Original Article :

Knowledge, Attitudes, and Perceptions of Hidradenitis Suppurativa Among the General Population of Saudi Arabia

Mohammed A Alahmadi[1], Sara M Radwan[2], Anwar A Alghamdi[3], Khuzama M Alaseeri[4], Shuruq T Asiri[5], Razan A Alfakher[6], Reenad K Alharbi[1], Fawaz H Aljehani[7], Aymen Alharbi[7]

1. College of Medicine, Taibah University, Madina, Saudi Arabia.
2. College of Medicine, Umm Al-Qura University, Mecca, Saudi Arabia.
3. Department of Dermatology, Asser Central Hospital, Abha, Saudi Arabia.
4. College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Jeddah, Saudi Arabia.
5. College of Medicine, Najran University, Najran, Saudi Arabia.
6. College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia.
7. Department of Dermatology, King Abdulaziz Hospital, Mecca, Saudi Arabia.

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Corresponding author:
Mohammed Abdullah Alahmadi. College of Medicine, Taibah University, KSA.
Email: mohammed.a.alahmadi@outlook.com, ORCID: 0000-0001-6552-8795

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Abstract

Background and Aims:
Hidradenitis Suppurativa (HS) is a chronic skin condition causing pain, abscesses, and psychological distress, impacting the quality of life. This study examines the Saudi population's knowledge, attitudes, and perceptions to address gaps, improve care, and enhance public health.

Methods:
This cross-sectional study was conducted from October 2023 to January 2024, and it surveyed 597 Saudi adults (≥18 years) using a validated self-administered questionnaire. Data were analyzed with SPSS version 22.0, summarizing categorical variables as frequencies and continuous data as means. Chi-square and t-tests assessed knowledge and attitude differences, with significance set at $p \leq 0.05$.

Result:
The study included 597 participants, most aged 18–25 years (63.8%) and predominantly female (71.9%). Self-reported Hidradenitis Suppurativa (HS) was present in 6.5% of participants. Knowledge of HS varied, with 93.8% recognizing its hereditary nature, yet only 45.7% understanding the need for dermatological intervention. Common misconceptions included those related to hygiene and self-treatment. Participants with personal connections to HS, particularly family members, and female participants demonstrated significantly greater knowledge and more positive attitudes toward the condition ($p < 0.05$). Favorable attitudes were also significantly higher among females.

Conclusion:
The study emphasizes the significance of educational interventions to raise awareness about Hidradenitis Suppurativa in Saudi Arabia. Such initiatives can facilitate early detection, enhance patient care, and implement effective public health strategies for improved management of chronic diseases.

Keywords:
Hidradenitis suppurativa; Knowledge; Prevalence; Saudi Arabia

Introduction:

Hidradenitis Suppurativa (HS), a chronic inflammatory skin condition, is a disease that significantly impacts the quality of life for those affected. It is characterized by painful, recurrent, and inflamed nodules, abscesses, and sinus tracts in intertriginous areas such as the axillae, inguinal folds, and perianal region[1]. HS is often associated with severe pain, malodorous discharge, and a considerable psychological burden on patients[2]. The pathogenesis of HS involves inflammation of hair follicles, with a significant genetic predisposition[3].

HS typically presents with painful, deep-seated nodules that may progress to abscess formation and sinus tract formation. These lesions can be quite disfiguring and lead to scarring. Patients may also experience pain, itching, and malodorous discharge from affected areas. Clinical presentation varies in severity, with some individuals experiencing mild, occasional lesions, while others suffer from severe, extensive disease[4]. Diagnosing HS can be challenging, as it often mimics other skin conditions. Diagnosis is primarily clinical, based on the characteristic appearance of nodules, abscesses, and sinus tracts[5]. However, histopathological examination may be necessary in atypical cases to confirm the diagnosis. Healthcare providers must differentiate HS from other skin conditions to provide appropriate treatment[6].

The management of HS is multifaceted and tailored to the severity of the disease. Conservative measures include lifestyle modifications, weight loss, and avoidance of exacerbating factors. Local wound care and antibiotic therapy can help control mild cases. For moderate to severe HS, immunomodulatory therapies, including biologics, may be prescribed[7]. Surgical interventions, such as drainage of abscesses and excision of affected areas, are often required for advanced cases[8]. The prognosis of HS varies widely. Mild cases can be managed effectively, but severe HS can lead to chronic pain, recurrent infections, and extensive scarring. Additionally, HS is associated with comorbid conditions, including metabolic syndrome and inflammatory bowel disease, which can further impact long-term health[9]. HS complications include cellulitis, sepsis, and the development of extensive sinus tracts, leading to a decreased quality of life. Psychosocial complications are also prevalent, with patients often experiencing depression, anxiety, and impaired self-esteem due to the disfiguring nature of the disease[10].

Hidradenitis Suppurativa is a globally recognized condition, though the prevalence varies among different populations. Worldwide, it is estimated to affect approx-

imately 0.03–4% of the population[10-13]. However, epidemiological data specific to Saudi Arabia is limited. Research studies focusing on the prevalence, incidence, and risk factors of HS within the Kingdom of Saudi Arabia are essential to better understand the impact of this condition on the local population. This research paper aimed to address this knowledge gap by conducting a cross-sectional study to explore the knowledge, attitudes, and perceptions of Hidradenitis Suppurativa among the general population of Saudi Arabia. By shedding light on the disease, its impact, and the awareness of HS, this study will contribute to improved patient care, early diagnosis, and targeted public health efforts within the region.

Methods and materials:

This cross-sectional, observational study was conducted from October 2023 to January 2024 to assess the self-reported prevalence, knowledge, attitudes, and perceptions of Hidradenitis Suppurativa (HS) in the Saudi population. The study was approved by the Biomedical Research Ethics Committee at Umm Al-Qura University, Saudi Arabia (IRB no. HAPO-02-K-012-2023-11-1902). Completion of the questionnaire was considered as consent from the participants to take part in the study. Confidentiality was maintained by not including any names or identifiable data that could expose the participants' identities. Participants included Saudi adults aged 18 years and older who completed the questionnaire. Non-consenting individuals, and incomplete responses were excluded. Using Raosoft's sample size calculator, a minimum of 385 participants was determined with a 5% margin of error and 95% confidence level, based on Saudi Arabia's population of 13,382,962.

A pre-validated questionnaire, adapted from prior research with permission, was administered via Google Forms and distributed through social media platforms (Facebook, Twitter, Instagram, and WhatsApp). Convenient sampling was employed, with data collectors assigned to Saudi Arabia's five regions to ensure diverse participation. The study employed a structured online survey to gather data efficiently and comprehensively from the target population.

Questionnaire:

The questionnaire used for this study was a pre-validated tool derived from a previous study1, obtained with the permission of the original researchers, and modified for the current study. It consisted of four sections:

1. Section 1: 13 items on participants'

sociodemographic characteristics and general information.

2. Section 2: 19 items on HS knowledge.
3. Section 3: 16 items on attitudes and perceptions of HS.
4. Section 4: 10 items on the prevalence of HS.

Assessment of Knowledge and Attitude Toward HS:

Participants' knowledge of hidradenitis suppurativa (HS) was assessed using 16 "yes" or "no" questions. Section 2 is divided into diagnosis history, general knowledge, symptoms, and treatment of HS. Section 3 includes questions about economics and work, interpersonal, social history, and psychological/mental history. Correct answers scored 1, and incorrect answers scored 0, with total scores categorized as poor knowledge (0–10) or good knowledge (11–16). Attitudes were evaluated using 16 items measured on a Likert scale, simplified into three categories: "agree," "neutral," and "disagree," scored as +1, 0, and -1, respectively. A mean attitude score was calculated, with a score >8 indicating a favorable positive attitude. Data was entered through Excel version 16.0.6742.2048 and analyzed using SPSS. Knowledge and attitude scores were analyzed and compared across participants' personal characteristics to identify trends and differences in HS awareness.

Statistical Analysis:

Data were analyzed using SPSS version 22.0 (SPSS Inc., Chicago, IL). Categorical variables were summarized as frequencies, while continuous variables were expressed as means and standard deviations. Knowledge and attitudes toward hidradenitis suppurativa (HS) and its prevalence were assessed and tabulated. Chi-square tests were used to compare good knowledge and prevalence of favorable attitudes (mean score > 8) among participants based on self-reported HS, HS-related symptoms, and demographic characteristics. Mean attitude scores were analyzed using t-tests and ANOVA, as appropriate. Statistical significance was set at $p \leq 0.05$. This analysis aimed to identify patterns and associations between participants' knowledge, attitudes, and characteristics, providing insights into HS awareness and its impact.

Result:

The study involved 597 subjects, primarily aged 18-25 (63.8%), with 71.9% female and 97.7% Saudi nationals. The Western region had the highest representation (33.0%), while the Northern region had the lowest (8.0%). Most participants had university-level education (80.9%), and 81.6%

had never smoked, while 40.4% engaged in physical exercise. Regarding BMI, 60.3% were normal weight, 24.3% were overweight, and 15.4% were obese. Most subjects reported no diseases (84.4%), though some had conditions like diabetes (2.2%), hypertension (5.5%), and hypercholesterolemia (4.4%). The prevalence of self-reported hidradenitis suppurativa (HS) was 6.5% (Table 1).

Table 1: Characteristics of the studied subjects.

Characteristics*	n= 597
Age in years	
18-25	381 (63.8)
26-35	123 (20.7)
36-45	51 (8.5)
45+	42 (7.0)
Sex	
Male	168 (28.1)
Female	429 (71.9)
Nationality	
Saudi	583 (97.7)
Non-Saudi	14 (2.3)
Saudi region	
Central	96 (16.1)
Southern	161 (27.0)
Western	197 (33.0)
Eastern	95 (15.9)
Northern	48 (8.0)
Educational level	
Elementary and intermediate	27 (4.5)
Secondary	87 (14.6)
University	483 (80.9)
Physical exercise	
No	356 (59.6)
Yes	241 (40.4)
Smoking	
Never	487 (81.6)
Current	76 (12.7)
Ex-smokers	34 (5.7)
Body mass index (kg/m²)	
Normal (< 25)	360 (60.3)
Overweight (>25.1 < 29.9)	145 (24.3)
Obese (> 30)	92 (15.4)
Diseases	
No	504 (84.4)
Diabetes mellitus	13 (2.2)
Hypertension	33 (5.5)
Hypercholesterolemia	26 (4.4)
Others**	21 (3.5)
Self-reported HS	
Yes	39 (6.5)
No	558 (93.6)

*Data are presented by n (%), **Others include psoriasis (n= 11), inflammatory bowel diseases (n= 3), and inflammatory arthritis (n= 7)

Table 2 highlights the frequency distribution of knowledge about hidradenitis suppurativa (HS) among the subjects. While most participants correctly identified that HS is not an infectious disease (94.3%) and recognized the higher risk for those with a family history (94.8%), there were misconceptions regarding poor hygiene (20.4%) and aging (10.6%) as causes. Many acknowledged that alcohol (33.0%), stress (34.7%), and smoking (40.5%) can worsen symptoms. Half recognized common symptoms (47.6%), but fewer were aware of their occurrence on the face (25.5%) or other body areas (40.7%). While

many believed HS can be treated (45.7%), there was uncertainty about the appropriate healthcare provider, with some thinking they could self-treat (45.7%) or that HS resolves without treatment (34.4%).

Table 2: Frequency distribution of knowledge about HS among the studied subjects.

Knowledge items	Yes	No
	(%) n	(%) n
HS is an infectious disease	(5.7) 34	(94.3) 563
Those with a family history of HS are at higher risk of developing HS	(94.8) 566	(5.2) 31
HS is caused by poor hygiene and cleanliness	(20.4) 122	(79.6) 475
HS is associated with obesity	(31.7) 189	(68.3) 408
HS is caused by aging	(10.6) 63	(89.4) 534
Alcohol worsens the symptoms of HS	(33.0) 197	(67.0) 400
Stress worsens the symptoms of HS	(34.7) 207	(65.3) 390
Smoking worsens the symptoms of HS	(40.5) 242	(59.5) 355
HS causes any of the following symptoms: Pimples; Blackheads; Scars; Bumps; Boils (painful pus-filled bumps); and Sores (clustered, small, fluid-filled blisters)	(47.6) 284	(52.4) 313
HS causes any of these symptoms (pimples, blackheads, scars, sores, bumps, boils) on the face	(25.5) 152	(74.5) 445
HS causes any of the above symptoms (pimples, blackheads, scars, sores, bumps, boils) on any of the following areas of the body: Armpits; Groin and inner thighs; Genitals (i.e. Penis, Testicles, Vagina); Buttocks; Abdomen; and/or Breasts	(40.7) 243	(59.3) 354
HS is a disease that can be cured	(45.7) 273	(54.3) 324
HS must be treated by a dermatologist	(50.1) 299	(49.9) 298
HS must be treated by a family doctor	(12.4) 74	(87.6) 523
I can treat HS by myself	(45.7) 273	(54.3) 324
HS does not require treatment and will resolve on its own with time	(34.4) 259	(65.6) 338

Table 3 presents a comparison of good knowledge about hidradenitis suppurativa (HS) among the studied subjects based on their characteristics.

Table 3: Comparison of good knowledge among the studied subjects by their characteristics.

Characteristics	Good knowledge (n= 223)	Poor knowledge (n= 374)	p- value
Age in years			
18-25	145 (65)	236 (63.1)	0.648
26-35	48 (21.5)	75 (20.1)	
36-45	15 (6.7)	36 (9.6)	
45+	15 (6.7)	27 (7.2)	
Sex			
Male	47 (21.1)	121 (32.4)	0.003*
Female	176 (78.9)	253 (67.6)	
Nationality			
Saudi	215 (96.4)	368 (98.4)	0.121
Non-Saudi	8 (3.6)	6 (1.6)	
Saudi region			
Central	31 (13.9)	65 (17.4)	0.002*
Southern	74 (33.2)	87 (23.3)	
Western	76 (34.1)	121 (32.4)	
Eastern	35 (15.7)	60 (16)	
Northern	7 (3.1)	41 (11)	
Educational level			
Elementary and intermediate	5 (2.2)	22 (5.9)	0.101
Secondary	31 (13.9)	56 (15)	
University and higher	188 (83.9)	295 (79.1)	
Physical exercise			
No	139 (62.3)	217 (58)	0.3
Yes	84 (37.7)	157 (42)	
Smoking			
Never	196 (87.9)	291 (77.8)	0.009*
Current	18 (8.1)	58 (15.5)	
Ex-smokers	9 (4)	25 (6.7)	
Body mass index (kg/m^2)			
Normal (< 25)	133 (59.6)	227 (60.1)	0.927
Overweight (>25.1 < 29.9)	54 (24.2)	91 (24.3)	
Obese (> 30)	36 (16.1)	56 (15)	
Diseases			
No	195 (87.4)	309 (82.6)	0.513
Diabetes mellitus	4 (1.8)	9 (2.4)	
Hypertension	9 (4)	24 (6.4)	
Hypercholesterolemia	7 (3.1)	19 (5.1)	
Others**	8 (3.6)	13 (3.5)	

Subjects with HS			
Yes	26 (11.7)	13 (3.5)	<.0001*
No	197 (88.3)	361 (96.5)	

*Significant, **Others include psoriasis (n= 11), inflammatory bowel diseases (n= 3), and inflammatory arthritis (n= 7)

The results show that good knowledge about HS was significantly higher among female participants, those from the Western region, never smokers, and those with self-reported HS ($p < 0.05$). Additionally, participants who experienced any HS symptoms such as pimples, blackheads, scars, bumps, boils, and/or sores, demonstrated significantly higher levels of good knowledge (data not shown). A comparison of mean attitude scores based on subjects' characteristics revealed no significant differences in age, nationality, education level, physical exercise habits, BMI, or the presence of other diseases. However, significant differences were observed between genders, with females (5.1 ± 5.7) and non-smokers (4.9 ± 5.7) scoring higher than males and smokers, respectively. The Western region had the highest significant mean score (5.8 ± 5.3) (data not shown). Figure 1 shows that the most common source of information about HS among the studied participants was the Internet (64.2%), followed by doctors and healthcare workers, who accounted for 15.2%.

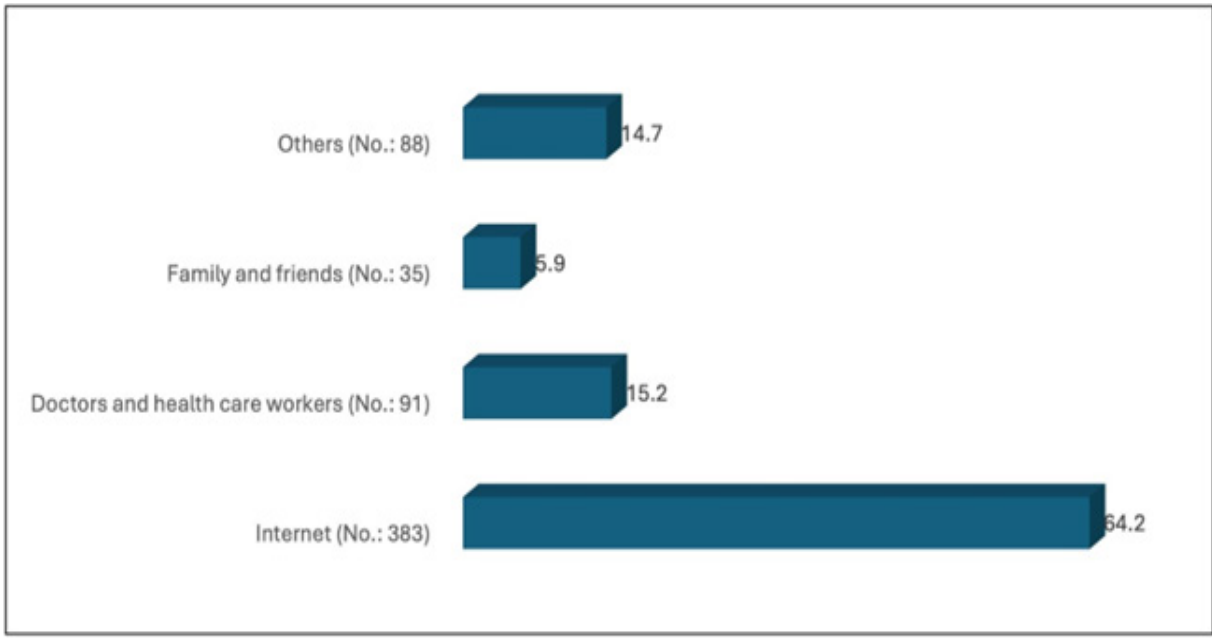


Figure 1:Percentage distribution of HS information sources among the studied 597 subjects.

Figure 2 illustrates that 13.4% of participants knew someone with HS, and of these, 48.7% reported that the patient was a family member or relative.

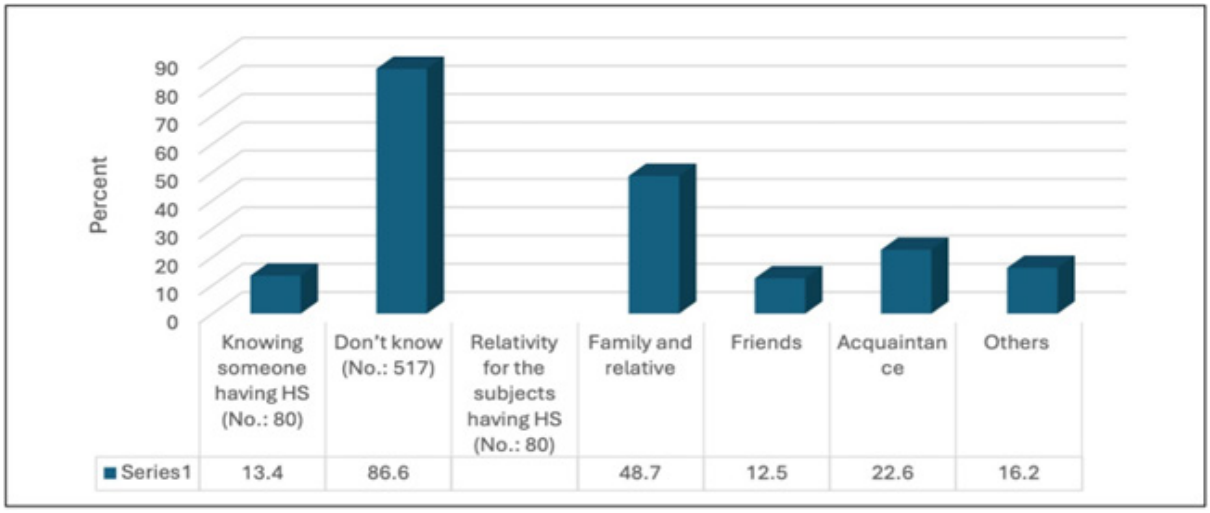


Figure 2: Percentage distribution of knowing someone having HS and its relativity for the subjects having HS.

Table 4 shows that the prevalence of good knowledge about HS was significantly higher among participants who received information from healthcare professionals ($p < 0.05$). Additionally, good knowledge was significantly more common among participants who knew someone with HS, particularly if the individual was a family member ($p < 0.05$). Regarding participants' attitudes toward the disease, a more favorable attitude was significantly observed among those who had a family member with HS ($p < 0.05$).

Table 4: Prevalence of good knowledge and favorable attitude among the studied subjects by source of information and knowing someone having HS.

Subjects with HS	Knowledge		p-value	Attitude		p-value
	Good	Poor		Favorable	Unfavorable	
	n (%)	n (%)		n (%)	n (%)	
Source of information						
Internet (n= 88)	40 (17.9)	48 (12.8)	<.0001*	37 (18)	51 (13)	0.163
Family and friends (n= 35)	14 (6.3)	21 (5.6)		15 (7.3	20 (5.1)	
Health care professionals (n= 91)	71 (31.8)	20 (5.3)		33 (16.1)	58 (14.8)	
Others (383)	98 (43.9)	285 (76.2)		120 (58.5)	263 (67.1)	
Knowing someone having HS						
Yes	56 (25.1)	24 (6.4)	<.0001*	32 (15.6)	48 (12.2)	0.252
No	167 (74.9)	350 (93.6)		173 (84.4)	344 (87.8)	
Relativity for the subjects having HS						
Family member (n= 45)	25 (11.2)	14 (3.7)	<.0001*	18 (8.8)	21 (5.4)	0.02*
Friends (n= 13)	9 (4)	1 (0.3)		3 (1.5)	7 (1.8)	
Acquaintance (n= 34)	14 (6.3)	4 (1.1)		6 (2.9)	12 (3.1)	
Others	8 (3.6)	5 (1.4)		5 (2.5)	8 (2)	
*Significant						

Discussion:

This study aimed to address knowledge, attitudes, and perceptions of Hidradenitis Suppurativa among the general population of Saudi Arabia. The results of this study showed that participants had a strong understanding that family history is a risk factor for HS and that the condition is not contagious. A third of patients had a favourable family history, according to studies. These findings lend credence to the idea that some HS patients have a hereditary component, namely to mutations in the g-secretase genes that are in charge of epidermal differentiation and proliferation[14-15]. Nonetheless, among the studied 597 subjects, 10.6% of them incorrectly believed that aging was a cause of HS, and 20.4% of them wrongly thought that poor hygiene and cleanliness contributed to HS.

This discrepancy is thought to be caused by false beliefs that HS is communicable or the result of poor cleanliness[16]. These false beliefs may cause people to steer clear of HS patients. On the other hand, people who are aware of the pathophysiology of HS and have heard of it may be more receptive to social contacts and interpersonal interactions with HS patients, which could result in higher attitude and perception scores[17]. Regarding participant attitude, 93.8 percent of participants in this study said they would consult a doctor if they thought they might have HS. A variety of views were also seen regarding HS, including differing degrees of stigmatization, social acceptability, and awareness of the condition's psychological effects.

According to a prior study, the majority of HS patients (84.9%) saw a dermatologist, followed by a general surgeon (78; 37.8%), an internist (47; 22.8%), a gynecologist (25; 12.1%), and an infectious disease specialist (18.7%) (17). According to a different study, one-third of the patients sought the opinion of five physicians before receiving a conclusive diagnosis[18].

According to the current study, 6.5% of participants self-reported having HS, and the most prevalent symptoms associated with HS were boils (15.4%), blisters (11.4%), bumps (12.7%), blackheads (12.2%), and pimples (19.4%). Numerous studies have indicated that misdiagnosis or underdiagnosis may be the reason for a larger prevalence than previously believed (2). From 2016 to 2020, a retrospective study was carried out at King Abdulaziz Medical City in Riyadh, Saudi Arabia. The axilla was the most often affected area, followed by the inguinal area, according to the study, which indicated that the prevalence of HS was 1.29% (2). The results of the current study showed that the partici-

pants' HS symptoms can appear in a variety of body parts, including the buttocks, belly, genitalia, inner thighs, armpits, and beneath the breast. It was discovered that the anterior region, especially the inguinal and mammary regions, was most frequently afflicted in females[19]. In contrast, the prevalent locations in males were the rear thighs, gluteal, and posterior inguinal[19]. The axilla was the most often affected site in both males and females in a prior Saudi study2; more males (68%) than females (43.7%) were affected, which is in line with a Turkish study[20].

In the current study, female participants showed significantly greater knowledge and a more positive attitude towards HS than male participants. According to a prior study, women significantly outperformed men in terms of social, economic, and work attitude perception scores[13]. This shows that while men have greater stigmatizing attitudes in social and professional environments, women stigmatize HS less than men do. Men scored lower on social attitude and perception in other attitude and perception studies on vitiligo and psoriasis[21-22]. Furthermore, females' higher perceptions of a lower quality of life may indicate that they are more sympathetic to the serious pain that dermatological disorders like HS can cause[22].

In the current study, participants with a university degree or above tended to know more about HS, but without a significant difference with other educational levels. Previous Saudi investigations have found a link between a higher educational level and better understanding of health-related concerns[23-24].

The majority of participants (78.0%) who learned about HS via medical experts also had the highest prevalence of good knowledge, followed by those who used the internet (45.5%). This order of information sources was also noted in an earlier Saudi survey, which revealed that the majority of people absolutely trusted doctors, with 87.6% of participants selecting them as their first information source. Additionally, despite the fact that doctors were highly regarded and favored, internet resources seemed to have an impact on Saudi people's medical knowledge[25].

In the current study, participants who knew someone having HS had significantly higher knowledge. At the same time higher good knowledge and favourable attitude towards the disease was significantly higher among participants who had a family member with HS. A prior study found that people with prior knowledge of HS had far higher interpersonal and social attitude-and-perception ratings than people

without prior knowledge[13].

Socioeconomic factors, such as employment status and perceived medication affordability, were also associated with relapse. Unemployment and financial strain emerged as significant risk factors, emphasizing the need for targeted interventions to address socioeconomic disparities in access to mental healthcare. Overall, the findings of this study underscore the complex interplay between economic factors, social support, and treatment outcomes in the management of schizophrenia spectrum disorders. Participants who perceived medications as unaffordable were more likely to skip doses, which led to poor adherence and an increased risk of relapse. This highlights the critical need for strategies aimed at addressing these barriers to improve patient outcomes and reduce relapse rates.

Limitations:

This study has several limitations. The use of a self-administered online questionnaire introduces potential reporting bias and may exclude individuals unfamiliar with the technology. Dermatologists did not confirm the presence or absence of HS lesions in participants, and some withdrew due to potentially disturbing images, potentially affecting results. Future research using in-person interviews is recommended to assess HS knowledge and perceptions more accurately. Additionally, the study highlights the underdiagnosis of HS and calls for further investigation into barriers delaying recognition and diagnosis. Despite these limitations, the findings provide a foundation for raising HS awareness among society, patients, and healthcare professionals, fostering acceptance and improved attitudes toward affected individuals.

Conclusion:

This study revealed key insights into HS awareness in Saudi Arabia. Females, individuals from the Western region, those with higher education, and non-smokers demonstrated greater knowledge and positive attitudes toward HS. Personal experience with HS symptoms, healthcare professional guidance, and social connections also correlated with better awareness. These findings highlight the need for targeted educational campaigns, healthcare provider involvement, and community-based initiatives to address disparities and enhance HS knowledge and attitudes across the population.

Declarations:

Ethics approval and consent to participate:

The study was approved by the

Biomedical Research Ethics Committee at Umm Al-Qura University, Saudi Arabia (IRB number: HAPO-02-K-012-2023-11-1902). Completion of the questionnaire was considered as consent from the participants to take part in the study.

Informed consent:

Informed consent is not required in this study.

Availability of data and material:

The datasets generated during and/or analyzed during the current study are available from the corresponding author [MA] on reasonable request.

Conflict of interests:

The authors have no relevant conflict of interest to disclose.

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