

Awareness Among 5th – 6th Year Medical Students Towards Referring to Appropriate Specialist, A Dermatologist or A Pediatrician, When Dealing with Common Pediatric Skin Diseases

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Abstract

Background

Pediatric skin diseases can range from mild to severe, requiring appropriate referral to specialists for accurate diagnosis and treatment. The level of awareness among medical students about when to refer pediatric patients to dermatologists or pediatricians can significantly impact patient outcomes.

Aim

This study aims to evaluate the awareness of 5th and 6th-year medical students at Thamar University regarding the appropriate referral to either a dermatologist or pediatrician when managing common pediatric skin diseases.

Materials and Methods

A cross-sectional study was conducted among 250 medical students at Thamar University in the 5th and 6th academic years. Data collection involved a structured questionnaire assessing students' knowledge of pediatric skin diseases, factors to consider when referring, and complications associated with various conditions.

Results

A majority (70.8%) of respondents were not very familiar with skin diseases in children, indicating a gap in general knowledge. However, 92.0% supported referring children with skin diseases to a dermatologist, and 86.0% had a basic understanding of the signs and symptoms. High awareness of complications was observed, with 81.2% recognizing associated risks. The scoring system categorized the knowledge level as "Good," with 70-100% correct answers, indicating that most respondents were well-informed.

Conclusion

Most medical students at Thamar University exhibit a "Good" level of knowledge regarding common pediatric skin diseases

and their complications. However, certain areas require further education, particularly in recognizing when dermatological referrals are needed.

Keywords: Dermatology, Referral Practices, Pediatricians

1. Introduction

Dermatology knowledge among non-dermatologists is often perceived as lacking [1,2]. Patients admitted to units outside of dermatology frequently present with multiple skin lesions alongside their primary systemic condition [2,3]. These dermatological issues can contribute significantly to morbidity and, in some cases, mortality [4]. Such dermatological conditions may be discovered incidentally during examination or may arise during the hospital stay, such as the development of adverse cutaneous drug reactions [5]. Inpatients with dermatological conditions often necessitate specialized dermatology consultation. Collaborative referrals between departments not only enhance patient care but also enhance the diagnostic skills and clinical knowledge of the referring clinician [5,6]. The incidence of pediatric dermatological problems varies from one part of the world to another [7]. Skin diseases, though very common in many developing countries, are not often regarded as a significant health problem even when serious diseases may be heralded by skin changes [4,8,9]. Studies carried out among children have indicated that the infective disorders mainly pyoderma and scabies are major causes for visit to primary health care facility in developing countries [10]. Prevalence studies from the community dermatology clinics general outpatient clinics and primary health centers have indicated some differences in the types of diseases found in the different settings. Furthermore, raising awareness about these dermatological disorders among healthcare providers, parents, and caregivers is important for early recognition and timely intervention [11-15]. This can help prevent complications and improve the overall well-being of the affected children [2,5]. In this study, our objective is to examine the awareness of dermatological disorders in children referred from the pediatrics department. We aim to identify the types of skin conditions commonly encountered, assess the level of knowledge among general practice doctors, and evaluate the impact of early dermatological intervention on outcomes for these children. By addressing these points, we aim to contribute to the enhancement of pediatric dermatological care, thereby improving the quality of life for children affected by skin disorders.

1.1. Study Objective

To evaluate the awareness of 5th and 6th-year medical students at Thamar University, Dhamar Governorate, Yemen, regarding the appropriate referral to either a dermatologist or a pediatrician when managing common pediatric skin diseases.

2. Methods

2.1. Study Area

This study was carried out at Thamar University located in Dhamar city, Dhamar governorate (15°40'N 43°56'E) is located at the central area of the western highland's region of Yemen 1600–3200 meters above sea level.

2.2. Study Design

It is a cross-sectional study.

2.3. Study Population

The research focused on 5th and 6th medical students enrolled in the Faculty of Medicine for the academic year 2023- 2024. 250 students were enrolled during the study period.

3. Data Collection

A structured questionnaire with close-ended questions was developed after reviewing relevant literature, comprising the following sections: Part (1): Socio-demographic characteristics, including age, gender, and academic year. Part (2): Assessment of students' knowledge regarding the referral of pediatric skin disease cases to either a dermatologist or a pediatrician. This section covered aspects such as the identification of common pediatric skin diseases, the importance of referral for skin lesions, recognition of signs, symptoms, and complications of lesions, counseling patients with skin lesions, and opinions on visiting a dermatologist or pediatrician or both for specific conditions like Chickenpox, Herpes zoster, Measles, Herpes simplex, Wart, Molluscum contagiosum, Scarlet fever, etc. Students' knowledge levels were scored, with correct answers receiving one point and incorrect or unknown responses receiving zero. Knowledge was categorized as Poor (up to less than 70%) and Good (70-100%). Part (3): Evaluation of students' knowledge regarding factors to consider when deciding to refer a child with a skin lesion, as well as multiple-choice questions about complications associated with various pediatric skin diseases. Students' knowledge levels were scored similarly to Part 2, categorized as Poor (less than 50%), Average (50% to less than 70%), and Good (70% -100%). Part (4): Exploration of students' attitudes toward counseling and referral, including whether to refer to a dermatologist, a pediatrician, or both in specific cases related to children with skin lesions.

4. Results

A total of 250 questionnaires were distributed among medical students in the 5th and 6th academic years, achieving a response rate of 100%. average age of the participants is 24.33 years, with a standard deviation of 2.84 years, indicating a relatively young sample. The gender distribution reveals that the majority of participants are male, accounting for 66.8%, while females make up 33.2%. Regarding academic year, most participants are in their 5th year, comprising 55.6% of the sample, while 44.4% are in their 6th year. Finally, the marital status shows that a significant portion of the participants are single, with 82.0% identifying as such, while 18.0% are married.

	Frequency	Percent
Age		
Mean(\pm SD)	24.33 \pm 2.84	
Sex		
Male	167	66.8%
Female	83	33.2%
Academic year		
6	111	44.4%
5	139	55.6%
Marital status		
Single	205	82.0%
Married	45	18.0%

Table 1: The Socio-Demographic Characteristics of Study Participants

A survey of participants' familiarity with and approaches to dealing with skin diseases in children, revealing a mix of knowledge levels and practices. A majority (70.8%) of respondents are not very familiar with skin diseases in children, with only 5.6% demonstrating partial accuracy in their responses, suggesting a notable gap in general knowledge. Despite this, the importance of referring children with skin diseases to a dermatologist is widely recognized, with 92.0% supporting this approach, indicating an awareness of the need for specialized care. The majority of participants (86.0%) have a basic understanding of the signs and symptoms of skin diseases, yet 14.0% lack this awareness, which could impact early detection and intervention. Similarly, while most participants (81.2%) understand the complications associated with skin diseases, 18.8% do not, potentially affecting their perception of the disease's severity. When asked about the preferred source for counseling in case of skin disease in children, 74.8% favored a combined approach with both dermatologists

and pediatricians, whereas 19.6% relied solely on dermatologists. This indicates a trend towards involving multiple specialists in care, though some still prefer a single-source approach. An overwhelming majority (98.0%) understand that skin diseases can lead to systemic conditions, and similarly, 97.6% believe systemic diseases can result in skin issues, indicating high awareness of these interconnections. The frequency of encountering children with skin lesions is also high, with 92.4% of respondents reporting such cases. Among those, 58.0% opted for dermatologist visits, while a smaller proportion (21.6%) chose both dermatologists and pediatricians, suggesting that while specialized care is the primary choice, some opt for a more comprehensive approach. Overall, these results suggest a general awareness of the importance of dermatology in pediatric care but highlight the need for improved education to bridge knowledge gaps and ensure appropriate management of skin diseases in children.

Variables	Frequency	Percent
General knowledge about skin disease in children		
Very familiar	58	23.2%
No very familiar	177	70.8%
Somewhat familiar [correct answer (CA)]	14	5.6%
Not familiar at all	1	0.4%
Importance of referring children with skin disease to a dermatologist		
Yes	230	92.0%
No	20	8.0%
Knowledge about signs and symptoms of skin disease		
Yes	215	86.0%
No	35	14.0%
Knowledge about complications associated with skin disease in children		
Yes	203	81.2%
No	47	18.8%
Counseling physician in case of skin disease		
Dermatologist (CA)	49	19.6%

Pediatrics	14	5.6%
Both	187	74.8%
There are skin diseases that can lead to systemic diseases		
Yes	245	98.0%
No	1	0.4%
I don't know	4	1.6%
There are systemic diseases can lead to skin diseases		
Yes	244	97.6%
No	3	1.2%
I don't know	3	1.2%
Encountered a child suffering from a skin lesion		
Yes	231	92.4%
Visit of dermatologist (CA)	145	58.0%
Visit of pediatrics	22	8.8%
Both	54	21.6%
Depend on primary diagnosis for case	10	4.0%
No	19	7.6%

Table 2: Frequency of Knowledge and Attitudes of The Study Subjects About Skin Disease

Table 3 illustrates participants' preferred healthcare providers for various skin conditions. The majority of respondents often opt for dermatologists, but in some cases, a mix of healthcare providers is preferred, indicating that certain skin conditions might benefit from a broader range of expertise. For conditions such as chickenpox and scarlet fever, a relatively balanced approach is observed, with 44.0% opting for dermatologists, 26.0% for pediatricians, and 28.8% choosing both. However, conditions like herpes zoster and herpes simplex lean heavily toward dermatologists, with 63.2% and 65.2% of respondents opting for dermatologists, respectively. This trend continues for other skin conditions like warts (88.8%), molluscum contagiosum (80.4%), and impetigo (72.0%), indicating a significant preference for dermatology when dealing with these cases.

For some diseases, a more diverse choice is seen. For staphylococcal scalded skin syndrome, participants tend to use both dermatologists

and pediatricians (26.8%), showing a mix of expertise. Similarly, leishmaniasis has 28.4% opting for both providers, indicating a complex nature requiring different types of care. Other notable findings include a significant proportion of respondents choosing dermatologists for conditions like scabies (90.0%), tinea capitis (87.2%), and tinea corporis (89.6%), highlighting a strong reliance on specialized care for these ailments. Conditions like psoriasis and vitiligo also show a preference for dermatologists, with 84.0% and 88.0% choosing this specialist, respectively, indicating an understanding of the need for specialized treatment.

Overall, the table 4.2 reflects a pattern where dermatologists are the preferred choice for many skin conditions, with some diseases requiring a broader spectrum of healthcare providers. This variability suggests a recognition of the complexities of skin diseases and the need for appropriate referrals for comprehensive care.

	Visit of dermatologist		Visit of Pediatrician		Both		Others	
	No.	%	No.	%	No.	%	No.	%
Chickenpox	110	44.0%	65	26.0%	72	28.8%	3	1.2%
Herps zoster	158	63.2%	34	13.6%	53	21.2%	5	2.0%
Measles	28	11.2%	156	62.4%	62	24.8%	4	1.6%
Herpes simplex	163	65.2%	36	14.4%	42	16.8%	9	3.6%
Wart	222	88.8%	4	1.6%	17	6.8%	7	2.8%
Molluscum contagiosum	201	80.4%	23	9.2%	21	8.4%	5	2.0%
Scarlet fever	56	22.4%	138	55.2%	49	19.6%	7	2.8%
Impetigo	180	72.0%	29	11.6%	35	14.0%	6	2.4%
Staphylococcal Scalded skin syndrome	146	58.4%	34	13.6%	67	26.8%	3	1.2%
Canadidiasis	186	74.4%	20	8.0%	42	16.8%	2	0.8%

Tinea capitis	218	87.2%	9	3.6%	20	8.0%	3	1.2%
Tinea corporis	224	89.6%	5	2.0%	17	6.8%	4	1.6%
Scabies	225	90.0%	3	1.2%	19	7.6%	3	1.2%
Leishmaniasis	166	66.4%	13	5.2%	71	28.4%	0	0.0%
Pediculosis	206	82.4%	8	3.2%	32	12.8%	4	1.6%
Urticaria	208	83.2%	7	2.8%	32	12.8%	3	1.2%
Diaper dermatitis	194	77.6%	14	5.6%	40	16.0%	2	0.8%
Seborrheic dermatitis	214	85.6%	6	2.4%	25	10.0%	5	2.0%
Atopic dermatitis	214	85.6%	7	2.8%	26	10.4%	3	1.2%
Contact dermatitis	220	88.0%	3	1.2%	24	9.6%	3	1.2%
Vitiligo	220	88.0%	1	0.4%	24	9.6%	5	2.0%
Albinism	196	78.4%	7	2.8%	41	16.4%	6	2.4%
Alopecia areata	214	85.6%	8	3.2%	22	8.8%	6	2.4%
Bullous diseases	197	78.8%	5	2.0%	43	17.2%	5	2.0%
Skin cancers	163	65.2%	10	4.0%	58	23.2%	19	7.6%
Psoriasis	210	84.0%	3	1.2%	31	12.4%	6	2.4%
Lice outbreaks	216	86.4%	3	1.2%	23	9.2%	8	3.2%
Skin biopsy	191	76.4%	7	2.8%	37	14.8%	15	6.0%
Birth mark	167	66.8%	21	8.4%	47	18.8%	15	6.0%
Sun burns	206	82.4%	8	3.2%	27	10.8%	9	3.6%
Freckles	216	86.4%	8	3.2%	21	8.4%	5	2.0%
Porphyria cutaneatarda	178	71.2%	11	4.4%	56	22.4%	5	2.0%

Table 3: Frequency of Knowledge and Attitudes of The Study Subjects Regarding Various Skin Diseases and Conditions

Table: 3 illustrates a high level of awareness among participants regarding various skin diseases and conditions, with most diseases having near-universal recognition. Conditions such as measles, shingles, warts, and herpes simplex demonstrate almost complete knowledge, with 100% of respondents acknowledging they know measles and 99.2% recognizing shingles, warts, and herpes simplex. This broad awareness indicates that these diseases are well-known and perhaps frequently discussed or encountered in the population.

Other conditions like chickenpox, scarlet fever, and impetigo also have high recognition rates, with 98.4% of respondents indicating knowledge of these diseases. Similarly, diseases like scabies, cutaneous leishmaniasis, and pediculosis maintain a high level of awareness, with 98.8%, 98.4%, and 97.2% knowing these conditions, respectively. This trend suggests that even lesser-

known conditions have a high awareness rate, potentially reflecting effective health education and communication.

Some conditions show slightly lower awareness, with Staphylococcal scalded skin syndrome known to 96.8% of respondents and seborrheic dermatitis to 96.8%. However, these percentages still indicate a strong understanding of skin diseases among participants. Atopic dermatitis is slightly lower at 96.0%, and Albinism is recognized by 96.4%, showing slight gaps in knowledge for these conditions compared to others.

Overall, the table 4.3 reveals a well-informed group regarding common and even less-common skin diseases. This suggests that public health campaigns and education efforts may have been effective in spreading awareness, contributing to the generally high recognition rates across most skin conditions.

Variables	Yes		No	
	No.	%	No.	%
Know chickenpox	246	98.4%	4	1.6%
Know shingles disease	248	99.2%	2	0.8%
Know measles	250	100.0%	0	0.0%
Know wart	248	99.2%	2	0.8%
Know herpes simplex	248	99.2%	2	0.8%
Know scarlet fever	246	98.4%	4	1.6%
Know impetigo	248	99.2%	2	0.8%
Know Staphylococcal scalded skin syndrome	242	96.8%	8	3.2%
Know scabies	247	98.8%	3	1.2%
Know cutaneous leishmaniasis	246	98.4%	4	1.6%
Know Pediculosis	243	97.2%	7	2.8%
Know candidiasis	246	98.4%	4	1.6%
Know Tinea capitis	246	98.4%	4	1.6%
Know atopic dermatitis	260	96.0%	10	4.0%
Know Contact Dermatitis	245	98.0%	5	2.0%
Know seborrheic dermatitis	242	96.8%	8	3.2%
Know Albinism	241	96.4%	9	3.6%
Know urticaria	247	98.8%	3	1.2%

Table 4: Frequency of Knowledge of The Study Subjects Towards A Sample of Skin Disease

As displayed in table 4 in this study, with regard to the factors that healthcare professionals consider when deciding whether to refer a child with skin disease. The most commonly considered factor is the presence of systemic symptoms, with 68.8% of respondents indicating that this plays a crucial role in the decision-making process. This suggests that when skin diseases are associated with broader health concerns, referrals to specialists or additional testing are more likely.

The type of skin lesion is also a significant factor, with 41.6% of respondents considering it in their referral decisions. This suggests that certain lesion types may necessitate specialized knowledge or treatment approaches, guiding the referral process.

Another factor commonly taken into account is the presence of skin lesions all over the body, with 43.2% considering this as a

reason to refer. This reflects the potential severity and extent of the condition, which may require more specialized care.

Other notable considerations include the essential diagnosis (29.6%) and the color and duration of the skin lesion (30.8%). The essential diagnosis likely reflects the initial interpretation by healthcare providers, while the color and duration could indicate progression or specific characteristics that suggest further examination. A small percentage (2.4%) cited other factors as influencing their decision to refer, indicating there might be additional, less common considerations not covered by the primary categories. Overall, table 4.4 reflects a multifaceted approach to referral decisions for skin disease, with systemic symptoms and lesion characteristics playing a pivotal role in guiding healthcare professionals in their referral choices.

Factors should be considering from design making for referring of patients with pediatric with skin disease	Responses	
	No.	Percent
Type of skin lesion	104	41.6%
presence of systemic symptoms	172	68.8%
Presence of the skin lesion in all over the skin of body	108	43.2%
Your essential diagnosis	74	29.6%
color and duration of skin lesion	77	30.8%
Others	6	2.4%

Table 5: Positive Multiple Responses for The Factors That Should Be Considering from Design Making for Referring of Patients

As displayed in table 5 in this study, reflects the understanding of study subjects regarding potential complications associated with various skin diseases. A high percentage of respondents demonstrate knowledge across a range of skin conditions, indicating a comprehensive awareness of the potential complications that these diseases can cause.

For instance, a notable proportion of respondents associate chickenpox with bacterial superinfections (71.5%) and encephalitis (52.8%), demonstrating that they recognize the severe complications that can arise from this common childhood illness. Similarly, shingles is largely understood to lead to post-herpetic neuralgia (94.0%), indicating a strong awareness of its painful aftermath, along with encephalitis (46.4%) and cranial nerve palsy (38.3%), which are also significant risks.

The majority of participants are aware of measles complications, with pneumonia (83.6%), otitis media (67.2%), and subacute sclerosing panencephalitis (75.2%) as common outcomes. These high percentages suggest that respondents have a good understanding of the potentially severe repercussions of measles,

which reinforces the importance of vaccination and early treatment. Regarding warts, disfiguration (68.5%) and recurrence (55.6%) are recognized as significant complications, highlighting the long-term concerns associated with these benign skin growths. Furthermore, herpes simplex complications, like keratitis (64.8%), blindness (39.5%), and eczema hepatica (64.4%), indicate that respondents are aware of the serious risks tied to this viral infection.

Scarlet fever association with glomerulonephritis (79.3%) and cervical lymphadenitis (47.6%) suggests an understanding of the possible systemic effects of this condition. In contrast, impetigo superinfections (68.5%) and staphylococcal scalded skin syndrome (54.8%) indicate awareness of the potential secondary infections stemming from this bacterial skin condition.

Overall, the table 5 demonstrates that the study subjects have a broad and accurate understanding of the complications associated with various skin diseases. This awareness reflects a solid foundation of knowledge, suggesting that these individuals can make informed decisions about seeking medical attention when needed.

Variable Variable items (Complications)	Yes	
	Frequency	(%)
Chickenpox disease		
Shingle	152	61.8%
Bacterial superinfections	176	71.5%
Encephalitis	130	52.8%
No effect	5	2.0%
Bleeding	24	9.8%
Pneumonia	99	40.2%
Shingle		
Post herpetic neuralgia	233	94.0%
Encephalitis	115	46.4%
Vasculopathy	31	12.5%
Corneal ulcer	76	30.6%
Meningitis	90	36.3%
Cranial nerve palsy	95	38.3%
Others	10	4.0%
Measles		
Subacute sclerosing panencephalitis	188	75.2%
Otitis media	168	67.2%
Pneumonia	209	83.6%
Gastroenteritis	128	51.2%
Meningitis	130	52.0%
Others	27	10.8%
I don't know	4	1.6%
Wart		
Infection	79	31.9%
Disfiguration	170	68.5%
Recurrence	138	55.6%
Meningitis	13	5.2%
Squamous cell carcinoma	135	54.4%
No effect	2	0.8%
I don't know	10	4.0%

Herpes simplex		
Keratitis	151	64.8%
Blindness	92	39.5%
Eczema herpeticum	150	64.4%
Corneal scarring	90	38.6%
No effect	3	1.3%
I don't know	11	4.7%
Scarlet fever		
Glomerulonephritis	195	79.3%
Cervical lymphadenitis	117	47.6%
Otitis media	100	40.7%
No effect	3	1.2%
I don't know	18	7.3%
Impetigo		
Superinfection	170	68.5%
Post streptococcal glomerulonephritis	148	59.7%
Staphylococcal scalded skin syndrome	136	54.8%
Cellulitis	96	38.7%
No effect	1	0.4%
I don't know	7	2.8%
Staphylococcal scalded skin syndrome		
Shock	184	76.0%
Dehydration	142	58.7%
Septic arthritis	99	40.9%
Pneumonia	88	36.4%
Secondary infection	137	56.6%
Hypothermia	96	39.7%
No effect	1	0.4%
I don't know	11	4.5%
Scabies		
Lymphadenitis	93	37.7%
Scopophobia	107	43.3%
Urticaria	111	44.9%
Pyoderma	76	30.8%
Skin infection	164	66.4%
Scratching	190	76.9%
I don't know	5	2.0%
No effect	1	0.4%
Cutaneous leishmaniasis		
Superinfection	157	63.8%
Disfigurement of skin and mucous membranes	216	87.8%
I don't know	5	2.0%
No effect	2	0.8%
Pediculosis		
Lymphadenitis	110	45.3%
Folliculitis	161	66.3%
Impetigo	70	28.8%
I don't know	30	12.3%
No effect	7	2.9%
Candidiasis		
Endophthalmitis	63	25.6%
Superinfection	182	74.0%
Pneumonia	79	32.1%

Candidemia	106	43.1%
No effect	11	4.5%
I don't know	14	5.7%
Tenia capitis		
Alopecia	191	77.6%
Favus	178	72.4%
Kerion	185	75.2%
No effect	4	1.6%
I don't know	3	1.2%
Drugs eruptions		
Pemphigus	85	35.7%
Toxic epidermal necrolysis	156	65.5%
Stevens-Johnson syndrome	194	81.5%
Erythroderma	109	45.8%
I don't know	20	8.4%
No effect	3	1.3%
Atopic dermatitis		
Secondary impetigo	130	54.2%
Eczema herpeticum	145	60.4%
Dermatitis herpeticum.	121	50.4%
I don't know	27	11.3%
No effect	9	3.8%
Contact dermatitis		
Bacterial superinfection	190	77.6%
Secondary Candida infection	93	38.0%
No effect	16	6.5%
I don't know	18	7.3%
Seborrheic dermatitis		
Generalized erythroderma	105	43.4%
Secondary bacterial infection	165	68.2%
Conjunctivitis	95	39.3%
Dry eye	65	26.9%
No effect	1	0.4%
I don't know	24	9.9%
Albinism		
Increase risk of skin cancer	196	81.3%
Photosensitivity.	189	78.4%
No effect	1	0.4%
I don't know	8	3.3%
Urticaria		
Anaphylaxis	204	82.6%
Respiratory compromise	131	53.0%
No effect	6	2.4%
I don't know	18	7.3%

Table 6: Positive Multiple Responses for Knowledge of The Study Subjects Towards the Complications of Skin Disease

5. Conclusion

While respondents generally have a solid understanding of common skin diseases and their complications, there are areas that require further education. The majority recognize the importance of referring patients with systemic symptoms and other key indicators, suggesting a structured approach to patient care. High awareness of severe complications, such as bacterial

superinfections and encephalitis, indicates a strong understanding of potential risks. The scoring system categorizes the knowledge level as "Good," showing that most respondents are well-informed. However, the preference for dermatologists over pediatricians depending on condition. This is highlighting a need for continued guidance on treatment and referral practices.

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