



Original Article

ISSN : 2277-3657
CODEN(USA) : IJPRPM

The Impact of Hyperhidrosis on Patients' Quality of Life and Daily Activities

Mohammad Almohideb^{1*}, Mohammed Aljihani², Meshal Bukhari¹, Bashayer Algethami³, Omar Asiri³, Alaa Alnamlah¹

¹Department of Dermatology, Faculty of Medical school, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.

²Department of Dermatology, Faculty of Medical school, King Khalid University, Bisha, Saudi Arabia.

³Department of Dermatology, Faculty of Medical school, Taif University, Taif, Saudi Arabia.

*Email: mohidebm@nha.med.sa

ABSTRACT

Hyperhidrosis is a disorder where excessive sweating occurs in the body more than required for thermoregulation needs. It could cause discomfort, embarrassment, and psychological trauma. Individuals with hyperhidrosis experience impairment in various functional domains as well as in the overall quality of life hyperhidrosis. Symptoms can be so severe that cause anxiety, depression, and can affect career choices, leisure time activities, personal relationships, self-image, and emotional well-being. There are mainly two types of hyperhidrosis; primary (idiopathic) hyperhidrosis, which is the most common type, and secondary type which is less common, but its causes are well known and may be due to metabolic and endocrine disorders such as Diabetes Mellites, obesity, menopause, hyperthyroidism, neurologic disorders (stroke, neuropathy, Parkinson's disease, brain tumor), medications (steroids), infections (bacterial endocarditis, TB), tumors (carcinoid, pheochromocytoma). This cross-sectional observational study was carried out among 104 people identified with Primary Hyperhidrosis from different regions in Saudi Arabia. The findings showed a prevalence of 31.7% (n=33) in males and 68.3% (n=71) in females, which was more prevalent in the age group of 22-31 years (29.8%). The study showed that primary hyperhidrosis has no significant consequences in patients' QOL even though a small percentage reported poor QOL. Patients experiencing hyperhidrosis should not only be given medical support but also given psychosocial support.

Key words: Hyperhidrosis, Quality of life, Depression, Sweating, Low self-esteem, Dermatology

INTRODUCTION

In the thermoregulation process, sweating plays an important role in the human body to maintain a consistent internal body temperature [1, 2]. Sweat is secreted through the eccrine sweat glands, which are spread throughout the whole body but are concentrated more intensely in areas like hands, axillae, sole, face, and head, which are neurologically supplied by postganglionic autonomic nerves and stimulated by acetylcholine and catecholamines [3, 4]. Hyperhidrosis is a disorder where excessive sweating occurs in the body more than required for thermoregulation needs [5]. Although it is not a life-threatening disorder, it could cause discomfort, embarrassment, and psychological trauma. Individuals with hyperhidrosis experience impairment in various functional domains as well as in the overall quality of life. Symptoms can be so severe that it causes anxiety, and can affect career choices, leisure time activities, personal relationships, self-image, and emotional well-being [6, 7].

There are mainly two types of hyperhidrosis; primary (idiopathic) hyperhidrosis, which is the most common type and accounts for 90% of the cases. Its etiology is not fully understood, and some research shows a genetic

association [8, 9]. The secondary type is less common, but its causes are well known and may be due to metabolic and endocrine disorders such as Diabetes Mellitus, obesity, menopause, hyperthyroidism, neurologic disorders (stroke, neuropathy, Parkinson's disease, brain tumor), medications (steroids), infections (bacterial endocarditis, TB), tumors (carcinoid, pheochromocytoma) [4, 10-12]. The prevalence of hyperhidrosis varies between countries, and it is estimated to approximately to be 1-2% in any population [13]. In the United States of America, it was reported that approximately 3% of the population is affected with a primary hyperhidrosis [14]. In contrast, in China and Germany, a prevalence of 14.5% and 16.3% has been reported, respectively [15, 16].

Hyperhidrosis is usually managed using topical aluminum salts as it is cheap and easy to get without a medical prescription. The mechanism of action of these salts is to block the ducts of the eccrine glands and shrink the secretory cells. But this gives only a short-term solution, which takes only 24-48 hours of action, and requires to be used many times again. Topical formaldehyde and glutaraldehyde are also used in the management. Most of the topical agents used for its management can cause skin irritation and pigmentation [17, 18]. Anticholinergics like (Glycopyrrolate, Oxybutynin) used as systemic management of Hyperhidrosis, but they are restricted because of their undesirable side effects (dry mouth, dry eyes, dry nasal mucosa, blurred vision, urinary retention, constipation, and tachycardia) [19]. Iontophoresis is restricted to be used only in the palm and sole Hyperhidrosis and should be avoided in pregnancy and pacemaker patients [20]. Botulinum toxin A injection prevents the release of the neurotransmitter acetylcholine from the neuromuscular junction and decreases sweating production from eccrine glands. It can be used as the first-line with excellent results reach up to 95% and is considered a long-term solution [17, 19]. Surgical options may be taken in the treatment of Hyperhidrosis if all conservative treatments fail [20]. Hyperhidrosis should not be underestimated, as it affects many aspects; psychological, emotional, social, professional, and overall quality of life [10].

There is a lack of data in Saudi Arabia regarding Hyperhidrosis's impact on patients' quality of life. Hence, this study aims to assess the impact of Primary Hyperhidrosis on patients' quality of life (QOL) in Saudi Arabia and measure the satisfaction rate for different treatment options used in Primary Hyperhidrosis.

MATERIALS AND METHODS

A cross-sectional observational study was carried out among people identified with Primary Hyperhidrosis from different regions in Saudi Arabia. A purposive and snowball sampling technique was used to recruit the participants. The participants' contact information was collected from the database in King Abdulaziz Medical City (KAMC) under National Guard Health Affairs (NGHA) in Riyadh. A pre-tested questionnaire was sent to the identified participants based on eligibility criteria. We had decided to include patients of both genders aged above 14 years with primary hyperhidrosis (PH) and exclude patients with secondary hyperhidrosis, those who are pregnant, and in the presence of neuromuscular disorders. The online link of the questionnaire was sent using Email, SMS, and different social media platforms (WhatsApp, Twitter) after contacting and informing the patients about the purpose of the study. Patients who still suffered from primary hyperhidrosis were requested to participate in the survey.

The questionnaire was adopted from the study to assess hyperhidrosis's impact on patient quality of life by Campos *et al.* [21]. The quality of life questionnaire consisted of 20 questions divided into five domains, namely: a) General Quality of Life, b) Functional/social domain, c) Personal domain, d) Emotional Domain, and e) Special circumstances. A five-point Likert scale ranging from 1 to 5 (Excellent-1, Very good-2, Good-3, Bad-4, Very bad-5) was used to record the participants' responses. The maximum total score one could get was 100, and the minimum was 20, where a lesser score shows a better quality of life and higher scores a poor quality of life. We also collected sociodemographic details and medical history-related information of the patients.

Data analysis

The participants' responses were downloaded from the link and transferred to a working Microsoft Excel sheet, and data cleaning was done for the purpose of statistical analysis. Data was then entered in SPSS ver. 23 (IBM. Corp, Chicago, USA) for carrying out the required statistical analysis. The scores obtained were checked for their normality that showed that data was following normal distribution (Shapiro-Wilk test statistic= 0.983; p=0.218). Means and standard deviation were used to describe continuous variables where categorical variables were expressed using frequencies and percentages. The quality of life scores differences between different groups was compared using the student 't' test and Analysis of Variance (ANOVA). Any association between categorical

variables was tested using Pearson's Chi-square test. A significance value (p-value) less than 0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

The analysis included responses from 104 patients identified with Primary Hyperhidrosis from different regions in Saudi Arabia that showed a prevalence of 31.7% (n=33) in males and 68.3% (n=71) in females. The prevalence was comparatively more in the age group of 22-31 years (29.8%) (**Table 1**).

Table 1. Prevalence of Primary Hyperhidrosis by Age and Gender

		Frequency	Percent
Age (In years)	<16 years	2	1.9
	16-21 years	25	24.0
	22-31 years	31	29.8
	32-41 years	22	21.2
	42-51 years	22	21.2
	>51 years	2	1.9
Gender	Male	33	31.7
	Female	71	68.3

The total score for QOL in our study was found to be 51.1± 16.1 (Min=20 and Max:100). The mean scores of different domains are given in **Table 2**.

Table 2. Quality of Life Scores in Primary Hyperhidrosis

		N	Mean	SD	Minimum	Maximum
Domains of Quality of Life (QOL)	General QOL	104	2.8	1.1	1.0	5.0
	Functional & social	104	16.6	6.5	7.0	35.0
	Personal	104	7.1	3.1	3.0	15.0
	Emotional	104	4.4	2.2	2.0	10.0
	Special circumstances	104	20.3	6.8	7.0	35.0
	Total score	104	51.1	16.1	20.0	100.0

The comparison of the total QOL showed no statistically significant differences between male (52.0±17.9) and female patients (50.7±15.4) (p=0.712). There was also no difference in QOL score between different age groups (p=0.652).

The total QOL scores were converted into Excellent (0-20), Very good (21-40), Good (41-60), Bad (61-80), and Very bad (81-100). The analysis showed that only 1% had excellent; 23.1% very good scores; 47.1% good; 26.9% bad, and only 1.9% had very bad QOL scores (**Figure 1**).

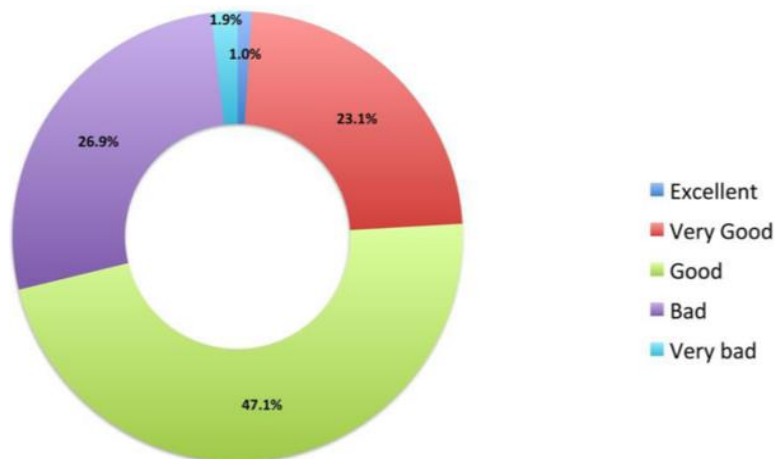


Figure 1. Quality of life in patients with primary hyperhidrosis

When we assessed the relationship of age with QOL in these patients, there was no statistically significant difference observed between different age groups ($p=0.480$). There was also no statistically significant difference noted in QOL scores between the two genders ($p=0.270$). The severity as reported by the patients showed that 15.4% had Type 3 and 36.5% had Type 2 hyperhidrosis. The QOL was found to be poor in those who had Type 3 and Type 2 hyperhidrosis that showed a statistically significant association ($p= 0.003$). There was no statistically significant association observed between QOL and Primary hyperhidrosis patients with hyperthyroidism ($p=0.490$) (**Table 3**).

Table 3. Sociodemographic Characteristics and Quality of Life

	N	QOL					Total	P value
		Excellent	Very Good	Good	Bad	Very bad		
Age (in years)	<16	0	1	0	1	0	2	0.480
		0.0	50.0	0.0	50.0	0.0	1.9	
	16-21 years	0	3	12	10	0	25	
		0.0	12.0	48.0	40.0	0.0	24.0	
	22-31 years	0	8	14	8	1	31	
		0.0	25.8	45.2	25.8	3.2	29.8	
	32-41 years	1	7	10	4	0	22	
	4.5	31.8	45.5	18.2	0.0	21.2		
	0	5	13	3	1	22	0.270	
	0.0	22.7	59.1	13.6	4.5	21.2		
	0	0	0	2	0	2		
	0.0	0.0	0.0	100.0	0.0	1.9		
Gender	Male	1	6	13	12	1		33
		3.0	18.2	39.4	36.4	3.0		31.7
	0	18	36	16	1	71		0.270
	0.0	25.4	50.7	22.5	1.4	68.3		
Severity of Hyperhidrosis*	Type 1	1	18	26	5	0	50	0.003
		2.0	36.0	52.0	10.0	0.0	48.1	
	Type 2	0	6	16	15	1	38	
	0.0	15.8	42.1	39.5	2.6	36.5	0.003	
Type 3	0	0	7	8	1	16		
	0.0	0.0	43.8	50.0	6.3	15.4		
Hyperthyroidism	Not sure	0	4	13	12	0	29	0.490
		0.0	13.8	44.8	41.4	0.0	27.9	
	No	1	19	33	16	2	71	
		1.4	26.8	46.5	22.5	2.8	68.3	
Yes	0	1	3	0	0	4	0.490	
	0.0	25.0	75.0	0.0	0.0	3.8		

*Type 1: Sweating in the affected area is tolerable and it does not affect my daily activities.

Type 2: I barely can tolerate the sweating in the affected area, and it usually affects my daily activities.

Type 3: I cannot tolerate the sweating as it always affects my daily activities.

It was observed that about 33.7% had primary hyperhidrosis in the axillary area, 13.5% on the face, 10.6% on the hands, and the least affected area was the feet. About 40.4% had it on more than one body part (**Figure 2**).

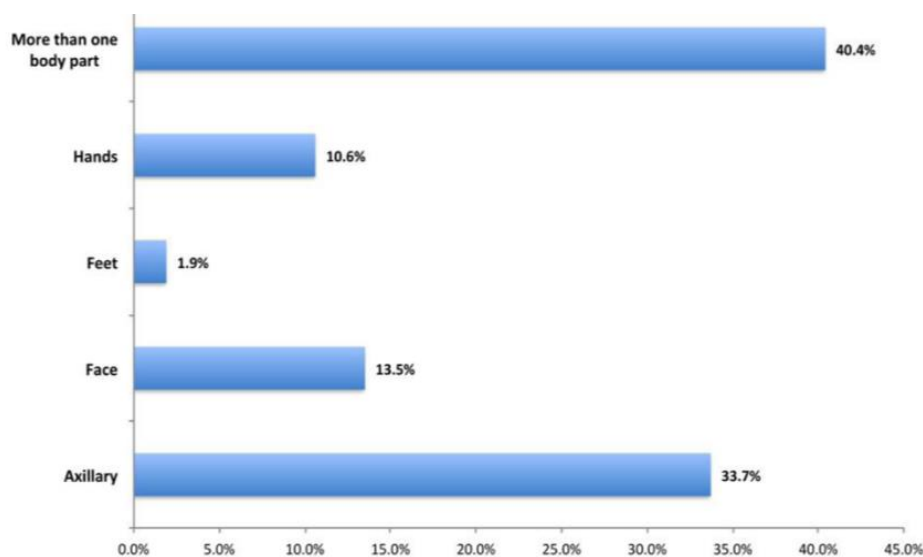


Figure 2. Affected body parts in primary hyperhidrosis

When the relationship of QOL was compared between the affected body parts, there was no statistically significant association observed (p=0.938) (Table 4).

Table 4. Affected Body Parts and QOL

	QOL					Total	P value
	Excellent	Very Good	Good	Bad	Very bad		
Axillary	0	10	16	9	0	35	0.938
	0.0	28.6	45.7	25.7	0.0	33.7	
Face	0	2	8	3	1	14	
	0.0	14.3	57.1	21.4	7.1	13.5	
Feet	0	1	0	1	0	2	
	0.0	50.0	0.0	50.0	0.0	1.9	
Hands	0	2	5	4	0	11	
	0.0	18.2	45.5	36.4	0.0	10.6	
More than one body part	1	9	20	11	1	42	
	2.4	21.4	47.6	26.2	2.4	40.4	

Individuals experiencing hyperhidrosis usually have functional impairments that negatively impact their quality of life. Studies have shown that patients with Primary hyperhidrosis (PH) report lower satisfaction and less accomplishment in social life and at the workplace [22, 23]. This survey was designed to identify those with PH and assess its impact on the quality of life. This study's findings showed that even though 47.1% had reported good QOL scores, most of the patients were not completely satisfied with their overall quality of life due to the frequent or constant sweating they experience. This shows that the diseases did not have a severe impact on the patients' lives' functional, social and emotional aspects. These findings are similar to a study done in Brazil by Hasimoto *et al.*, which had reported that nearly half of the subjects diagnosed with PH reported excellent or good QOL [9]. Both these study findings contrast to the findings of another de Campos *et al.*, which reported that 100% of patients with PH had poor or very poor QOL [3]. When interpreting and comparing these contrasting findings, it should be highlighted that our study was conducted on patients who have either consulted or taken treatment, whereas the latter study was done on patients who sought medical treatment for PH.

The prevalence of PH was found to be comparatively more in females than males in our study, and this finding is similar to studies were done by Liu *et al.* [14] and Lai *et al.* [24], both of which showed a higher prevalence in females. Another study done in Germany among the adult population reported a higher prevalence among males [25]. Even though there is no clear picture regarding the gender relationship with PH, studies report that males are more likely to develop this disease than females. The current finding shows that the prevalence was more in the younger age group (16-31 years) even though there were no significant differences observed between them.

These findings are supported by another study done by Stefaniak *et al.* in Poland that showed no statistical differences in age difference in PH [26]. Observational studies showed that there is a dramatic decrease in the prevalence of PH as age increases and suggested that this is not a lifelong condition and could become milder or resolves with age. In this study, it was found that axillaries are the commonly affected body parts compared to the palmoplantar areas. It has been reported that females are more likely to develop PH in the axillaries than males [15]. In our study, most of the patients were females, which supports the above findings. Similar findings were also reported by Strutton *et al.* in the USA, where more than half of the patients had axillary hyperhidrosis [14]. In the current study, as the severity of the sweating increased, the QOL of the patients decreased. These patients would often feel anxious about sweating out at any moment, creating a negative self-image [26]. It has been reported that stress or anxiety and being in a social environment are more crucial aggravating factors for PH than heat or summer season [27]. A study done by Hamm *et al.* reported that patients with PH spend more time managing the symptoms of the condition and also change their clothes frequently compared to others [28]. When interpreting the findings of this study, some limitations and other factors that could directly or indirectly influence the response of the patients should be discussed. First of all, the study was conducted during the COVID-19 pandemic. People have restrictions in social gatherings and other outside activities, which could have influenced the response to questions on QOL. Another finding is that most of the patients were females in this study. In Saudi Arabia, most females are disproportionately involved in social gatherings and other outdoor activities compared to males [29, 30]. Online surveys like ours that rely on patients' responses are subjective to recall bias that may have an impact on the findings. As we have concentrated on patients' current disease characteristics and their impact on their QOL would have minimized the recall bias in this study. Other major limitations are the sample size and lack of opportunity to carry out the survey face-to-face. In addition, we did not record any information related to treatment undergoing or received for hyperhidrosis. All these limitations may have limited the generalizability of the current findings. There is a need to conduct a similar study on a large sample by including more variables that could have an impact on both the QOL and PH.

CONCLUSION

The study findings showed that Primary hyperhidrosis did not significantly have major consequences in patients' QOL even though a small percentage reported poor QOL. Sweating in the axillaries region is the main concern in most patients, and people experiencing axillary hyperhidrosis reported poor QOL than others. Both public and health care professionals must understand the epidemiology of hyperhidrosis and its impact on individuals' daily activities. Patients experiencing hyperhidrosis should not only be given medical support but also given psychosocial support.

ACKNOWLEDGMENTS : None

CONFLICT OF INTEREST : None

FINANCIAL SUPPORT : None

ETHICS STATEMENT : The institutional review board (IRB) obtained by King Abdullah International Medical Research Center (KAIMRC). Written consent obtained from every participant.

REFERENCES

1. Boulant JA. Hypothalamic mechanisms in thermoregulation. Fed Proc. 1981;40(14):2843-50.
2. Lenhardt R, Kurz A, Sessler DI. Thermoregulation and hyperthermia. Acta Anaesthesiol Scand Suppl. 1996;109:34-8.
3. de Campos JR, Kauffman P, Werebe Ede C, Andrade Filho LO, Kusniek S, Wolosker N, et al. Quality of life, before and after thoracic sympathectomy: report on 378 operated patients. Ann Thorac Surg. 2003;76(3):886-91.
4. Romero FR, Haddad GR, Miot HA, Cataneo DC. Palmar hyperhidrosis: clinical, pathophysiological, diagnostic and therapeutic aspects. A Bras Dermatol. 2016;91(6):716-25.
5. Sammons JE, Khachemoune A. Axillary hyperhidrosis: a focused review. J Dermatolog Treat. 2017;28(7):582-90.

6. Amir M, Arish A, Weinstein Y, Pfeffer M, Levy Y. Impairment in quality of life among patients seeking surgery for hyperhidrosis (excessive sweating): preliminary results. *Isr J Psychiatry Relat Sci.* 2000;37(1):25-31.
7. Lerer B, Jacobowitz J, Wahba A. Personality features in essential hyperhidrosis. *Int J Psychiatry Med.* 1981;10(1):59-67.
8. Wechter T, Feldman SR, Taylor SL. The Treatment of Primary Focal Hyperhidrosis. *Skin Therapy Lett.* 2019;24(1):1-7.
9. Hasimoto EN, Cataneo DC, Reis TAD, Cataneo AJM. Hyperhidrosis: prevalence and impact on quality of life. *J Bras Pneumol.* 2018;44(4):292-8.
10. Lenefsky M, Rice ZP. Hyperhidrosis and its impact on those living with it. *Am J Manag Care.* 2018;24(23 Suppl):S491-5.
11. Almarzooq AH, Alshahrani NF, Al-Hariri NA, Alobaid JM, Alshurafa ZH, Abdulmajid TJ, et al. Evaluation of Acute ischemic stroke management approach in the emergency department: Literature review. *Arch Pharm Pract.* 2020;11(4):26-31.
12. Mahassni SH. Overweight and Obesity and the Immune System, Lipids and C-reactive Protein in Young and Middle-aged Saudi Female University Workers. *J Biochem Technol.* 2020;11(1):49-56.
13. Dewey TM, Herbert MA, Hill SL, Prince SL, Mack MJ. One-year follow-up after thoracoscopic sympathectomy for hyperhidrosis: Outcomes and consequences. *Ann Thorac Surg.* 2006;81(4):1227-32.
14. Strutton DR, Kowalski JW, Glaser DA, Stang PE. US prevalence of hyperhidrosis and impact on individuals with axillary hyperhidrosis: results from a national survey. *J Am Acad Dermatol.* 2004;51(2):241-8.
15. Liu Y, Bahar R, Kalia S, Huang RY, Phillips A, Su M, et al. Hyperhidrosis prevalence and demographical characteristics in dermatology outpatients in Shanghai and Vancouver. *PLoS One.* 2016;11(4):e0153719.
16. Augustin M, Radtke MA, Herberger K, Kornek T, Heigel H, Schaefer I. Prevalence and disease burden of hyperhidrosis in the adult population. *Dermatology.* 2013;227(1):10-3.
17. Haider A, Solish N. Focal hyperhidrosis: diagnosis and management. *CMAJ.* 2005;172(1):69-75.
18. White JW Jr. Treatment of primary hyperhidrosis. *Mayo Clin Proc.* 1986;61(12):951-6.
19. Connolly M, de Berker D. Management of primary hyperhidrosis: a summary of the different treatment modalities. *Am J Clin Dermatol.* 2003;4(10):681-97.
20. Sato K, Timm DE, Sato F, Templeton EA, Meletioui DS, Toyomoto T, et al. Generation and transit pathway of H⁺ is critical for inhibition of palmar sweating by iontophoresis in water. *J Appl Physiol.* 1993;75(5):2258-64.
21. Campos JR, Kauffman P, Werebe ED, Andrade Filho LO, Kuzniak S, et al. Questionnaire of quality of life in patients with primary hyperhidrosis. *J Bras Pneumol.* 2003;29(4):178-81.
22. Cina CS, Robertson SG, Young EJ, Cartier B, Clase CM. Effect of endoscopic sympathectomy for hyperhidrosis on quality of life using the illness intrusiveness rating scale. *Minerva Chir.* 2006;61(3):231-9.
23. Kamudoni P, Mueller B, Halford J, Schouveller A, Stacey B, Salek MS. The impact of hyperhidrosis on patients' daily life and quality of life: a qualitative investigation. *Health Qual Life Outcomes.* 2017;15(1):121.
24. Lai FC, Tu YR, Li YP, Li X, Lin M, Chen JF, et al. Nationwide epidemiological survey of primary palmar hyperhidrosis in the People's Republic of China. *Clin Auton Res.* 2015;25(2):105-8.
25. Stefaniak T, Tomaszewski KA, Proczko-Markuszevska M, Idestal A, Royton A, Abi-Khalil C. Is subjective hyperhidrosis assessment sufficient enough? prevalence of hyperhidrosis among young Polish adults. *J Dermatol.* 2013;40(10):819-23.
26. Beltraminelli H, Itin P. Skin and psyche--from the surface to the depth of the inner world. *J Dtsch Dermatol Ges.* 2008;6(1):8-14.
27. Park EJ, Han KR, Choi H, Kim do W, Kim C. An epidemiological study of hyperhidrosis patients visiting the Ajou University Hospital hyperhidrosis center in Korea. *J Korean Med Sci.* 2010;25(5):772-5.
28. Hamm H, Naumann MK, Kowalski JW, Kutt S, Kozma C, Teale C. Primary focal hyperhidrosis: disease characteristics and functional impairment. *Dermatology.* 2006;212(4):343-53.
29. Al-Sobayel H, Al-Hazzaa HM, Abahussain NA, Qahwaji DM, Musaiger AO. Gender differences in leisure-time versus non-leisure-time physical activity among Saudi adolescents. *Ann Agric Environ Med.* 2015;22(2):344-8.
30. Al-Hazzaa HM. Physical inactivity in Saudi Arabia revisited: A systematic review of inactivity prevalence and perceived barriers to active living. *Int J Health Sci (Qassim).* 2018;12(6):50-64.