

Association between severity and locations of primary hyperhidrosis and quality of life among medical students

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ABSTRACT

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Background: Primary hyperhidrosis (PH) is a condition of excessive sweating on certain body parts with unknown cause and has an adverse impact on quality of life. We expected that medical students might also be influenced by PH during their study activities.

Objective: To determine the association between severity and locations of PH and quality of life in medical students.

Methods: This study was conducted on 77 medical students at Atma Jaya Catholic University of Indonesia. Hyperhidrosis Disease Severity Scale (HDSS) questionnaire and Hyperhidrosis Quality of Life Index (HidroQoL) questionnaire were used. Data analysis was performed using Chi-Square.

Results: The prevalence of PH was 15.33%. Mild-moderate hyperhidrosis was found in 77.9% respondents, while 22.1% respondents had severely severe hyperhidrosis. The location of hyperhidrosis was found in palmar (66.1%), axillary (28.6%), plantar (1.0%), and others (9.1%). The score of the daily life activities domain (29.65 ± 21.96) was higher than the psychosocial score (27.92 ± 20.46). Data showed that 33.3% of respondents with mild-moderate hyperhidrosis and 82.4% with severely severe hyperhidrosis' quality of life were affected by their excessive sweating. Total of 34.0% respondents with palmar hyperhidrosis and 54.5% with axillary hyperhidrosis' quality of life were affected. An association between severity of PH and quality of life was found ($p=0.000$), but no association between locations of PH and quality of life was found statistically ($p=0.106$).

Conclusion: We found an association between the severity of PH and the quality of life, and no association between the location of PH and quality of life.

Latar belakang: Hiperhidrosis primer (PH) adalah kondisi berkeringat berlebih pada bagian tubuh tertentu dengan sebab yang tidak diketahui dan memiliki dampak negatif terhadap kualitas hidup. Kami menduga bahwa mahasiswa kedokteran juga terpengaruh akibat kondisi hiperhidrosis primer dalam melaksanakan kegiatan pembelajaran.

Tujuan: Mengetahui hubungan antara tingkat keparahan dan lokasi PH dengan kualitas hidup pada mahasiswa kedokteran.

Metode: Penelitian dilakukan pada 77 mahasiswa kedokteran Universitas Katolik Indonesia Atma Jaya.

Data dikumpulkan menggunakan kuesioner *Hyperhidrosis Disease Severity Scale (HDSS)* dan *Hyperhidrosis Quality of Life Index (HidroQoL)*. Data dianalisis dengan uji statistik *Chi-Square*.

Hasil: Prevalensi PH ditemukan sebesar 15,33%. Hiperhidrosis ringan-sedang ditemukan pada 77,9% responden, sementara 22,1% responden lainnya memiliki hiperhidrosis berat-sangat berat. Lokasi hiperhidrosis ditemukan pada palmar (66,1%), aksila (28,6%), plantar (1,0%), dan lokasi lainnya (9,1%). Total skor domain aktivitas sehari-hari ditemukan lebih tinggi (29.65 ± 21.96) dibandingkan dengan skor domain psikososial (27.92 ± 20.46). Data menunjukkan sebanyak 33,3% responden dengan hiperhidrosis ringan-sedang dan 82,4% responden hiperhidrosis berat-sangat berat terpengaruh kualitas hidupnya akibat kondisi berkeringat berlebih. Sebanyak 34,0% responden hiperhidrosis palmaris dan 54,5% hiperhidrosis aksilaris terpengaruh kualitas hidupnya. Ditemukan hubungan bermakna antara tingkat keparahan PH dan kualitas hidup ($p=0,000$), tetapi tidak ditemukan hubungan antara lokasi PH dan kualitas hidup secara statistik ($p=0,106$).

Kesimpulan: Terdapat hubungan antara tingkat keparahan PH dengan kualitas hidup dan tidak ditemukan adanya hubungan antara lokasi PH dengan kualitas hidup.

INTRODUCTION

Sweating is a form of the body's attempt to maintain a constant body temperature.¹ However, the amount of sweat produced in people with hyperhidrosis exceeds the body's physiological needs. PH is usually characterized by the appearance of bilateral sweating in certain parts of the body, such as the palms, soles of the feet, armpits, or on the face for no apparent reason.^{2,3} A study conducted in Brazil found that the prevalence of PH among medical students reached 14.76%.⁴ PH onset peaked in individuals aged 14–25 years, where the incidence of PH was primarily found in individuals 18–39 years.⁵⁻⁶

Referring to several studies conducted in Germany and Japan, it was found that 30–37.95% of people with hyperhidrosis feel disturbed in carrying out their daily activities, including school and work activities, also affect mental health and social interactions.^{7,8}

Prevalence of depression and anxiety in patients with hyperhidrosis is higher than in control subjects.⁹ Hyperhidrosis, in addition to atopic dermatitis, psoriasis, and urticaria, are found to be a skin disorder that significantly affect the quality of life of the patients.¹⁰

Based on searches conducted through PubMed, Google Scholar, and SpringerLink with the keywords "Indonesian hyperhidrosis," "hyperhidrosis in Indonesia," and "Indonesian hyperhidrosis," we could not find such research in Indonesia, even though PH may have a significant effect on the quality of life. We expected that medical students should also be influenced by PH. PH could have a negative effect on their daily various activities, such as conducting examinations, using tools, using gloves, and writing. Therefore, we want to conduct a study to determine the incidence of PH and the association between the severity and location of PH and the quality of students' life in Indonesia. As a member of School of Medicine and Health Sciences of Atma Jaya Catholic University of Indonesia, we found it is more likely to be implemented to do the study among medical students in our School.

METHODS

This study was an analytic observational study with a cross-sectional study design that has been reviewed by the Ethics Committee at the School of Medicine, Atma Jaya Catholic University of Indonesia (No: 10/02/KEP-FKUAJ/2020). The research samples were pre-clinical medical students of Atma Jaya Catholic University of Indonesia. We used an online survey via Google Forms for two weeks to find respondents with hyperhidrosis that met the inclusion and exclusion criteria (purposive sampling technique). The inclusion criteria in this study were active students batch 2017, 2018, and 2019, who agreed to participate in the research, gave their informed consent, and met the diagnosis criteria of PH based on Multi-Specialty Working Group on the Recognition, Diagnosis, and Treatment of Primary Focal Hyperhidrosis.³ The exclusion

criteria were conditions that could cause secondary hyperhidrosis, such as infection, malignancy, endocrine/metabolic disorders, cardiovascular disease, respiratory disease, neurologic/psychiatric disorders, or drugs consumption.

The measuring instruments used were:

- The demographic questionnaire.
- The Hyperhidrosis Severity Scale (HDSS) questionnaire.
- The Hyperhidrosis Quality of Life Index (HidroQoL) questionnaire.

HDSS questionnaire was used to determine the severity of PH.¹¹ Respondents were asked to choose 1 out of 4 statements. If they decided on statement number 1 or 2, they were categorized as having mild-moderate hyperhidrosis. Statement number 3 or 4 were classified as severe-very severe hyperhidrosis. The HidroQoL questionnaire was used to determine the quality of life of those who had PH. It was divided into two domains: the daily life activities domain, which consisted of 6 questions, and the psychosocial domain, which consisted of 12 questions.¹² Respondents answered the questions by choosing not at all (= 0), a little (= 1), or very much (= 2). A total score of 0–11 was categorized as not affected, whereas 12–36 was affected. Data were analyzed using the Chi-Square test.

RESULTS

There were 502 students who participated in our survey to collect samples. They were 87.76% (502/572) of all students from Atma Jaya Catholic University of Indonesia batch 2017, 2018, and 2019. They consisted of 373 females (74.3%) and 129 males (25.7%). The survey revealed that 81 out of 502 respondents, with an age range of 17–22 years, had hyperhidrosis. Four respondents were excluded because they had neurologic/psychiatric disorder, endocrine disorder, or drugs consumption that could cause secondary hyperhidrosis. Thus, the prevalence of PH was 15.33% (77/502 respondents). Furthermore, the prevalence of PH was higher among females (70.1%) than males (29.9%).

Sweating characteristics experienced by respondents such as bilateral and relatively symmetric sweating was experienced by 61 respondents (79.22%), 30 (38.96%) stated that the episode of excessive sweating was more than once a week, 24 (31.11%) claimed that there was some impairment in their daily activities, the age of onset of all hyperhidrosis respondents in this study were under 25 years. Family history of PH was reported in 9 respondents (11.68%), which mentioned that their father, mother, and sibling also experienced the same symptoms. Aggravation of sweating related to stressful situations was reported by 56 (72.72%) respondents and cessation of sweating during sleep was claimed by 32 (42.55%) of respondents.

Based on the severity of hyperhidrosis experienced by respondents, it was found that 77.9% of respondents had mild-moderate hyperhidrosis, 22.1% had severe-very severe hyperhidrosis. The regions affected by hyperhidrosis were palmar in 47 respondents (61.0%), axilla 22 in (28.6%), plantar in 1 (1.0%), and other regions, such as facial in 4 (5.2%); back in 2 (2.6%); and thigh in 1 (1.3%).

There were 44.2% of respondents felt that their quality of life was affected by hyperhidrosis. The HidroQoL questionnaire used to assess the quality of life of hyperhidrosis respondents was divided into two domains, namely the daily life activities domain, which consisted of 6 questions, and the psychosocial domain, which consisted of 12 questions. The total raw score obtained was then converted into a transformed score with a scale of 0-100 to equalize the weight of the scores in each domain. The transformed scores for the daily activity domain and psychosocial domain were 29.65 ± 21.96 and 27.92 ± 20.46 (Table 1).

The association between severity of PH and quality of life

A total of 20 respondents (33.3%) with mild-moderate hyperhidrosis and 14 respondents (82.4%) with severe-very severe hyperhidrosis had affected the quality of life. An association between the severity of PH and quality of life

was found to be significant ($p < 0.05$) (Table 2).

The association between locations of PH and quality of life

The hyperhidrosis location reported by respondents was mainly palms and armpits, so we used those locations for association analysis.

A total of 16 respondents (34.0%) with palmar hyperhidrosis and 12 respondents (54.5%) with axillary hyperhidrosis had affected quality of life. However, statistical analysis showed no association between the location of PH and quality of life ($p \geq 0.05$) (Table 3).

Table 1. Quality of Life Domain Scores

Domain	Mean±SD	
	Raw score	Transformed score
Daily Activities	3.55±2.63	29.65 ± 21.96
Psychosocial	6.70±4.912	27.92 ± 20.46

Table 2. The association between severity of PH and quality of life

Hyperhidrosis Severity	Quality of Life		Total	p-value
	Affected	Not Affected		
Mild-moderate	20 (33.3%)	40 (66.7%)	60 (100%)	0.000
Severe-very severe	14 (82.4%)	3 (17.6%)	17 (100%)	

Table 3. The association between locations of PH and quality of life

Hyperhidrosis Locations	Quality of Life		Total	p-value
	Affected	Not Affected		
Palmar	16 (34.0%)	31 (66.0%)	47 (100%)	0.106
Axilla	12 (54.5%)	3 (45.5%)	22 (100%)	

DISCUSSION

As far as we know, this is the first hyperhidrosis study among medical students in Indonesia. We found that the prevalence of PH was 15.33%. The prevalence obtained in this study is similar to a research which found the prevalence of PH in medical students as much as 14.76 in Brazil, a tropical country like Indonesia.⁴ We also found that PH was more prevalent in female respondents (70.1% vs 29.9%). On the contrary, two research in Brazil found no significant difference in gender.^{4,10} The higher prevalence of PH among female respondents in this study was probably due to more female students who participated in the survey (74.3%).

The severity of hyperhidrosis varies from mild to very severe, according to HDSS. This study found that 22.1% of respondents had

severe-very severe hyperhidrosis, comparable to Brazilian research which found 23.89% severe-very severe hyperhidrosis (HDSS 3 and 4) among their respondents.¹⁰ A significant association between the severity of PH and the quality of life was also found in the study, with 82.4% of respondents' quality of life with severe-very severe hyperhidrosis were affected. The research in Brazil also found that 89.20% of their PH respondents reported some degree of life quality impairment.¹⁰ The condition of excessive sweating can cause patients to have limitations to do work, social relations, and physical activity. It can cause embarrassment and anxiety that disrupt their mental and emotional health.^{9,13,14} A study in Greece found a correlation between severity of hyperhidrosis and quality of life. A decrease in the severity of hyperhidrosis was

followed by an improvement in the quality of life of their patients.¹⁵

HidroQoL used to assess quality of life in this study consists of two domains: daily activity and psychosocial domains. The score of the daily activity domain in this study was higher (29.65 ± 21.96) compared to the psychosocial domain score. This indicates that hyperhidrosis has more influence on respondents when they are doing their daily activities, such as writing, taking exams, or doing hobbies. Respondents in this study claimed that they often had to wipe sweaty body parts with tissues or towels, change clothes, turn on the air conditioner, and use deodorant to deal with hyperhidrosis. Research conducted on medical students in Brazil found a similar results that the students have limitations and disturbances in activities, learning activities, and work due to their excessive sweating.⁴

Hereafter, we will discuss the locations of hyperhidrosis. In this study, palmar was most affected by hyperhidrosis, followed by axilla. Based on research by Lima, et al. and Westphal, et al., it was found that palmar was also the most affected region. It was followed by plantar and axilla.^{4,16} Meanwhile, research by Doolittle, et al. and Morard, et al. found axilla as the most affected region.^{10,17} The location of hyperhidrosis was found to vary in studies conducted.

Based on the analysis test conducted on the location of the palmar and axilla, there was no significant association between the location of PH and the respondent's quality of life. This is in line with the research in UK which found that the location of hyperhidrosis does not affect the quality of life of people with hyperhidrosis. Regardless of its location, every hyperhidrosis patient has a similar burden to deal with the symptoms of hyperhidrosis and a similar effect on the patient's quality of life.¹⁸

Although in this study there was no significant association between the location of hyperhidrosis and the patient's quality of life, about 54.5% respondents with axillary hyperhidrosis had an affected quality of life. Studies in Germany and Sweden found that axillary hyperhidrosis has more psychological effects, such as anxiety and

disturbances in performing daily activities, than palmar hyperhidrosis.^{13,14,19,20} A double-blind trial study found that axillary hyperhidrosis patients with Generalized Anxiety Disorder (GAD) experienced an improvement in their anxiety disorders after undergoing therapy for their hyperhidrosis condition.²⁰ Patients with axillary hyperhidrosis feel embarrassed and stressed, especially in social activities, due to their excessive sweating in the armpits. It may attract attention from many people around them, who will think that they lack personal hygiene. Patients with axillary hyperhidrosis need to change their clothes up to 2 times a day. Besides, excessive sweating often causes an unpleasant odor that greatly affects the patient's quality of life, especially their emotional well-being.²¹⁻²³

We noted some limitations of this study. A self-administered questionnaire (SAQ) with Google Form was used and we could not conduct an in-depth interview with respondents due to pandemic situations. We also could not find out more about the prevalence of family history of hyperhidrosis which was found to be lower than previous studies. The low prevalence of hyperhidrosis in the family is unknown, whether caused by genetic differences in Indonesian or due to lack of awareness of hyperhidrosis as a medical condition.

CONCLUSION

Our study found a significant association between the severity of PH and quality of life, but there is no significant association between the location of PH and quality of life among medical students.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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