

Original Research Article

Knowledge, Attitude, and Practice on Paederus Dermatitis Among Students in UiTM Puncak Alam, Selangor

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Abstract

Paederus dermatitis is a skin disease caused by staphylinids beetle (Coleoptera: Staphylinidae) from the genus *Paederus*. Paederus dermatitis cases have been reported in Malaysia, especially among university students including Universiti Teknologi MARA (UiTM). Therefore, this study was carried out to access the current level of knowledge, attitude, and practice (KAP) on paederus dermatitis among UiTM Puncak Alam students. Besides, we also compared the level of knowledge, attitude, and practice on paederus dermatitis among students from different faculties and residential colleges in UiTM Puncak Alam. A cross-sectional survey was conducted on 388 undergraduate students from September 2019 until July 2020. The majority of the students have an adequate level of knowledge and practice while a moderate level of attitude towards paederus dermatitis. There was a significant positive correlation between knowledge and attitude on paederus dermatitis ($p < 0.05$). Data showed that knowledge and attitude regarding paederus dermatitis were significantly different between faculties ($p < 0.05$). Students from the Faculty of Pharmacy have better knowledge and attitude score compared to the accountancy students. There was a significant influence of residence college on practice towards paederus dermatitis ($p < 0.05$). Students staying at Dahlia college have the best practice followed by Casuarina, Angsana, and Rafflesia. In conclusion, awareness and educational programs regarding paederus dermatitis should be done by targeting students from different faculties and hostels. The effort also must be put to translate the components of good knowledge into a good attitude and practice of paederus dermatitis.

Keywords: Paederus dermatitis, knowledge, attitude, practice, student.

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Received 28 May 2021; accepted 28 July 2021

Available online: 4 Oct 2021

<https://doi.org/10.24191/IJPNaCS.v4.01>



1.0 Introduction

Paederus dermatitis is an irritant dermatitis caused by a potent toxin called pederin (1-3). Pederin is the main toxin produced by beetles from the genus *Paederus* (Figure 1). Outbreaks of paederus dermatitis have been observed mainly from the southern regions of Europe and Asia, and in other continents at lower latitudes (4). It includes the United States, Hawaii, Italy, Nigeria, Sri Lanka, Venezuela, Tanzania, and Iran (5). *Paederus* dermatitis is found in all zoogeographic regions across the world except in Antarctica but is more common in tropical and subtropical regions (6).

A contact with the pederin resulting in the characteristic linear lesions with a burning sensation that heal with hyperpigmentation (1) (Figure 2). It also results in the bullous lesions with surrounding erythema (7). The treatments of paederus dermatitis include oral antibiotics and antihistamines, topical steroids, intravenous injection of antibiotics, and combination treatments (8-11). In general, the preventive steps may include reducing the *Paederus* beetles population in the environment, avoiding contact with the skin, and minimizing the post-contact lesions (1). Body areas that were commonly

reported were the face, neck, shoulders and arms (12). A survey in UiTM found that most students noticed the symptoms upon awakening in the morning (13). An outbreak in a primary school in Terengganu was reported associated with fluorescent lighting and location near paddy fields (14). Bright light sources and higher elevation levels are also known to attract *Paederus* beetles and causes infestations in residential areas (15).

Based on previous records, there are many studies on paederus dermatitis and its causative agents in Malaysia (12-16) including one study in UiTM (13). It was noted that paederus dermatitis was prevalent among students in university hostels in Malaysia (12-13) as well in other countries (17-18), however, their knowledge, attitude and practice were never been accessed. Moreover, as a preventive measure, it is important to provide knowledge and cultivate a good attitude and practices to the younger generation, especially among students. Therefore, this study was initiated to access the current level of knowledge, attitude, and practice (KAP) on paederus dermatitis among UiTM Puncak Alam students. The relationship between knowledge, attitude, and practice of students in UiTM Puncak Alam regarding paederus dermatitis was also studied.



Figure 1: *Paederus* sp. beetle



Figure 2: Linear lesions with a burning sensation on the neck of a patient

2.0 Materials and Methods

This cross-sectional survey was conducted among 388 undergraduate students represented by pharmacy and accountancy students of UiTM Puncak Alam, Selangor Branch, Malaysia. These two faculties were chosen because students from both faculties came from a different stream and undergoing a distinct university syllabus, therefore making educational factors evaluable in the study. The study was conducted from September 2019 until July 2020. The sample size was calculated based on the Krejcie and Morgan (19), considering the confidence interval (CI) of 95% and a significance level of 0.05. Participants were recruited through systematic random sampling.

2.1 Ethical consideration

Ethical approval was obtained from the Human Research Ethics Committee, University Teknologi MARA (UiTM) (REC/03/2020 (UG/MR/105). Participatory students in this study were based on voluntary and supported by a consent form from each student. The respondent's identity was kept confidential, as the data set and analysis was not linked to the name of the respondent.

2.2 Research tools

An online questionnaire was used to collect the data for this study. As there are no validated questionnaires is available, a self-constructed questionnaire was used. To construct the questionnaire, a set of relevant questions was created. The questionnaire was bilingual (English and Malay) and divided into four (4) sections; sociodemographic, knowledge, attitude, and practice. In order to ensure that the set of questions created are suitable, it was sent to experts to be reviewed and checked. After the questionnaire went through experts opinion, it was delivered to 34 respondents for reliability and validity checking. It was

delivered to 34 respondents through google form. The respondents were asked for consent before they can answer the questionnaire.

2.3 Reliability tests and questionnaire validation

A reliability test based on 34 returned questionnaires was performed using SPSS version 20. The reliability test analysis of questions for knowledge, attitude, and practice categories showed that Cronbach's Alpha is 0.757, 0.709, and 0.781 respectively which is considered acceptable for the instrument to be reliable. For the test-retest, the intraclass correlation coefficient shows that the average measure is 0.999 for the knowledge category while 1.000 for both attitude and practice categories indicating strong reliability.

2.4 Data analysis

Data were analyzed using Statistical Package for the Social Science (SPSS) version 20. Descriptive analysis was performed to describe the students' sociodemographic information, the score of knowledge, attitude, and practice on paederus dermatitis. Man-Whitney test was performed to compare the current level of knowledge, attitude, and practice on paederus dermatitis among students from different faculty at UiTM Puncak Alam. Kruskal-Wallis test was conducted to compare the current level of knowledge, attitude, and practice on paederus dermatitis among students staying at different hostels in UiTM Puncak Alam. Meanwhile, Pearson's correlation test was performed to determine the correlation between knowledge and attitude, attitude and practice, and knowledge and practice of paederus dermatitis among students. Results were considered significant at $p < 0.05$.

3.0 Results

3.1 Sociodemographic characteristics of the respondents

A total of 388 students of UiTM Puncak Alam, Selangor participated in this study consisted of 51.8% females and 48.2% males. The majority of the students were age from 19 to 22 years old. 70.3% of students had a foundation or matriculation education background while 29.7% had a diploma background. Besides, 53.8% of respondents were from the Faculty of Pharmacy and 46.2% were from the Faculty of Accountancy. Meanwhile, 15.3% of students stayed at Angsana college, 32.1% stayed at Casuarina college, 15.3% stayed at Dahlia college and 37.3% stayed at Rafflesia college (Table 1).

3.2 Influence of sociodemographic factors on knowledge, attitude, and practice of students in UiTM Puncak Alam, Selangor

As normality assumption for data was not met, non-parametric tests were performed. A Mann-Whitney test showed a significant difference in knowledge between age groups 19-22 years old and 23-25 years old ($U=9863.00$, $p<0.05$). The age group of 23-25 years old (Mean rank=243.23) has a higher score than the 19-22 age group (Mean rank=172.39). There was also a significant difference in knowledge between educational background levels ($U=9328.50$, $p<0.05$) (Table 1). Students with diploma scored higher (Mean rank=248.88) than foundation or matriculation (Mean rank=170.80). Also, there was a significant difference between the Faculty of Pharmacy and Accountancy ($U=7186.50$, $p<0.05$). Faculty of pharmacy students obtained higher scores (Mean rank=247.28) than students from Faculty of Accountancy (Mean rank=129.87) (Figure 3).

For the attitude category, significant differences were found between education

background ($U=13667.00$, $p<0.05$) and faculties ($U=13201.500$, $p<0.05$) (Table 1). Students with diploma background have higher attitude score (Mean rank=211.16) than foundation or matriculation (Mean rank=186.75) while Faculty of Pharmacy students have higher attitude score (Mean rank= 218.22) than Faculty of Accountancy students (Mean rank=163.67) (Figure 3). For practice on *paederus dermatitis*, there was a significant influence of residence college ($H=18.013$, $p<0.05$). Students stayed at Dahlia college (Mean rank=233.70) have higher practice score than students at Kolej Casuarina college (Mean rank=202.08), Angsana college (Mean rank= 191.54) and Rafflesia college (Mean rank=166.41) (Figure 4).

3.3 Attitude towards *paederus dermatitis*

A list of 13 positive attitudes towards *paederus dermatitis* among students in UiTM Puncak Alam, Selangor is showed in Table 2. The most frequent positive attitude toward *paederus dermatitis* is “*paederus dermatitis* patients do not need to be avoided” with 63.90% of students agreed with it. On the other hand, the least frequent practice is “You are the key individuals in preventing *paederus dermatitis*” with 38.70% of students agreed with it (Figure 5).

3.4 Prevention practice

A list of 13 positive practices towards *paederus dermatitis* among students in UiTM Puncak Alam, Selangor is showed in Table 3. The highest preventive practice toward *paederus dermatitis* is “switch off the lights when sleeping” with 97.7%. The least practice is “use insect repellent cream to prevent exposure to *Paederus* sp.” with only 8.1% (Figure 6).

Table 1: Respondents demographic, knowledge, attitude, and practice towards paederus dermatitis. P values were obtained from Mann-Whitney test. *indicates significant different at alpha 0.05

Variables	n=388	Percentage (%)	p-value		
			knowledge	attitude	practice
Gender					
Female	201	51.8	0.566	0.822	0.32
Male	187	48.2			
Age group					
19-22	271	70.2	<0.001*	0.063	0.455
23-25	116	29.8			
Education level background					
Diploma	115	29.7	<0.001*	0.049*	0.323
Foundation or Matriculation	272	70.3			
Faculty					
Pharmacy	207	53.8	<0.001*	<0.001*	0.143
Accountancy	178	46.2			
Residential college					
Angsana	59	15.3	0.443	0.512	<0.001*
Casuarina	124	32.1			
Dahlia	59	15.3			
Rafflesia	144	37.3			

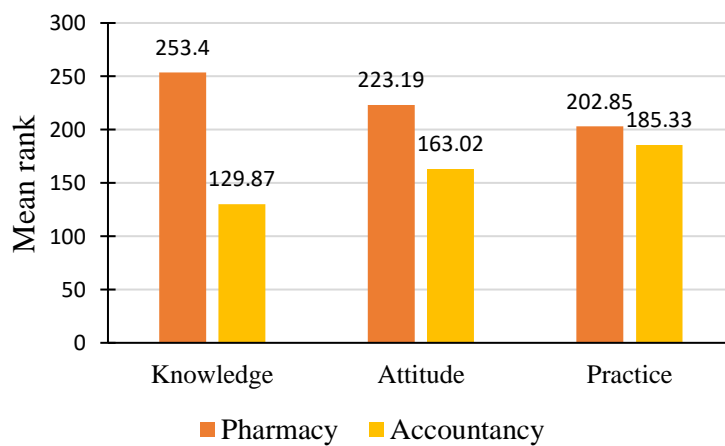


Figure 3: Comparison of the mean rank of knowledge, attitude, and practice score between different faculties.

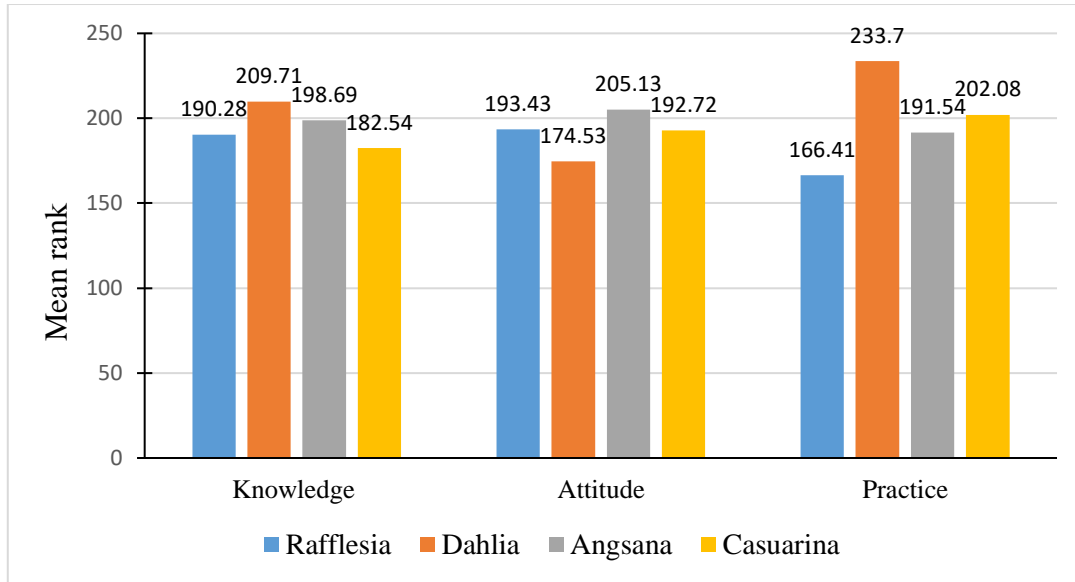


Figure 4: Comparison of the mean rank of knowledge, attitude, and practice score between different residential colleges.

Table 2: A list of 13 positive attitudes towards paederus dermatitis. Items are arranged from the highest to the lowest frequency.

No.	Positive attitudes
1.	Paederus dermatitis patients do not need to be avoided.
2.	If found cases of paederus dermatitis, treatment should be done quickly to prevent the worsening of the disease.
3.	To keep a distance from paederus dermatitis sufferers are unnecessary or not needed.
4.	If infected by paederus dermatitis, going to a clinic for treatment is better than self-treating it at home.
5.	You will take as much as preventive measures to avoid paederus dermatitis.
6.	You are afraid of having paederus dermatitis.
7.	You are aware that you have a chance to get paederus dermatitis at the place that you currently staying.
8.	Paederus dermatitis is a skin disease that should not be taken lightly.
9.	Eliminating <i>Paederus</i> sp. is not the only method of controlling or preventing paederus dermatitis
10.	Everyone has a chance for full recovery if infected with paederus dermatitis.
11.	Everyone has a chance to get paederus dermatitis.
12.	If you experience the sign and symptoms of paederus dermatitis, you will immediately treat it.
13.	You are the key individuals in preventing paederus dermatitis.

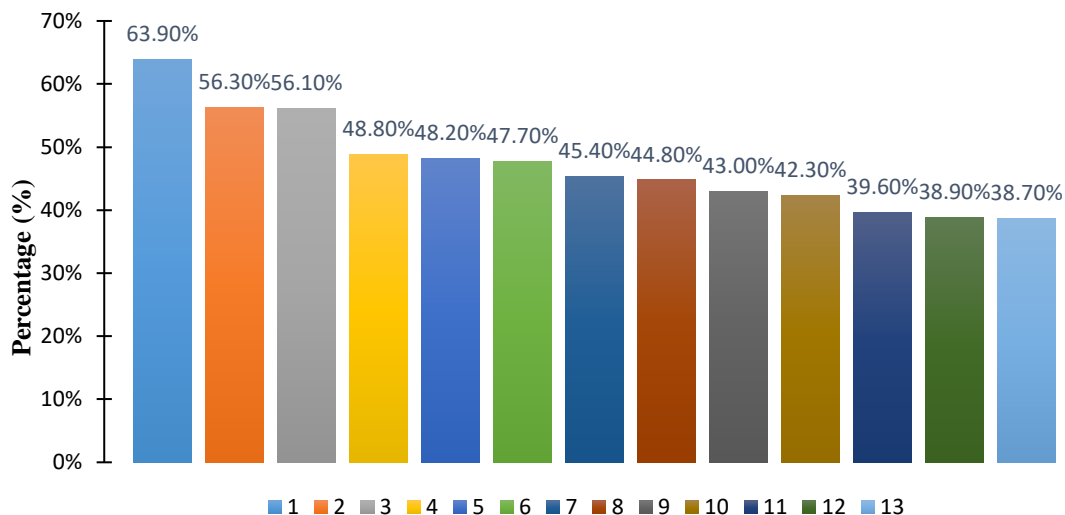


Figure 5: Attitude towards paederus dermatitis among students in UiTM Puncak Alam, Selangor.

Table 3: A list of 13 preventive practices of paederus dermatitis. Items are arranged from the highest to the lowest frequency.

No.	Preventive practices
1.	Switch off the lights when sleeping
2.	Avoid crushing the insect
3.	Wash skin affected with <i>Paederus</i> sp. with water immediately.
4.	Avoid touching the insect
5.	Quickly self-treated skin when affected by <i>Paederus</i> sp.
6.	Wear a long-sleeved shirt to prevent exposure to <i>Paederus</i> sp.
7.	Close windows when sleeping at night
8.	Use cellophane tape to trap the <i>Paederus</i> sp. when see it
9.	Removed it gently with a paper or some other object when see it on skin
10.	Flick off the insect when see it on skin
11.	Spray insecticide to the <i>Paederus</i> sp. when see it.
12.	Go to a clinic when get infected with paederus dermatitis
13.	Use insect repellent cream to prevent exposure to <i>Paederus</i> sp.

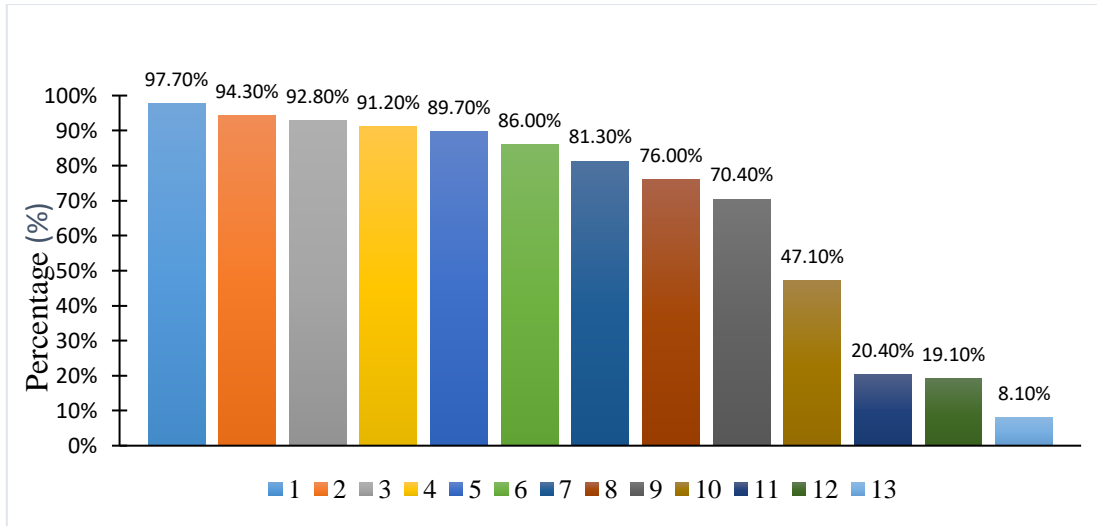


Figure 6: Preventive practice of paederus dermatitis among students in UiTM Puncak Alam, Selangor.

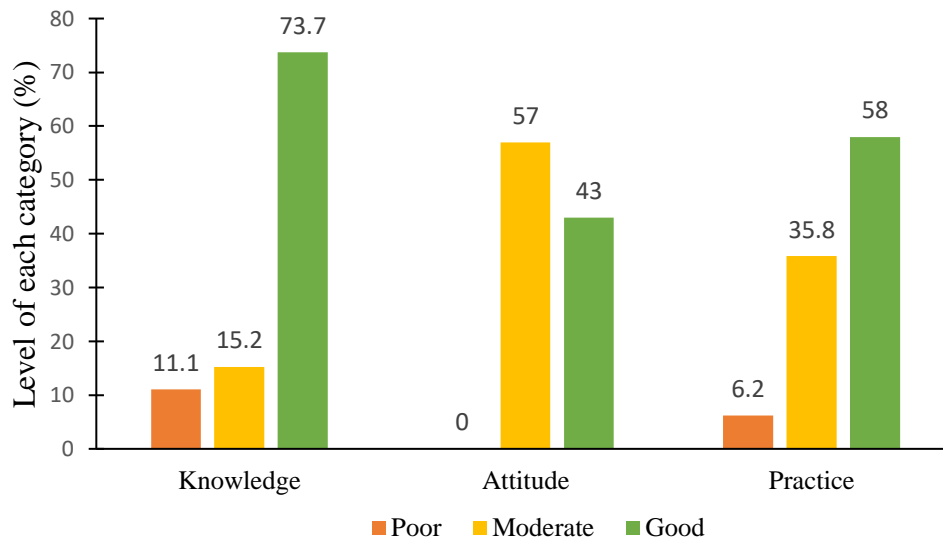


Figure 7: Level of knowledge, attitude and practice of paederus dermatitis among students in UiTM Puncak Alam, Selangor

3.5 Current level of knowledge, attitude, and practice on paederus dermatitis among students in UiTM Puncak Alam

A total score of knowledge, attitude, and practice were calculated and each of them was categorized into three-level; poor, moderate, and good. The results were summarized in Figure 7. Based on the figure, the majority of the students had good

knowledge and practice and moderate attitude.

3.6 Relationship between KAP of paederus dermatitis among students in UiTM Puncak Alam, Selangor

Pearson's Correlation showed that there was no significant correlation between knowledge and practice ($r=0.079$, $p=0.122$),

and attitude and practice ($r=0.080$, $p=0.114$). In contrast, a significant and weak positive correlation was evident

between knowledge and attitude of students related to paederus dermatitis ($r=0.26$, $p<0.05$) (Figure 8).

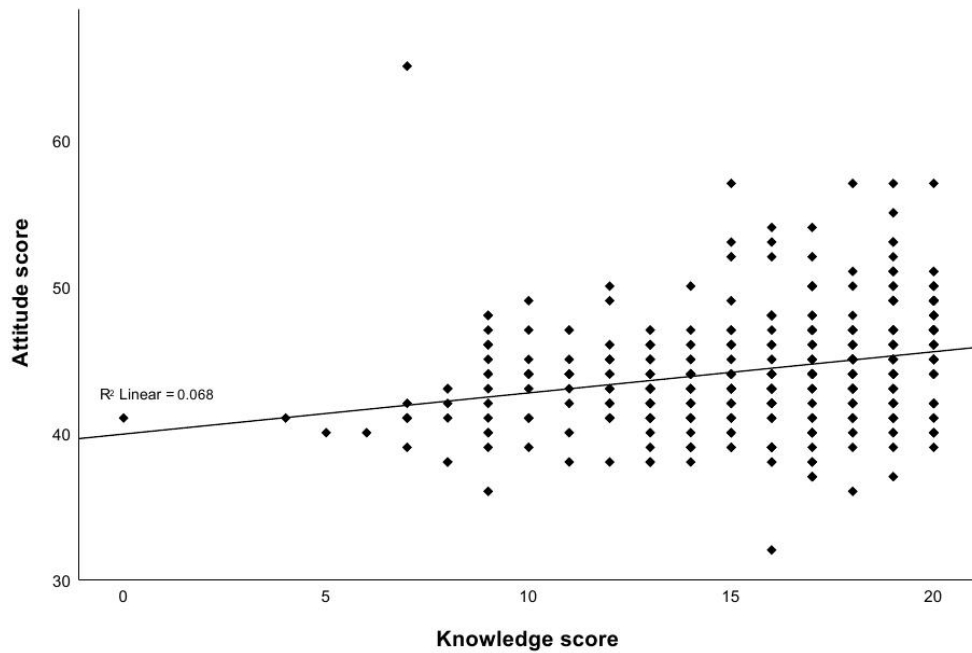


Figure 8: Relationship between knowledge and attitude of students towards paederus dermatitis.

4.0 Discussion

A few sociodemographic factors including age, education background, faculty, and residential college, were significantly influenced the KAP score. Students with diploma backgrounds have higher knowledge and attitude scores compared to the others. However, a previous study involving UiTM Puncak Alam students found that students from matriculation are more aware of *Paederus* sp. (13). One of the reasons is that their hostels during matriculations are located near to *Paederus* sp. habitat which is dominated by the oil palm plantation.

Students from the Faculty of Pharmacy have higher knowledge and attitude scores towards paederus dermatitis compared to accountancy students. It has proven our hypothesis that respondents who enrolled in medical-related courses as part of their syllabus have more knowledge regarding paederus dermatitis. Similar to our findings, a comparative study on health knowledge

between medical and non-medical college students in Beijing found that medical students' knowledge was higher as they had learned the basic courses in the medical field (20).

Besides that, the significant difference in practices level between students stayed at different resident college was revealed in this study. Dahlia college is located close to the forested area, therefore, they are more familiar with the *Paederus* beetles. This could be the possible explanation why they are more aware of the prevention measures related to paederus dermatitis.

Results have shown that most UiTM Puncak Alam students have adequate knowledge and practice towards paederus dermatitis. Students may get some information regarding paederus dermatitis from their senior. A case series study in 2010 conducted among UiTM Puncak Alam students revealed that senior students had warned junior students about the *Paederus* sp. (13). The students were commonly used adhesive tape to trap the

Paederus sp. Even though this is not a recommended action, it showed that they are aware that avoiding contact with the beetles is important. Avoid touching and crushing the beetles is one of the important positive practices towards paederus dermatitis.

Nevertheless, however, our result showed that the students have a moderate attitude towards paederus dermatitis. The majority of students agreed that patients with paederus dermatitis should not be avoided. This is true as paederus dermatitis is a non-contagious disease. It is actually caused by toxin release by *Paederus* sp. beetles (1). The students' second most positive attitude towards paederus dermatitis is that treatment should be done quickly to prevent the worsening of the disease. In a research carried out at UiTM Puncak Alam in 2013, it was reported that some students tend to ignore the symptoms of paederus dermatitis such as burning sensation and erythema (13). As soon as the insect comes into contact with the patient, removal of the toxin should be done immediately. The symptoms could progress into more serious complications such as extensive exfoliating and ulcerating dermatitis if immediate treatment is not taken (1). Meanwhile, the least positive attitudes were towards statements that they are the key individuals for preventing paederus dermatitis. This misconception must be corrected since individual behaviour plays a vital role in reducing the vector that causes the disease (21).

This study indicated that the least rehearsed preventive practice was related to insect repellent usage, with only 8.1% of students have practiced it. This finding is comparable to a study in Turkey reporting that out of forty-six patients diagnosed with paederus dermatitis, none of them was using repellent as a preventive measure (5). The use of insect repellent and wearing protective clothing has been proven can provide protection (22). Other than the repellent, the application of aerosol insecticide is also recommended. A study in

Karuna Medical College India proposed regular sprays of insect repellents containing 20% Baygon and 50% Malathion as the preventive measure (23). A systematic review showed insect repellent creams should be used by individuals when working in areas abundant with *Paederus* sp. (1).

A significant but weak correlation was evident between the knowledge and attitude of the students. This confirmed our hypothesis and is also in line with other behavioural studies (24-25). However, no significant correlation was evident between knowledge and practice, and attitude and practice in the study. This showed that students current knowledge and attitude were insufficient to change the student towards more positive practices towards paederus dermatitis. To improve it, various actions can be taken such as distribution of infographic leaflets, sticking posters on building walls, giving talks and conducting continuous awareness campaigns.

The findings of the study were still subjected to several limitations. For example, the study had involved students from two faculties only, in fact, there are seven faculties in UiTM Puncak Alam campus. More information can be expected if respondents were extended to other faculties. Hence, a wider target respondents from other faculties is needed for the future research works. Similar research can be proposed to respondents from outside the university area in Bandar Puncak Alam, Selangor.

5.0 Conclusion

This study concludes that students of UiTM Puncak Alam, Selangor have adequate knowledge and practice while an average level of attitude towards paederus dermatitis. However, knowledge and attitudes level were subjected to student's educational backgrounds. Meanwhile student's practice level was subjected to student's college. Therefore, to balance students KAP in UiTM, some actions can be proposed such

as distribution of infographic leaflets, sticking posters on building walls, giving talks and conducting continuous awareness campaigns. To understand the current KAP of a larger population, further studies on students from other faculties in UiTM Puncak Alam are recommended. Besides that, similar research can be proposed to the residents of Bandar Puncak Alam, Selangor.

Acknowledgment

The authors would like to acknowledge the University of Teknologi MARA (UiTM) for supporting this study. We would also like to acknowledge all the respondents who participated in this study.

Conflict of interest

The authors declare that there are no conflicts of interest.

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