

Original Research Article

Factors associated with the prevalence of diseases in the scalp: a prospective study in Mugdha Medical College and Hospital, Dhaka, Bangladesh

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ABSTRACT

Background: The scalp skin is distinct from other areas of the body due to its unique characteristics, including the density of hair follicles and the high rate of sebum production. So of creating a dark, warm, and moist environment and various types of diseases in the scalp are usually occur.

Methods: This was a prospective cross-sectional study conducted at the Department of Dermatology in Mugdha Medical College and Hospital during January, 2023 to June, 2023. A total of 60 clinically diagnosed scalp diseases patients were enrolled in this study. The collected data were analysed using Statistical Package for Social Sciences (SPSS) software, version-23.0. The ethical clearance of this study was obtained from the Institutional Review Board (IRB) of Mugdha Medical College and Hospital, Dhaka, Bangladesh.

Results: A total of 60 clinically diagnosed scalp diseased OPD patients aged 1 to 60 years were enrolled in this study. Among the patients, 30 (50%) were male and 30 (50%) were female. According to multinomial logistic regression, the major factors contributed to exposing the diseases on scalp were age, sex, educational level, occupation, socio-economic condition, family history and behaviour (OR>1 or OR<1).

Conclusions: This study prevailed, Age, sex, behaviour, family history, occupation, education level, socio-economic condition, hygiene, associated systemic diseases, hair grooming are the factors associated with the prevalence of diseases on the scalp of humans.

Keywords: Associated, Diseases, Factors, Scalp

INTRODUCTION

The scalp skin is distinct from other areas of the body due to its unique characteristics, including the density of hair follicles and the high rate of sebum production. Firstly, the scalp's follicular density is considerably higher, creating a dark, warm, and moist environment. While this provides thermal insulation, it also creates conditions favorable for parasitic infestation. Secondly, in adults,

there is a notable production of sebum, which, combined with desquamated epithelial cells, can serve as a food source for microorganisms. Lastly, the scalp is subject to brushing and contact with various styling implements, which can lead to friction injuries and potentially introduce microorganisms.^{1,2} These distinct features of the scalp render it susceptible to various conditions, such as superficial mycotic infections (such as dandruff, seborrheic dermatitis, and tinea capitis), parasitic infestations (such as pediculosis capitis), and

inflammatory conditions (such as psoriasis). These scalp disorders often exhibit overlapping clinical symptoms, including hyperkeratosis (scaling), pruritus, alopecia, and inflammatory signs (such as erythema and purulence). Scaling and pruritus are particularly common complaints among patients.³

Psoriasis is a common disease affecting approximately 2-3% of the population worldwide. Genetic and environmental factors are believed to play an etiological role in the disease. Environmental factors considered include stress, chronic skin trauma, infections, drugs, alcohol consumption and smoking. However, the role of each factor needs to be clarified.⁴ The worldwide prevalence of seborrheic dermatitis is around 5%, but the prevalence of its non-inflammatory variant, dandruff, is probably closer to 50%. SD affects all ethnic groups in all regions globally. The prevalence of SD is bimodal with a peak in the first three months of life and then from adrenarche to a second peak after the fourth decade. Risk factors for the development of seborrheic dermatitis include: age, male sex, increased sebaceous gland activity immunodeficiency, including: lymphoma, renal transplantation, HIV-AIDS, Neurological and psychiatric disease, including: parkinson disease, stroke, alzheimer, dementia, major, depression, autonomic, dysfunction, exposure to drug treatment, including: dopamine antagonists, immunosuppressants, psoralen/PUVA, low ambient humidity and/or low ambient temperature.^{5,6} Tinea capitis is a highly contagious fungi infection. The incidence of tinea capitis among children is greater in developing countries. This has been associated with some factors. For example: inadequacies of improved social, economic, healthcare and hygiene practices; this includes poor living conditions, children's interaction patterns, poor sanitation, housing congestion, limited water supply, and poor health-seeking behavior.⁷ *Pediculus humanus capitis*, is a common public health concern, especially in children. It is an obligate holometabolous ectoparasite that spends its complete life cycle in hair on a human head. Transmission occurs mainly by direct person-to-person contact or by instruments such as shared combs, pillows and hats. Climate, geography, ethnicity, and hygienic conditions play a role in spreading lice. Head lice are bloodsucking insects that can cause pruritus, excoriation, conjunctivitis, secondary bacterial infection.^{8,9} Alopecia is hair loss from the scalp. It is mainly classified into five main types: Alopecia Areata, Alopecia Totalis, Alopecia Universalis and Androgenetic Alopecia, Traction Alopecia. All these types of alopecia can be associated with psychiatric disorders, such as anxiety, depression, substance abuse, etc. The development of alopecia can be influenced by underlying diseases and health conditions, such as systemic diseases like systemic lupus erythematosus, rheumatoid arthritis, and thyroid diseases.^{10,11} Impetigo is the most common bacterial skin infection in children two to five years of age. There are two principal types: nonbullous (70% of cases) and bullous (30% of cases). Nonbullous impetigo, or impetigo contagiosa, is caused by *Staphylococcus aureus* or *Streptococcus pyogenes*.¹²

Osteoma is a benign slow growing osteogenic lesion, characterized by the proliferation of compact or cancellous bone, almost exclusively found in the head and neck region. It can be of central, peripheral or extra skeletal variety. Various concepts have been suggested for the aetiology of osteoma, but the exact factor still remains unclear.¹³ The aim of this paper was to determine the factors associated with the diseases on the scalp. This study also aimed to identify the patterns and prevalence of diseases in the scalp, to determine the association between various types of factors and the prevalence of diseases in the scalp and to compare the risk of the factors associated with the prevalence of diseases in the scalp.

METHODS

This was a prospective cross-sectional study conducted at the department of dermatology in Mugdha Medical College and Hospital during January, 2023 to June, 2023. Purposive sampling technique was used and a total of 60 clinically diagnosed scalp diseased patients were enrolled in this study. A pre structured questionnaire containing demographic and clinical history of the diseases in the scalp was used to collect the data of this study. The ethical clearance of this study was obtained from the Institutional Review Board (IRB) of Mugdha Medical College and Hospital, Dhaka, Bangladesh. The inclusion and exclusion criteria of this study were as follows.

Inclusion criteria

Patient with any age, clinically diagnosed diseases on scalp, willing to give written consent to participate in this study, and physically able to communicate with the researcher were included.

Exclusion criteria

Patient unwilling to participate in this study and severely ill and unable to communicate with the researcher were excluded.

Statistical analysis

The collected data were edited, coded and processed for computer data entry. The edited data were analysed using Statistical Package for Social Sciences (SPSS) software, version-23.0. Univariate analysis were performed to determine the association between dependent and independent variables and the results were presented in the tables and graph. Then, multinomial logistic regression tests were performed to determine the state of risk of the individual factor associated with the diseases in the scalp, where $P < 0.05$ considered as the level of significance with 95% CI. In multinomial logistic regression, likelihood ratio tests, model fitness and effect of the model were performed to test the significant effect on the basis of odd ratio of the individual factor on the individual diseases on the scalp. Unexpected and

indefinite value were excluded finally from the results table of the effect test.

RESULTS

Table 1 shows the prevalence of diseases on the scalp among the study patients. The most frequent of diseases 22 (36.67%) was observed in the age group (21-30). The male and female equal dominance was observed which includes 30 (50%). The frequent 48 (80%) diseases was

in urban population. The most frequent diseases 30 (50%) were observed in middle class family. 45 (75%) patients had negative family history. The most frequent 25 (41.66%) diseases was observed among the business men. The most frequent 26 (43.33%) diseases was observed in the patients having college level education. There was no statistical association was observed between baseline characteristics and the prevalence of diseases on the scalp (p>0.05), except education (p<0.05).

Table 1: Association of baseline characteristics with the prevalence of diseases on the scalp (n=60).

Variables	Psoriasis (%)	Seborrheic dermatitis (%)	Tinea capitis (%)	Pediculosis capitis (%)	Alopecia areata (%)	Alopecia totalis (%)	Alopecia Universalis (%)	Androgenetic alopecia (%)	Telogen Effluvium (%)	Impetigo contagiosa (%)	Osteoma of scalp (%)	Total (%)	P value
Age (in yrs)													
<20	2 (3.33)	4 (6.67)	4 (6.67)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.33)	1 (1.67)	1 (1.67)	16 (26.67)	0.586
21-30	0 (0)	10 (16.67)	1 (1.67)	1 (1.67)	3 (5)	0 (0)	0 (0)	5 (8.33)	2 (3.33)	0 (0)	0 (0)	22 (36.67)	
31-40	2 (3.33)	6 (10)	0 (0)	1 (1.67)	0 (0)	0 (0)	1 (1.67)	2 (3.33)	0 (0)	1 (1.67)	0 (0)	12 (20)	
41-50	1 (1.67)	3 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (6.67)	
51-60	0 (0)	3 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.67)	0 (0)	0 (0)	4 (6.67)	
>60	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.33)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Sex													
Male	2 (3.33)	18 (30)	1 (1.67)	1 (1.67)	2 (3.33)	0 (0)	1 (1.67)	5 (8.33)	0(0)	1 (1.67)	0 (0)	30 (50)	0.126
Female	3 (5)	9 (15)	4 (6.67)	2 (3.33)	1 (1.67)	1 (1.67)	0 (0)	2 (3.33)	5 (8.33)	1 (1.67)	1 (1.67)	30 (50)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Residence													
Urban	4 (6.67)	24 (40)	4 (6.67)	2 (3.33)	1 (1.67)	0 (0)	0 (0)	7 (11.67)	3 (5)	1 (1.67)	1 (1.67)	48 (80)	0.472
Rural	1 (1.67)	3 (5)	1 (1.67)	1 (1.67)	2 (3.33)	1 (1.67)	1 (1.67)	0 (0)	22 (3.33)	1 (1.67)	0 (0)	12 (20)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
SEL													
Upper	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.67)	1 (1.67)	0 (0)	0 (0)	2 (3.33)	0.286
Middle	2 (3.33)	15 (25)	2 (3.33)	1 (1.67)	2 (3.33)	0 (0)	0 (0)	4 (6.67)	3 (5)	1 (1.67)	0 (0)	30 (50)	
Lower	3 (5)	12 (20)	3 (5)	2 (3.33)	1 (1.67)	1 (1.67)	1 (1.67)	2 (3.33)	1(1.67)	1 (1.67)	1 (1.67)	28 (46.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Family history													
Positive	0 (0)	5 (8.33)	1 (1.67)	1 (1.67)	2 (3.33)	1 (1.67)	1 (1.67)	3 (5)	0 (0)	1(1.67)	0 (0)	15 (25)	0.485
Negative	5 (8.33)	22 (36.67)	4 (6.67)	2 (3.33)	1 (1.67)	0 (0)	0(0)	4 (6.67)	5 (8.33)	1 (1.67)	1 (1.67)	45 (75)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Profession													
Outdoor Job	2 (3.33)	3 (5)	12 (20)	0 (0)	1 (1.67)	0(0)	1 (1.67)	1 (1.67)	1 (1.67)	0 (0)	0 (0)	14 (23.33)	0.538
Indoor Job	1 (1.67)	5 (8.33)	1 (1.67)	2 (3.33)	1 (1.67)	0 (0)	0 (0)	0 (0)	1 (1.67)	0 (0)	1 (1.67)	11 (18.33)	
Student	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.67)	3 (5)	0 (0)	0 (0)	3 (5)	
Business	1	10	4	1	0 (0)	0 (0)	0 (0)	5 (8.33)	0 (0)	0 (0)	0 (0)	25 (41.66)	

Continued.

Variables	Psoriasis (%)	Seborrheic dermatitis (%)	Tinea capitis (%)	Pediculosis capitis (%)	Alopecia areata (%)	Alopecia totalis (%)	Alopecia Universalis (%)	Androgenetic alopecia (%)	Telogen Effluvium (%)	Impetigo contagiosa (%)	Osteoma of scalp (%)	Total (%)	P value
	(1.67)	(16.67)	(6.67)	(1.67)									
Not applicable	1 (1.67)	2 (3.33)	0 (0)	0 (0)	1 (1.67)	1 (1.67)	0 (0)	0 (0)	0 (0)	2 (3.33)	0 (0)	7 (11.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Education level													
School level	2 (3.33)	3 (5)	1 (1.67)	2 (3.33)	1 (1.67)	1 (1.67)	1 (1.67)	1 (1.67)	1 (1.67)	1 (1.67)	1 (1.67)	14 (23.33)	0.017
College level	3 (5)	14 (23.33)	3 (5)	1 (1.67)	1 (1.67)	0 (0)	0 (0)	2 (3.33)	2 (3.33)	1 (1.67)	0 (0)	26 (43.33)	
Graduate	0 (0)	7 (11.67)	1 (1.67)	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (15)	
Post graduate	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (5)	2 (3.33)	0 (0)	0 (0)	7 (11.66)	
Not applicable	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	4 (6.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	

P value is calculated by univariate analysis. P<0.05 considered as the level of significance with 95% CI.

Table 2: Various types of risk factors of diseases on the scalp (n=60).

Risk factors	Frequency	Percentage
Diet food		
Vegetarian	2	3.3
Non-vegetarian	58	96.7
Diet milk	60	100
Artificial milk	0	0.0
Behaviour		
Smoker	6	10.0
Alcoholic	1	1.7
Both	1	1.7
Hygiene		
Daily shampoo use	11	18.3
Irregular shampoo use	49	81.7
Associated systemic diseases		
Diabetes	6	10.0
Thyroid	2	3.3
Both diabetes and thyroid	3	5.0
Others	1	1.7
None	48	80.0
Hair grooming habits		
Using oil	36	60
Dry hair	5	8.3
Hair steaming	2	3.3
Hair straightening	2	3.3
Others	15	25.0

Table 3: Overall prevalence of diseases on the scalp (n=60).

Diseases on the scalp	Frequency	Percentage
Psoriasis	5	8.3
Seborrheic dermatitis	27	45.0

Continued.

Diseases on the scalp	Frequency	Percentage
Tinea capitis	5	8.3
Pediculosis capitis	3	5.0
Alopecia areata	3	5.0
Alopecia totalis	1	1.7
Alopecia universalis	1	1.7
Androgenetic alopecia	7	11.7
Telogen deffluviam	5	8.3
Impetigo contagiosa	2	3.3
Osteoma of scalp	1	1.7
Total	60	100

Table 4: Association of risk factors with the prevalence of diseases on the scalp (n=60).

Risk factors	Psoriasis (%)	Seborrhic dermatitis (%)	Tinea capitis (%)	Predicloss capitis (%)	Alopecia areata (%)	Alopecia totalis (%)	Alopecia universalis (%)	Androgenetic alopecia (%)	Telogen deffluviam (%)	Impetigo contagiosa (%)	Osteoma of scalp (%)	Total (%)	P value
Diet food													
Veget-arian	0 (0)	0 (0)	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.33)	0 (0)	0 (0)	4 (6.66)	0.142
Non-vegetarian	5 (8.33)	27 (45)	5 (8.33)	1 (1.67)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	3 (5)	2 (3.33)	1 (1.67)	56 (76.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Diet milk													
Diet milk	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	Constant
Artificial milk	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Behaviour													
Smoker	0 (0)	1 (1.67)	1 (1.67)	0 (0)	1 (1.67)	0 (0)	1 (1.67)	2 (3.33)	0 (0)	0 (0)	0 (0)	6 (10)	0.756
Alcoholic	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.66)	
Both	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.66)	
None	4 (6.67)	25 (41.67)	4 (6.67)	3 (5)	2 (3.33)	1 (1.67)	0 (0)	5 (8.33)	5 (8.33)	2 (3.33)	1 (1.67)	52 (86.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Hygiene													
Daily shampoo use	0 (0)	5 (8.33)	1 (1.67)	0 (0)	2 (3.33)	0 (0)	0 (0)	1 (1.67)	2 (3.33)	0 (0)	0 (0)	11 (18.33)	0.840
Irregular shampoo use	5 (8.33)	22 (36.67)	4 (6.67)	3 (5)	1 (1.67)	1 (1.67)	1 (1.67)	6 (10)	3 (5)	2 (3.33)	1 (1.67)	49 (81.66)	
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)	
Associated systemic diseases													
Diab-etes	1 (1.67)	2 (3.33)	0 (0)	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	1 (1.67)	0 (0)	1 (1.67)	6 (10)	0.431
Thyroid	0 (0)	2 (3.33)	0 (0)	0 (0)	0 (0)	1 (1.67)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	4 (6.66)	
Both diabetes & thyroid	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.67)	0 (0)	0 (0)	1 (1.66)	

Continued.

Risk factors	Psoriasis (%)	Seborrheic dermatitis (%)	Tinea capitis (%)	Pediculosis capitis (%)	Alopecia areata (%)	Alopecia totalis (%)	Alopecia universalis (%)	Androgenetic alopecia (%)	Telogen effluvium (%)	Impetigo contagiosa (%)	Osteoma of scalp (%)	Total (%)	P value	
Others	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.66)	0.299	
None	3 (5)	23 (38.33)	5 (8.33)	3 (5)	2 (3.3)	0 (0)	0 (0)	7 (11.67)	3 (5)	2 (3.33)	0 (0)	48 (80)		
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)		
Hair grooming habits														
Using oil	3 (5)	13 (21.67)	1 (1.67)	1 (1.67)	3 (5)	1 (1.67)	1 (1.67)	6 (10)	4 (6.67)	1 (1.67)	1 (1.67)	35 (58.33)		
Dry hair	0 (0)	5 (8.33)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (10)		
Hair steaming	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.66)		
Hair straightening	0 (0)	1 (1.67)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.66)		
Others	2 (3.33)	7 (11.67)	3 (5)	2 (3.3)	0 (0)	0 (0)	0 (0)	1 (1.67)	1 (1.67)	1 (1.67)	0 (0)	17 (28.33)		
Total	5 (8.33)	27 (45)	5 (8.33)	3 (5)	3 (5)	1 (1.67)	1 (1.67)	7 (11.67)	5 (8.33)	2 (3.33)	1 (1.67)	60 (100)		

P value is calculated by univariate analysis. P<0.05 considered as the level of significance with 95% CI

Table 5: Multinomial logistic regression of baseline characteristic and various types of risk factors associated with the diseases on the scalp (n=60).

Diseases on the scalp	Psoriasis		Seborrheic dermatitis		Tinea capitis		Pediculosis capitis		Alopecia areata		Androgenetic alopecia		Telogen effluvium		Impetigo contagiosa	
	OR	P value	OR	P value	OR	P value	OR	P value	OR	P value	OR	P value	OR	P value	OR	P value
Age	0.450	0.474	1.390	0.934	0.040	0.195	0.480	0.707	3.240	0.758	0.229	0.521	0.016	0.213	1.506	0.873
Sex	1.481	0.860	0.299	0.447	46.443	0.334	18.377	0.709	0.022	0.746	0.148	0.548	4.785	0.641	3.190	0.874
Education	0.246	0.535	2.447	0.415	0.603	0.831	0.478	0.813	10.655	0.717	21.732	0.180	18.535	0.217	62.942	0.412
Occupation	1.084	0.939	2.195	0.308	0.024	0.457	0.604	0.302	59.193	0.311	2.255	0.657	0.422	0.640	17.029	0.568
Socio-economic condition	0.591	0.846	6.890	0.405	0.667	0.891	31.332	0.586	94.131	0.686	0.113	0.593	2.982	0.735	2375.888	0.554
Family history	77.361	0.632	1.638	0.800	4.669	0.882	0.897	0.995	0.100	0.805	12534.626	0.152	1231.150	0.836	1.194	0.990
Behaviour	3.024	0.899	0.696	0.831	0.335	0.898	0.196	0.870	0.104	0.840	0.003	0.605	6.278	0.836	0.249	0.871
Hygiene	0.871	0.956	2.165	0.734	5208.144	0.973	5650.386	0.982	0.104	0.840	52.652	0.286	2.369	0.808	696.643	0.944
ASD	1.965	0.505	1.470	0.350	14.054	0.722	16.061	0.786	191.044	0.886	6.092	0.894	1.143	0.946	1.561	0.930
HGH	0.831	0.715	0.848	0.662	0.968	0.950	0.260	0.907	0.653	0.880	0.099	0.258	0.711	0.138	0.969	0.975

a. The reference category is: Osteoma of scalp. b. This parameter is set to zero because it is redundant. *P value and Odd ratio is calculated by Multinomial Logistic Regression with 95% CI. ASD= Associated systemic diseases; HGH= Hair grooming habits; ASD= Associated systemic diseases; HGH= Hair grooming habits.

Table 2 shows various types of risk factors of diseases on the scalp. The common risk factors were observed diet milk 60 (100%), non-vegetarian 58 (96.7%), irregular shampoo use 49 (81.7%), using oil 36 (60%).

Table 3 shows the overall prevalence of diseases on the scalp. Among the 60 studied patients, psoriasis, seborrheic dermatitis, tinea capitis, pediculosis capitis, alopecia areata, alopecia totalis, alopecia universalis, androgenetic alopecia, telogen deffluvium, impetigo contagiosa and osteoma of scalp were being observed 5

(8.3%), 27 (45.0%), 5 (8.3%), 3 (5.0%), 3 (5.0%), 1 (1.7%), 1 (1.7%), 7 (11.7%), 5 (8.3%), 2 (3.3%) and 1 (1.7%), respectively.

Table 4 shows the association of risk factors with the prevalence of diseases on the scalp. According to univariate analysis, there was no statistical association was observed between the habitual factors and the prevalence of diseases in the scalp ($p>0.05$).

Table 5 shows the multinomial logistic regression of factors associated with the diseases on the scalp. According to multinomial logistic regression, there was no statistical significance was observed ($p>0.05$). Only the odd ratio (OR) signifies the risk of the factors associated with the diseases on the scalp. The major factors contributing to exposing the diseases on the scalp (a) age was psoriasis (OR=0.45), seborrheic dermatitis (OR=1.39), tinea capitis (OR=0.04) (prediculous capitis (OR=0.48), alopecia areata (OR=3.24), androgenic alopecia (OR=0.22), telogen effluvium (OR=0.01), impetigo contagiosa (OR=1.50). Sex: psoriasis (OR=1.48), seborrheic dermatitis (OR=0.29), tinea capitis (OR=46.44) ($P=0.33$), prediculous capitis (OR=18.37), alopecia areata (OR=0.02), androgenic alopecia (OR=0.14), telogen effluvium (OR=4.78), impetigo contagiosa (OR=3.19), education: psoriasis (OR=0.24) seborrheic dermatitis (OR=2.44), tinea capitis (OR=0.60), prediculous capitis (OR=0.47), alopecia areata (OR=10.65), androgenic alopecia (OR=21.73), telogen effluvium (OR=18.53), impetigo contagiosa (OR=62.94). Occupation: psoriasis (OR=1.08), seborrheic dermatitis (OR=2.19), tinea capitis (OR=0.02), prediculous capitis (OR=0.60), alopecia areata (OR=59.19), androgenic alopecia (OR=2.25), telogen effluvium (OR=0.42), impetigo contagiosa (OR=17.02), socio-economic condition: psoriasis (OR=0.59), seborrheic dermatitis (OR=6.89), tinea capitis (OR=0.66), prediculous capitis (OR=31.332), alopecia areata (OR=94.131), androgenic alopecia (OR=0.113), telogen effluvium (OR=2.982), impetigo contagiosa (OR=2375.88), family history: psoriasis (OR=77.36), seborrheic dermatitis (OR=1.63), tinea capitis (OR=4.66), prediculous capitis (OR=0.897), alopecia areata (OR=0.10), androgenic alopecia (OR=12534.62), telogen effluvium (OR=1231.15), impetigo contagiosa (OR=1.19) hygiene: psoriasis (OR=0.87), seborrheic dermatitis (OR=2.16), tinea capitis (OR=5208.14), prediculous capitis (OR=5650.38), alopecia areata (OR=0.10), androgenic alopecia (OR=52.65), telogen effluvium (OR=2.36), impetigo contagiosa (OR=696.64), hair grooming habits: psoriasis (OR=0.83), seborrheic dermatitis (OR=0.84), tinea capitis (OR=0.96), prediculous capitis (OR=0.26), alopecia areata (OR=0.65), androgenic alopecia (OR=0.09), telogen effluvium (OR=0.71), impetigo contagiosa (OR=0.969).

DISCUSSION

This study observed 30 (50%) patients were male and 30 (50%) patients were female. This results indicate the

proportion of male and female was equal and total prevalence of diseases in the scalp was observed equally between male and female. The highest prevalence of diseases in the scalp was observed in the age group (21-30) years which was 22 (36.67%). In this study, there is no statistical association was observed between the age group and the prevalence of diseases on the scalp ($p>0.05$). These findings of this study are similar to some extent with another study conducted in Saudi Arabia in 2021 by Alomaish et al. In their study, they observed, the prevalence of alopecia 66.3% ($n=729$) and the most reported hair loss was telogen effluvium as well as demographic and habitual risk factors were observed significant ($p<0.05$) which differed our study due to small sample size.¹⁴ Similarly, in the univariate analysis, this study observed there is no statistical association between the residential status, socio-economic condition, family history and profession of the patients and the prevalence of diseases on the scalp ($p>0.05$).¹⁵ This current study observed in the univariate analysis, there was an association between the level of education of the patients and the prevalence of diseases in the scalp ($p<0.05$). That means there had the effect of education level of the patients on the prevalence of diseases on the scalp. In this present study, in the univariate analysis no significant association was observed between habitual factors and the prevalence of diseases on the scalp.¹⁶ This results occur due to limited small purposive sample size but in multinomial logistic regression, the individual odd ratio of the diseases in the scalp signifies, the significant association between the demographic and habitual risk factors and the prevalence of diseases on the scalp. In the multinomial logistic regression analysis, this present study observed, the most significant factors contributing to exposing the diseases in the scalp were age, sex, education level, socio-economic condition, family history, behaviour. Hygiene and associated systemic diseases of the patients. Another study observed oxidative stress, the inability of the body to sufficiently counteract the sources of oxidation are the prevalent factors contributing to premature hair loss.¹⁷

At the same time, a study conducted by Kyei et al, on medical and environmental risk factors of alopecia observed that 59% of the respondents were clinically consistent with CCCA. Diabetes mellitus type 2 was significantly higher in those with CCCA ($p=0.01$), bacterial scalp infections ($p=0.045$) and hair styles associated with traction ($p=0.02$).¹⁸ But they did not conduct multinomial logistic regression analysis of the factors contributing to diseases on the scalp and it may be a limitation of their study but this present study emphasized on the risk comparison of each factor with the help of odd ration of each disease in the scalp is unique in this study and this type of analysis was not done in some previous studies to determine the predictors of the diseases in the scalp.¹⁹⁻²²

This study has few limitations. This was a single centre study with a limited purposive sample size over a short period of time. So, the findings of this study may not reflect the whole scenario of the country.

CONCLUSION

This study prevailed, age, sex, behaviour, family history, occupation, education level, socio-economic condition, hygiene, associated systemic diseases, hair grooming are the associated factors with the prevalence of diseases in the scalp of humans.

Recommendations

A multicentre study may be conducted on a large scale with a statistical calculated sample size to justify the results of this study.

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REFERENCES

- Theelen B, Cafarchia C, Gaitanis G, Bassukas ID, Boekhout T, Dawson Jr TL. Malassezia ecology, pathophysiology, and treatment. *Medi Mycol.* 2018;56(suppl_1):S10-25.
- Xu Z, Wang Z, Yuan C, Liu X, Yang F, Wang T, et al. Dandruff is associated with the conjoined interactions between host and microorganisms. *Sci Rep.* 2016;6(1):24877.
- Pitney L, Weedon D, Pitney M. Is seborrheic dermatitis associated with a diffuse, low-grade folliculitis and progressive cicatricial alopecia? *Australas J Dermatol.* 2016;57(3):e105-7.
- Hepat A, Chakole S, Rannaware A. Psychological well-being of adult psoriasis patients: a narrative review. *Cureus.* 2023;15(4).
- Lally A, Casabonne D, Imko-Walczuk B, Newton R, Wojnarowska F. Prevalence of benign cutaneous disease among Oxford renal transplant recipients. *J Eur Acad Dermatol Venereol.* 2011;25(4):462-70.
- Dessinioti C, Katsambas A. Seborrheic dermatitis: etiology, risk factors, and treatments: facts and controversies. *Clin Dermatol.* 2013;31(4):343-51.
- Ndako JA, Osemwegie O, Spencer TH, Olopade BK, Yunusa GA, Banda JM. Prevalence of dermatophytes and other associated fungi among school children. *Glob Advan Res J Medi Medi Sci.* 2012;1(3):49-56.
- Gutiérrez MM, González JW, Stefanazzi N, Serralunga G, Yañez L, Ferrero AA. Prevalence of *Pediculus humanus capitis* infestation among kindergarten children in Bahía Blanca city, Argentina. *Parasitol Res.* 2012;111(3):1309-13.
- Al Ahoud AM, Zito PM. Alopecia. *Treasure Island (FL): StatPearls;* 2020:141-60.
- Villasante Fricke AC, Miteva M. Epidemiology and burden of alopecia areata: A systematic review. *Clin Cosmet Investig Dermatol.* 2015;8:397-403.
- Korta DZ, Christiano AM, Bergfeld W, Duvic M, Ellison A, Fu J, et al. Alopecia areata is a medical disease. *J Am Acad Dermatol.* 2018;78(4):832-4.
- Hartman-Adams H, Banvard C, Juckett G. Impetigo: diagnosis and treatment. *Am Fam Phys* 2014;90(4):229-35.
- Sayan NB, Uçok C, Karasu HA, Gunhan O. Peripheral osteoma of the oral and maxillofacial region: A study of 35 new cases. *J Oral Maxillofac Surg.* 2002;60(11):1299-301.
- Alomaish AR, Gosadi IM, Dallak FH, Durayb AA, Dallak AH, Hakami JA, et al. Prevalence of alopecia and its contributing factors among primary healthcare attendees in the Jazan region, Saudi Arabia. *J Fam Med Prim Care.* 2021;10(10):3851-6.
- Adesiji YO, Omolade FB, Aderibigbe IA, Ogungbe O, Adefioye OA, Adedokun SA, et al. Prevalence of Tinea Capitis among Children in Osogbo, Nigeria, and the Associated Risk Factors. *Diseases.* 2019;7(1):13.
- Kamiya K, Kishimoto M, Sugai J, Komine M, Ohtsuki M. Risk factors for the development of psoriasis. *Int J Mol Sci.* 2019;20(18):4347.
- Trüeb RM, Henry JP, Davis MG, Schwartz JR. Scalp condition impacts hair growth and retention via oxidative stress. *Int J Trichol.* 2018;10(6):262-70.
- Kyei A, Bergfeld WF, Piliang M, Summers P. Medical and environmental risk factors for the development of central centrifugal cicatricial alopecia: a population study. *Arch Dermatol.* 2011;147(8):909-14.
- Scher JU, Ogdie A, Merola JF, Ritchlin C. Preventing psoriatic arthritis: focusing on patients with psoriasis at increased risk of transition. *Nat Rev Rheumatol Nat Publ Group.* 2019;15(3):153-66.
- Moto JN, Maingi JM, Nyamache AK. Prevalence of Tinea capitis in school going children from Mathare, informal settlement in Nairobi, Kenya. *BMC Res Notes.* 2015;8:1-4.
- Falahati M, Akhlaghi L, Lari AR, Alaghebandan R. Epidemiology of dermatophytoses in an area south of Tehran, Iran. *Mycopathol.* 2003;156:279-87.
- Ameh IG, Okolo RU. Dermatophytosis among school children: domestic animals as predisposing factor in Sokoto, Nigeria. *J Boil.* 2004;7(7):1109-12.

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