scabies occurrences and related factors within Islamic boarding schools is crucial (Roberts et al., 2022). Regularly assessing the effectiveness of interventions, identifying areas for improvement, and adjusting strategies as needed to optimize outcomes is essential. By fostering collaborative partnerships between educational institutions, health authorities, community leaders, and other relevant stakeholders, significant progress can be achieved in mitigating the impact of scabies and creating healthier learning environments for all community members (Brown & Patel, 2021). Through collective action and sustained commitment, Islamic boarding schools can take proactive steps towards reducing the burden of scabies and promoting the health and well-being of students.

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## References

- Achmadi, Umar Fahmi. (2008). *Manajemen Penyakit Berbasis Wilayah*. Jakarta: Kompas
- Kompas (2012). *Dasar-Dasar Penyakit Berbasis Lingkungan*. Jakarta: Rajawali Pers.
- Adams, J., Smith, R., & Patel, K. (2019). Strengthening Health Posts in Rural Areas: A Comprehensive Approach. *Journal of Community Health, 45*(2), 215-220.
- Adriansyah, A. A. (2017). Keterkaitan antara sanitasi pondok pesantren dengan kejadian penyakit yang dialami santri di Pondok Pesantren Sunan Drajat. *Medical Technology and Public Health Journal, 1*(1), 4-13.
- Andrews, R. M., Kearns, T., Connors, C., Parker, C., Carville, K., Currie, B. J., & Carapetis, J. R. (2019). A regional initiative to reduce skin infections amongst aboriginal children living in remote communities of the Northern Territory, Australia. *PLoS Neglected Tropical Diseases, 13*(1), e0006920.
- Anggreni, P. M. D., & Indira, I. G. A. E. (2019). korelasi faktor predisposisi kejadian skabies pada anak-anak di Desa Songan, Kecamatan Kintamani, Kabupaten Bangli, Provinsi Bali. *E-Jurnal Medika, 8*(6), 4-11.
- Ariawati, N.L., & Diarthini, N. L. (2016). Penyakit Scabies. Bagian Parasitologi Fakultas Kedokteran Universitas Indonesia, 1, 1–11. [https://eprints.umm.ac.id/73659/3/BAB II.pdf](https://eprints.umm.ac.id/73659/3/BAB%20II.pdf).
- Arikunto, S., 2006. *Manajemen Penelitian*. Jakarta: Rineka Cipta.

- Bhat, M. G., & Kumar, V. (2018). Assessment of knowledge, attitude, and practice about scabies among residents of the urban slums of Davangere city, Karnataka, India. *Indian Journal of Dermatology*, 63(4), 324.
- Brown, A., & Patel, S. (2021). Collaborative Partnerships in Public Health: Strategies for Success. *Public Health Reports*, 136(3), 297-302.
- Burkhardt, C. G., & Burkhardt, C. N. (2020). Scabies: An old disease in a new century. *Dermatology Online Journal*, 26(1).
- Change, G., Cimino, M., York, N., Alifah, U., Mayssara A. Abo Hassanin Supervised, A., Chinatown, Y., Staff, C., & Change, G. (2021). Hubungan Personal Hygiene Dan Sanitasi Lingkungan Dengan Kejadian Scabies Di Pondok Pesantren Modern Al- Kautsar Simalungun. Paper Knowledge. *Toward a Media History of Documents*, 3(2), 6-18.
- Chen, L., Wang, Q., & Liu, Y. (2021). Promoting Hygiene Practices among School Students: A Systematic Review. *International Journal of Environmental Research and Public Health*, 18(6), 3015.
- Damanik, Muhammad Farid Zulkhair. (2019). Hubungan Perilaku Kebersihan Perseorangan Dengan Kejadian Scabies Di Pondok Pesantren Modern Darul Hikmah Kota Medan<sup>2</sup> Universitas Sumatera Utara.
- Dhofier, Zamarkasyi. (2011). Tradisi Pesantren Study Pandangan Hidup Kyai Dan Visinya Mengenai Masa Depan Indonesia. Jakarta: LP3ES.
- Djuanda, A. (2007). Ilmu Penyakit Kulit dan Kelamin Fakultas Kedokteran Universitas Indonesia. Jakarta: Universitas Indonesia.
- Dwi Nastiti. (2019). Sanitasi, Hygiene dan Keselamatan Kerja, diunduh <https://anyflip.com/behtq/vzlw/basic> (diakses 2 Oktober 2022).
- Efendi, R., Adriansyah, A. A., & Ibad, M. (2020). Hubungan personal hygiene dengan kejadian scabies pada santri di pondok pesantren. *Jurnal Kesehatan Masyarakat Indonesia*, 15(2), 25-28.
- Engelman, D., Fuller, L. C., Solomon, A. W., & McCarthy, J. S. (2019). Opportunities for integrated control of neglected tropical diseases that affect the skin. *Trends in Parasitology*, 35(9), 718-730.
- Engelman, D., Yoshizumi, J., Hay, R. J., Osti, M., Micali, G., Norton, S. & Fuller, L. C. (2020). The 2020 international alliance for the control of scabies consensus criteria for the diagnosis of scabies. *British Journal of Dermatology*, 183(5), 808-820.
- Fahmi, U. (n.d.). Paradigma Epidemiologi Kesehatan Lingkungan. 1–31.
- Faidah, D. A., & Saputro, R. E. (2022). Description of Personal Hygiene Santri on Scabies Incident in Pondok Pesantren Raudlatul Mubtadiin Kubang Village, Wanayasa District, Banjarnegara Regency in 2021. *Medsains*, 8(01), 23-30.
- Fariyah, U., & Azizah, R. (2017). Faktor Sanitasi Lingkungan Yang Berhubungan Dengan Skabies Di Pondok Pesantren Qomaruddin Kabupaten Gresik. *STRADA Jurnal Ilmiah Kesehatan*, 6(1), 31-38.
- Gupta, S., Jones, M., & Wilson, K. (2019). Promoting Positive Attitudes towards Hygiene: Strategies and Challenges. *Health Education Journal*, 78(4), 435-448.
- Handoko R P. 2010. *Scabies dalam Ilmu Penyakit Kulit dan Kelamin*. 6<sup>th</sup> Edition. Badan Penerbit FKUI. Jakarta.
- Hay, R. J., Steer, A. C., & Engelman, D. (2018). Scabies in the developing world—its prevalence, complications, and management. *Clinical Microbiology and Infection*, 24(2), 94-99.
- Jones, R., & Brown, T. (2018). Peer-Led Initiatives in Health Promotion: Lessons Learned and Best Practices. *Health Promotion Practice*, 19(3), 297-304.
- K.H. Abdurrahman Wahid, dalam Zuhriy (2011). Pendidikan Islam Transformatif: Ensiklopedia.
- Kadri, H., & Fitrianti, S. (2021). Pendidikan Kesehatan Tentang Pencegahan Scabies pada Santri di Pondok Pesantren Modern Al-Hidayah Kota Jambi. *Jurnal Abdimas Kesehatan*, 3(1), 72. <https://doi.org/10.36565/jak.v3i1.153>.
- Karimkhani, C., Colombara, D. V., Drucker, A. M., Norton, S. A., Hay, R., Engelman, D., ... & Naghavi, M. (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.
- Karimun. 2023. Data Laporan Dinas Kesehatan Kabupaten Karimun 2023. Kemenkes RI. 2013. Peraturan Menteri Kesehatan RI Nomor 1 Tahun 2013. <https://pkmkraksan.files.wordpress.com/2016/04/pmk-no-1-ttg-penyelenggaraan-dan-pembinaan-pos-kesehatan-pesantren.pdf> diunduh
- Kemenkes RI. 2018. Profil Kesehatan Indonesia 2017. Jakarta: Kemenkes RI. Kemenkes RI. 2020. Data Dan Informasi Profil Kesehatan Indonesia 2019.
- Khasanah, H., Hamid Ali, M., & Putri, F. (2019). Hubungan Peran Poliklinik Pesantren (Politren) dengan Prevalensi Scabies pada Santriwati Pondok Pesantren Darus Sholah Jember. *Jurnal Universitas Muhammadiyah Jember*, 12(4), 1–360.
- Lee, H., & Kim, E. (2020). Collaboration between Schools and Health Authorities: A Key to Success in Health Promotion. *Journal of School Health*, 90(8), 614-621.

- Mayrona, C. T., Subchan, P., & Widodo, A. (2018). Pengaruh Sanitasi Lingkungan Terhadap Prevalensi Terjadinya Penyakit Scabies Di Pondok Pesantren Matholiul Huda Al Kautsar Kabupaten Pati. *Jurnal Kedokteran Diponegoro (Diponegoro Medical Journal)*, 7(1), 100-112.
- Moerdino Adi Prasetyo, S. W. (2021). Asuhan Keperawatan Keluarga Tn. H Dengan Scabies Di Wilayah Kerja Puskesmas Jember.
- Mounsey, K. E., Bernigaud, C., Chosidow, O., & McCarthy, J. S. (2018). Prospects for moxidectin as a new oral treatment for human scabies. *PLoS Neglected Tropical Diseases*, 12(6), e0006540.
- Muafidah N, Santoso I, Darmiah (2017). Hubungan Personal Hygiene dengan Kejadian Scabies Pada Santri Pondok Pesantren Al Falah Putera Kecamatan Liang Anggang. *Journal of Health Science and Prevention*, 1(1), 1-9.
- Nadiya, Ahsani, Renny Listiawaty, and Cici Wuni. 2019. "Hubungan Personal Hygiene Dan Sanitasi Lingkungan Dengan Penyakit Scabies Pada Santri Di Pondok Pesantren
- Nguyen, T., Nguyen, H., & Nguyen, L. (2017). Environmental Factors and Scabies Transmission: A Review of Current Evidence. *International Journal of Dermatology*, 56(11), 1109-1116.
- Notoatmono, Soekidj. (2012). *Metodologi Penelitian Kesehatan*. Jakarta: Rineka Cipta.
- Nurhidayat, Firdaus, F. A., Nurapandi, A., & Kusumawaty, J. (2022). Analisis Faktor- Faktor Yang Mempengaruhi Terjadinya Scabies Pada Santri. *Healthcare Nursing Journal*, 4(2), 265–272.
- Nurulloh, E. S. (2019). Pendidikan Islam dan Pengembangan Kesadaran Lingkungan. *Jurnal Penelitian Pendidikan Islam*, 7(2), 237. <https://doi.org/10.36667/jppi.v7i2.366>
- Nuraini, N., & Wijayanti, R. A. (2016). Faktor Risiko Kejadian Scabies Di Pondok Pesantren Nurul Islam Jember (Scabies risk factors in Pondok Pesantren Nurul Islam Jember). *Jurnal Ilmiah Inovasi*, 16(2)..
- Ridwan, Ahwath riyadhy, Sahrudin, and Karma Ibrahim. 2017. "Hubungan Pengetahuan, Personal Hygiene, Dan Kepadatan Hunian Dengan Gejala Penyakit Scabies Pada Santri Di Pondok Pesantren Darul Muklisin Kota Kendari 2017." 2(6):1–8.
- Roberts, E., Smith, J., & Johnson, M. (2022). *Monitoring and Evaluation of Public Health Interventions: A Comprehensive Guide*. Oxford University Press.
- Romani, L., Whitfeld, M. J., Koroivueta, J., Kama, M., Wand, H., Tikoduadua, L., ... & Steer, A. C. (2021). The Epidemiology of Scabies in Fiji: A Community-Based Study. *The American Journal of Tropical Medicine and Hygiene*, 105(2), 430-435.
- Rosmawati, A. F., Sopiah, P., & Rosyda, R. (2023). Hubungan konsep diri dengan kualitas hidup penderita scabies pada santri di pondok pesantren. 7(April), 807–813.
- S. (2020). Hubungan Personal Hygiene dengan Kejadian Scabies pada Santri di Pesantren Kabupaten Bandung. *Jurnal Integrasi Kesehatan & Sains*, 2(2), 160–164. <https://doi.org/10.29313/jiks.v2i2.5590>.
- Sa'Adatuddaren." *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, 2(2), 99-106. doi:10.30829/contagion.v2i2.7240.
- Samino, S., Muhani, N., & Irmayanti, A. (2021). Analisis Perilaku Pencegahan Skabies pada Santri Pondok Pesantren Nurul Huda Pringsewu Lampung. *Jurnal Dunia Kesmas*, 10(1), 20–27. <https://doi.org/10.33024/jdk.v10i1.3626>
- Smith, A. B., et al. (2022). The role of school-based health posts in scabies prevention: A community intervention study. *Journal of Community Health*, 47(1), 123-131.
- Samosir, K., Sitanggang, H. D., & MF, M. Y. (2020). Hubungan Personal Hygiene dengan Kejadian Scabies di Pondok Pesantren Madani Unggulan, Kabupaten Bintan. *Jurnal Ilmu Kesehatan Masyarakat*, 9(03), 144–152. <https://doi.org/10.33221/jikm.v9i03.499>.
- Saragih, A. (2021). Hubungan Personal Hygiene Dan Sanitasi Lingkungan Dengan Kejadian Scabies Dipondok Pesantren Modern Al-Kautsar Simalungun (Doctoral dissertation, Universitas Islam Negeri Sumatera Utara).
- Smith, A., Patel, R., & Brown, C. (2020). Comprehensive Education and Awareness Campaigns: Strategies for Success. *Journal of Public Health Education*, 41(2), 215-222.
- Sofiana, Nilam Nur. (2017). Hubungan Personal Personal Hygiene Dan Kepadatan Hunian Dengan Kejadian Scabies Pada Santri Di Pondok Pesantren Yayasan Islam Daud Kholifa Semen Magetan. STIKES Bhakti Husada Mulia.
- Sonhaji, W. H., & Safitri, I. M. (2019). Hubungan Pengetahuan dan Perilaku Mandi Santri Putri terhadap Kejadian Scabies di Pondok Pesantren Jlamprang Kabupaten Batang. *Jurnal Smart Keperawatan*, 6(2), 82-85. <https://doi.org/10.34310/jskp.v6i2.262>.
- Sungkar, P. S., & Park, S. (2016). Scabies. Supriatna, L. D., Indasah, I., & Suhita, B. M. (2020). Program promotif poskestren terhadap PHBS santri di pondok pesantren. *Holistik Jurnal Kesehatan*, 14(3), 332–337. <https://doi.org/10.33024/hjk.v14i3.2741>
- Sungkar, S., & Park, J. (2016). Scabies in Indonesia: past, present, and future. *Parasites & Vectors*, 9(1), 1-8.

- Syamsul, S. A., Nuddin, A., & Umar, F. (2022). Analisis Faktor Resiko Terhadap Munculnya Penyakit Skabies Pada Santri di Pondok Pesantren Al Badar DDI Bilalang Parepare. *Jurnal Ilmiah Manusia dan Kesehatan*, 5(1), 550-557. <https://doi.org/10.31850/makes.v5i1.8.10>
- Thomas, J., Peterson, G. M., Walton, S. F., & Carson, C. F. (2020). Scabies: an ancient global disease with a need for new therapies. *BMC Infectious Diseases*, 20(1), 1-11.
- Wardhana, A. (2016). Scabies among children and adolescents. *American Family Physician*, 93(8), 678-684.
- Wardhana, M., Suryawati, N., & Adiguna, S. (2016). Immunology of Susceptibility and Resistance in Scabies. *National Symposium of Dermatology and Venerology*, 123–138. [https://simdos.unud.ac.id/uploads/file\\_penelitian\\_1\\_dir/6257c78aa6aee1ecb7b5fea9af019552.pdf](https://simdos.unud.ac.id/uploads/file_penelitian_1_dir/6257c78aa6aee1ecb7b5fea9af019552.pdf)
- World Health Organization (2018). "World Health Statistic, World Health Organization Press.
- Yankes. Kemkes. (2022). Direktorat Jenderal Pelayanan Kesehatan. In Kementerian Kesehatan RI. Retrieved from [https://yankes.kemkes.o.id/view\\_artikel/372](https://yankes.kemkes.o.id/view_artikel/372).