



The Status of Dermoscopy in Chile: First National Study in Dermatologists

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ABSTRACT **Introduction:** Scientific evidence supports dermoscopy as an essential tool in dermatological diagnosis.

Objectives: The objective is to know the factors that influence its use in Chilean dermatologists.

Methods: Analytical cross-sectional study. An adapted version of the survey was submitted from the pan-European study by Forsea et al to members of the Chilean Society of Dermatology, between September and December 2020. Analysis using descriptive statistics and multivariate analysis with ordinal logistic regression looking for factors associated with greater use of.

Results: One hundred and ninety-eight responses, mean age 46.3 years and 14.6 years on average practicing as dermatologists. 61.6% trained in dermoscopy during their residency. 98% use a dermatoscope. More than 80% consider dermoscopy useful for the diagnosis of melanomas, follow-up of melanocytic lesions, and diagnosis of pigmented and non-pigmented tumors. Between 50% and 70% consider it useful for monitoring non-melanocytic lesions, nail and hair pathologies. Greater confidence when evaluating pigmented and non-pigmented tumors and capillary pathology. Adjusting for age, sex, confidence, and education, participation in teaching was associated with greater use of dermoscopy in non-pigmented and pigmented tumors, and capillary pathology.

Conclusions: Percentage of participation in the survey and training in dermoscopy higher than in the reference study, recognizing the usefulness of dermoscopy for the diagnosis and follow-up of tumor pathologies. Participating in teaching is a strong independent factor that is associated with a greater use of dermoscopy in Chile. Dermoscopy is positioned as a tool widely used by Chilean dermatologists in their daily practice.

Introduction

Dermoscopy, also known as dermatoscopy, epiluminescence microscopy, or skin surface microscopy is a non-invasive, in-vivo technique that has traditionally been useful for the evaluation of suspicious skin lesions. Nowadays, dermoscopy main role has expanded beyond early detection of skin cancer, especially melanoma, becoming a routinely diagnostic and screening tool for several skin pathologies [1-3] including benign, inflammatory, infectious, and adnexal tumors. It is also useful to evaluate lesions on specific anatomical sites, such as mucosa and genitalia, and is helpful even on specific populations like afro-american and pediatric [4]. Recently, its usefulness has even been raised in the diagnosis of monkeypox [5].

In addition, the association of dermoscopy with some other technologies adds new development possibilities, such as super high magnification optical dermoscopy [6], teledermoscopy [7], ex vivo dermoscopy [8] and artificial intelligence-assisted diagnosis [9].

Nevertheless, not all dermatologists use dermoscopy on a daily basis, and several studies have attempted to explain this phenomenon, highlighting among the reasons the limited access to dermatoscopes and the lack of training in dermoscopy during residency and continuing education programs [10-15].

There are no similar studies in Chile that allow us to acknowledge the variables of dermoscopy use within the country.

Objectives

The objective of this paper is to characterize dermoscopy use among national dermatologists and clarify the main obstacles to expand its implementation.

Methods

An analytical cross-sectional study was carried out. The sample corresponded to all the registered dermatologists of the Chilean Society of Dermatology (SOCHIDERM), which is the only scientific organization that brings together 70% of dermatologists in Chile, with 453 members in 2020. The instrument used to collect the information was created based on the Eurodermoscopy working group questionnaire (Drs. Ana-María Forsea, Alan C Geller, Giuseppe Argenziano, Veronique del Marmol, Iris Zalaudek and Peter H. Soyer) in accordance with International Dermoscopy Society (IDS) guidelines and adapted to Spanish language by Dr. Susana Puig. A cross-cultural adaptation was also carried out to modify the questionnaire to Chilean Spanish, without altering the content of the questions. Formal authorization was

requested from the authors of the questionnaire for its use. The final questionnaire was transcribed into a digital version using the Google Forms tool.

The original questionnaire was composed of twenty short-answer and multiple-choice questions that inquire demographic and clinical practice characteristics of the subjects, their formal education and experience with the dermatoscope, their opinion about its usefulness and their self confidence in the use of this tool. Three questions were added to the original questionnaire: "How many minutes on average do you have for each consultation?", "In what area of dermatology do you usually work?" and "Age of dermatological patients attended". The instrument did not include questions that would allow participants to be identified.

The survey was distributed by email and could be completed on a computer or mobile phone if there was an internet connection. The questionnaire allowed only one answer per dermatologist, and it was not possible to be sent unless all the questions were answered. At question number twelve ("Do you use dermoscopy?") only those who answered "yes" were able to access the following questions related to the use of dermoscopy in clinical practice, and those who answered "no" accessed a new section of the questionnaire in which the reasons for not using this technique were inquired. The questionnaire was available between September 2020 and December 2020, during which time an email reminder was sent once a month to all dermatologists in the database. The answers were compiled by Google Forms as they were obtained in a spreadsheet.

An exploratory analysis of the database was carried out, identifying missing values and distribution of the variables. Subsequently, averages and standard deviations were calculated for the quantitative variables, and absolute and relative frequencies for the qualitative ones. Finally, an ordinal logistic regression model was built to identify factors associated with the use of dermoscopy in the different groups of pathologies. Analyses were performed in STATA 16.1. Statistically significant was defined as obtaining a P value less than 0.05.

Results

Of the initial sample of 453 surveys sent, a total of 198 (43.71%) were answered and 255 were unanswered. All the answered surveys were considered in the analysis of the data. The demographic and clinical practice characteristics of the participants are described in Tables 1 and 2. Of the dermatologists surveyed, 122 (61.6%) reported having received training in dermoscopy during their residency. It should be noted that the average age of this group is 38.8 years (standard deviation [SD] 6.9), while the average age of those who state that they have not received formal education during their residency is 58.1 years (SD 8.9), difference being statistically

Table 1. General characteristic of the surveyed (Part 1).

Characteristic	
<i>Gender</i>	
• Male	99 (50%)
• Female	99 (50%)
<i>Age</i>	
• Average age	46,3 years (SD 12.2)
• Age range	28 – 74 years
• Average male age	46,3 years (SD 12.4)
• Average female age	46,4 years (SD 12.2)
<i>Workplace</i>	
• Private personal practice	96 (48.5%)
• Medical center	83 (41.9%)
• Private clinic	93 (47%)
• Public hospital	95 (48%)
• Resident teaching	86 (43.4%)
• Other	3 (1.52%)
<i>Number of years as a dermatologist</i>	
• Average	14.6 years (SD 12.5)
• Range	0 – 47 years

SD = standard deviation.

significant ($P < 0.0001$). In addition to residency, those surveyed indicate attendance at congresses (93.9%), books on the subject (80.3%) and face-to-face courses (61.6%) as the main source of training in dermoscopy. Only 6 of those surveyed (3%) stated that they did not have any type of training in dermoscopy.

Of the total respondents, 4 (2%) did not use dermoscopy, whose average age is 69.5 years (SD 3.3), with no differences by gender. When asked the reasons that lead them to not use dermoscopy, 3 of them stated that they do not have enough confidence in their abilities and 1 did not considered it useful for clinical practice.

Of the total number of respondents, 98% used dermoscopy, and have been using this technique for an average of 10.6 years (SD 6.1). The majority used polarized light dermoscopy (90.9%), followed by non-polarized light (32.3%) and digital camera dermoscopy (24.8%). Videodermoscopy was used by 13.1% of those surveyed.

Regarding the different clinical diagnosis in which dermoscopy was found to be useful, the results are shown in Table 3. There was unanimous agreement in the usefulness of this tool for the diagnosis of melanoma (100%) and

Table 2. General characteristic of the surveyed (Part 2).

Characteristic	
<i>Average number of patients attended per month</i>	
• Less than 150 patients	27 (13.64%)
• Between 150 and 300 patients	88 (44.44%)
• Between 300 and 450 patients	64 (32.32%)
• More than 450 patients	19 (9.6%)
<i>Average consult time per patient</i>	19,3 minutes (SD 5.3)
• 15 minutes	83 (41.9%)
• 20 minutes	80 (40.4%)
• 30 minutes	28 (14.1%)
<i>Area of practice in dermatology</i>	
• General dermatology	171 (86.4%)
• Pediatrics	55 (27.8%)
• Acne and rosacea	101 (51.0%)
• Psoriasis	70 (35.4%)
• Esthetic	51 (25.8%)
• Oncology	88 (44.4%)
• Psychodermatology	11 (5.6%)
• Other	24 (12.6%)
<i>Percentage of adult and pediatric patients seen per month</i>	
• 100% adults	29 (14.5%)
• 75% adults and 25% pediatrics	145 (72.5%)
• 50% adults and 50% pediatrics	20 (10.0%)
• 25% adults and 75% pediatrics	0 (0%)
• 100% pediatrics	6 (3.0%)
<i>Average number of skin cancer patients seen per month</i>	
• Less than 5%	83 (41.5%)
• Between 5 and 15%	71 (35.5%)
• Between 15 and 30%	28 (14.0%)
• More than 30%	18 (9.0%)

Table 3. Usefulness of dermoscopy in different areas of dermatological care.

Area	Useful	Somewhat useful	Not useful
Diagnosis of melanoma	194 (100%)	0	0
Follow-up of melanocytic lesions	192 (99%)	2 (1%)	0
Diagnosis of pigmented skin tumors	194 (100%)	0	0
Diagnosis of non-pigmented skin tumors	167 (86.1%)	24 (12.4%)	3 (1.5%)
Diagnosis of inflammatory skin lesions	68 (35.0%)	103 (53.1%)	23 (11.9%)
Follow-up of non-melanocytic skin lesions	106 (54.6%)	69 (35.6%)	19 (9.8%)
Diagnosis and follow-up of hair disorders	132 (68.0%)	52 (26.8%)	10 (5.2%)
Diagnosis and follow-up of nail disorders	112 (57.7%)	63 (32.5%)	19 (9.8%)

Table 4. Frequency of use of dermoscopy according to diagnostic groups.

	<10%	11%-30%	31%-50%	51%-70%	>70%
Pigmented skin tumors	2 (1%)	1 (0.5%)	15 (7.7%)	18 (9.3%)	158 (81.5%)
Non-pigmented skin tumors	5 (2.6%)	7 (3.6%)	17 (8.8%)	28 (14.4%)	137 (70.6%)
Inflammatory skin lesions	24 (12.4%)	22 (11.3%)	44 (22.7%)	52 (26.8%)	52 (26.8%)
Hair disorders	14 (7.2%)	19 (9.8%)	29 (15%)	26 (13.4%)	106 (54.6%)
Nail disorders	22 (11.4%)	21 (10.8%)	41 (21.1%)	36 (18.6%)	74 (38.1%)

Table 5. Confidence level in dermoscopic diagnostic skills.

	Trust	Somewhat trust	Does not trust
Pigmented skin tumors	174 (89.7%)	19 (9.8%)	1 (0.5%)
Non-pigmented skin tumors	154 (79.4%)	34 (17.5%)	6 (3.1%)
Inflammatory skin lesions	64 (33%)	96 (49.5%)	34 (17.5%)
Hair disorders	101 (52.1%)	74 (38.1%)	19 (9.8%)
Nail disorders	80 (41.2%)	88 (45.4%)	26 (13.4%)

pigmented tumors (100%). It was also considered to be useful for non-pigmented tumors (86.1%), monitoring melanocytic lesions (99%), follow-up of non-melanocytic lesions (54.6%), the evaluation of hair pathologies (68%) and to evaluate nail pathologies (57.7%). In the diagnosis of inflammatory lesions, the respondents considered it useful in 35% and somewhat useful by 53.1% of them.

When asking the subjects about dermoscopy use frequency according to the type of lesion, the most of them referred using it in more than 70% of cases of pigmented tumors, non-pigmented tumors and hair pathologies, being less used in inflammatory and nail pathologies (Table 4).

Regarding the use of diagnostic algorithms for pigmented lesions, pattern analysis ranks first with 70.2%, followed by ABCD with 34.9% and those that do not use any algorithm with 26.8%. It should be noted that 43.9% of those surveyed used more than one algorithm.

The respondents stated that they were confident in their dermoscopy skills to evaluate pigmented tumors (89.7%), non-pigmented tumors (79.4%) and hair pathology (52.1%).

The degree of confidence was lower when evaluating inflammatory and nail lesions (Table 5).

The main advantages of using dermoscopy, according to those surveyed are the diagnosis of melanomas in early stages (93.3% strongly agree), the follow-up of lesions (89.7% strongly agree), the increase in the confidence on the clinical diagnosis (83.5% strongly agree) and the reduction in the number of unnecessary biopsies/excisions (77.3% strongly agree). It is noteworthy that, when asking for an increase in remuneration associated with the use of dermoscopy, 28.9% state that they disagree and 36.6% state that they strongly disagree. The rest of the results associated with the advantages of dermoscopy are presented in Table 6.

Of those surveyed, 94.8% believed that using dermoscopy has increased the number of detected melanomas compared to a naked eye examination, and 78.9% believe that it has reduced the number of excisions of benign lesions.

After adjusting for age, sex, confidence, and education, being involved in teaching was associated with greater use of dermoscopy in non-pigmented tumors, with an OR 2.8

Table 6. Level of agreement with recognizing the utility in supporting the diagnostic process.

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
Diagnosis of early-stage melanoma	181 (93.3%)	13 (6.7%)	0	0	0
Allows follow-up of lesions	174 (89.7%)	20 (10.3%)	0	0	0
Reduces the number of unnecessary biopsies/excisions	150 (77.3%)	31 (16%)	9 (4.6%)	4 (2.1%)	0
Increases confidence in my clinical diagnosis	162 (83.5%)	30 (15.5%)	1 (0.5%)	1 (0.5%)	0
Improve the data saving	121 (62.3%)	41 (21.1%)	26 (13.4%)	3 (1.6%)	3 (1.6%)
Reduces patient anxiety	96 (49.5%)	60 (30.9%)	28 (14.4%)	7 (3.6%)	3 (1.6%)
Improve documentation for medical liability	123 (63.4%)	51 (26.3%)	16 (8.2%)	4 (2.1%)	0
Increase remuneration	7 (3.6%)	13 (6.7%)	47 (24.2%)	56 (28.9%)	71 (36.6%)

(95%CI 1.3-6.3), pigmented tumors with an OR 2.5 (95%CI 1.1 - 6.2), and in capillary pathology with an OR 2.4 (95%CI 1.2 - 4.8)

Conclusions

There was a 43.71% participation between the SOCHIDERM dermatologist, a higher percentage than the reference pan-European study with an average response rate of 33.2% among the participating countries [10]. In our sample, we have a lower percentage of non-users of this technique, compared to 11% in the reference study, with a very high percentage of use of this tool, consistent with other similar reports [11]. Its use was especially high in benign and malignant melanocytic lesions and pigmented tumors, similar to what is described in the European study. In the study by Forsea et al, 40% of the dermatologists had training in dermatology during their residency, a result similar to the finding in our survey. Also, similar results were found regarding the use of digital dermoscopy, reaching 38% of use. Participation in teaching activities arises with a factor that is associated with a greater use of this technique.

The main reason for not using digital dermoscopy among our respondents was a lack of confidence in their abilities, while the pan-European study revealed a lack of training on the subject as the main cause.

Our work has limitations in relation to its design, methodology and proportions. The main limitation of this study is the composition of the sample, since it is a convenience sample, which, despite the large sample size, does not ensure the representativeness of the results for all dermatologists in Chile. Although SOCHIDERM, the only association in the area in the country, brings together most dermatologists in Chile, 30% of the country specialists were not contacted for the application of the survey. In its records, it mentions an average age for its partners of 55 years, with 56.07% women,

however, not all of them continue in professional practice. Our convenience sample could have had an overrepresentation of young dermatologists, since it is a survey sent over the Internet, which could be unfriendly to older dermatologists who are less experienced in the use of technology. However, our sample average age was only 9 years compared to the average age of SOCHIDERM dermatologists and a similar percentage of men and women. On the other hand, it could be argued that this type of survey is usually answered by professionals with an interest in dermoscopy rather than by those who are sporadic users or who simply do not use it.

This pioneer study in Chile and Latin America shows that, nowadays, dermoscopy is widely used among Chilean dermatologists in a daily basis and beyond the diagnosis and follow-up of malignant skin pathology, expanding to other aspect of the dermatological practice. Nevertheless, it is important to look for new strategies to increase the adherence of this technique among dermatologists and to increase confidence in all areas of clinical practice. Videodermoscopy is a tool that is still under-used, possibly due to its lower access and associated cost.

Even if there are similar study worldwide that try to describe the use of dermoscopy in different countries and, in fact, the Spanish version of the study by Forsea et al was used to carry out our work with only a few minor changes, this is the first study in Chile to characterize the Chilean dermatologist population and its pattern of use of dermoscopy. On the other hand, the replication of the survey from the pan-European study allowed us to use a validated instrument and be able to make comparisons more easily with international experiences.

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