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Original Article

Trends in the use of trichoscopy among dermatologists of Pakistan

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Abstract

Background Trichoscopy, also known as scalp dermatoscopy, is a non-invasive diagnostic tool used to identify hair morphological features not visible to naked eye. It is a relatively new field and despite establishing the importance of trichoscopy in clinical practice, it has repeatedly been identified as a practice gap among dermatologists.

Objective To investigate the frequency of use of trichoscope by dermatologists in Pakistan.

Methods A cross-sectional study including 265 practicing consultant dermatologists and resident dermatologists were included. Dermatologists were given an online questionnaire to be filled out. Descriptive statistics were calculated. Stratification was done. Chi square t-test was used to compare the age, sex and years of experience with the use of trichoscopy. P-value ≤0.05 was considered as significant with confidence intervals set at 95%.

Results 9.4% dermatologists reported using trichoscope to diagnose hair disorders. This use was significantly higher with older age (p=0.019), but not with gender, clinical experience, job position, place of work or government versus private set up. Only 37.2% dermatologists were trained in using a trichoscope, where most were self-trained. Limited access to a trichoscope, absence of formal training and high costs of trichoscope were identified as the main hurdles to trichoscope use in Pakistan.

Conclusion Trichoscope use is very limited in Pakistan often leading to inaccurate diagnosis and insufficient treatment of hair disorders. Access to formal training and low-cost trichoscopes are needed to bridge this important clinical gap.

Key words
Trends; Trichoscopy; Dermatologists.

Introduction

In 2006, the name trichoscopy was first proposed for the use of dermatoscopy in the diagnosis of hair and scalp disorders.[1] Since then its use has grown significantly over the years, with many guidelines available to identify primary hair and scalp disorders as well as trichoscopic features of dermatologic and systemic diseases with secondary scalp involvement.[2] The addition of Artificial Intelligence to detect hair parameters with software like Trichosan® has made trichoscopy use in everyday clinic even more accessible with some referring to it as the 'Third eye' of dermatologists.[3]

The primary use of hair trichoscopy is to recognize dermatoscopic features of non-cicatricial and cicatricial alopecia such as hair diameter, density, vellus to terminal hair ratio and anagen to telogen ratio without the need to

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remove hair.[4] It also allows to accurately examine hair multiple times in a specific time period with fixed intervals to identify the natural history of disease and monitoring treatment response with 'sequential trichoscopy'.[5] Trichoscopy can be used to identify the most severely affected area of scalp and can aid in choosing the right site for skin biopsy or treatment.[6] Moreover, real-time trichoscopic analysis can help satisfy a worried patient by viewing their hair analysis on a screen with a dermatologist to understand the disease better, in addition to recorded images which can be viewed by patients on their follow up visits.[7]

Despite huge disadvantages of including trichoscopy in regular clinics by dermatologists, a clinical and practice gap has been consistently identified.[8] In a cross-sectional survey done in India, only 54.7% dermatologists used dermoscopy regularly in clinics and the primary application was for diagnosis of hair disorders by 58.5% while the main reasons for not using dermoscope/ trichoscope were unfamiliarity with technique, lack of time, high cost and no training. Only 55% were trained in doing trichoscopy/dermoscopy. In comparison, a significantly higher percentage of dermatologists regularly used dermoscope/ trichoscope in developed countries: 100% in Australia, 98.5% in United Kingdom, 97.5% in France, and 80% in United States.[9–12] The use of dermoscope/ trichoscope has consistently risen over the last few decades in most of these countries[13] and although, the most common use of dermoscope/ trichoscope in Western countries is to identify skin malignancies, it was consistently used for hair disorders as well.[10]

Despite the established efficacy of trichoscopy in diagnosing hair disorders over naked eye examinations, very few clinicians are seen using advanced equipment for diagnosis of hair conditions in Pakistan.[14] No studies have been carried out to document use of trichoscope among dermatologists of Pakistan. Our study aimed to investigate the frequency of its use, factors affecting clinical trichoscopy practice such as training and access along with common uses and hurdles faced by dermatologists. The findings of this study will allow us to add to the current body of knowledge on this topic and provide vital information to improve this practice gap and encourage trichoscopy in Pakistan.

Methods

A cross-sectional survey was carried out. The study protocol was approved by the Ethical Review Committee of PAF Hospital Islamabad and informed consent was taken from all participants before the start of the study.

The study was conducted in Department of Dermatology, PAF Hospital, Islamabad from June 2021 to December 2021. 265 dermatologists and residents of dermatology currently working in a clinical set up were enrolled in the study from all over Pakistan via non-probability consecutive sampling.

The questionnaire used in the study was adapted from a previously validated questionnaire, used in a cross-sectional survey, and used in our study after acquiring author's permission.[10]

The questionnaire consisted of two parts: first part contained five close ended questions related to demographics including age, gender, hospital/ clinic name, clinical experience in years and job title, while the second part consisted of three questions related to the type of patients seen in clinical practice and sixteen questions related to use of trichoscopy, its access, type of trichoscope in use, training acquired for trichoscopy, most common uses of trichoscope and hurdles in its use.

Content validity and face validity were evaluated to determine the validity and reliability of our questionnaire. Two senior dermatologists analysed the questionnaire for content validity and determined whether the questions appropriately covered the use of trichoscopy in Pakistan. Their responses were utilised to confirm that our questionnaire accurately captured our objective. Face validity was tested by pilot study of six dermatologists from our target demographic, who were asked to assess its readability, clarity, and relevance. The response was mostly positive and their feedback was used to do minor adjustments to our questionnaire.

Dermatologists fulfilling the above criteria were recruited through a cross sectional online questionnaire-based survey using Google Forms®, a professional online survey tool. After their informed consent, access to the questionnaire was given as a link via email to all dermatologists fulfilling the above criteria and purpose of the study was explained to them. Data was collected without blinding the investigators to the dermatologist's identity to avoid duplication of data. Each participant was given two weeks to complete the survey, failing which two reminder emails were sent.

Descriptive statistics were calculated for quantitative variables including age, experience in years, patients seen per week, job title and hospital versus clinic setting and presented as mean±SD. Frequency and percentages were calculated for awareness, access, interest in this technology, use of trichoscope, reasons for use and disuse of trichoscope, training in use of trichoscope, confidence in use of trichoscope, perception of usefulness, perception of reason for less usage of this technology. Chi square t-test was used to compare the age, sex and years of experience with the use of trichoscopy. P value of <0.05 was considered significant with confidence intervals set at 95%. Physicians who failed to answer individual questions were excluded from the respective calculations.

Results

The questionnaire was sent to a total of 1000 dermatologists, of which 331 responded (32.6%). Among the 331 dermatologists, 81.3% (n=265) were in active clinical practice while 18.7% (n=61) were not currently practicing and thus excluded. Total 265 dermatologists of either gender currently present in Pakistan meeting inclusion criteria of study were evaluated to assess the use of trichoscopy.

Among these 265 dermatologists, 26.2% were males (n=70) and 73.8% were females (n=195). Overall mean age was 34.62±5.87 years while the mean clinical experience of dermatologists was 5.45±5.097 years. Demographic characteristics of the study group are presented in **Table 1**.

Although 87.9% (n=233) of the dermatologists were aware of the concept of trichoscopy and 90.6% (n=240) showed interest in using a trichoscope in their clinics, only 17% (n=45) had access to a trichoscope in dermatology clinics and only 9.4% (n=25) used it to diagnose hair disorders. Of those who used trichoscope, only 3.4% (n=9) reported regular use while 6% (n=16) used only when there was clinical uncertainty. 42.3% of dermatologists had a dermoscope available in the clinic while 5.3% had a videodermoscope.

Most of the dermatologist had no training in using a trichoscope **(Table 2)** and thus the majority, 52% (n=138) and 49% (n=130) of dermatologists, had no confidence in assessing hair structures and diagnosing hair disorders with a trichoscope respectively and only 1% (n=3) dermatologists reported being highly

Table 1 Sociodemographic characteristics of medical graduates.

Age	≤ 35	183	69%
	36-45	66	25%
	46-55	13	5%
	55-65	3	1%
Gender	Female	195	74%
	Male	70	26%
Current job title	Resident	142	54%
	Consultant	78	29%
	Senior Registrar	20	8%
	Assistant Professor	6	2%
	Associate Professor	5	2%
	Professor	14	5%
Place of work	Clinic	56	21%
	Primary/secondary care hospital	57	21%
	Tertiary care hospital	152	58%
Type of clinic set up	Government	146	55%
	Private	89	34%
	Government-Private partnership	30	11%
Patient's seen in clinic per week	<25	36	13%
	25-100	84	32%
	100-200	58	22%
	200-500	61	23%
	>500	26	10%
Patients with hair disorder seen in clinic per week	>25	136	51%
	25-100	107	40%
	100-200	20	8%
	200-500	2	1%

confident in identifying hair features and diagnosing using a trichoscope. The common reasons for using a trichoscope were that it is more accurate than naked eye examination (36.4%), it increases confidence in diagnosis (29.6%), helps track treatment response (12.0%), assists in correctly identifying biopsy site (8.9%), improves record keeping (6.5%) and reduces patient anxiety (6.5%). In contrast, common reasons for not using a trichoscope were no or limited access to a dermoscope/ trichoscope (58.7%), lack of training (31.4%), time consuming (7.6%), lack of interest in trichoscopy (2%) and not finding trichoscopy helpful (0.3%). Commonly identified hurdles in using a trichoscope in Pakistan and suggestions to improve its use have been enlisted in **Table 3**.

Table 2 Training in use of trichoscopy

Reason		*n*	*%*
Training experience	Yes	86	32.4%
	No	179	62.8%
Type of training done	Conference session	24	8.4%
	Trichoscopy meeting	6	2.1%
	Internet training (YouTube etc.)	29	10.2%
	Expert shadowing	12	4.2%
	Books/atlases/journals	35	12.3%
Duration of training	Half day	38	48.7%
	1-2 days	24	30.7%
	>2 days	16	20.5%

Stratification with respect to gender, age, job title, place of work and government/private set up was done to observe effect of these modifiers on outcome. Chi square test of significance was applied. P-value ≤0.05 was considered as significant. The results showed significant association of use of trichoscope with age (p=0.019) while no significant association was found with gender (p=0.445), clinical experience (p=0.49), job position (p=0.796), place of work (p=0.437) and government versus private set up (p=0.493), as presented in **Table 4**.

Discussion

Trichoscopy has been referred to as a dermatologist's third eye and its utility in identifying hair parameters and diagnosing hair disorders with more accuracy than naked eye examination has been repeatedly shown in studies.[15] Very few studies have been carried out specifically studying the use of trichoscopy by dermatologists, where most researches focused on the use of dermoscope by dermatologists with a lesser emphasis on trichoscopy. Overall, it has been repeatedly shown that a very small percentage of dermatologists are well versed in the art of trichoscopy and an even smaller percentage practice trichoscopy regularly. Decreased application of trichoscopy is attributable to both attitude and knowledge gaps.[16] Most dermatologists are not inclined to

Table 3 Hurdles in the use of trichoscope and suggestions to improve its use.

		n	*%*
Hurdles in the use of trichoscope			
	Unavailability	179	39%
	No trichoscopic training	141	31%
	High costs	62	13%
	Not confident in their own trichoscopic skills	42	9.1%
	Inconvenient to use	31	7%
	Limited time per patient due to high patient load	5	1%
	Increased focus on aesthetic dermatology than clinical dermatology	1	0.2%
	Naked eye examination of hair is sufficient	1	0.2%
Suggestions to encourage trichoscope use			
	Access to affordable trichoscopes	202	44%
	More training	173	38%
	Software automated hair parameter calculation	51	11%
	Demand by patients for more reliable treatment response assessments	31	7%
	Ensuring standardized dermatology training and practice	1	0.2%

Table 4 Trichoscope use according to demographic characteristics.

Characteristic		*Total (n)*	*Using trichoscope (n)*	*%*	*P value*
Age	≤ 45 yrs.	250	21	8%	0.019
	> 46 yrs.	15	4	27%	
Gender	Male	70	5	7%	0.445
	Female	195	20	10%	
Clinical experience in dermatology	≤25 yrs.	263	24	9%	0.490
	>25 yrs.	2	1	50%	
Job Title	Resident	139	12	9%	0.796
	Consultant	78	9	12%	
	Senior registrar	20	1	5%	
	Assistant Professor	6	0	0%	
	Associate Professor	5	1	20%	
	Professor	14	1	7%	
Place of work	Clinic	56	7	13%	0.437
	Primary/secondary care hospital	55	3	6%	
	Tertiary care hospital	152	15	10%	
Government vs. private set up	Government	146	12	8%	0.493
	Private	89	11	12%	
	Government-Private partnership	30	2	7%	

do intensive examination or investigations for most patients with hair disorders nor do the majority pay heed to the potential psychological distress that hair disorders cause to the patients. Dermatologists recognize the terminology of a 'difficult hair loss patient' but still fail to understand the implications of the disease.[17] Reid *et al*. showed that most dermatologists also underestimate the effect of hair disorders on the patient's quality of life.[18]

This study showed a huge disparity between knowledge and application of trichoscopy. Although 87.9% of dermatologists were aware of trichoscopy and 90.6% were interested in applying trichoscopy, only 17% had access to it and only 9.4% used a trichoscope in clinics, with only 3.4% reporting regular use. In comparison, a similar study conducted in the United Kingdom in 2012 showed that 98.5% dermatologists regularly used dermoscope/ trichoscope in dermatology clinics and of the 292 respondents only two had limited access to a dermoscope/ trichoscope.[10] In United States,

50% of dermatology fellows reported regular use of dermoscope/ trichoscope. Most dermoscope users were young, in an academic set up and had previous training in the use of the device.[13] A survey in Australia showed that 100% of dermatology residents and 98% of dermatologists used dermatoscope and most training institutes (98%) provided access to the device themselves.[9,19] A cross sectional study by Kaliyadan *et al*. reported 54.7% of Indian dermatologists regularly using dermoscope/ trichoscope in clinics while 63.4% had undergone training.[20]

Dermoscope use in most countries is mostly focused on detection of skin malignancies, while in countries where skin malignancies have a lower incidence, the more common use is to diagnose hair disorders. In this study, the most common reason for using a trichoscope was that it was more accurate at diagnosing hair disorders than naked eye examination (36.4%). Similarly in India, 58.5% dermatologists found dermoscopy useful for hair disorders and the most common reason for using it was to enhance patient care and enthusiasm for the technique.[20] In contrast, survey of dermatologists in United Kingdom, Australia, Europe showed that the most common use of a dermoscope was to diagnose skin malignancies by 98.5%, 84% and 72.7% respectively.[10,19,21]

The two most common causes for not using a dermoscope in our study were limited access followed by no training in the use of device by 51.7% and 38.4% of the respondents, highlighting the important practice gap in both skill of dermatologists and access to technological advancements in the field of dermatology. Kaliyadan *et al*. reported that most Indian dermatologists didn't use trichoscopy due to unfamiliarity with the technique (69.1%), high cost (30.8%), unconvinced of techniques usefulness and lack of time (16.1%).[20] In comparison, among the dermatologists responding to the survey in United Kingdom, only 4 reported not using dermatoscope due to limited access (1%), not finding it useful (0.5%) and no training (1%).[10]

Very few dermatologists in Pakistan have been trained to use a dermoscope/ trichoscope (37.2%). Lack of training is a major contributor and a major hurdle in making trichoscopy a standard practice in dermatology clinics of the country. Only 8.4% had acquired training at a conference, 4.2% trained by an expert in the subject and only 2.1% had been trained at a trichoscopy specific meeting. Most had self-trained themselves using books/ atlases (12.3%) and Internet (10.2%). This is much less as compared to training of dermatologists in countries of similar economic status for example India (63.4%)[20] and even less as compared to more developed countries like United Kingdom (81%), Australia (95%) and France (79.9%).[10,12,19]

This study showed that a significantly greater proportion of dermoscopy/ trichoscopy users were of older age; 8.4% users under 45 years of age and 26.7% users above 45 years of age. This is in stark contrast to most studies in developing countries where the younger dermatologists are more inclined towards applying dermoscopy/ trichoscopy in regular clinical use.[10,12,13] The reason for this disparity can be that most resident dermatologists and young consultants are under-paid and struggle to make ends meet. They probably will not be able to make a personal splurge buying a device which is available at a very high cost in Pakistan. On the other hand, senior consultants will have enough financial support to buy a trichoscope and also invest in training courses to learn the technique.[22]

Despite several limitations, this study on the

trends in the usage of trichoscopy among dermatologists in Pakistan provides significant information. The 33.1% response rate may have introduced response bias, thereby affecting the findings' generalizability. Furthermore, a high proportion of resident responders may have resulted in an under representation of more regular dermoscopy users among the dermatology community, influencing the study's overall outcomes. However, this research remains a significant contribution to the field, being one of the first to explore trichoscopy trends in this specific context. The substantial sample size and rigorous methodology employed lend credibility to the reported results. This study serves as a foundation for future researches to improve response rates, explore the reasons behind trichoscopy preferences, monitor trends over time, and analyse the impact of trichoscopy on clinical outcomes and healthcare expenses. Addressing these aspects will further increase our understanding of trichoscopy utilization for dermatological practice in Pakistan and beyond.

Conclusion

Trichoscopy, an essential tool for accurate hair structure assessment and diagnosing hair disorders, is often underutilized by dermatologists due to various factors such as attitude, knowledge, and skill gaps. In this study, only 9.4% of dermatologists utilized dermoscope/ trichoscope for hair disorder diagnosis. Older age showed a significant association with increased usage, while other demographic factors like gender, clinical experience, job position, and workplace type did not exhibit significant differences. Merely 37.2% of dermatologists received formal training in trichoscopy, with self-training being the predominant mode. Limited access, lack of formal training, and high costs were identified as major barriers hindering trichoscope adoption in Pakistan.

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