

Warm Salt Water Immersion Therapy Can Reduce Scabies Pruritus

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Abstract

Scabies is one of the most common skin infections worldwide caused by infection of *Sarcoptes scabiei var hominis* that caused lesion and pruritus (itching). It is the most common skin disease in the community, especially at male students of the Islamic boarding school community. The purpose of this study was to identify the effect of warm salt water immersion therapy on reducing the pruritus of scabies among male students in Islamic boarding school. The research was a quasi-experiment with a pre-posttest design with a control group. The total of respondents was 56 male students with Scabies divided into two group, with 28 respondents each. The control group received warm water immersion. The intervention group received warmed sea salt water immersion on their legs, hands and toes with the duration of 10 minutes once a day for 6 days. The pruritus score data were collected using a pruritus severity scale questionnaire with 12 items. The t-test analysis showed that there is a different of mean pruritus scabies before and after intervention in both group scabies by 2.72. The warm salt water immersion therapy has a significant effect in reducing mean pruritus. The warm sea salt water soak therapy is more effective than warm water only (p-value; $0.000 \leq 0.05$). Warm sea salt water immersion therapy is easy to do for community and beneficial in reducing scabies pruritus and increase a sense of comfort and accelerate the healing of skin lesion.

Keywords: pruritus; soak; sea salt; scabies; warm water

INTRODUCTION

Scabies is one of the most common skin infections worldwide caused by infection with *Sarcoptes Scabiei Var Hominis* and is transmitted through skin-to-skin contact. WHO (World Health Organization) in 2017 stated that scabies is a Neglected Tropical Diseases (NTD) or a neglected tropical disease and is the most common skin disease in the community. The Global Burden of Disease (GBD) study for 20 years involving 187 countries showed that the prevalence of scabies in 2013 was estimated at 204,151,000 people, in 2017 it was 175,406,000 people and in 2020 there will be an increase of more than 200 million people (Cox et al., 2020; Sungkar, 2016; World Health Organization (WHO), 2020).

Scabies is a skin disease endemic in tropical and subtropical climates, such as Africa, South America, the Caribbean, Central, Southern Australia, and Asia. The prevalence of scabies in developing countries is higher than in developed countries. Scabies in some developing

countries is reported to be 6-27% of the general population and the highest incidence occurs in school-age children and adolescents. The high prevalence of scabies in developing countries is due to poverty associated with low levels of hygiene, difficult access to water, and overcrowding (Ihtiarinyas, Mulyaningsih, & Umniyati, 2019; Ratnasari & Sungkar, 2014).

The prevalence of scabies in Indonesia according to Ihtiarinyas et al (2019) ranged from 4.6-12.95%, and was ranked 7th out of 10 main diseases at puskesmas and ranked 3rd of the most skin diseases. Data on the profile of the Bengkulu City Health Office in 2017 shows that of the 10 most skin diseases, skin diseases are in 10th place with the number of sufferers reaching 3750 (1.02%) of the total population of 368,065 people spread over 9 sub-districts in Bengkulu City, and the number of sufferers scabies in 2018 reached 260 people (Bengkulu City Health Office, 2017, 2018; Ihtiarinyas et al., 2019).

The high prevalence of this disease is due to the fact that scabies is often neglected, so it is considered normal and common in Indonesian society. Besides that, scabies is considered not life-threatening so that the priority of treatment is low, when in fact chronic and severe scabies can cause dangerous complications. Scabies is often found in places with densely populated areas such as army dormitories, prisons and Islamic boarding schools. Dense residential areas with an environment that is not kept clean will facilitate the transmission and transmission of scabies mites. Scabies occurs a lot in Islamic boarding schools as reported in a study conducted by Rinaldi et al (2015) in Islamic boarding schools throughout Kendari which stated that out of 92 students, it was found that 50 (54.3%) students had scabies. Research by Ratnasari and Sungkar (2014) in East Jakarta from 192 students showed that 99 (51.6%) students suffered from scabies (Hilma & Ghazali, 2014; Mading & Sopi, 2015; Ratnasari & Sungkar, 2014; Rinaldi, Dupai, & Erawan, 2015).

The most common clinical symptom of scabies is pruritus. Pruritus is an unpleasant sensation that causes the urge or reflex to scratch. Pruritus can last for months in untreated patients ranging from mild, moderate to severe. Pruritus caused by scabies will cause lesions that can lead to secondary infection that can trigger severe systemic complications such as kidney disease and rheumatic heart disease. The impact of scabies pruritus can cause sleep disturbances at night so that the next day sufferers become sleepy, lower self-confidence, social isolation, feel isolated so they can experience depression (Cox et al., 2020; Weber & Camozzato, 2018).

Scabies pruritus is more common in men, this is because men pay less attention to personal hygiene than women. Women are generally more concerned with cleanliness and beauty so that they take better care of themselves and maintain cleanliness than men as reported

in the Almomani study (2011) at the Gaza Field Hospital which stated that out of 145 patients, it was found that 93 (64%) male patients experienced pruritus in at night (Almomani, 2014; Sungkar, 2016).

The treatment of scabies pruritus has been done by pharmacological and non-pharmacological methods. Pharmacological treatment is carried out by administering oral drugs Ivermectin 200 mg/kg and topically such as Permenthri Cream 5%, Benzyl Benzoate, and Sulfur Precipitatum which is applied to the skin surface area. Handling scabies pruritus by pharmacological means has side effects such as Permenthri Cream 5% and Benzyl Benzoate, namely pruritus, heat or a burning sensation, and causes irritation after use. non-pharmacological methods are required. Non-pharmacological or complementary treatment of pruritus can be an alternative to reduce pruritus such as warm water therapy, salt water, and the use of clean clothes (Jannic, Bernigaud, & Brenaut, 2018; Shah, 2019; Sungkar, 2016; Weber & Camozzato, 2018).

Warm water is effective in treating scabies pruritus because it is able to stimulate nerve endings and cause a reflex effect that results in dilation of blood vessels resulting in changes in blood flow and metabolic function, these changes which can relieve pruritus symptoms. Warm water therapy also affects physical and psychological conditions so that it can provide a comfort effect, namely a relaxation effect so that it can provide a comfortable sensation on the physical and affect the psychological condition. As reported in a study conducted by Celikbilek (2018) of 62 patients, it was found that 15 (24.2%) people overcome their uremic pruritus problem with a complementary method using warm water. The study of Moufarrij et al (2014) in Switzerland of 31 patients with burns with pruritus who underwent warm water hydrotherapy overall showed that the symptoms of pruritus were reduced (Almassmoum et al., 2018; Celikbilek, 2018; Hoesny, Alim, & Hartina, 2018; Moufarrij et al., 2014).

Non-pharmacological treatment other than warm water is to use salt. Salt can be an alternative to reduce pruritus. Salt contains more than 80 minerals that the body needs to be healthy, such as anti-bacterial, anti-inflammatory, eliminating pathogens and in skin diseases, salt is able to absorb bacteria, clean infections and other impurities on the skin. Salt is one of the non-pharmacological treatments that can be combined with warm water because salt is soluble in water. Salt combined with warm water will form different electrically charged particles, namely positively charged sodium ions and negatively charged chlorine ions. The salt solution that forms these particles will make the wound dry quickly, killing bacteria (especially *Staphylococcus* and *Streptococcus* bacteria) (Angkasa, Ta'adi, & Hartono, 2017; Shah, 2019).

The results of the initial survey conducted by researchers through interviews and observations of the Darussalam Islamic Boarding School students in Bengkulu City showed that of the 35 students who lived in the dormitory, 35 (100%) students stated that they had scabies. Scabies pruritus causes lesions that can cause secondary infection, systemic complications, lower self-confidence, feel uncomfortable, social isolation, and even eventually experience depression, for this reason, non-pharmacological treatment of warm water and salt has an effect on scabies pruritus. Warm water has the effect of providing a sense of comfort, and salt has anti-bacterial properties that can kill scabies mites.

Based on the literature search, studies on warm salt water immersion therapy on scabies pruritus has never been held in Indonesia, especially in Bengkulu Province. The study on the therapy of warm water has been held at civil society with a conventional method and custom of community and at Islamic Boarding School. However, study on salt warm water effect on pruritus due to scabies among students has never been conducted. This indicates the need in doing research identify the effect of salt warm water on scabies pruritus. The purpose of this study was to determine the effect of warm sea salt water immersion therapy on pruritus scale.

METHOD

The type of research used is quantitative research with a quasi-experimental using pre-test and post-test designs with the control group design. The samples taken in were total male students who suffered scabies. The number of samples in this study amounted of 56 with each group 28 male students. This research was conducted from January to April 2021 at Darussalam and Pancasila Islamic Boarding School Kota Bengkulu. The intervention group given warm salt water immersion and the control group immersion in warm water only. The intervention of immersion in warm salt water is given once a day during 6 days with duration of immersion is 10 minutes. The salt type used in this study is sea salt. The amount of salt used is 35 gram and dissolved in 1-liter warm water. The water temperature used for both groups was 37°C-38°C (warm). Area of body that received immersion including legs, toes and hands that was felt itchy or pruritus scabies. The first step was checking the water temperature appropriately for respondents, then soaking the area in warm salt water in 10 minutes and maintain a constant temperature. The instrument used to measure the pruritus score was a 12-item Pruritus Severity Scale questionnaire. The assessment of pruritus carried out through interview before the intervention. The data of pruritus scabies reassessed on seventh days. Data were analyzed using T Paired and T Independent with level of significancy 95%.

RESULTS

The characteristics of the respondent in both groups was shown in the table 1.

Table 1. Respondents' Characteristics

Variable	Group	
	Intervention (n=28)	Control (n=28)
Age (year)		
Mean (SD)	14.57 (1.45)	15.11(1.73)
Level Education		
Junior High School	17 (60.7%)	20 (71.4%)
Senior High Scholl	11 (39.3%)	8 (28.6%)
Parent's Income		
Mean (SD)	2.275 (1.32)	1.625 (0.98)
Length of Stay (Month)		
Mean	19.93 (12.65)	22.18 (14.08)
Duration of Scabies (Days)		
Mean (SD)	30.21(25.53)	34.61(25.08)
Location of Scabies		
Between fingers	7 (25.0%)	4 (14.3%)
Between toes	4 (14.3%)	1 (3.6%)
Between fingers and toes	10 (35.7%)	13 (46.4%)
Others	7 (25%)	10 (35%)
Pruritus Level		
Moderate Pruritus	17 (60.7%)	15 (53.6%)
Severe Pruritus	11 (39.3%)	13 (46.4%)

Table 1 shows the average age of both group is 15 years old (adolescent), level education is mostly junior high school (basic level education), the average of parent income is 2.3 million for intervention group and 1.6 million for control group, the average duration of scabies is 30-35 days (1 month), the most location of scabies is at fingers and toes, and the level of pruritus scabies is moderate. Before we analyzed different mean of pruritus in both group, we did the normality test, and the result of mean pruritus for both group is normally distributed with p-value > 0.05. The difference in mean of pruritus scabies in both groups was shown in the table 2.

Table 2. The Difference in Mean of Pruritus Scabies in Both Group

Pruritus Scabies	Group		<i>p Value</i>
	Intervention Mean (SD)	Control Mean (SD)	
Before Intervention	11.29 (1.884)	11.00 (1.886)	0.562*
After Intervention	8.57 (1.952)	9.71(1.802)	0.027*

P Value

0.000**

0.000**

SD, Standard Deviation, *p value sig* α 0,05, **t independent*, ** *t paired*

Table 2 shows that the p value in the intervention group is 0.000 (p-value=0.05), which means that there is a difference in the average score of pruritus before and after the intervention. The control obtained a p value of 0.000 (p value 0.05), which means that there is a difference in the mean score of pruritus before and after the intervention. When compared between the two groups based on the results of the independent t statistical test, the p value 0.027 (p value 0.05), means that there is a difference in the average score of pruritus between groups after the intervention. The warm salt water intervention had an effect on reducing the scabies pruritus score in male students.

DISCUSSION

The intervention in this study was warm salt water soak therapy with a duration of 10 minutes for 6 days for each respondent. the soaked area is part of the body area, namely between the fingers and between the toes. the salt used is 35 grams of dead sea salt dissolved in 1 liter of warm water at 37°C. Researchers used warm salt water soak therapy referring to the research by Angkasa et al (2017) on the diabetic ulcer treatment which was carried out for 6 consecutive days, the duration of soaking was 10 minutes with a water temperature of 37°C. In addition, it refers to Hasan (2017) who studied on the treatment for scabies lesions by soaking the scabies area with 35 grams of salt water dissolved in 1 liter of water for 1 week with a duration of soaking for 10 minutes.

The results of this study illustrate that there is a decrease in the average pruritus of scabies after the intervention of 2.71, which is greater than the average in the control group which is only 1.29. The salt used in this study is dead sea salt which is of better quality than ordinary salt. Dead sea salt contains several minerals, namely magnesium, potassium, bromide and bitumen. The magnesium content is 15 times higher than other salts which function to heal damaged skin tissue, provide a new skin surface, be anti-allergic (anti-histamine) and anti-inflammatory (Nurainiwati, 2011; Pecoraro et al., 2020). the content of potassium functions to increase potassium oxidation which regulates muscle and nervous system processes and regulates skin moisture, the bromide content is 50 times higher than ordinary salt which functions to relax the body and help repair skin cells, and the last bituminous content is to prevent inflammation so it is good for healing skin (Nurainiwati, 2011). salt combined with warm water will form different electrically charged particles, namely positively charged sodium

ions and negatively charged chlorine ions which when applied to the wound, these ions will regulate the cells around the wound so that the fluid in the cells does not which eventually causes the wound to dry quickly. in addition, this saline solution can kill bacteria that attack wounds such as staphylococci and streptococci (Angkasa et al., 2017; Shah, 2019).

Inflammation caused by scabies is an immunoprotected response. this inflammatory activity will induce mast cell degranulation resulting in the secretion of various mediators including histamine (Harlim, 2018). Magnesium content can also improve skin health with the help of the adhesion molecule e-cadherin and integrin-mediated migration of keratinocytes, exhibiting anti-inflammatory properties and can inhibit antigen presenting capacity of Langerhans cells resulting in sensitization and allergic reactions. magnesium can be absorbed by damaged skin and trans membrane proteins can lead to further penetration through organ systems, where it can exert anti-inflammatory activity by tumor necrosis factor-alpha (TNF- α) and core factor kappa-b (CFKB) (Pecoraro et al., 2020).

One of the mediators of inflammation is histamine. Histamine plays an important role in the pathophysiology of allergic diseases such as itching. Salt contains anti-histamine. Anti-histamine is a substance that can reduce or eliminate the effects of histamine on the body by blocking the histamine receptors, namely h1 and h2, that found on human skin (Sari & Yenny, 2018).

In line with research conducted by Yoo et al (2020) which showed atopic dermatitis patients experienced a decrease in pruritus scores after administration of ground saltwater intervention, which initially a score of 5 dropped to a score of 2 (Yoo et al., 2020). in addition, the study of Sultan et al (2020) showed that patients at the Punjab rangers teaching hospital from 35 patients with pruritus kaligato (chill blains) were given warm salt water baths, showing 7 (20%) people experienced improvement >50%, 18 (51%) people experienced improvement of 30-40% and 10 (29%) experienced improvement <40%. in addition, this is also in line with the research of Hamza et al (2017) at the Medina General Hospital of 175 anorectal pruritus patients who were given a warm salt water bath experienced a complete recovery of pruritus within 9 days.

Warm water that gives the effect of comfort. Scabies pruritus is an uncomfortable feeling that causes the urge or reflex to scratch. giving warm water therapy has an effect on physical and psychological conditions so that it can provide a comfort effect, namely a relaxation effect

so that it can provide a comfortable sensation on the physical and affect psychological conditions (Hoesny et al., 2018; Utami, Suratini, & Sudyasih, 2015).

The average scabies pruritus decreases in both, these are meaningful interventions were able to reduce scabies pruritus, namely the intervention group with warm salt water therapy of 2.71 while the control group with warm water was 1.29. this is because warm water therapy only provides a comfort effect in reducing pruritus, while warm salt water therapy in addition to providing a comfort effect, salt contains magnesium as an anti-inflammatory and anti-histamine which can reduce pruritus in scabies, so it can be concluded that warm salt water soak therapy is more effectively used than warm water therapy for scabies pruritus felt by students.

In addition, the decrease in pruritus in this study was still relatively small. The predisposing factors such as the length of time suffering from scabies, the longer the students stay in the Islamic Boarding School, the students get scabies is due to the daily activities of students such as bathing together, exchanging clothes, towels and so on which can cause the disease to spread. scabies, and environmental factors such as humidity due to closed ventilation in Islamic Boarding Schools, dirty water, poor sanitation in this place, itching activity that can damage skin integrity to be scabies lesion. This lesion makes itchy, pain and not comfort. The weakness of this study such as small number of samples, the poor school environment, this study could not examine all of the pruritic areas such as genital, buttock, groin and the others pruritus areas, but only feet and hands.

CONCLUSSION

Based on the results of this study, both of treatment can reduce pruritus score in each group. The decrease in score of pruritus in intervention group was higher than that in the control group. Provide warm sea salt water immersion as daily routine during six days is more effective in reducing pruritus scabies in male students at Islamic Boarding School. This treatment is benefit for male students to relieve the itchy or pruritus scabies that increase a sense of comfort and accelerate the healing of lesion.

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