Original Article

Knowledge And Attitude Towards Abnormally Excessive Sweating On The Hands (Palmar Hyperhidrosis) Among Malaysian Undergraduate Students

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Abstract

Palmar hyperhidrosis is a medical condition in which a person's hands sweat excessively and uncontrollably. Even when the temperature is cool or when at rest, their hands will continue to sweat. Under certain circumstances or situations that make them anxious, frightened, angry, or even ashamed, their hands tend to sweat even more. Abnormal excessive sweating on the hands may occur without causes. This may be because the sweat glands in the hands appear to be overactive in palmar hyperhidrosis patients. It is proven that sweating uncontrollably can cause significant physical and mental discomfort towards affected individuals. There are generally two types of hyperhidrosis, primary and secondary. Primary hyperhidrosis may be localized such as on the hands, feet, and armpits and normally affects 2–3% of the population. However, only around 40% of patients reach out for medical assistance. There is no clear etiology for primary hyperhidrosis in most cases and appears to be genetic. Secondary hyperhidrosis on the other hand, is associated with other health issues and the excessive sweating may occur systemic. Society's ignorance towards palmar hyperhidrosis has caused affected individuals to be wrongly stigmatized and thus impacted their overall wellbeing. Therefore, taking into consideration that the youth are the future of this nation, we had conducted this study amongst undergraduate students and have utmost faith that this study provided us an opportunity to better understand as well as increased the knowledge and attitude towards abnormal excessive sweating on the hands (palmar hyperhidrosis) amongst undergraduate students. Cross-sectional and convenience sampling method was used throughout the research whereby the respondents consisted of 312 undergraduate students; 98 Malays, 109 Chinese and 105 Indians from both medical and non-medical fields. The responses were collected through online platforms. The collected data was then analyzed using Statistical Package for Social Science (SPSS). Based on the data collected regarding comparison of the knowledge between medical and non-medical undergraduate students towards abnormally excessive sweating on the hands (palmar hyperhidrosis), questions 1,2,3,5,7,8 and 10 were statistically significant with p values less than 0.05 ($p<0.05$) whereas questions 4,6 and 9 showed no significance as their p values were greater than 0.05 ($p>0.05$). In addition to that, the comparison of attitudes between medical and non-medical undergraduate students towards abnormally excessive sweating on the hands (palmar hyperhidrosis) displayed that questions

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1,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 and 19 were not statistically significant as their p values were greater than 0.05 ($p > 0.05$) whereas questions 2,3 and 20 were statistically significant with p values less than 0.05 ($p < 0.05$). In conclusion, our study revealed that medical students had more knowledge regarding abnormally excessive sweating on the hands (palmar hyperhidrosis) as compared to non-medical undergraduate students. Our study also revealed that there was no significant difference in the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students. The findings of our study could be used as a foundation for developing awareness programs among undergraduate students. By improving the public's knowledge and attitude towards palmar hyperhidrosis, we are certain that it can make a difference and change the mindset of society, especially the younger generation as to reduce the stigmatization of those affected by palmar hyperhidrosis as well as enables patients and medical providers to acknowledge this disorder as a medically validated condition and encourage those affected to pursue treatment for the better.

INTRODUCTION

The term hyperhidrosis was used to describe a pathological condition that involves the excessive and persistent sweating of the body that exceeds its thermoregulatory demands. [1] This condition can affect several parts of the body, most notably the hands, head, feet as well as armpits. [2] There are generally two types of hyperhidrosis; primary which occurs without causes or external stimuli and often involves localized sweating such as in the hands whereas secondary occurs due to association with health issues as well as involves systemic sweating; all over the body. [3] Palmar hyperhidrosis on the other hand, is the condition whereby there is abnormally excessive sweating on the hands. It equally affects both hands and may range from moderate clammy hands to severe perspiration. 1-3% of the population; mainly of which occur during childhood or even in their adolescent years is seen to be suffering from this condition and it can bring about negative impact in the quality of life (QOL) of affected individuals; socially, emotionally, personally as well as affect their daily general lifestyle. [4] Studies have shown that there is a greater demand for knowledge regarding this condition. This is because a lack of information about palmar hyperhidrosis in society caused individuals to be stigmatized, increased humiliation and stress of excessive sweating experienced by them as well as acted as a stumbling block in the pursuit for treatment. [5]

Palmar hyperhidrosis is a rare condition as only 1-3% of the entire population suffers from it. Nonetheless, despite it being rare, many still experienced it. Studies have proven that palmar hyperhidrosis can severely impact the quality of life (QOL) negatively, even more so than that of acne, eczema or psoriasis. [6] Affected individuals experienced social embarrassment and anxiety, decreased self-esteem and confidence, isolation, feeling of shamefulness due to their excessive sweating as well as hardship in their everyday life. [7] The symptoms of palmar hyperhidrosis are generally overlooked due to poor awareness of this condition. Thus, awareness of palmar hyperhidrosis is essential to aid in destigmatizing those affected.

There is not much research report available on the level of knowledge regarding palmar hyperhidrosis between medical and non-medical undergraduate students. However, there has been some research that was conducted in the United States in 2016. This study was conducted based on all age groups and among male and females. Of all the respondents, only 51% of hyperhidrosis sufferers had discussed their condition with a healthcare professional, according to this study. Children/adolescents (<21 years old) with the disease are nearly twice as likely (81%) as their adult counterparts (42%) to be seen by a healthcare professional. The most prevalent reason for not discussing their condition with a healthcare professional is that they do not believe it is a medical condition (60 %) or that there is nothing that can be done to treat their excessive sweating (47 %). Only 53 % who consulted a doctor about their excessive sweating were diagnosed (73 % of children and adolescents, 43 % of adults). [8]

Moreover, another study was done in the United Kingdom (UK) in 2017. This study was conducted based on 21 male (30%) and 50 female (70%) affected with hyperhidrosis. According to this study, the patients expressed concern regarding the level of knowledge about hyperhidrosis of their medical providers as well as the lack of public's awareness. This is because they believed that due to the lack of knowledge about this medical condition, society has stigmatized them and treated those affected with hyperhidrosis with minimal sympathy. [9]

A study was conducted in 2017 based on several hyperhidrosis patient support groups such as the Very Sweaty Betty, UK Hyperhidrosis Patient Support group, and other hyperhidrosis patient support groups. The study concluded that hyperhidrosis has affected the daily lifestyles of the individuals in which 61% of the patients say that sweating affects their clothing choice and limiting the choice of clothing. 41% of the patients confessed about the significance of hyperhidrosis in limiting the activity of the hobbies of the patients, besides, 73% of patients confessed that hyperhidrosis did affect the everyday activities of the patients in the summer months as they will be sweating excessively. Not only that, the patients do find trouble when using touch-based technologies such as smartphones and computer touchpads. Secondly, the psychological aspect of the patients are also affected. This can be seen as 69% of the patients experience negative emotions as the effect of hyperhidrosis. Besides, the fear of other people's reactions, low self-esteem, and feeling of having a restricted life as well as losing control of one's life can be seen in the minority of the patients which are affected by hyperhidrosis. Third, the effects of hyperhidrosis towards the social life of the patients includes difficulties of the patients being out in the social situations, having physical contact with other individuals, and intimate and personal relationships. [9]

A study was conducted in India in 2016 which included 500 students. The study aims to find the prevalence of hyperhidrosis among college students to find out the quality of life of the students affected by hyperhidrosis using the Dermatology Life Quality Index (DLQI). This survey concluded that 38% of the population rate hyperhidrosis as bothersome to extremely bothersome in their daily life. 58% of the participants having hyperhidrosis are male. More male patients who have palmar hyperhidrosis require treatment as compared to female palmar hyperhidrosis patients. Majority of the participants have palmar hyperhidrosis. The DLQI scores 35% of the people affected by hyperhidrosis, and requires appropriate treatment and care. The test done can be used to determine the type of treatment which is required by the individual depending on how much of hyperhidrosis affects their life, the treatment needed can range from topical treatment to surgery for severe cases. [10]

Nonetheless, it is seen that not much research regarding the level of knowledge and the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) has been done in Malaysia and globally. Therefore, we had chosen to conduct this research amongst undergraduate students in Malaysia because we hoped to increase the knowledge and improved the attitude towards abnormally excessive sweating in the hands (palmar hyperhidrosis) among undergraduate students in Malaysia, as they are the future of this nation and may bring about impact in the future.

MATERIALS AND METHODS

Study area:
This study was conducted at colleges and universities in Malaysia. The ethical approval to perform this study was obtained by the ethical committee of SEGI University.

Study population:

The study population involved approximately 312 Malaysian undergraduate students consisting of 98 Malay, 109 Chinese and 105 Indians from both medical and non-medical fields. There was a total of 173 females and 139 males that took part in this study. The total samples in this research included 118 medical and 194 non-medical undergraduate students.

Sampling method and sample size:

A cross-sectional study was carried out by using a convenience sampling method. The convenience sampling method known as non-probability sampling method. Convenience sampling was chosen because it can easily recruit data from students who were most conveniently available. Moreover, it was a very easy and inexpensive method to collect data. The Daniel formula (1999) was used to calculate the sample size to recruit the data. [11-12]

Research instruments:

Instrument used in this research was a questionnaire, because it is easy to recruit data from a large sample size, inexpensive, can be distributed digitally or physically, and is easy to interpret. [13] A total of 30 close-ended questions were used for the questionnaire in this study. The questionnaire consisted of three sections: A, B, and C. Section A had 6 questions of the sociodemographic profile of students such as race which included Malays, Chinese, and Indians. The age range was classified into two groups which were (18-21) and (22-25) years old and the university was filled by participants and the faculty which consisted of medical and non-medical, gender and year of study. Furthermore, knowledge-based studies were conducted to better understand palmar hyperhidrosis; such as its signs and symptoms, diagnosis, and treatment. [2] Therefore, Section B consisted of 10 knowledge questions based on the palmar hyperhidrosis, involving a 5-point Likert scale. For Section C, various studies were carried out on how hyperhidrosis influenced the quality of life (QOL). The domain used withinside the questionnaire was included: functional/social, personal, emotional, and special. [14] It also involved a 5-point Likert scale whereby respondents indicate their agreement level with a statement, through: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. [15] Thus, in accordance with this, section C consisted of 20 questions that were related to attitude towards palmar hyperhidrosis.

Data entry and analysis:

The data was collected from the questionnaire given to undergraduate students at colleges and universities in Malaysia. After getting the participant's consent, the questionnaire was distributed to students through a google form. Moreover, this questionnaire was given to students who were available in colleges and universities in Malaysia. Statistical Package for the Social Sciences (SPSS) version 22 was an analytical software that was used in this study. SPSS was used to carry out parametric tests and non-parametric tests to analyze data. The type of test carried out in the SPSS depends on the sample distribution. The parametric test was used when the sample is normally distributed. Examples of parametric tests included one-way analysis of variance (ANOVA), t-test. Moreover, the non-parametric test was carried out when the data was not normally distributed such as Mann-Whitney test, Wilcoxon test, Friedman test, Chi-square test. [16] Pearson's Chi-square test was used to assess any relationship between categorical variables. A significance value (p-value) of less than 0.05 was deemed statistically significant. [17]

RESULTS

Sociodemographic characteristics of the participants:

As shown in table 1, the questionnaire was answered by 173 female respondents and 139 male respondents; a total of 312 respondents were involved in this research. Out of 312 participants, 115 (36.9%) belonged to the age group of 18 - 21 years, and 197 (63.1%) belonged to the age group of 22 - 25 years. Among the respondents, 98 (31.4%) were Malay, 105 (33.5%) were Indian and 109 (35.1%) were Chinese. Moreover, 118 (37.8%) respondents were from medical faculties and 194 (62.2%) respondents were from non-medical faculties.

Table 1: Sociodemographics Profile

Characteristics	**Classification**	**n (%)**
Gender	Female	173 (55.4%)
	Male	139 (44.6%)
Age	18 - 21	115 (36.9%)
	22 - 25	197 (63.1%)
Races	Malay	98 (31.4%)
	Indian	105 (33.5%)
	Chinese	109 (35.1%)
Faculty	Medical	118 (37.8%)
	Non-medical	194 (62.2%)

Knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) among medical and non-medical undergraduate students

Table 2 displays the frequency and the percentage of undergraduate medical and non-medical students concerning the questions regarding the knowledge towards excessive sweating on the hands (palmar hyperhidrosis). A total of 10 questions were used to determine the knowledge of the participants. Moreover, the frequency and the percentage of the three different races about palmar hyperhidrosis were also shown in table 2 along with the total percentage for each question.

Table 2: Questions related to the knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) among medical and non-medical undergraduate students

Q	Question	Options	Medical			N = 118 (37.8%)	Non-medical			N =194 (62.2%)
			Malay	Indian	Chinese		Malay	Indian	Chinese	
1	Are you familiar with the term palmar hyperhidrosis?	Strongly disagree	3 (2.5%)	2 (1.7%)	1 (0.8%)	6 (5.1%)	4 (2.1%)	4 (2.1%)	20 (10.3%)	28 (14.4%)
		Disagree	3 (2.5%)	5 (4.2%)	5 (4.2%)	13 (11.0%)	10 (5.2%)	3 (1.5%)	11 (5.7%)	24 (12.4%)
		Neutral	7 (5.9%)	8 (6.8%)	5 (4.2%)	20 (16.9%)	13 (6.7%)	5 (2.6%)	20 (10.3%)	38 (19.6%)
		Agree	9 (7.6%)	7 (5.9%)	8 (6.8%)	24 (20.3%)	28 (14.4%)	10 (5.2%)	22 (11.3%)	60 (30.9%)
		Strongly agree	14 (11.9%)	36 (30.5%)	5 (4.2%)	55 (46.7%)	7 (3.6%)	25 (12.9%)	12 (6.2%)	44 (22.7%)
2	If you have heard about palmar hyperhidrosis, what was your source of information? (Participants can choose more than 1 answer)	Family & friends	17 (14.4%)	41 (34.7%)	9 (7.6%)	67 (56.7%)	27 (13.9%)	35 (18.0%)	34 (17.5%)	96 (49.5%)
		Internet Sources	19 (16.1%)	41 (34.7%)	15 (12.7%)	75 (63.6%)	46 (23.7%)	38 (19.6%)	56 (28.9%)	140 (72.2%)
		Educational flyers or videos	6 (5.1%)	21 (17.8%)	5 (4.2%)	32 (27.1%)	14 (7.2%)	14 (7.2%)	12 (6.2%)	40 (20.6%)
		Healthcare professionals	14 (11.9%)	28 (23.7%)	5 (4.2%)	47 (39.8%)	12 (6.2%)	15 (7.7%)	15 (7.7%)	42 (21.6%)
		Never Heard of it	0 (0.0%)	0 (0.0%)	1 (0.8%)	1 (0.8%)	0 (0.0%)	1 (0.5%)	9 (4.6%)	10 (5.1%)
3	Do you suffer from palmar hyperhidrosis?	Strongly disagree	17 (14.4%)	23 (19.5%)	11 (9.3%)	51 (43.2%)	26 (13.4%)	25 (12.9%)	31 (16.0%)	82 (42.3%)
		Disagree	5 (4.2%)	7 (5.9%)	4 (3.4%)	16 (13.6%)	14 (7.2%)	4 (2.1%)	20 (10.3%)	38 (19.6%)

		Neutral	5 (4.2%)	9 (7.6%)	5 (4.2%)	19 (16.1%)	10 (5.2%)	10 (5.2%)	11 (5.6%)	31 (16.0%)
		Agree	4 (3.4%)	6 (5.1%)	2 (1.7%)	12 (10.2%)	10 (5.2%)	2 (1.0%)	18 (9.3%)	30 (15.5%)
		Strongly agree	5 (4.2%)	13 (11.0%)	2 (1.7%)	20 (16.9%)	2 (1.0%)	6 (3.1%)	5 (2.6%)	13 (6.7%)
4	Do you know anyone who suffers from this condition?	Strongly disagree	5 (4.2%)	6 (5.1%)	7 (5.9%)	18 (15.3%)	8 (4.1%)	6 (3.1%)	18 (9.3%)	32 (16.5%)
		Disagree	2 (1.7%)	2 (1.7%)	3 (2.5%)	7 (5.9%)	5 (2.6%)	0 (0.0%)	9 (4.6%)	14 (7.2%)
		Neutral	4 (3.4%)	2 (1.7%)	2 (1.7%)	8 (6.8%)	8 (4.1%)	3 (1.5%)	17 (8.8%)	28 (14.4%)
		Agree	7 (5.9%)	11 (9.3%)	8 (6.8%)	26 (22.0%)	21 (10.8%)	7 (3.6%)	24 (12.4%)	52 (26.8%)
		Strongly agree	18 (15.3%)	37 (31.3%)	4 (3.4%)	59 (50.0%)	20 (10.3%)	31 (16.0%)	17 (8.8%)	68 (35.1%)
5	Which symptoms do you know are associated with palmar hyperhidrosis? (Participants can choose more than 1 answer)	Frequent Sweating	30 (25.4%)	49 (41.5%)	19 (16.1%)	98 (83.1%)	46 (23.7%)	40 (20.6%)	62 (32.0%)	148 (76.3%)
		Wet hands	30 (25.4%)	52 (44.1%)	20 (16.9%)	102 (86.4%)	57 (29.4%)	39 (20.1%)	73 (37.6%)	169 (87.1%)
		Increases body temperature	10 (8.5%)	12 (10.2%)	5 (4.2%)	27 (22.9%)	7 (3.6%)	10 (5.2%)	16 (8.2%)	33 (17.0%)
		Fatigue	6 (5.1%)	1 (0.8%)	1 (0.8%)	8 (6.7%)	9 (4.6%)	4 (2.1%)	4 (2.1%)	17 (8.8%)
		Chest pain	2 (1.7%)	1 (0.8%)	1 (0.8%)	4 (3.3%)	3 (1.5%)	3 (1.5%)	3 (1.5%)	9 (4.6%)
		Nausea	4 (3.4%)	0 (0.0%)	1 (0.8%)	5 (4.2%)	5 (2.6%)	1 (0.5%)	3 (1.5%)	9 (4.6%)
		Night Sweats	6 (5.1%)	21 (17.8%)	4 (3.4%)	31 (26.3%)	16 (8.2%)	31 (15.9%)	27 (13.9%)	74 (38%)
		Discomfort	20 (16.9%)	34 (28.8%)	5 (4.2%)	59 (50%)	29 (14.9%)	31 (15.9%)	23 (11.9%)	83 (42.7%)

		Shortness of breath	3 (2.5%)	3 (2.5%)	3 (2.5%)	9 (7.6%)	6 (3.1%)	0 (0.0%)	6 (3.1%)	12 (6.2%)
		Pain	1 (0.8%)	2 (1.7%)	1 (0.8%)	4 (3.4%)	1 (0.5%)	1 (0.5%)	6 (3.1%)	8 (4.1%)
		Swelling	6 (5.1%)	2 (1.7%)	2 (1.7%)	10 (8.5%)	1 (0.5%)	5 (2.6%)	6 (3.1%)	12 (6.2%)
6	The symptoms of palmar hyperhidrosis in women are similar to men.	Strongly disagree	0 (0.0%)	2 (1.7%)	1 (0.8%)	3 (2.5%)	3 (1.5%)	0 (0.0%)	1 (0.5%)	4 (2.1%)
		Disagree	2 (1.7%)	3 (2.5%)	3 (2.5%)	8 (6.8%)	9 (4.6%)	1 (0.5%)	4 (2.1%)	14 (7.2%)
		Neutral	16 (13.6%)	15 (12.7%)	11 (9.3%)	42 (35.6%)	28 (14.4%)	14 (7.2%)	45 (23.2%)	87 (44.8%)
		Agree	9 (7.6%)	14 (11.9%)	8 (6.8%)	31 (26.3%)	15 (7.7%)	6 (3.1%)	26 (13.4%)	47 (24.2%)
		Strongly agree	9 (7.6%)	24 (20.3%)	1 (0.8%)	34 (28.8%)	7 (3.6%)	26 (13.4%)	9 (4.6%)	42 (21.6%)
7	Palmar hyperhidrosis is inherited.	Strongly disagree	1 (0.8%)	5 (4.2%)	1 (0.8%)	7 (5.9%)	2 (1.0%)	0 (0.0%)	3 (1.5%)	5 (2.6%)
		Disagree	5 (4.2%)	3 (2.5%)	5 (4.2%)	13 (11.0%)	12 (6.2%)	0 (0.0%)	8 (4.1%)	20 (10.3%)
		Neutral	11 (9.3%)	12 (10.2%)	7 (5.9%)	30 (25.4%)	19 (9.8%)	16 (8.2%)	43 (22.2%)	78 (40.2%)
		Agree	12 (10.2%)	11 (9.3%)	8 (6.8%)	31 (26.3%)	22 (11.3%)	5 (2.6%)	26 (13.4%)	53 (27.3%)
		Strongly agree	7 (5.9%)	27 (22.9%)	3 (2.5%)	37 (31.4%)	7 (3.6%)	26 (13.4%)	5 (2.6%)	38 (19.6%)
8	Which factor does not contribute to the diagnosis?	Age	9 (7.6%)	9 (7.6%)	7 (5.9%)	25 (21.2%)	23 (11.9%)	6 (3.1%)	31 (16.0%)	60 (30.9%)
		Family History	5 (4.2%)	4 (3.4%)	4 (3.4%)	13 (11.0%)	12 (6.2%)	10 (5.2%)	15 (7.7%)	37 (19.1%)
		Frequency of Sweating	8 (6.8%)	9 (7.6%)	3 (2.5%)	20 (16.9%)	5 (2.6%)	4 (2.1%)	8 (4.1%)	17 (8.8%)
		Gender	14 (11.9%)	36 (30.5%)	10 (8.5%)	60 (50.9%)	22 (11.3%)	27 (13.9)	31 (16.0%)	80 (41.2%)
9	Palmar hyperhidrosis	Strongly disagree	0 (0.0%)	1 (0.8%)	0 (0.0%)	1 (0.8%)	1 (0.5%)	0 (0.0%)	1 (0.5%)	2 (1.0%)

	can be treated.	Disagree	2 (1.7%)	3 (2.5%)	1 (0.8%)	6 (5.1%)	3 (1.5%)	0 (0.0%)	1 (0.5%)	4 (2.1%)
		Neutral	12 (10.2%)	11 (9.3%)	4 (3.4%)	27 (22.9%)	18 (9.3%)	6 (3.1%)	23 (11.8%)	47 (24.2%)
		Agree	9 (7.6%)	12 (10.2%)	14 (11.9%)	35 (29.7%)	31 (16.0%)	7 (3.6%)	44 (22.7%)	82 (42.3%)
		Strongly agree	13 (11.0%)	31 (26.3%)	5 (4.2%)	49 (41.5%)	9 (4.6%)	34 (17.5%)	16 (8.2%)	59 (30.4%)
10	Which type of treatment method fully cures palmar hyperhidrosis? (Participants can choose more than 1 answer)	Prescription antiperspirant	4 (3.4%)	7 (5.9%)	5 (4.2%)	16 (13.6%)	20 (10.3%)	6 (3.1%)	18 (9.3%)	44 (22.7%)
		Botulinum toxin injections (Botox)	9 (7.6%)	6 (5.1%)	1 (0.8%)	16 (13.6%)	3 (1.5%)	4 (2.1%)	5 (2.6%)	12 (6.2%)
		Surgical procedures	11 (9.3%)	32 (27.1%)	7 (5.9%)	50 (42.3%)	18 (9.3%)	30 (15.5%)	35 (18.0%)	83 (42.8%)
		Non-surgical Microwave Energy Destruction of sweat gland	6 (5.1%)	9 (7.6%)	9 (7.6%)	24 (20.3%)	9 (4.6%)	2 (1.0%)	13 (6.7%)	24 (12.4%)
		Oral medication	6 (5.1%)	4 (3.4%)	2 (1.7%)	12 (10.2%)	12 (6.2%)	5 (2.6%)	12 (6.2%)	29 (14.9%)
		Surgical procedures & non-surgical microwave energy destruction of sweat glands	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	1 (0.5%)
		Prescription antiperspirant, Botox, surgical procedures & oral medication	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	1 (0.5%)

Table 3 shows the frequency and percentage of undergraduate medical and non-medical students regarding the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis). A total of 20 questions were used to determine the attitude of the participants. In addition, the frequency and percentage of the 3 different races about palmar hyperhidrosis were also shown in table 3 along with the total percentage for each question.

Table 3: Questions related to the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) among medical and non-medical undergraduate students

Q	Question	Options	Medical			N =118 (37.8%)	Non-medical			N =194 (62.2%)
			Malay	Indian	Chinese		Malay	Indian	Chinese	
1	Feeling embarrassed when shaking hands with others.	Strongly disagree	3 (2.5%)	0 (0.0%)	1 (0.8%)	4 (3.3%)	2 (1.0%)	3 (1.5%)	2 (1.0%)	7 (3.6%)
		Disagree	0 (0.0%)	2 (1.7%)	3 (2.5%)	5 (4.2%)	4 (2.1%)	0 (0.0%)	5 (2.6%)	9 (4.6%)
		Neutral	8 (6.8%)	2 (1.7%)	2 (1.7%)	12 (10.2%)	8 (4.1%)	7 (3.6%)	16 (8.2%)	31 (16.0%)
		Agree	10 (8.5%)	16 (13.6%)	8 (6.8%)	34 (28.9%)	23 (11.9%)	8 (4.1%)	25 (12.9%)	56 (28.9%)
		Strongly agree	15 (12.7%)	38 (32.2%)	10 (8.5%)	63 (53.4%)	25 (12.9%)	29 (14.9%)	37 (19.1%)	91 (46.9%)
2	Having trouble holding/grasping objects (e.g., pencil, phone, glass, etc.)	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (1.5%)	0 (0.0%)	6 (3.1%)	9 (4.6%)
		Disagree	2 (1.7%)	1 (0.8%)	3 (2.5%)	6 (5.1%)	3 (1.55%)	2 (1.0%)	8 (4.1%)	13 (6.7%)
		Neutral	6 (5.1%)	4 (3.4%)	4 (3.4%)	14 (11.9%)	9 (4.6%)	4 (2.1%)	24 (12.4%)	37 (19.1%)
		Agree	12 (10.2%)	21 (17.8%)	10 (8.5%)	43 (36.5%)	27 (14.0%)	13 (6.7%)	25 (12.9%)	65 (33.5%)
		Strongly agree	16 (13.6%)	32 (27.1%)	7 (5.9%)	55 (46.7%)	20 (10.3%)	28 (14.4%)	22 (11.3%)	70 (36.1%)

3	Having trouble writing (e.g. during examination).	Strongly disagree	0 (0.0%)	0 (0.0%)	1 (0.8%)	1 (0.8%)	1 (0.5%)	1 (0.5%)	5 (2.6%)	7 (3.6%)
		Disagree	4 (3.4%)	2 (1.7%)	5 (4.2%)	11 (9.3%)	3 (1.5%)	0 (0.0%)	7 (3.6%)	10 (5.2%)
		Neutral	6 (5.1%)	3 (2.5%)	3 (2.5%)	12 (10.2%)	10 (5.2%)	6 (3.1%)	16 (8.2%)	32 (16.5%)
		Agree	9 (7.6%)	19 (16.1%)	9 (7.6%)	37 (31.4%)	25 (12.9%)	12 (6.2%)	38 (19.6%)	75 (38.7%)
		Strongly agree	17 (14.4%)	34 (28.8%)	6 (5.1%)	57 (48.3%)	23 (11.9%)	28 (14.4%)	19 (9.8%)	70 (36.1%)
4	Abnormally excessive sweating in the hands (palmar hyperhidrosis) negatively impacts the quality of life.	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	2 (1.0%)	1 (0.5%)	5 (2.6%)
		Disagree	4 (3.4%)	4 (3.4%)	5 (4.2%)	13 (11.0%)	3 (1.5%)	3 (1.5%)	8 (4.1%)	14 (7.2%)
		Neutral	9 (7.6%)	9 (7.6%)	5 (4.2%)	23 (19.5%)	13 (6.7%)	6 (3.1%)	19 (9.8%)	38 (19.6%)
		Agree	14 (11.9%)	15 (12.7%)	10 (8.5%)	39 (33.1%)	26 (13.4%)	10 (5.2%)	31 (16.0%)	67 (34.5%)
		Strongly agree	9 (7.6%)	30 (25.4%)	4 (3.4%)	43 (36.4%)	18 (9.3%)	26 (13.4%)	26 (13.4%)	70 (36.1%)
5		Strongly disagree	4 (3.4%)	1 (0.8%)	0 (0.0%)	5 (4.2%)	2 (1.0%)	3 (1.5%)	5 (2.6%)	10 (5.2%)

	Suffering from social embarrassment.	Disagree	5 (4.2%)	5 (4.2%)	2 (1.7%)	12 (10.2%)	7 (3.6%)	3 (1.5%)	6 (3.1%)	16 (8.2%)
		Neutral	12 (10.2%)	6 (5.1%)	5 (4.2%)	23 (19.5%)	17 (8.8%)	5 (2.6%)	20 (10.3%)	42 (21.6%)
		Agree	6 (5.1%)	13 (11.0%)	13 (11.0%)	32 (27.1%)	24 (12.4%)	10 (5.2%)	30 (15.5%)	64 (33.0%)
		Strongly agree	9 (7.6%)	33 (28.0%)	4 (3.4%)	46 (39.0%)	12 (6.2%)	26 (13.4%)	24 (12.4%)	62 (32.0%)
6	Feeling uncomfortable in holding hands in a relationship.	Strongly disagree	3 (2.5%)	1 (0.8%)	0 (0.0%)	4 (3.4%)	2 (1.0%)	3 (1.5%)	3 (1.5%)	8 (4.1%)
		Disagree	2 (1.7%)	1 (0.8%)	2 (1.7%)	5 (4.2%)	4 (2.1%)	1 (0.5%)	7 (3.6%)	12 (6.2%)
		Neutral	4 (3.4%)	6 (5.1%)	2 (1.7%)	12 (10.2%)	6 (3.1%)	6 (3.1%)	16 (8.2%)	28 (14.4%)
		Agree	11 (9.3%)	19 (16.1%)	11 (9.3%)	41 (34.7%)	33 (17.0%)	10 (5.2%)	32 (16.5%)	75 (38.7%)
		Strongly agree	16 (13.6%)	31 (26.3%)	9 (7.6%)	56 (47.5%)	17 (8.8%)	27 (13.9%)	27 (13.9%)	71 (36.6%)
7	Feeling distressed during intimate touching.	Strongly disagree	2 (1.7%)	0 (0.0%)	0 (0.0%)	2 (1.7%)	2 (1.0%)	3 (1.5%)	2 (1.0%)	7 (3.6%)
		Disagree	2 (1.7%)	0 (0.0%)	2 (1.7%)	4 (3.4%)	5 (2.6%)	3 (1.5%)	5 (2.6%)	13 (6.7%)
		Neutral	11 (9.3%)	7 (6.0%)	3 (2.5%)	21 (17.8%)	10 (5.2%)	4 (2.1%)	19 (9.8%)	33 (17.0%)
		Agree	11 (9.3%)	21 (17.8%)	14 (11.9%)	46 (39.0%)	31 (16.0%)	9 (4.6%)	36 (18.6%)	76 (39.2%)
		Strongly agree	10 (8.5%)	30 (25.4%)	5 (4.2%)	45 (38.1%)	14 (7.2%)	28 (14.4%)	23 (11.9%)	65 (33.5%)
8	Feeling uncomfortable being	Strongly disagree	6 (5.1%)	4 (3.4%)	0 (0.0%)	10 (8.5%)	2 (1.0%)	5 (2.6%)	2 (1.0%)	9 (4.6%)

	physically close to others.	Disagree	5 (4.2%)	2 (1.7%)	2 (1.7%)	9 (7.6%)	4 (2.1%)	2 (1.0%)	5 (2.6%)	11 (5.7%)
		Neutral	4 (3.4%)	12 (10.2%)	6 (5.1%)	22 (18.6%)	11 (5.7%)	4 (2.1%)	25 (12.9%)	40 (20.6%)
		Agree	10 (8.5%)	15 (12.7%)	10 (8.5%)	35 (29.7%)	29 (15.0%)	5 (2.6%)	27 (13.9%)	61 (31.4%)
		Strongly agree	11 (9.3%)	25 (21.2%)	6 (5.1%)	42 (35.6%)	16 (8.2%)	31 (16.0%)	26 (13.4%)	73 (37.5%)
9	Constantly needing to wipe hands.	Strongly disagree	1 (0.8%)	0 (0.0%)	0 (0.0%)	1 (0.8%)	1 (0.5%)	1 (0.5%)	1 (0.5%)	3 (1.5%)
		Disagree	1 (0.8%)	0 (0.0%)	1 (0.8%)	2 (1.7%)	2 (1.0%)	1 (0.5%)	7 (3.6%)	10 (5.2%)
		Neutral	5 (4.2%)	5 (4.2%)	2 (1.7%)	12 (10.2%)	6 (3.1%)	5 (2.6%)	9 (4.6%)	20 (10.3%)
		Agree	10 (8.5%)	23 (19.5%)	12 (10.2%)	45 (38.1%)	27 (13.9%)	10 (5.2%)	41 (21.1%)	78 (40.2%)
		Strongly agree	19 (16.1%)	30 (25.4%)	9 (7.63%)	58 (49.2%)	26 (13.4%)	30 (15.5%)	27 (13.9%)	83 (42.8%)
10	Constant need to wash hands, to use tissue paper, to air-dry hands, etc.	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	1 (0.5%)	0 (0.0%)	3 (1.5%)
		Disagree	2 (1.7%)	2 (1.7%)	2 (1.7%)	6 (5.1%)	1 (0.5%)	2 (1.0%)	9 (4.6%)	12 (6.3%)
		Neutral	9 (7.6%)	9 (7.6%)	4 (3.4%)	22 (18.6%)	7 (3.6%)	4 (2.1%)	17 (8.8%)	28 (14.4%)

		Agree	7 (6.0%)	17 (14.4%)	11 (9.3%)	35 (29.7%)	26 (13.4%)	13 (6.7%)	28 (14.4%)	67 (34.5%)
		Strongly agree	18 (15.3%)	30 (25.4%)	7 (6.0%)	55 (46.6%)	26 (13.4%)	27 (13.9%)	31 (16.0%)	84 (43.3%)
11	Afraid of being judged/rejected by others due to the condition.	Strongly disagree	4 (3.4%)	5 (4.2%)	1 (0.8%)	10 (8.5%)	4 (2.1%)	3 (1.5%)	4 (2.1%)	11 (5.7%)
		Disagree	10 (8.5%)	1 (0.8%)	2 (1.7%)	13 (11.0%)	4 (2.1%)	2 (1.0%)	5 (2.6%)	11 (5.7%)
		Neutral	4 (3.4%)	6 (5.1%)	5 (4.2%)	15 (12.7%)	9 (4.6%)	8 (4.1%)	25 (12.9%)	42 (21.6%)
		Agree	8 (6.8%)	17 (14.4%)	8 (6.8%)	33 (28.0%)	21 (10.8%)	9 (4.6%)	29 (15.0%)	59 (30.4%)
		Strongly agree	10 (8.5%)	29 (24.6%)	8 (6.8%)	47 (39.8%)	24 (12.4%)	25 (12.9%)	22 (11.3%)	71 (36.6%)
12	Having the need to always justify yourself for your condition.	Strongly disagree	2 (1.7%)	1 (0.8%)	1 (0.8%)	4 (3.4%)	3 (1.5%)	4 (2.1%)	3 (1.5%)	10 (5.2%)
		Disagree	4 (3.4%)	4 (3.4%)	1 (0.8%)	9 (7.6%)	4 (2.1%)	1 (0.5%)	6 (3.1%)	11 (5.7%)
		Neutral	10 (8.5%)	8 (6.8%)	6 (5.1%)	24 (20.4%)	11 (5.7%)	6 (3.1%)	21 (10.8%)	38 (19.6%)
		Agree	10 (8.5%)	19 (16.1%)	12 (10.1%)	41 (34.7%)	29 (15.0%)	8 (4.1%)	32 (16.5%)	69 (35.6%)
		Strongly agree	10 (8.5%)	26 (22.0%)	4 (3.4%)	40 (33.9%)	15 (7.7%)	28 (14.4%)	23 (11.9%)	66 (34.0%)
13	Having low self-esteem and	Strongly disagree	3 (2.5%)	5 (4.2%)	1 (0.8%)	9 (7.6%)	3 (1.5%)	3 (1.5%)	3 (1.5%)	9 (4.6%)

	self-confidence due to palmar hyperhidrosis (abnormally excessive sweating in the hands).	Disagree	8 (6.8%)	4 (3.4%)	4 (3.4%)	16 (13.6%)	7 (3.6%)	1 (0.5%)	10 (5.2%)	18 (9.3%)
		Neutral	9 (7.6%)	4 (3.4%)	4 (3.4%)	17 (14.4%)	11 (5.7%)	8 (4.1%)	30 (15.5%)	49 (25.3%)
		Agree	5 (4.2%)	20 (17.0%)	9 (7.6%)	34 (28.8%)	24 (12.4%)	10 (5.2%)	25 (12.9%)	59 (30.4%)
		Strongly agree	11 (9.3%)	25 (21.2%)	6 (5.1%)	42 (35.6%)	17 (8.8%)	25 (12.9%)	17 (8.8%)	59 (30.4%)
14	Feeling worried that the sweating is noticeable by others.	Strongly disagree	3 (2.5%)	3 (2.5%)	0 (0.0%)	6 (5.1%)	4 (2.1%)	3 (1.5%)	3 (1.5%)	10 (5.2%)
		Disagree	4 (3.4%)	3 (2.5%)	5 (4.2%)	12 (10.2%)	3 (1.5%)	2 (1.0%)	6 (3.1%)	11 (5.7%)
		Neutral	8 (6.8%)	5 (4.2%)	5 (4.2%)	18 (15.3%)	14 (7.2%)	6 (3.1%)	26 (13.4%)	46 (23.7%)
		Agree	11 (9.3%)	22 (18.6%)	7 (6.0%)	40 (33.9%)	21 (10.8%)	10 (5.2%)	25 (12.9%)	56 (28.9%)
		Strongly agree	10 (8.5%)	25 (21.2%)	7 (6.0%)	42 (35.6%)	20 (10.3%)	26 (13.4%)	25 (12.9%)	71 (36.6%)
15	Palmar hyperhidrosis may lead to anxiety.	Strongly disagree	1 (0.8%)	0 (0.0%)	1 (0.8%)	2 (1.7%)	2 (1.0%)	2 (1.0%)	3 (1.5%)	7 (3.6%)
		Disagree	1 (0.8%)	1 (0.8%)	4 (3.4%)	6 (5.1%)	4 (2.1%)	3 (1.5%)	6 (3.1%)	13 (6.7%)
		Neutral	6 (5.1%)	10 (8.5%)	2 (1.7%)	18 (15.3%)	10 (5.2%)	3 (1.5%)	18 (9.3%)	31 (16.0%)
		Agree	13 (11.0%)	19 (16.1%)	10 (8.5%)	41 (34.7%)	29 (14.9%)	11 (5.7%)	37 (19.1%)	77 (39.7%)
		Strongly agree	15 (12.7%)	29 (24.6%)	7 (6.0%)	51 (43.2%)	17 (8.8%)	28 (14.4%)	21 (10.8%)	66 (34.0%)
16	Women tend to seek treatments	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	2 (1.0%)

	more often than men.	Disagree	5 (4.2%)	0 (0.0%)	0 (0.0%)	5 (4.2%)	3 (1.5%)	1 (0.5%)	5 (2.6%)	9 (4.6%)
		Neutral	7 (6.0%)	8 (6.8%)	8 (6.8%)	23 (19.5%)	23 (11.9%)	7 (3.6%)	31 (16.0%)	61 (31.4%)
		Agree	6 (5.1%)	18 (15.3%)	11 (9.3%)	35 (29.7%)	22 (11.3%)	7 (3.6%)	24 (12.4%)	53 (27.3%)
		Strongly agree	18 (15.3%)	32 (27.1%)	5 (4.24%)	55 (46.6%)	14 (7.2%)	32 (16.5%)	23 (11.9%)	69 (35.6%)
17	Palmar hyperhidrosis (abnormally excessive sweating in the hands) is not taken seriously in society.	Strongly disagree	1 (0.8%)	0 (0.0%)	0 (0.0%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	3 (1.5%)	3 (1.5%)
		Disagree	1 (0.8%)	0 (0.0%)	2 (1.7%)	3 (2.5%)	4 (2.1%)	1 (0.5%)	4 (2.1%)	9 (4.6%)
		Neutral	7 (6.0%)	6 (5.1%)	4 (3.4%)	17 (14.4%)	13 (6.7%)	8 (4.1%)	19 (9.8%)	40 (20.6%)
		Agree	9 (7.6%)	16 (13.6%)	8 (6.8%)	33 (28.0%)	30 (15.5%)	7 (3.6%)	29 (14.9%)	66 (34.0%)
		Strongly agree	18 (15.3%)	36 (30.5%)	10 (8.5%)	64 (54.2%)	15 (7.7%)	31 (16.0%)	30 (15.5%)	76 (39.2%)
18	Palmar hyperhidrosis will disappear over time.	Strongly disagree	2 (1.7%)	7 (6.0%)	2 (1.7%)	11 (9.3%)	5 (2.6%)	1 (0.5%)	7 (3.6%)	13 (6.7%)
		Disagree	3 (2.5%)	6 (5.1%)	7 (6.0%)	16 (13.6%)	12 (6.2%)	4 (2.1%)	21 (10.8%)	37 (19.1%)
		Neutral	18 (15.3%)	10 (8.5%)	9 (7.6%)	37 (31.4%)	20 (10.3%)	7 (3.6%)	36 (18.6%)	63 (32.5%)
		Agree	6 (5.1%)	14 (11.9%)	4 (3.4%)	24 (20.3%)	17 (8.8%)	7 (3.6%)	12 (6.2%)	36 (18.6%)
		Strongly agree	7 (6.0%)	21 (17.8%)	2 (1.7%)	30 (25.4%)	8 (4.1%)	28 (14.4%)	9 (4.6%)	45 (23.2%)
19	Will hot places increase the frequency of sweating in the hands (palmar hyperhidrosis)?	Strongly disagree	1 (0.8%)	1 (0.8%)	1 (0.8%)	3 (2.5%)	1 (0.5%)	0 (0.0%)	1 (0.5%)	2 (1.0%)
		Disagree	3 (2.5%)	1 (0.8%)	3 (2.5%)	7 (5.9%)	5 (2.6%)	0 (0.0%)	8 (4.1%)	13 (6.7%)
		Neutral	5 (4.2%)	8 (6.8%)	2 (1.7%)	15 (12.7%)	9 (4.6%)	11 (5.7%)	23 (11.9%)	43 (22.2%)

		Agree	8 (6.8%)	14 (11.9%)	12 (10.2%)	34 (28.8%)	25 (12.9%)	7 (3.6%)	32 (16.5%)	64 (33.0%)
		Strongly agree	19 (16.1%)	34 (28.8%)	6 (5.1%)	59 (50.0%)	22 (11.3%)	29 (14.9%)	21 (10.8%)	72 (37.1%)
20	Palmar hyperhidrosis affects career choices/paths.	Strongly disagree	9 (7.6%)	4 (3.4%)	2 (1.7%)	15 (12.7%)	4 (2.1%)	3 (1.5%)	6 (3.1%)	13 (6.7%)
		Disagree	0 (0.0%)	4 (3.4%)	6 (5.1%)	10 (8.5%)	5 (2.6%)	3 (1.5%)	14 (7.2%)	22 (11.3%)
		Neutral	10 (8.5%)	6 (5.1%)	8 (6.8%)	24 (20.3%)	18 (9.3%)	10 (5.2%)	31 (16.0%)	59 (30.4%)
		Agree	5 (4.2%)	15 (12.7%)	5 (4.2%)	25 (21.2%)	28 (14.4%)	6 (3.1%)	24 (12.4%)	58 (29.9%)
		Strongly agree	12 (10.2%)	29 (24.6%)	3 (2.5%)	44 (37.3%)	7 (3.6%)	25 (12.8%)	10 (5.2%)	42 (21.6%)

Comparison of the knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students

Table 4 shows that questions 1, 2, 3, 5, 7, 8 and 10 were significant whereby the P-value was less than <0.05 whilst questions 4, 6 and 9 showed no significance with a P-value of more than >0.05.

Table 4: Comparison of the knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students

Q	Options	Medical	Non-Medical	Significance (Chi-Square)	
				Value	P-value
1	Strongly disagree	6 (5.1%)	28 (14.4%)	22.569	.000
	Disagree	13 (11.0%)	24 (12.4%)		
	Neutral	20 (16.9%)	38 (19.6%)		
	Agree	24 (20.3%)	60 (30.9%)		
	Strongly agree	55 (46.7%)	44 (22.7%)		
2	Family & friends	67 (56.7%)	96 (49.5%)	343.178	.000
	Internet Sources	75 (63.6%)	140 (72.2%)		
	Educational flyers or videos	32 (27.1%)	40 (20.6%)		

	Healthcare professionals	47 (39.8%)	42 (21.6%)		
	Never Heard of it	1 (0.8%)	10 (5.1%)		
3	Strongly disagree	51 (43.2%)	82 (42.3%)		
	Disagree	16 (13.6%)	38 (19.6%)	10.370	.035
	Neutral	19 (16.1%)	31 (16.0%)		
	Agree	12 (10.2%)	30 (15.5%)		
	Strongly agree	20 (16.9%)	13 (6.7%)		
4	Strongly disagree	18 (15.3%)	32 (16.5%)		
	Disagree	7 (5.9%)	14 (7.2%)	8.671	.070
	Neutral	8 (6.8%)	28 (14.4%)		
	Agree	26 (22.0%)	52 (26.8%)		
	Strongly agree	59 (50.0%)	68 (35.1%)		
5	Frequent Sweating	98 (83.1%)	148 (76.3%)		
	Wet hands	102(86.4%)	169 (87.1%)		
	Increases body temperature	27 (22.9%)	33 (17.0%)		
	Fatigue	8 (6.7%)	17 (8.8%)	395.635	.000
	Chest pain	4 (3.3%)	9 (4.6%)		
	Nausea	5 (4.2%)	9 (4.6%)		
	Night Sweats	31 (26.3%)	74 (38%)		
	Discomfort	59 (50%)	83 (42.7%)		
	Shortness of breath	9 (7.6%)	12 (6.2%)		
	Pain	4 (3.4%)	8 (4.1%)		
	Swelling	10 (8.5%)	12 (6.2%)		
6	Strongly disagree	3 (2.5%)	4 (2.1%)		
	Disagree	8 (6.8%)	14 (7.2%)		

	Neutral	42 (35.6%)	87 (44.8%)	3.283	.512
	Agree	31 (26.3%)	47 (24.2%)		
	Strongly agree	34 (28.8%)	42 (21.6%)		
7	Strongly disagree	7 (5.9%)	5 (2.6%)	11.071	.026
	Disagree	13 (11.0%)	20 (10.3%)		
	Neutral	30 (25.4%)	78 (40.2%)		
	Agree	31 (26.3%)	53 (27.3%)		
	Strongly agree	37 (31.4%)	38 (19.6%)		
8	Age	25 (21.2%)	60 (30.9%)	324.263	.000
	Family History	13 (11.0%)	37 (19.1%)		
	Frequency of Sweating	20 (16.9%)	17 (8.8%)		
	Gender	60 (50.9%)	80 (41.2%)		
9	Strongly disagree	1 (0.8%)	2 (1.0%)	7.901	.095
	Disagree	6 (5.1%)	4 (2.1%)		
	Neutral	27 (22.9%)	47 (24.2%)		
	Agree	35 (29.7%)	82 (42.3%)		
	Strongly agree	49 (41.5%)	59 (30.4%)		
10	Prescription antiperspirant	16 (13.6%)	44 (22.7%)	325.725	.000
	Botulinum toxin injections (Botox)	16 (13.6%)	12 (6.2%)		
	Surgical procedures	50 (42.3%)	83 (42.8%)		
	Non-surgical Microwave Energy Destruction of sweat gland	24 (20.3%	24 (12.4%)		
	Oral medication	12 (10.2%)	29 (14.9%)		
	Surgical procedures & non-surgical microwave energy destruction of sweat glands	0 (0.0%)	1 (0.5%)		

	Prescription antiperspirant, Botox, surgical procedures & oral medication	0 (0.0%)	1 (0.5%)		

Comparison of the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students

In table 5, questions 1,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 and 19 showed that the results were statistically not significant whereby the P-value was more than >0.05, whilst questions 2,3 and 20 showed statistically significant results whereby the P-value was less than <0.05.

Table 5: Comparison of the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students

Q	Options	Medical	Non-Medical	Significance (Chi-Square)	
				Value	P-value
1	Strongly disagree	4 (3.4%)	7 (3.6%)	2.458	.652
	Disagree	5 (4.2%)	9 (4.6%)		
	Neutral	12 (10.2%)	31 (16.0%)		
	Agree	34 (28.8%)	56 (28.9%)		
	Strongly agree	63 (53.4%)	91 (46.9%)		
2	Strongly disagree	0 (0%)	9 (4.6%)	10.333	.035
	Disagree	6 (5.1%)	13 (6.7%)		
	Neutral	14 (11.9%)	37 (19.1%)		
	Agree	43 (36.4%)	65 (33.5%)		
	Strongly agree	55 (46.6%)	70 (36.1%)		
3	Strongly disagree	1 (0.8%)	7 (3.6%)		
	Disagree	11 (9.3%)	10 (5.2%)		

	Neutral	12 (10.2%)	32 (16.5%)	9.939	.041
	Agree	37 (31.4%)	75 (38.7%)		
	Strongly agree	57 (48.3%)	70 (36.1%)		
4	Strongly disagree	0 (0%)	5 (2.6%)	4.316	.365
	Disagree	13 (11.0%)	14 (7.2%)		
	Neutral	23 (19.5%)	38 (19.6%)		
	Agree	39 (33.1%)	67 (34.5%)		
	Strongly agree	43 (36.4%)	70 (36.1%)		
5	Strongly disagree	5 (4.2%)	10 (5.2%)	2.462	.651
	Disagree	12 (10.2%)	16 (8.2%)		
	Neutral	23 (19.5%)	42 (21.6%)		
	Agree	32 (27.1%)	64 (33.0%)		
	Strongly agree	46 (39.0%)	62 (32.0%)		
6	Strongly disagree	4 (3.4%)	8 (4.1%)	4.082	.395
	Disagree	5 (4.2%)	12 (6.2%)		
	Neutral	12 (10.2%)	28 (14.4%)		
	Agree	41 (34.7%)	75 (38.7%)		
	Strongly agree	56 (47.5%)	71 (36.6%)		
7	Strongly disagree	2 (1.7%)	7 (3.6%)	2.881	.578
	Disagree	4 (3.4%)	13 (6.7%)		
	Neutral	21 (17.8%)	33 (17.0%)		
	Agree	46 (39.0%)	76 (39.2%)		
	Strongly agree	45 (38.1%)	65 (33.5%)		
8	Strongly disagree	10 (8.5%)	9 (4.6%)	2.513	.642
	Disagree	9 (7.6%)	11 (5.7%)		
	Neutral	22 (18.6%)	40 (20.6%)		
	Agree	35 (29.7%)	61 (31.4%)		
	Strongly agree	42 (35.6%)	73 (37.6%)		

9	Strongly disagree	1 (0.8%)	3 (1.5%)	3.303	.508
	Disagree	2 (1.7%)	10 (5.2%)		
	Neutral	12 (10.2%)	20 (10.3%)		
	Agree	45 (38.1%)	78 (40.2%)		
	Strongly agree	58 (49.2%)	83 (42.8%)		
10	Strongly disagree	0 (0%)	3 (1.5%)	3.505	.477
	Disagree	5 (5.1%)	12 (6.2%)		
	Neutral	22 (18.6%)	28 (14.1%)		
	Agree	35 (29.7%)	67 (34.5%)		
	Strongly agree	55 (46.6%)	84 (43.3%)		
11	Strongly disagree	10 (8.5%)	11 (5.7%)	7.144	.128
	Disagree	13 (11.0%)	11 (5.7%)		
	Neutral	15 (12.7%)	42 (21.6%)		
	Agree	33 (28.0%)	59 (30.4%)		
	Strongly agree	47 (39.8%)	71 (36.6%)		
12	Strongly disagree	4 (3.4%)	10 (5.2%)	.983	.912
	Disagree	9 (7.6%)	11 (5.7%)		
	Neutral	24 (20.3%)	38 (19.6%)		
	Agree	41 (34.7%)	69 (35.6%)		
	Strongly agree	40 (33.9%)	66 (34.0%)		
13	Strongly disagree	9 (7.6%)	9 (4.6%)	7.125	.129
	Disagree	16 (13.6%)	18 (9.3%)		
	Neutral	17 (14.4%)	49 (25.3%)		
	Agree	34 (28.8%)	59 (30.4%)		
	Strongly agree	42 (35.6%)	59 (30.4%)		
14	Strongly disagree	6 (5.1%)	10 (5.2%)	5.198	.268
	Disagree	12 (10.2%)	11 (5.7%)		
	Neutral	18 (15.3%)	46 (23.7%)		

	Agree	40 (33.9%)	56 (28.9%)		
	Strongly agree	42 (35.6%)	71 (36.6%)		
15	Strongly disagree	2 (1.7%)	7 (3.6%)	3.401	.493
	Disagree	6 (5.1%)	13 (6.7%)		
	Neutral	18 (15.3%)	31 (16.0%)		
	Agree	41 (34.7%)	77 (39.7%)		
	Strongly agree	51 (43.2%)	66 (34.0%)		
16	Strongly disagree	0 (0.0%)	2 (1.0%)	7.530	.110
	Disagree	5 (4.2%)	9 (4.6%)		
	Neutral	23 (19.5%)	61 (31.4%)		
	Agree	35 (29.7%)	53 (27.3%)		
	Strongly agree	55 (46.6%)	69 (35.6%)		
17	Strongly disagree	1 (0.8%)	3 (1.5%)	7.225	.124
	Disagree	3 (2.5%)	9 (4.6%)		
	Neutral	17 (14.4%)	40 (20.6%)		
	Agree	33 (28.0%)	66 (34.0%)		
	Strongly agree	64 (54.2%)	76 (39.2%)		
18	Strongly disagree	11 (9.3%)	13 (6.7%)	2.269	.686
	Disagree	16 (13.6%)	37 (19.1%)		
	Neutral	37 (31.4%)	63 (32.5%)		
	Agree	24 (20.3%)	36 (18.6%)		
	Strongly agree	30 (25.4%)	45 (23.2%)		
19	Strongly disagree	3 (2.5%)	2 (1.0%)	7.950	.093
	Disagree	7 (5.9%)	13 (6.7%)		
	Neutral	15 (12.7%)	43 (22.2%)		
	Agree	34 (28.8%)	64 (33.0%)		
	Strongly agree	59 (50.0%)	72 (37.1%)		
20	Strongly disagree	15 (12.7%)	13 (6.7%)		

	Disagree	10 (8.5%)	22 (11.3%)	14.943	.005
	Neutral	24 (20.3%)	59 (30.4%)		
	Agree	25 (21.2%)	58 (29.9%)		
	Strongly agree	44 (37.4%)	42 (21.6%)		

DISCUSSION

Table 1 displayed the sociodemographic profile of the respondents which was answered by 173 female respondents and 139 male respondents; a total of 312 respondents. Out of 312 respondents, 115 (36.9%) belonged to the age group of 18 - 21 years, and 197 (63.1%) belonged to the age group of 22 - 25 years. Among the respondents, 98 (31.4%) were Malay, 105 (33.5%) were Indian and 109 (35.1%) were Chinese. Moreover, 118 (37.8%) respondents were from medical faculties and 194 (62.2%) respondents were from non-medical faculties.

Table 2 displayed the frequency and the percentage of undergraduate medical and non-medical students concerning the questions regarding the knowledge towards excessive sweating on the hands (palmar hyperhidrosis). A total of 10 questions were used to determine the knowledge of the participants. Moreover, the frequency and the percentage of the three different races about palmar hyperhidrosis were also shown in table 2 along with the total percentage.

Table 3 displayed the frequency and percentage of undergraduate medical and non-medical students regarding the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis). A total of 20 questions were used to determine the attitude of the participants. In addition, the frequency and percentage of the 3 different races about palmar hyperhidrosis were also shown in table 3 along with the total percentage.

Table 4 displayed the comparison of the knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students. Based on all the 10 questions that were used to compare the knowledge level, it is seen that questions 1, 2, 3, 5, 7, 8 and 10 showed statistically significant results with the P-value of less than <0.05 whereas questions 4, 6 and 9 showed no statistically significance results with the P-value of more than <0.05. Due to the majority of the questions being significant, it can be concluded that medical undergraduate students do possess a higher level of knowledge regarding abnormally excessive sweating on the hands (palmar hyperhidrosis) as compared to non-medical undergraduate students in our research.

There has been no previous research done that reports on the level of knowledge regarding palmar hyperhidrosis between medical and non-medical undergraduate students. However, there has been some research that was conducted in the United States in 2016. This study was conducted based on all age groups and among male and females. Of all the respondents, only 51% of hyperhidrosis sufferers have discussed their condition with a healthcare professional, according to this study. Children/adolescents (<21 years old) with the disease are nearly twice as likely (81%) as their adult counterparts (42%) to be seen by a healthcare professional. The most prevalent reason for not discussing their condition with a healthcare professional is that they do not believe it is a medical condition (60 %) or that there is nothing that can be done to treat their excessive sweating (47 %). Only 53 % who consulted a doctor about their excessive sweating were diagnosed (73 % of children and adolescents, 43 % of adults). [8]

Moreover, another study was done in the United Kingdom (UK) in 2017. This study was conducted based on 21 male (30%) and 50 female (70%) affected with hyperhidrosis. According to this study, the patients expressed concern regarding the level of knowledge about hyperhidrosis of their medical providers as well as the lack of public's awareness. This is because they believed that due to the lack of knowledge about this medical condition, society has stigmatized them and treated those affected with hyperhidrosis with minimal sympathy. [9]

Besides that, there was also another research that was done in Korea in 2010. This research, though mainly focused on general primary hyperhidrosis, stated that palmar and plantar sites were most commonly affected. [18] The targeted group of this research is primary hyperhidrosis patients however according to the study, it is shown that majority of the patients were students (elementary, high school, college and graduate) showing 51.8%. [18] In this study, it concluded that the patients rarely seek medical attention because many have no knowledge that they have a treatable medical condition; hyperhidrosis. [18-19]

Table 5 shows the comparison of attitudes towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students. The questions 2,3 and 20 showed statistically significant results with the P-value of less than <0.05. In addition, the questions 1,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 and 19 showed statistically not significant results with the P-value of higher than >0.05. Therefore, our study revealed that the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students was not much different as medical students did not possess a more positive attitude towards palmar hyperhidrosis as compared to non-medical students.

There has been no previous research done that reports on the level of attitude regarding palmar hyperhidrosis between medical and non-medical undergraduate students. However, there has been some research that reports that palmar hyperhidrosis impacts the quality of lifestyle among hyperhidrosis patients on the daily lifestyle from Hyperhidrosis Support Group UK. [9] Their study showed that about 61% of hyperhidrosis patient's attitudes towards abnormally excessive sweating mainly gives a negative impact on their lifestyle. [9] The study included daily life, psychological well -being, social life, professional / school life, dealing with hyperhidrosis, unmet health

care needs and physical effects the hyperhidrosis patients were statistically significant for their attitudes toward excessive sweating. According to another study that was conducted in Rio de Janeiro among medical students based on the prevalence and characteristics of primary hyperhidrosis, some degree of deterioration in quality of life was reported by 89.20% of the 900 medical students who had participated in the study. [20]

CONCLUSION

According to our data, for the comparison of knowledge towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students; questions 1, 2, 3, 5, 7, 8, and 10 were showed to be statistically significant with P values less than (<) 0.05. Meanwhile, questions 4, 6, and 9 were shown to be not statistically significant whereby their P values were greater than (>) 0.05. These results concluded that medical students do have more knowledge regarding abnormally excessive sweating on the hands (palmar hyperhidrosis) as compared to non-medical undergraduate students in our research.

On the other hand, for the data regarding the comparison of attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students; the questions number 2, 3, and 20 were shown to be statistically significant with a P value of less than (<) 0.05. Moreover, questions 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19 showed no statistically significant results whereby their P value was greater than (>) 0.05. Thus, the attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) between medical and non-medical undergraduate students was not much different as medical students did not possess a more positive attitude towards palmar hyperhidrosis as compared to non-medical students. This can be concluded as most of the data showed insignificant results.

In conclusion, more research or information regarding palmar hyperhidrosis is required to improve the knowledge and attitude towards abnormally excessive sweating on the hands (palmar hyperhidrosis) amongst the public. Besides that, the finding of our study could be used as a foundation for developing awareness programs among the undergraduate students. By improving the public's knowledge and attitude towards palmar hyperhidrosis, we are certain that it can make a difference and change the mindset of society, especially the younger generation as

to reduce the stigmatization of those affected by palmar hyperhidrosis as well as enables patients and medical providers to acknowledge this disorder as a medically validated condition and encourage those affected to pursue treatment for the better.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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