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A Causality Study of Tinea Pedis Incidence in Scavengers at the Final Disposal Site (TPA) of Jatibarang Semarang in 2018

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Abstract

Tinea Pedis is a fungal infection that usually begins between the toes. It commonly occurs in people whose feet have become very sweaty while confined within tightfitting shoes. It often attacks adults who work in wet places such as washers, farmers or people who have to wear closed shoes every day, such as scavengers. The purpose of this study was to examine the causality of the incidence of Tinea pedis in scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018. This study was done using a type of quantitative research supported by qualitative data obtained from interviews, with a cross sectional approach. The sample used in this study were 78 respondents obtained by using simple random sampling technique. The data collection techniques were done by using interview, observation, and documentation (diagnostic report sheet of a dermatologist). The data analysis in this study was done using Descriptive Statistics, Chi Square and Multiple Logistics Regression tests. The results showed that there was an effect of changing socks used for work (p=0.000), the practice of washing and drying feet after work (p=0.000), the practice of washing shoes after being worn to work (p=0.000), individual characteristics (age (p=0.031), gender (p=0.046), education (p=0.024) and working period (p=0.020) on the incidence of Tinea pedis among scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018. The results of the logistic regression showed that the most dominant factors for causing the incidence of Tinea pedis on scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018 is the practice of washing shoes after being used to work with an adjusted OR or Exp (B) = 45.179. It is expected that the results of this study able to increase the knowledge of scavengers about the risks of work, especially skin disease of Tinea pedis.

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INTRODUCTION

A work environment refers to the elements that comprise the setting in which employees work and impact workers. It is also a potential place that affects the health of workers. Factors that can affect the health of workers include physical factors, chemical factors, and biological factors. The work environment or type of work can also cause some occupational diseases (Suma'mur, 2009).

Final Disposal Sites (TPA), along with the times, has become a source of livelihood for people who are often referred to as scavengers. This work in the informal sector is very helpful for the urban waste management system, especially in the city of Semarang. On the other hand, the working environment of scavengers that are directly related to dust, garbage and sunburn causes health problems. One of the health problems suffered by scavengers is a skin infection that occurs between the toes and the soles of the feet caused by a fungus or better known as *Tinea pedis* or *ringworm of the foot* (Djuanda, 2013).

Tinea pedis is a foot infection due to a dermatophyte fungus. It is the most common dermatophyte infection and is particularly prevalent in hot, tropical, urban environments. *Tinea pedis* is caused by the anthropophilic fungus *Trichophyton rubrum* which often gives chronic abnormalities (79.08%) (Baranova *et al.,* 2018). The annual incidence of patients with *Trichophyton rubrum* infection increased from 131,122 dermatophytosis patients, of which 115,846 patients (88.35%) had *Trichophyton rubrum* infection (Lee et al*.,* 2015).

The prevalence of dermatophytosis in Asia reaches to 36.6% (Kumar et al*.,* 2011). Research Toukabri et al. (2017) in Tunisia from 485 samples, *Tinea pedis* and Tinea unguium were found in 88.2% of cases. Research by Batool et al. (2015) in Pakistan showed positive cases of *Tinea pedis* in scavengers by 13.6%. The research of Sakka et al. (2015) in Israel showed the prevalence of *Tinea pedis* from 221 respondents was 14%.

The data reports of pain or disease for dermatophytosis in Semarang tend to increase in the last four years. The *Incidence rate* (IR) of dermatophytosis in 2014 was 0.096% per 100.000 populations, increased in 2015 by 0.316% per 100,000 populations and 0.627% per 100.000 populations in 2016. The data from 2017 to October showed that 0.632% per 100,000 populations suffered from dermatophytosis (Dinas Kesehatan Kota Semarang, 2017).

Research on the incidence of *Tinea pedis* has also been conducted on the traffic police in Semarang. In this study, the incidence of *Tinea pedis* was found to be 41.5% (Napitupulu *et al.,* 2016). The use of closed shoes for a long time by traffic police and scavengers when working can cause the skin around the toes to become moist due to excessive sweat production. This is what causes the fungus to grow, especially the fungus that causes *Tinea pedis* (Bramono, 2014). The research of Ishijima et al. (2019) showed that 40% of the safety shoes of Japanese workers were associated with the incidence of *Tinea pedis*. Humid and hot environmental conditions between the toes due to the use of shoes and socks will also stimulate the growth of the fungus *Trichophyton rubrum* (Perdoski, 2011).

Based on interviews with scavengers, almost all of them experienced itching on the body, hands and feet. Many scavengers also experience itching on their feet during the rain season. In some cases, *Tinea pedis* in scavengers showed sores and blisters on the skin. Some scavengers showed the signs of symptoms such as burning, dry, cracked, and peeling skin, and discoloration in the area between the fingers and soles of the feet. The fungus also spreads to become nail fungus causing the nail to look pale, thickened with an uneven surface, and the nail looks like it is pulled and will fall off the nail bed. But the scavengers think that itching is a normal thing, they do not check it at the Puskesmas (Public Health Center).

The purpose of this study was to examine the causality of the incidence of *Tinea pedis* among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018. Specific objectives were:

1. Analyzing the effect of the practice of replacing socks worn at work on the incidence of Tinea pedis among scavengers at the Final Disposal Site of (TPA) Jatibarang, Semarang in 2018.

2. Analyzing the effect of the practice of washing and drying feet after work on the incidence of Tinea pedis among scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018.
3. Analyzing the effect of the practice of washing shoes after being used for work on the incidence of Tinea pedis among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018.
4. Analyzing the effect of individual characteristics (age, gender, education and working period) on the incidence of Tinea pedis among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018.
5. Analyzing the most influential factors on the incidence of Tinea pedis among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018.

METHOD

The type of this study was a quantitative research supported by qualitative data obtained from interviews. The design of this study was an observational analytic with *cross sectional* approach. The purpose of this study was to analyze the causality of the occurrence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018. The population in this study was all scavengers who worked in the Final Disposal Site (TPA) of Jatibarang, Semarang, with a total population of 350 scavengers. The sample in this study was 78 people, determined by using the *Slovin* formula by using *simple random sampling* technique.

The independent variables in this study were the practice of changing socks used for work, the practice of washing and drying feet after work, the practice of washing shoes after being used for work and individual characteristics (age, gender, education, and working period). The dependent variable in this study was the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018. The data collection techniques in this study were conducted by using interviews, observation, and documentation (diagnostic report sheet of a dermatologist).

In this study, multivariate analysis was performed by using multiple logistic regression. The analysis in this study was conducted to determine the most influential independent variables (the practice of changing socks worn to work, the practice of washing and drying feet after work, the practice of washing shoes after work, and individual characteristics (age, gender, education and working period) on the dependent variable, which is the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018.

RESULTS AND DISCUSSION

This study was conducted at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018, with the aim of assessing the causality of the incidence of *Tinea pedis* among scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018.

Table 1. Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Age, Gender, Education, and Working Period)

No	Characteristics of Respondents	Frequency (f)	Percentage
	Age		
	< 43 Years	32	41.0
1	≥ 43 Years	46	59.0
	Total	78	100.0
	Gender		
	Female	29	37.2
2	Male	49	62.8
	Total	78	100.0
	Education		
	Basic (neve go to school, primary school Elementary,		
3	Junior)	50	64.1
	Middle (SMA, SMK)	28	35.9
	Total	78	100.0
	Working period		
	< 6 Years	26	33.3
4	≥ 6 Years	52	66.7
	Total	78	100.0

Based on table 1 data, it can be seen that from 78 respondents, most of them have an age of more than or equal to 43 years totaling 46 people (59.0%), male respondents dominate totaling 49 people (62.8%), respondents who have a predominant basic education are 50 people (64.1%) and respondents who have a working period of more than or equal to 6 years are 52 people (66.7%).

Table 2. Univariate Analysis of the Distribution of Respondents Based on the Practice of Replacing Socks Worn at Work

The Practice of replacing socks worn at work	Frequency (f)	Percentage
Poor	32	41.0
Good	46	59.0
Total	78	100.0

Based on the data in table 2, it can be seen that of the 78 respondents who have the practice of replacing the socks used at work with good category is 46 people (59.0%) have the practice of changing socks with poor category is 32 people (41.0%).

Table 3. Univariate Analysis of Respondent Distribution Based on the Practice of Washing and Drying Feet After Work

The Practice of Washing and Drying Feet After Work	Frequency (f)	Percentage
Poor	36	46.2
Good	42	53.8
Total	78	100.0

Based on the data in table 3, it can be seen that of the 78 respondents who had the practice of washing and drying their feet after work in the good category is 42 people (53.8%) and respondents who had the practice of washing and drying their feet after work in the poor category is 36 people (46.2%).

Table 4. Univariate Analysis of Respondents Distribution Based on the Practice of Washing Shoes after Wearing for Work

The Practice of Washing Shoes After Wearing for Work	Frekuency (f)	Percentage
Poor	38	48.7
Good	40	51.3
Total	78	100.0

Based on the data in table 4, it can be seen that of the 78 respondents who had the practice of washing shoes after being used for work in the good category is 40 people (51.3%) and the respondents who had the practice of washing shoes after they were used for work in the poor category is 38 people (48.7 %).

Table 5. Univariate Analysis of Respondents Distribution Based on the Incidence of *Tinea Pedis*

Incident of Tinea Pedis	Frekuency (f)	Percentage
Tinea pedis	37	47.4
Not Tinea pedis	41	52.6
Total	78	100.0

Based on the data in table 5, it can be seen that from 78 respondents who experienced *Tinea pedis* is 37 people (47.4%) and respondents who did not experience *Tinea pedis* is 41 people (52.6%).

Table 6. The Effect of the practice of changing socks worn at work on the incidence of *Tinea pedis*

The Practice of changing socks worn to work	Incident of Tinea Pedis				p-value	OR	95%CI
	Tinea Pedis		Not				
	F	%	f	%			
Poor	30	81.1	2	4.9	0.000	83,571	16.179-431.673
Good	7	18.9	39	95.1			
Total	37	100.0	41	100.0			

Based on table 6, it was found that there was a significant effect between the practice of changing socks used for work on the incidence of *Tinea pedis* (p=0.000). In addition, the value of *Odd Ratio* (OR) = 83.571 (OR> 1) with 95% CI = 16.179-431.673. This shows that respondents who have the practice of replacing socks used for work in the poor category have an 83.571 times greater risk of suffering from *Tinea pedis* than respondents who have the practice of changing socks used for work in the good category. The results of the research in the field of study show that almost all respondents have the practice of replacing the socks used for work in a good category, namely changing the socks every day even though they are not new ones. The results of the study were supported by the answers of respondents in the interview, as follows:

" *wah nda tahan mba kalau tidak mengganti kaos kaki setiap hari…mambu* (We cannot stand with the smells if not changing socks everyday)".

" *yaa… harus ganti mba, kami kan pekerja di tempat sampah, bau, kotor, panas jadi gampang kringetan kakinya mba..*(Of course we must change our socks, we work with garbage, smells bad, dirty, and hot, then our feet can easily sweating)".

Based on the results of the study, respondents who experienced Tinea pedis were those who had poor practice of replacing socks worn at work. The results of the research were indicated by their answers as follows:

" *kalau ada gantinya mestinya saya ganti to mba.. mba, lha kahanan saya aja kaya begini .. eman mba kalau beli kaus kaki* (If I have other socks, I will change everyday, with our condition like this, it is too difficult for us to buy new socks)".

"*saya aja buat makan pas-pasan mba..jadi ya…nda punya serep kaus kaki*..(Our money even not enough for daily food, that is why I do not have so many socks)".

"*sebenarnya saya pengen ganti setiap hari mba..ra ketang kaus kaki besar..sing penting..bersih*..(Actually I want to change socks everyday, a big one is fine, but clean)".

Changing socks every day is one way to avoid the occurrence of Tinea pedis. The practice of changing socks every day is also not necessarily able to prevent the occurrence of Tinea pedis, since the socks worn are not necessarily free of fungus. Considering that the scavenger residences are in the TPA location, the contact process with fungi or fungal spores can occur when the socks are dried in the sun, where socks can be exposed to fungal spores that cause Tinea pedis which are carried away by the wind or when putting socks on a place that has been attached by fungus. This study is supported by the results of a study conducted by Gupta & Versteeg (2019) that cured or improved dermatophytosis can be reinfected if exposed to a fungal reservoir, such as infected shoes, socks, or textiles.

Table 7. The Effect of Washing and Drying Feet After Work on the Incidence of Tinea Pedis

The Practice of Washing and Drying Feet After Work a	Incident of Tinea Pedis				p-value	OR	95%CI
	Tinea Pedis		Not				
	F	%	F	%			
Poor	32	86.5	4	9.8	0.000	59.200	14.638-239.427
Good	5	13.5	37	90.2			
Total	37	100.0	41	100.0			

Based on table 7, the results showed that there was a significant effect between the practice of washing and drying the feet after work on the incidence of *Tinea pedis* (p = 0.000). In addition, the value of *Odd Ratio* (OR) = 59.200 (OR>1) with 95% CI = 14.638-239.427 was also found. This shows that respondents who have the practice of washing and drying their feet after work in the poor category have a 59.200 times greater risk of suffering from *Tinea pedis* than respondents who have the practice of washing and drying feet after work in the good category. The results of the research in the field of study showed that almost all respondents were considered in the good category for the practice washing their feet after work and drying their feet after work by washing their feet after work using clean water and laundry soap and drying their feet after washing with dry cloth or towels. The results of the study were strengthened by the answers of respondents in-depth statements submitted by the researcher during data collection and observation, as follows:

"*nda tahan baunya mba kalau tidak mencuci kaki habis kerja*, *terus saya lap pake handuk mba* (I cannot stand with the smells, after work I usually wash my feet and dry it with towel)".

"*saya kalau nyuci kaki pake sabun mbleyek mba..busanya banyak, baunya bau jeruk..lumayan bisa ngurangi bau kaki, njuk di lap pake kain*…(I usually wash my feet using liquid soap, it has so much bubble and has orange fragrance, it is good to reduce bad smells then I dry my feet with towel)".

The results of the study also showed that there were still respondents with *Tinea pedis* who had good practice of washing and drying their feet after work. The results of the study were strengthened by the answer of respondents in-depth statements submitted by the researcher during data collection and observation, as follows:

"*..kadang-kadang saya nyucinya kurang bersih mungkin mba… biasane kalau buru-buru mau pulang terus oga di lap mba..* ..(Sometimes, I done wash it cleanly, If I am in rush, I seldom wash my feet, I only wiping it)".

"*…sebenarnya saya tahu cara nyucinya mba…tapi rasa malesnya lebih kuat.. jadi nak gek ingat …yaa.. saya cuci dengan bener.. he .. hee…di lap juga kadang- kadang mba pake lap* (I know how to wash, but sometimes too lasy to do it, If I am not lazy I will wash it well, but sometimes only wiping it with towel)".

The habit of sharing towels can be a risk factor for transmitting fungal infections (Sharma & Tendolkar, 2017). This is in line with research by Hadi (2020) which shows that skin cleanliness (p = 0.000) and towel cleanliness (p = 0.002) are factors related to the incidence of *Tinea Pedis* in Tamta Students in the Main Regiment of Kodam VII Wirabuana Makassar. Another study by Indasah et al. (2016) showed that *personal hygiene* was associated with the health problems for scavengers at TPA Kediri (p value = 0.000).

Table 8. The Effect of the Practice of Washing Shoes after Wearing to Work on the Incidence of *Tinea Pedis* on Scavengers at the Jatibarang TPA Semarang City in 2018

The Practice of Washing Shoes After Wearing for Work	Incident of *Tinea Pedis*				p-*value*	OR	95%CI
	Tinea Pedis		Not				
	f	%	f	%			
Poor	34	91.9	4	9.8	0.000	104.833	21.860-502.735
Good	3	8.1	37	90.2			
Total	37	100.0	41	100.0			

Based on table 8, it was found that there was a significant effect on the practice of washing shoes after being used to work with the incidence of *Tinea pedis* (p=0.000). In addition, the value of *Odd Ratio* (OR) = 104.833 (OR>1) with 95% CI = 21.860-502.735. This shows that respondents who have the practice of washing shoes after being used to work in the poor category have a 104.833 times greater risk of suffering from *Tinea pedis* than respondents who have the practice of washing shoes after being worn to work in the good category. This study also shows that respondents who experience *Tinea pedis* are those who have poor shoe washing practices. The results of the study were strengthened by the answer of respondents, as follow:

"*…saya nyuci sepatu kalau sempat aja mba… rumah saya jauh soale*.. (I wash my shoes if I have enough time to doit, my house is far from here)".

"*..nyuci kalau punya sabun mba.. kalau nda ada sabun kan percuma mba di cuci… bener nda*..(If I have soap I will wash it, if not I think it is useless to wash it)".

Keeping shoes clean is also very important. Once your feet sweat, the sweat will stick to your shoes,
making it a breeding ground for bacteria that can cause foot ailments. To keep the shoes by washing with clean water, then rinsing with enough water, and drying it upside down so that the mouth of the shoe is at the bottom, this is to remove water from the shoes (Budiono, 2013). This is in accordance with the study of Sasagawa (2019) where using footwear registered a significantly higher temperature (p<0.001), humidity (p<0.001), thus it was associated with the cause of *Tinea pedis.*

This study is in line with previous research conducted by Wardawati et al. (2017) which showed that the condition of shoes, smelly shoes, damp shoes, dirty shoes and socks with p<0.05 was a predictor of the risk of *Tinea pedis* in male workers in hot environments.

Table 9. The Relationship between Characteristics and the Incidence of *Tinea Pedis* in Scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018

cCharacteristics	Incident of *Tinea Pedis*				p- *value*	OR	95%CI
	Tinea Pedis		Not				
	f	%	F	%			
Age							
< 43 Years	10	27.0	22	53.7	0.031	0.320	0.124-0.827
≥ 43 Years	27	73.0	19	46.3			
Gender							
Female	9	24.3	20	48.8	0.046	0.338	0.128-0.889
Male	28	75.7	21	51.2			
Education							
Basic/ Elementary	29	78.4	21	51.2	0.024	3.452	1.278-9.327
Middle	8	21.6	20	48.8			
Working period							
< 6 Years	7	18.9	19	46.3	0.020	0.270	0.097-0.754
≥ 6 Years	30	81.1	22	53.7			

The results of the study in table 9 show that there is a significant influence between the age variable on the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018 (p = 0.031). In addition, the value of *Odd Ratio* (OR) = 0,320 (OR < 1) with 95% CI = 0,124-0,827. This shows that respondents who are less than 43 years old have a 3,125 times less risk of suffering from *Tinea pedis* than respondents who are more than or equal to 43 years of age. Adults are more often active in household activities or the duration of wearing closed shoes during activities, thereby increasing humidity. This study is in line with previous research conducted by Srisantyorini & Cahyaningsih (2017) showing that age is related to

the incidence of skin disease (p = 0.008) in scavengers at the Integrated Waste Management Site (TPST) Sumur Batu Village, Bantar Gate District, Bekasi.

In table 9, it is found that there is a significant influence between the gender variables on the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018. In addition, the *Odd Ratio* (OR) = 0.338 (OR < 1) with 95% CI = 0.128- 0.889. This shows that female respondents have a 2.958 times less risk of suffering from *Tinea pedis* than male respondents. Men often engage in sports activities, wear tight footwear and for long periods of time, and lack foot hygiene. *Tinea pedis* is often found in people who wear closed shoes in their daily lives accompanied by poor foot care and workers whose feet are always or often wet (Djuanda, 2013).

In table 9, it is found that there is a significant effect between education variables on the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018. In addition, the Odd Ratio (OR) = 3.452 (OR > 1) with 95% CI = 1.278-9.327 . This shows that respondents with basic education have a 3.452 times greater risk of suffering from *Tinea pedis* than respondents with secondary education. The existence of health information about *Tinea pedis* can affect the opinion and beliefs of respondents, the information obtained can make it easier for respondents to perceive it, so that it can be assessed directly which in turn can affect knowledge and the realization of a clean and healthy lifestyle in preventing *Tinea pedis* (Azwar, 2008).

This study is in line with previous research conducted by Jasmine et al. (2016) which shows that there is a relationship between *personal hygiene* knowledge and scabies transmission prevention behavior (p = 0.000). In line with the research of Angriyasa et al. (2018) there is a relationship between knowledge about *personal hygiene* and symptoms of skin disease in scavengers at the Suwung Denpasar Final Disposal Site (p = 0.029).

In table 9, it is found that there is a significant effect between the variable period of service on the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018. In addition, the *Odd Ratio* (OR) = 0.270 (OR < 1) with 95% CI = 0.097- 0.754. This shows that respondents who have a working period of less than 6 years have a 3.703 times less risk of suffering from *Tinea pedis* than respondents who have a working period of more than or equal to 6 years. This study is in line with previous research conducted by Muhtadin & Latifah (2018) which showed that length of work was associated with *Tinea pedis* in fishermen on Panggang Island, Thousand Islands, North Jakarta (p = 0.05).

Table 10. Analysis of the Causality Study of *Tinea pedis* Incidence on Scavengers at the Final Disposal Site (TPA) Jatibarang, Semarang in 2018 (Multiple Logistics Regression Test Analysis)

Variable	p *value*	*Wald*	B	*Exp* B
The practice of washing and drying feet after work	0.000	11.223	3.117	22.577
The practice of washing shoes after wearing them to work	0.000	16.785	3.811	45.179

Based on table 10, the results of the practice of washing shoes have a *Wald* value = 16.785 and have the largest value compared to other variables *adjusted* OR or *Exp* (B) = 45.179. This means that respondents who have the practice of washing shoes after being used to work in the poor category have a 45.179 times greater risk of suffering from *Tinea pedis* than respondents who have the practice of washing shoes after being worn to work in the good category. The results of the study were strengthened by the answer of respondents submitted by the researcher during data collection and observation, as follows:

"…saya seneng kebersihan kok mba..meskipun saya kerja di tempat kotor..saya juga sadar kalau gampang terkena penyakit ..terutama rangen mba (I like cleanliness,.. even though I work in a dirty place.. I am also aware that it is easy to get sick.. especially fungi)".

"..sepatu dan kaki ibarat asset penting kami mba…jadi saya sangat rajin merwat kebersihanya mba.. susah mba kalau sampai sakit … misale rangen..waduh

..ampuuun (Shoes and legs become the most important assets for us, so I must often keep the cleanliness of my shoes and feet, it is hard when get sick, especially when I got fungus on my feet)".

Shoe hygiene is very important to avoid skin problems. Prolonged use of shoes creates an occlusive and humid environment, with retention of sweat from heat, physical exertion and *hyperhidrosis* that contribute to skin irritations such as shoe allergic dermatitis and fungal infections (Ntatamala, 2018). The maximum probability of workers with damp shoes is 74.3% for the occurrence of *Tinea pedis* (Wardawati et al., 2017). This study is in line with the research of Napitupulu et al., (2016) showed that there was a relationship between the level of *personal hygiene* and the incidence of *Tinea pedis* in traffic police in Semarang (p = 0.008). Another study by Miftahurrohmah & Budiati (2013) showed that *Tinea pedis* (water fleas) was associated with *personal hygiene* in scavengers at Tanjungrejo TPA Kudus (p=0.018). Another study by Pratama & Prasasti (2017) showed aspects of the use of Personal Protective Equipment (PPE) from 27 scavengers who experienced skin disorders of more than 70% due to the use of gloves and shoes that were not clean.

CONCLUSION

The practice of replacing socks used for work significantly affected the incidence of *Tinea pedis* among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018 (p *value* = 0.000).

The practice of washing and drying feet after work significantly affects the incidence of *Tinea pedis* among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018 (p *value* = 0.000).

The practice of washing shoes after being used for work significantly affects the incidence of *Tinea pedis* in scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018 (p *value* = 0.000).

Individual characteristics (age (p *value* = 0.031), gender (p *value* = 0.046), education (p *value* = 0.024) and working period (p *value* = 0.020)) significantly affected the incidence of *Tinea pedis* among scavengers at the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018.

The most risky factor for the incidence of *Tinea pedis* among scavengers at the the Final Disposal Site (TPA) of Jatibarang, Semarang in 2018 is the practice of washing shoes after they are used to work with an adjusted OR or Exp (B) = 45.179.

REFERENCES

Angriyasa, I.K.J., Mahayana, I.M.B., & Hadi, M.C. (2018). Hubungan Pengetahuan *Personal Hygiene* dengan Gejala Penyakit Kulit pada Pemulung di Tempat Pembuangan Akhir Sampah Suwung Denpasar Tahun 2018. *Jurnal Kesehatan Lingkungan*, 8(2), 51-58.

Azwar, S, (2008). *Sikap Manusia Teori dan Pengukurannya*. Yogyakarta: Pustaka Pelajar.

Baranova, Z., Kampe, T., Dorko, E., & Rimarova, K. (2018). Epidemiological and clinical aspects of dermatophytoses in eastern Slovakia: A retrospective three-year study. *Central European Journal of Public Health*, 26(88), S72-S75.

Batool, Z., Akram, M., Anjum, F., Faiz, S., & Ibrahim, M. (2015). Occupational Hazards and Health Status of Trash Picker Children in Faisalabad City, Punjab, Pakistan. *Mediterranean Journal of Social Sciences*, 6(5S2), 590-595.

Bramono, K, (2014). *Pemaparan tentang jamur*. Jakarta: FKUI.

Budiono, A.M.S., Jusuf R.S.M & Pusparini, A, (2013). *Bunga Rampai Hiperkes & KK*. Semarang: Badan Penerbit Universitas Diponegoro.

Dinas Kesehatan Kota Semarang, (2017). *Profil Dinas Kesehatan Kota Semarang*. Semarang: Dinas Kesehatan Kota Semarang.

Djuanda, A, (2013). *Ilmu Penyakit Kulit dan Kelamin*. Jakarta: Fakultas Kedokteran Universitas Indonesia.

Gupta, A.K., & Versteeg, S.G. (2019). The role of shoe and sock sanitization in the management of superficial fungal infections of the feet. *Journal of the American Podiatric Medical Association*, 109(2), 141-149.

Hadi, S. (2020). Faktor yang Berhubungan dengan Kejadian Tinea Pedis pada Mahasiswa

Tamta di Resimen Induk Kodam VII Wirabuana Makassar. *UMI Medical Journal*, 5(1), 12-19.

Indasah., Maula, N.Z., & K, P.D. (2016). Relationship of Behaviour in the Use of Personal Protective Equipment (APD), Eating a Healthy and Balanced, and Personal Higiene to Health Status of Skin on Scavengers in Tpa Kediri". *Journal of Applied Environmental and Biological Science*, 6(2), 1-5.

Ishijima, S.A., Hiruma, M., Sekimizu, K., & Abe, S. (2019). Detection of *Trichophyton* spp. from footwear of patients with tinea pedis. *Drug Discoveries & Therapeutics*, 13(4), 207-211.

Jasmine, I.A., Rosida, L., & Marlinae, L. (2016). Hubungan Antara Pengetahuan dan Sikap Tentang Personal Higiene dengan Perilaku Pencegahan Penularan Skabies Studi Observasional Pada Narapidana Anak di Lembaga Pemasyarakatan Anak klas IIA Martapura. *Jurnal Publikasi Kesehatan Masyarakat Indonesia*, 3(1), 7-12.

Kumar, V., Tilak, R., Prakash, P., Nigam, C., & Gupta, R. (2011). Tinea pedis: An Update. *Asian Journal of Medical Sciences*, 2(2), 134-138.

Lee, W.J., Kim, S.L., Jang, Y.H., Lee, S. J., Kim, D.W., Bang, Y.J., & Jun, J.B. (2015). Increasing prevalence of Trichophyton rubrum identified through an analysis of 115,846 cases over the last 37 years. *Journal of Korean Medical Science*, 30(5), 639-643.

Miftahurrohmah, D., & Budiati, R.E. (2013). Hubungan Kejadian Tinea Pedis (Kutu Air) dengan Praktik Personal Hygiene Pada Pemulung. *Jurnal Keperawatan dan Kesehatan*, 1, 77-78.

Muhtadin, F., & Latifah, I. (2018). Hubungan Tinea pedis dengan Lamanya Bekerja sebagai Nelayan Di Pulau Panggang Kepulauan Seribu. *Jurnal Ilmiah Kesehatan*, 10(1), 103-109.

Napitupulu, A.N., Subchan, P., & Widodo, Y.L.A. (2016). Prevalensi Dan Faktor Risiko Terjadinya Tinea Pedis Pada Polisi Lalu Lintas Kota Semarang. *Jurnal Kedokteran Diponegoro*, 5(4), 495-503.

Ntatamala, I. (2018). Shoe-Allergic Dermatitis Affecting A Sanitation Worker. *Journal of Current Allergy & Clinical Immunology*, 31(3).

Perdoski, (2011). *Dermatofitosis Superfisialis*. Jakarta: Balai Penerbit FKUI.

Pratama, K.F., & Prasasti, C.I. (2017). Gangguan Kulit Pemulung Di Tpa Kenep Ditinjau Dari Aspek Keselamatan Dan Kesehatan Kerja. *The Indonesian Journal of Occupational Safety and Health*, 6(2), 135-145.

Sakka, N., Shemer, A., Barzilai, A., Farhi, R., & Daniel, R. (2015). Occult Tinea Pedis in an Israeli Population and Predisposing Factors for the Acquisition of the Disease. *International Journal of Dermatology*, 54(2), 146-149.

Sasagawa, Y. (2019). Internal Environment of Footwear is a Risk Factor for Tinea Pedis. *Journal of Dermatology*, 46, 940-946.

Sharma, N., & Tendolkar, U. (2017). Modifiable Risk Factors Associated With Patients Of Tinea Corporis. *Medpulse Internation Medical Journal*, 4(2), 165-169.

Srisantyorini, T., & Cahyaningsih, N.F. (2017). Analisis Kejadian Penyakit Kulit pada Pemulung di Tempat Pengolahan Sampah Terpadu (TPST) Kelurahan Sumur Batu Kecamatan Bantar Gebang Kota Bekasi. *Jurnal Kedokteran dan Kesehatan*, 5(2), 135-147.

Suma'mur, (2009). *Higiene Perusahaan dan Kesehatan Kerja (HIPERKES)*. Jakarta: Sagung Seto.

Toukabri, N., Dhieb, C., Euch, D. El., Rouissi, M., Mokni, M., & Sadfi-zouaoui, N. (2017). Prevalence, Etiology, and Risk Factors of Tinea Pedis and Tinea Unguium in Tunisia. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 8, 1-9.

Wardawati, I., Effendi, F., & Kamal, K. (2017). Model Prediksi Risiko Kejadian Tinea Pedis pada Pekerja Laki-Laki di Lingkungan Kerja Panas. *J Indon Med Assoc*, 67(10), 571-575.