Profile of dermatological consultations in Brazil (2018)*

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Abstract: Background**:** Dermatological diseases are among the primary causes of the demand for basic health care. Studies on the frequency of dermatoses are important for the proper management of health planning.
Objectives: To evaluate the nosological and behavioral profiles of dermatological consultations in Brazil.
Methods: The Brazilian Society of Dermatology invited all of its members to complete an online form on patients who sought consultations from March 21–26, 2018. The form contained questions about patient demographics, consultation type according to the patient's funding, the municipality of the consultation, diagnosis, treatments and procedures. Diagnostic and therapeutic decisions were compared between subgroups.
Results: Data from 9629 visits were recorded. The most frequent causes for consultation were acne (8.0%), photoaging (7.7%), nonmelanoma skin cancer (5.4%), and actinic keratosis (4.7%). The identified diseases had distinct patterns with regard to gender, skin color, geographic region, type of funding for the consultation, and age group. Concerning the medical conducts, photoprotection was indicated in 44% of consultations, surgical diagnostic procedures were performed in 7.3%, surgical therapeutic procedures were conducted in 19.2%, and cosmetic procedures were performed in 7.1%.
Study limitations: Nonrandomized survey, with a sample period of one week.
Conclusion: This research allowed us to identify the epidemiological profiles of the demands of outpatients for dermatologists in various contexts. The results also highlight the importance of aesthetic demands in privately funded consultations and the significance of diseases such as acne, nonmelanoma skin cancer, leprosy, and psoriasis to public health.
Keywords: Dermatology; Diagnosis; Epidemiology; Therapeutics

INTRODUCTION

Dermatological diseases are frequent among those who seek health care and are among the initial causes of the demand for outpatient services.[1] Because they are often visible to others, they are a source of embarrassment and social rejection, leading to psychological suffering.[2,3] Although certain dermatological diseases can be treated in the primary care setting, many require specialized care.[4]

A 2017 publication reported that in the US, the burden of dermatological diseases is high and that its direct and indirect costs are comparable with those of other diseases, such as diabetes and cardiovascular diseases. This tremendous expense is due to the implementation of treatments—not to the diagnostic phase. Overall, 1 in 4 individuals of all ages in the US were seen by a doctor for at least 1 skin disease in 2013. In 2013, skin diseases resulted in direct health costs of 75 billion USD and, indirectly, opportunity costs of 11 billion USD in the US. [5]

Skin diseases place a huge burden on global health. Collectively, skin conditions were the fourth leading cause of nonfatal disease burden, expressed in years lost due to disability, in 2010. Taking

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into account the loss of health due to premature death, expressed in disability-adjusted life years (DALYs), skin is the 18th leading cause. Based on the distribution of dermatological diseases by age, DALYs peak between age 10 and 20 years due to acne and at age 60 years due to nonmelanoma skin cancers.[1]

However, there is a trend toward the nonvalorization of such diseases by those who are responsible for defining health care policies, due to the underestimation of their lethality and morbidity as a health problem. Several studies have shown that dermatological diseases have a significant impact on the quality of life of those who are affected, especially those who are chronically ill, highlighting the need for their valorization as a health issue by those who formulate public policies, because they are, in fact, valued by affected patients. Individuals with dermatological diseases perceive their health to be affected, feel limited in performing their daily tasks, and experience a loss of vitality, lowering their quality of life.[6-14] Dermatological diseases are therefore limiting, causing school and work absenteeism, and their carriers are more likely to experience anxiety and depression.[3,15-17]

Studies on the distribution of these diseases are important for the proper management of health planning, with regard to health plans and the Brazilian public health care system (SUS). The incorporation of new procedures, in association with an aging population, is contributing to the rise in the demand for and cost of care in dermatology.

In 2018, the Brazilian Society of Dermatology (SBD) conducted a survey on diagnoses and procedures that were performed during dermatological consultations, advancing the initiative that was begun in 2006, when the nosological profile of consultations was published.[18]

METHODS

The SBD invited all 8800 dermatologists who were current members to participate in the study, which consisted of the completion of an online form on all patients who were treated from May 21–26, 2018—the same week of the study that was conducted in 2006.[18] The form included the patient's age, gender, and skin color; city and state size; ICD-10 diagnosis; and their procedures.

For the analysis, certain related diseases were grouped, such as all superficial fungal infections, contact dermatitis, nonmelanoma skin cancers (basal cell and squamous cell carcinoma), and the ectoparasitoses. We also created the category "Others," which incorporated the diagnoses that were to be elucidated and those diseases with an occurrence of less than 10 cases in the sample.

The main outcome was the frequency of diagnoses that were established at each consultation. Multinomial confidence intervals (95%) were calculated from 10,000 bootstrap replications.[19]

To evaluate the statistical significance of the univariate analyses of the diagnoses by gender, we applied Spearman's rank correlation coefficient to the entire set of diagnoses from each table.

To examine the association of known variables with frequent and important diagnoses with regard to public health, we hypothesized a case control study with an outpatient basis, in which the main diagnosis corresponded to the cases, while the other diagnoses corresponded to the controls. We then estimated the association, based on the adjusted odds ratio by multivariate logistic regression. [20]

The study was approved by the research ethics committee of UNESP (nº 2.668.226).

RESULTS

Eight hundred eighty-five dermatologists completed the survey, which corresponds to 10% of the members of the Society at the time. Data were collected from 9629 consultations, with 13,293 diagnoses, wherein 61.9% of patients had only 1 diagnosis, 29.7% had 2, 7.7% had 3, and 0.7% had 4.

The 9629 patients had a mean (standard deviation) age of 42.8 (21.1) years (Figure 1); 65.1% (6266) was female, and 68.6% (6601) was Caucasian. Regarding funding for the consultation, 48.7% (4685) was financed by health plans, 25.0% (2409) was privately (out of pocket) funded, and 26.3% (2535) was funded by the SUS.

Table 1 shows the 60 most frequent diagnoses in the consultations, corresponding to 98.3% of attended cases. Acne was the most frequent diagnosis (8.0%), followed by photoaging (7.7%), nonmelanoma skin cancer (6.6%), actinic keratosis (4.7%), and superficial mycoses (4.5%).

Tables 2 to 7 present the leading 10 causes by age group, skin color, gender, type of funding for the consultation, type of consultation (first or second appointment) , and demographic region. In these tables, differences were statistically significant between age groups, genders, and types of funding for consultation; there was no significance between the classifications by phototype, type of consultation, and demographic region.

Figure 2 shows the age histograms of the frequency of atopic dermatitis, acne, nonmelanoma skin cancer, and photoaging; Figure 3 shows the age histograms for superficial mycoses, leprosy, actinic keratosis, and psoriasis.

With regard to skin color, diagnoses of photoaging (9.5%), nonmelanoma skin cancer (8.5%), and acne (8.3%) were more frequent among whites, compared with acne (7.4%), superficial mycoses (5.8%), and melasma (5.5%), in non-whites. Although acne was the third most common condition in whites, its frequency was higher among non-whites. This phenomenon resulted non-significant regarding the ordination (rank) distribution, although diagnoses of photoaging and nonmelanoma skin cancer were more frequent among whites.

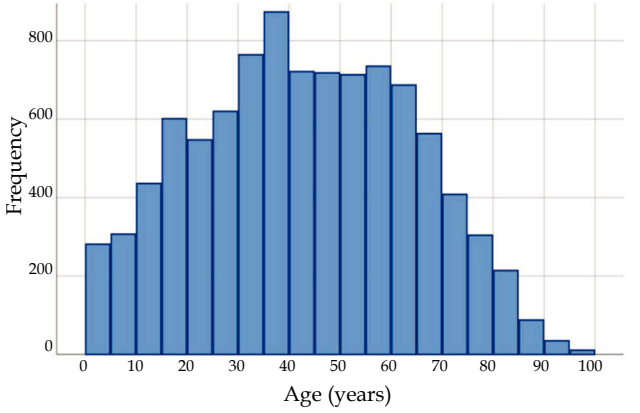

Figure 1: Age histogram of attended patients (n = 9627)

Between genders, women were most frequently diagnosed with photoaging (10.9%) and acne (6.2%), versus acne (11.4%) and nonmelanoma skin cancer (9.3%) in men, confirming that the demand for dermatological care for aesthetic reasons is greater in females.

Regarding infectious diseases, the most frequent diagnosis was superficial mycoses, with 437 cases (4.5%). Moreover, 44 (0.5%) patients had a diagnosis of genital warts, 137 (1.4%) had leprosy, 61 (0.6%) had syphilis, 84 (0.9%) had scabies / pediculosis, and 71 (0.7%) had molluscum contagiosum.

Table 1: Main diagnoses of dermatological consultations (n = 9629)

	Diagnosis	N	%	95% CI*
1	Acne	771	8.0	7.5 -8.6
2	Photoaging /Skin aging	746	7.7	7.2-8.3
3	Nonmelanoma skin cancer	633	6.6	6.1-7.1
4	Actinic keratosis / Actinic cheilitis	451	4.7	4.3-5.1
5	Superficial mycosis (tinea versicolor, dermatophytosis, onychomycosis)	437	4.5	4.1-5.0
6	Psoriasis	421	4.4	4.0-4.8
7	Melasma	357	3.7	3.3-4.1
8	Others**	349	3.6	3.3-4.1
9	Melanocytic nevus	333	3.5	3.1-3.8
10	Atopic dermatitis	326	3.4	3.0-3.8
11	Contact dermatitis (allergic, irritant)	325	3.4	3.0-3.7
12	Male or female pattern androgenetic alopecia	307	3.2	2.8-3.5
13	Seborrheic keratosis	300	3.1	2.8-3.5
14	Acne in adult women	250	2.6	2.3-2.9
15	Seborrheic dermatitis	223	2.3	2.0-2.6
16	Viral wart	207	2.1	1.9-2.5
17	Telogen effluvium	196	2.0	1.8-2.3
18	Epidermal cyst / trichilemmal cyst	169	1.8	1.5-2.0
19	Acrochordon (skin tag) / molluscum pendulum	167	1.7	1.5-2.0
20	Vitiligo	158	1.6	1.4-1.9
21	Leprosy	137	1.4	1.2-1.7
22	Rosacea	124	1.3	1.1-1.5
23	Alopecia areata	120	1.2	1.0-1.5
24	Folliculitis	110	1.1	0.9-1.4
25	Cutaneous xerosis / Asteatosis	106	1.1	0.9-1.3
26	Hypertrophic scar/Keloid	97	1.0	0.8-1.2
27	Lichen simplex chronicus/ Prurigo / Chronic eczema	94	1.0	0.8-1.2
28	Pruritus (sine materiae)	85	0.9	0.7-1.1
29	Scabies / Pediculosis	84	0.9	0.7-1.1
30	Solar lentigo / Solar melanosis	83	0.9	0.7-1.1
31	Cicatricial alopecia (lupus, folliculitis decalvans, lichen planus pilaris)	82	0.9	0.7-1.0
32	Urticaria /Angioedema	73	0.8	0.6-0.9
33	Molluscum contagiosum	71	0.7	0.6-0.9
34	Melanoma	64	0.7	0.5-0.8
35	Post-inflammatory hyperpigmentation	63	0.7	0.5-0.8
36	Cutaneous lupus erythematosus	60	0.6	0.5-0.8
37	Striae distansae	58	0.6	0.5-0.8
38	Chronic lower limb ulcer	58	0.6	0.4-0.8
39	Impetigo and ecthyma	55	0.6	0.4-0.7
40	Drug eruptions	53	0.6	0.4-0.7
41	Onycholysis /Onychomadesis/ Onychomalacia / Onychodystrophy	53	0.6	0.4-0.7
42	Acne scar	49	0.5	0.4-0.7
43	Pemphigus and pemphigoid	46	0.5	0.3-0.6
44	Anogenital warts (HPV) / Condyloma	44	0.5	0.3-0.6
45	Keratosis pilaris	43	0.4	0.3-0.6
46	Cutaneous lymphoma and lymphomatoid proliferations	42	0.4	0.3-0.6
47	Lipoma	41	0.4	0.3-0.6
48	Cutaneous / systemic scleroderma	37	0.4	0.3-0.5
49	Pityriasis rosea	34	0.4	0.2-0.5
50	Herpes zoster	31	0.3	0.2-0.4
51	Ingrown toenail / Onychocryptosis	30	0.3	0.2-0.4
52	Dermatofibroma	29	0.3	0.2-0.4
53	Genital / extralabial herpes	25	0.3	0.2-0.4
54	Hidradenitis suppurativa	24	0.2	0.2-0.4
55	Pityriasis alba	22	0.2	0.1-0.3
56	Subcutaneous / Systemic mycosis	21	0.2	0.1-0.3
57	Syringoma / Sweat glands neoplasms	20	0.2	0.1-0.3
58	Lichen planus	19	0.2	0.1-0.3
59	Hemangioma	18	0.2	0.1-0.3
60	Syphilis	17	0.2	0.1-0.3

* 95% CI: 95% confidence interval calculated from 10,000 bootstrap replications; ** Diagnoses with fewer than 10 occurrences or to be clarified

Table 2: Primary diagnoses by age group

	0-12 years old			12-24 years old		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	Atopic dermatitis	212	25.8	Acne	557	41.2
2	Molluscum contagiosum	61	7.4	Contact dermatitis	58	4.3
3	Viral wart	55	6.7	Atopic dermatitis	55	4.1
4	Acne	48	5.8	Superficial mycosis	49	3.6
5	Others	34	4.1	Melanocytic nevus	42	3.1
6	Superficial mycosis	32	3.9	Psoriasis	40	3.0
7	Melanocytic nevus	32	3.9	Viral wart	34	2.5
8	Scabies / Pediculosis	29	3.5	Others	32	2.4
9	Vitiligo	29	3.5	Striae distensiae	31	2.3
10	Alopecia areata	24	2.9	Male or female pattern androgenetic alopecia	31	2.3
11	Seborrheic dermatitis	20	2.4	Seborrheic dermatitis	28	2.1
12	Contact dermatitis	19	2.3	Acne in adult women	28	2.1
13	Impetigo and ecthyma	18	2.2	Telogen effluvium	24	1.8
14	Psoriasis	18	2.2	Alopecia areata	23	1.7
15	Hemangioma	14	1.7	Folliculitis	20	1.5
16	Diaper dermatitis	14	1.7	Vitiligo	19	1.4
17	Pityriasis alba	14	1.7	Hypertrophic scar	19	1.4
18	Lichen simplex chronicus	12	1.5	Scabies / Pediculosis	15	1.1
19	Xerosis / Asteatosis	11	1.3	Epidermoid cysts	15	1.1
20	Keratosis pilaris	9	1.1	Urticaria	14	1.0

	25-59 years old			60 years and older		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	Photoaging	540	10.5	Nonmelanoma skin cancer	446	19.3
2	Melasma	341	6.6	Actinic keratosis	299	12.9
3	Psoriasis	251	4.9	Photoaging	202	8.7
4	Superficial mycosis	244	4.7	Seborrheic keratosis	144	6.2
5	Melanocytic nevus	225	4.4	Psoriasis	112	4.8
6	Male or female pattern androgenetic alopecia	221	4.3	Superficial mycosis	112	4.8
7	Acne in adult women	220	4.3	Contact dermatitis	78	3.4
8	Others	208	4.0	Others	75	3.2
9	Nonmelanoma skin cancer	179	3.5	Male or female pattern androgenetic alopecia	52	2.3
10	Contact dermatitis	170	3.3	Pruritus (sine materiae)	44	1.9
11	Acne	156	3.0	Acrochordon /skin tag	42	1.8
12	Seborrheic keratosis	149	2.9	Epidermoid cysts	42	1.8
13	Actinic keratosis	149	2.9	Lower limb ulcer	38	1.6
14	Seborrheic dermatitis	143	2.8	Xerosis / Asteatosis	35	1.5
15	Telogen effluvium	141	2.7	Melanocytic nevus	34	1.5
16	Acrochordon /skin tag	116	2.3	Seborrheic dermatitis	32	1.4
17	Epidermoid cysts	109	2.1	Leprosy	32	1.4
18	Vitiligo	95	1.8	Rosacea	30	1.3
19	Viral wart	90	1.7	Solar lentigo / Solar melanosis	30	1.3
20	Leprosy	88	1.7	Telogen effluvium	29	1.3

Spearman rank R: -0.07 t=-7.23 p<0.01

Table 3: Main diagnoses by skin color

	COLOR - White			COLOR - Non-white		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	Photoaging	628	9.5	Acne	225	7.4
2	Nonmelanoma skin cancer	564	8.5	Superficial mycosis	175	5.8
3	Acne	546	8.3	Melasma	168	5.5
4	Actinic keratosis	418	6.3	Psoriasis	159	5.3
5	Melanocytic nevus	281	4.3	Atopic dermatitis	128	4.2
6	Superficial mycosis	262	4.0	Photoaging	118	3.9
7	Psoriasis	262	4.0	Contact dermatitis	116	3.8
8	Others	246	3.7	Others	103	3.4
9	Seborrheic keratosis	215	3.3	Acne in adult women	97	3.2
10	Male or female pattern androgenetic alopecia	211	3.2	Seborrheic dermatitis	97	3.2
11	Contact dermatitis	209	3.2	Male or female pattern androgenetic alopecia	96	3.2
12	Atopic dermatitis	198	3.0	Leprosy	91	3.0
13	Melasma	189	2.9	Seborrheic keratosis	85	2.8
14	Acne in adult women	153	2.3	Acrochordon / skin tag	70	2.3
15	Viral wart	142	2.2	Nonmelanoma skin cancer	69	2.3
16	Telogen effluvium	138	2.1	Viral wart	65	2.1
17	Seborrheic dermatitis	126	1.9	Epidermoid cysts	63	2.1
18	Rosacea	113	1.7	Telogen effluvium	58	1.9
19	Epidermoid cysts	106	1.6	Vitiligo	58	1.9
20	Vitiligo	100	1.5	Alopecia areata	56	1.8

Spearman rank R: 0.01 t=0.815 p=0.42.

Table 4: Distribution of diagnoses by gender

	Female			Male		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	Photoaging	682	10.9	Acne	385	11.4
2	Acne	386	6.2	Nonmelanoma skin cancer	312	9.3
3	Melasma	335	5.3	Actinic keratosis	193	5.7
4	Nonmelanoma skin cancer	321	5.1	Superficial mycosis	192	5.7
5	Actinic keratosis	258	4.1	Psoriasis	180	5.4
6	Superficial mycosis	245	3.9	Atopic dermatitis	138	4.1
7	Acne in adult women	243	3.9	Melanocytic nevus	128	3.8
8	Psoriasis	241	3.8	Others	109	3.2
9	Others	240	3.8	Seborrheic dermatitis	105	3.1
10	Contact dermatitis	224	3.6	Contact dermatitis	101	3.0
11	Male or female pattern androgenetic alopecia	206	3.3	Androgenetic alopecia	101	3.0
12	Seborrheic keratosis	206	3.3	Seborrheic keratosis	94	2.8
13	Melanocytic nevus	205	3.3	Viral wart	86	2.6
14	Atopic dermatitis	188	3.0	Leprosy	76	2.3
15	Telogen effluvium	187	3.0	Acrochordon /skin tag	71	2.1
16	Viral wart	121	1.9	Photoaging	64	1.9
17	Seborrheic dermatitis	118	1.9	Alopecia areata	64	1.9
18	Vitiligo	115	1.8	Epidermoid cysts	61	1.8
19	Epidermoid cysts	108	1.7	Folliculitis	53	1.6
20	Acrochordon /skin tag	96	1.5	Vitiligo	43	1.3

Spearman rank R: -0.15 t=-15.00 p<0.01

Table 5: Distribution of diagnoses by type of funding for consultation

	COVERAGE / HEALTH INSURANCE			PRIVATE / OUT OF POCKET PAYMENT			SUS / PUBLIC		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**	**Diagnosis**	**N**	**%**
1	Acne	497	10.6	Photoaging	495	20.5	Nonmelanoma skin cancer	297	11.7
2	Superficial mycosis	261	5.6	Acne	160	6.6	Psoriasis	225	8.9
3	Actinic keratosis	230	4.9	Nonmelanoma skin cancer	155	6.4	Leprosy	131	5.2
4	Melasma	227	4.8	Others	149	6.2	Actinic keratosis	128	5.0
5	Photoaging	201	4.3	Male or female pattern androgenetic alopecia	114	4.7	Superficial mycosis	121	4.8
6	Seborrheic keratosis	200	4.3	Actinic keratosis	93	3.9	Acne	114	4.5
7	Melanocytic nevus	187	4.0	Contact dermatitis	88	3.7	Atopic dermatitis	90	3.6
8	Nonmelanoma skin cancer	181	3.9	Psoriasis	85	3.5	Others	83	3.3
9	Atopic dermatitis	179	3.8	Melasma	80	3.3	Melanocytic nevus	70	2.8
10	Acne in adult women	172	3.7	Melanocytic nevus	76	3.2	Vitiligo	68	2.7
11	Contact dermatitis	171	3.6	Atopic dermatitis	57	2.4	Contact dermatitis	66	2.6
12	Male or female pattern androgenetic alopecia	154	3.3	Superficial mycosis	55	2.3	Seborrheic dermatitis	51	2.0
13	Seborrheic dermatitis	140	3.0	Acne in adult women	55	2.3	Photoaging	50	2.0
14	Acrochordon / skin tag	138	2.9	Seborrheic keratosis	51	2.1	Melasma	50	2.0
15	Telogen effluvium	137	2.9	Rosacea	46	1.9	Seborrheic keratosis	49	1.9
16	Viral wart	134	2.9	Telogen effluvium	39	1.6	Alopecia areata	45	1.8
17	Epidermoid cysts	124	2.6	Vitiligo	38	1.6	Chronic ulcer	42	1.7
18	Others	117	2.5	Seborrheic dermatitis	32	1.3	Viral wart	41	1.6
19	Psoriasis	111	2.4	Viral wart	32	1.3	Pemphigus and pemphigoid	41	1.6
20	Folliculitis	60	1.3	Cicatricial alopecia	30	1.2	Male or female pattern androgenetic alopecia	39	1.5

Spearman rank R: -0.09 t=-8.52 p<0.01

Table 6: Distribution of diagnoses by type of consultation

	FIRST APPOINTMENT			SECOND APPOINTMENT		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	Acne	386	8.2	Photoaging	260	9.9
2	Superficial mycosis	282	6.0	Acne	386	7.9
3	Photoaging	260	5.5	Nonmelanoma skin cancer	255	7.7
4	Nonmelanoma skin cancer	255	5.4	Psoriasis	115	6.2
5	Contact dermatitis	202	4.3	Actinic keratosis	190	5.3
6	Atopic dermatitis	197	4.2	Others	160	3.9
7	Seborrheic keratosis	197	4.2	Melasma	170	3.8
8	Actinic keratosis	190	4.0	Male or female pattern androgenetic alopecia	140	3.4
9	Melanocytic nevus	189	4.0	Superficial mycosis	282	3.2
10	Melasma	170	3.6	Melanocytic nevus	189	2.9
11	Others	160	3.4	Atopic dermatitis	197	2.6
12	Seborrheic dermatitis	148	3.1	Contact dermatitis	202	2.5
13	Acne in adult women	146	3.1	Viral wart	90	2.4
14	Male or female pattern androgenetic alopecia	140	3.0	Acne in adult women	146	2.1
15	Telogen effluvium	120	2.5	Seborrheic keratosis	197	2.1
16	Psoriasis	115	2.4	Leprosy	36	2.1
17	Acrochordon / skin tag	99	2.1	Vitiligo	61	2.0
18	Epidermoid cysts	93	2.0	Telogen effluvium	120	1.6
19	Viral wart	90	1.9	Epidermoid cysts	93	1.6
20	Xerosis / Asteatosis	72	1.5	Seborrheic dermatitis	148	1.5

Spearman Rank R: 0.01 t=0.95 p=0.34

Table 7: Distribution of diagnoses by region in Brazil

	North			Northeast			Southeast		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**	**Diagnosis**	**N**	**%**
1	Acne	110	7.6	Photoaging	52	10.9	Photoaging	374	8.6
2	Atopic dermatitis	72	5.0	Acne	38	8.0	Acne	336	7.7
3	Superficial mycosis	63	4.4	Leprosy	24	5.0	NM skin cancer	281	6.5
4	Melasma	63	4.4	NM skin cancer	23	4.8	Superficial mycosis	224	5.2
5	NM skin cancer	61	4.2	Melasma	20	4.2	Psoriasis	205	4.7
6	Others	56	3.9	Psoriasis	20	4.2	Actinic keratosis	186	4.3
7	Contact dermatitis	54	3.8	Superficial mycosis	18	3.8	Others	180	4.1
8	Photoaging	48	3.3	Atopic dermatitis	17	3.6	Melasma	154	3.5
8	Psoriasis	44	3.1	Seborrheic keratosis	17	3.6	Melanocytic nevus	149	3.4
10	Acrochordon /skin tag	44	3.1	Acne in adult women	16	3.4	Contact dermatitis	135	3.1
11	Seborrheic dermatitis	43	3.0	Male or female pattern androgenetic alopecia	15	3.2	Atopic dermatitis	134	3.1
12	Scabies / Pediculosis	42	2.9	Actinic keratosis	15	3.2	Seborrheic keratosis	130	3.0
13	Male or female pattern androgenetic alopecia	39	2.7	Seborrheic dermatitis	14	2.9	Male or female pattern androgenetic alopecia	129	3.0
14	Epidermoid cysts	39	2.7	Contact dermatitis	13	2.7	Acne in adult women	104	2.4
15	Acne in adult women	36	2.5	Acrochordon /skin tag	12	2.5	Viral wart	104	2.4
16	Melanocytic nevus	33	2.3	Melanocytic nevus	12	2.5	Seborrheic dermatitis	100	2.3
17	Seborrheic keratosis	30	2.1	Others	11	2.3	Telogen effluvium	89	2.0
18	Actinic keratosis	28	1.9	Epidermoid cysts	9	1.9	Epidermoid cysts	80	1.8
19	Telogen effluvium	26	1.8	Viral wart	9	1.9	Vitiligo	65	1.5
20	Viral wart	26	1.8	Telogen effluvium	8	1.7	Leprosy	62	1.4

	South			Midwest		
	Diagnosis	**N**	**%**	**Diagnosis**	**N**	**%**
1	NM skin cancer	195	8.9	Acne	119	9.8
2	Photoaging	185	8.5	Photoaging	87	7.1
3	Actinic keratosis	171	7.8	NM skin cancer	73	6.0
4	Acne	168	7.7	Superficial mycosis	56	4.6
5	Psoriasis	105	4.8	Male or female pattern androgenetic alopecia	55	4.5
6	Melanocytic nevus	100	4.6	Acne in adult women	54	4.4
7	Seborrheic keratosis	79	3.6	Contact dermatitis	51	4.2
8	Superficial mycosis	76	3.5	Actinic keratosis	51	4.2
9	Contact dermatitis	72	3.3	Melasma	49	4.0
10	Melasma	71	3.2	Psoriasis	47	3.9
11	Male or female pattern androgenetic alopecia	69	3.2	Seborrheic keratosis	44	3.6
12	Others	66	3.0	Melanocytic nevus	39	3.2
13	Atopic dermatitis	65	3.0	Atopic dermatitis	38	3.1
14	Viral wart	52	2.4	Others	36	3.0
15	Vitiligo	51	2.3	Seborrheic dermatitis	30	2.5
16	Telogen effluvium	49	2.2	Acrochordon / skin tag	25	2.0
17	Rosacea	48	2.2	Alopecia areata	25	2.0
18	Acne in adult women	40	1.8	Telogen effluvium	24	2.0
19	Seborrheic dermatitis	36	1.6	Leprosy	21	1.7
20	Acrochordon /skin tag	30	1.4	Cicatricial alopecia	17	1.4

Spearman rank R: -0.01 t=-0.08 p=0.94

When we considered all consultation-based diagnoses - not only the main diagnosis - the most relevant result was the increase in the proportion of patients who were affected by the most common diseases. For example, 48.4% of patients aged between 13 and 24 years had a diagnosis of acne, and 24.1% of those aged 60 years and older had a diagnosis of nonmelanoma skin cancer, whereas these diseases were the chief diagnoses in the consultations in 41.2% and 19.3% of the age groups above.

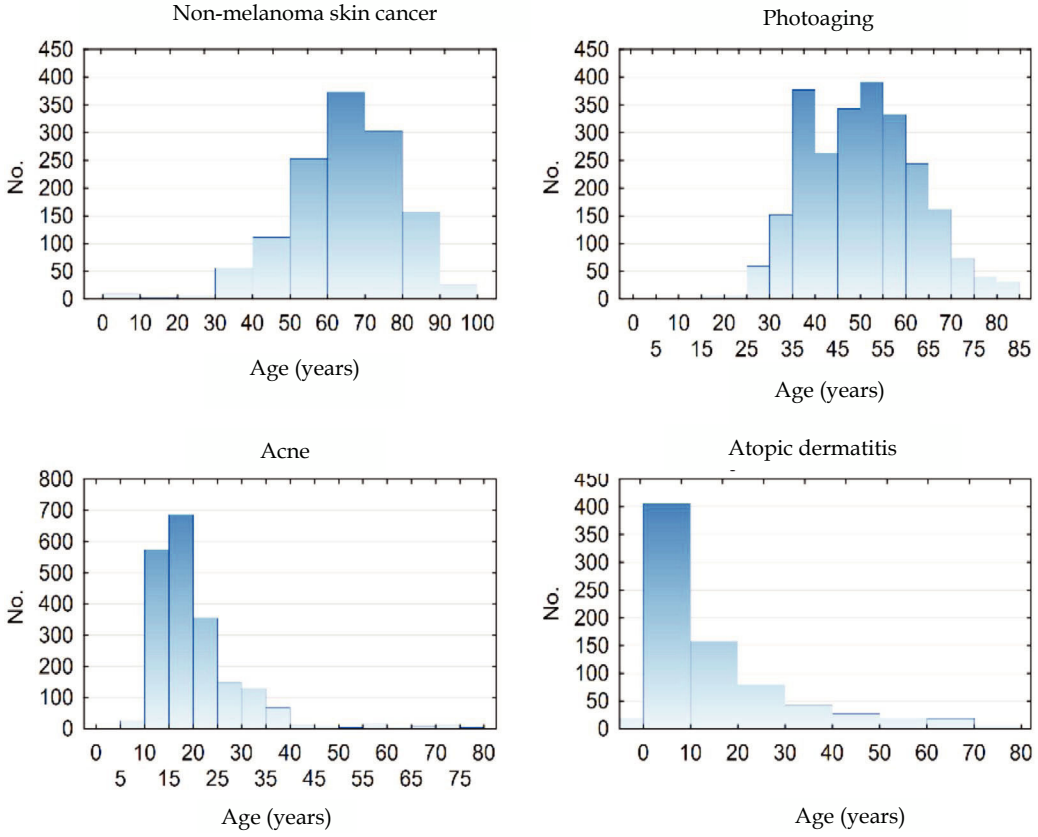

Figure 2: Age histograms for patients diagnosed with atopic dermatitis, acne, nonmelanoma skin cancer, and photoaging

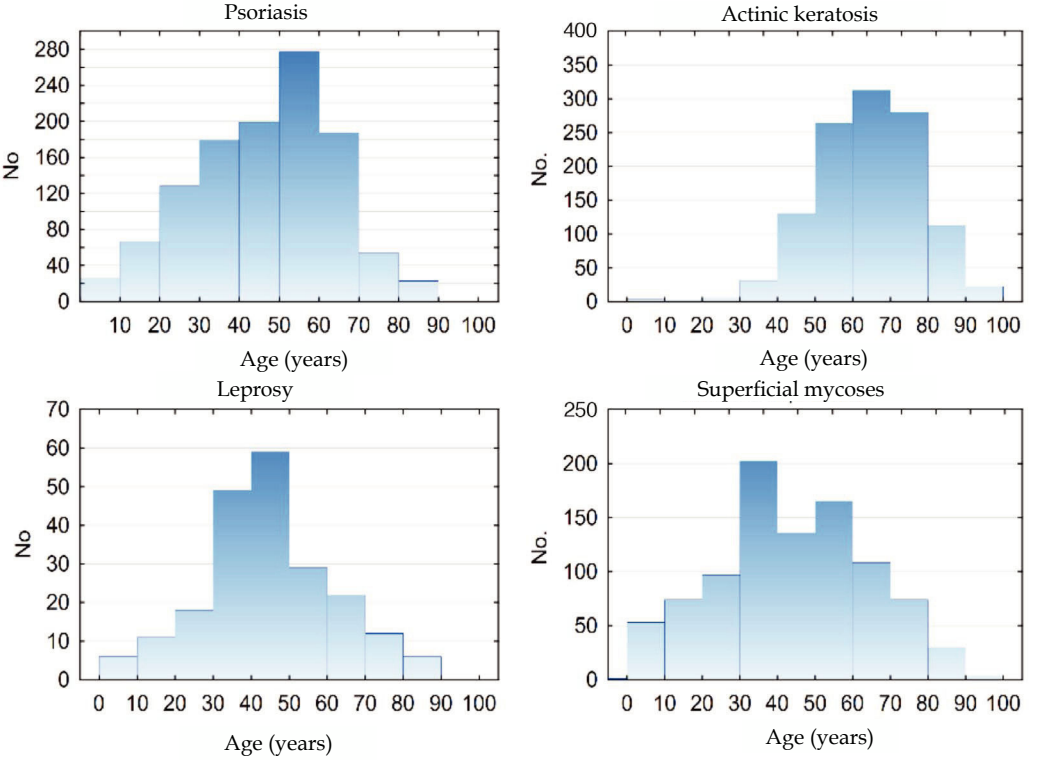

Figure 3: Age histograms for patients diagnosed with superficial mycoses, Hansen disease, actinic keratosis, and psoriasis

Table 8 shows the most frequent standard treatments and the proportion of patients to whom they were administered. Table 9 shows the practices and the proportion of patients by funding type. Notably, each patient received more than 1 treatment, for example, 2.51 indications on average in consultations funded by health plans, compared with 2.61 for private funding and 2.16 for SUS-funded consultations.

Table 8: Frequencies of (standard) treatments resulting from consultations

CONDUCT	N	% of patients
Topical Medications[1]	4922	51.1
Sunscreen	4232	44.0
Moisturizers and emollients	3002	31.2
Oral medications[2]	2379	24.7
Topical cosmeceuticals[3]	1859	19.3
Therapeutic surgical procedure[4]	1838	19.1
Diagnostic clinical procedure[5]	801	8.3
Diagnostic surgical procedure[6]	706	7.3
Cosmetic surgical procedure[7]	674	7.0
Nutraceuticals, antioxidants and food supplements	605	6.3
Botulinum toxin	524	5.4
Fillers/volumizers	303	3.1
Phototherapy[8]	149	1.5
Immunobiologicals[9]	65	0.7

1. e.g., corticoid, antifungal, antimicrobial, tretinoin, minoxidil
2. e.g., antimicrobials, antihistamines, isotretinoin, immunosuppressants
3. e.g., antioxidants, retinoids, soaps
4. e.g., electrocoagulation, excision and suturing, cryosurgery
5. e.g., dermatoscopy, Wood's lamp, esthesiometer
6. e.g., biopsy, puncture, mycological examination
7. e.g., peeling, laser, needling, microdermabrasion
8. e.g., PUVA, NBUVB, PUVA sun
9. e.g., anti-TNF, anti-IgE, anti-IL17

Table 10 presents the results of the logistic regression, comparing certain diseases by region in Brazil, gender, age group, and funding type. Leprosy was associated with regional differences, a preponderance of SUS-based care, males the working age group, non-white skin color, and the need for subsequent appointments. The frequency of psoriasis was higher in the south of Brazil, those in the public health care system, males, the economically productive age group, and those who required return visits. Nonmelanoma skin cancers were more common in those who were on public assistance, males, resident of smaller towns, and those with white skin color.

DISCUSSION

Dermatology, as a medical specialty, typically encompasses a high number of nosological entities from skin, mucosae and skin appendages. In parallel, it assists many populations, enclosing all age groups and genders, which, added to the sociocultural, climatic, and ethnic differences of the Brazilian population, results in individualized patterns of disease occurrence.[21] All of these elements should be weighed in planning specialty care, public health policies, and medical education.[22-26]

The most frequent primary diagnosis of the consultations in our study was acne, as well as in a previous report from 2006.[18] Actually, acne is the main cause for consultations in Saudi Arabia[27] and the US.[28] In a study with dermatologists in Spain,[4] the most frequent diagnosis was nonmelanoma skin cancer, although acne was the chief diagnosis among those aged under 18 years. The inconsistency between our results and those in Spain is due to the disparate age groups between study populations.

Table 9: Frequencies of (standard) treatments by type of funding for consultation

	CONDUCT / PRESCRIPTION	Coverage / health insurance		Private / Out of pocke		SUS / public	
		N	% of patients	N	% of patients	N	% of patients
1	All procedures	11741	250.6	6266	260.1	5474	215.9
2	Topical medications	2657	56.7	1045	43.4	1220	48.1
3	Sunscreen	2203	47.0	988	41.0	1041	41.1
4	Moisturizers and emollients	1456	31.1	672	27.9	874	34.5
5	Oral medications	1056	22.5	583	24.2	740	29.2
6	Topical cosmeceuticals	1128	24.1	525	21.8	206	8.1
7	Therapeutic surgical procedure	1012	21.6	349	14.5	477	18.8
8	Diagnostic clinical procedure	415	8.9	212	8.8	174	6.9
9	Diagnostic surgical procedure	338	7.2	126	5.2	242	9.5
10	Cosmetic surgical procedure	181	3.9	432	17.9	61	2.4
11	Nutraceuticals and antioxidants	355	7.6	213	8.8	37	1.5
12	Botulinum toxin	134	2.9	381	15.8	9	0.4
13	Fillers/volumizers	79	1.7	222	9.2	2	0.1
14	Phototherapy	43	0.9	46	1.9	60	2.4
15	Immunobiologicals	14	0.3	18	0.7	33	1.3

Spearman rank R: 0.03 t=4.33 p<0.01

Differences in the occurrence of conditions between ages are expected and are characteristic of the natural history of dermatoses, such as ectoparasitoses and childhood viral infections, in contrast to melasma and acne in adult women and nonmelanoma skin cancers and seborrheic keratosis among the elderly.[29-33] Chronic diseases, such as psoriasis and androgenetic alopecia, tend to increase progressively in frequency, depending on the age group.[21,34-36] Conversely, more limited diseases, such as acne and atopic dermatitis, become less common in adulthood. Superficial mycoses, in contrast, are frequent in all age groups.

The skin is an organ that interfaces directly with the environment, and external insults can promote several dermatoses. The ethnic and climatic variety in Brazil is considered in the type of epidemiological examination that we performed in this study. Contact dermatitis became frequent in consultations, especially beginning in adolescence, when work activities initiate. Nonmelanoma skin cancer and actinic keratoses were frequent among the elderly, especially those with light skin color who were treated by the public health system, reflecting chronic exposure to ultraviolet radiation in such activities as agriculture and fishing.[35, 37, 38] Melasma was typical in women and non-white adult patients, due to the role of female hormones and miscegenation in its pathogenesis.[32, 38-41]

In comparing our results with those of the 2006 study, which used only the general ICD-10 category codes, a major difference arose between the two sets of patients with regard to the inclusion of patients with a primary diagnosis of photoaging, which reflects the cosmetic demand for dermatologists, especially in private consultations and among white women. When using the same type of coding as in the previous study, a diagnosis of acne (L70) was given to 10.6% (1021) of patients, whereas skin alterations due to chronic exposure to non-ionizing radiation (L57) was diagnosed in 12.4% (1197) of patients, versus 14.0% and 5.1% in the 2006 study, respectively.

Notably, in our study, superficial mycoses were the fifth most frequent diagnosis (4.5%) compared with the second most common diagnosis in the 2006 study (8.7%). This difference is attributed to the finding that in SUS-funded patients, this was the main diagnosis in 2006 (9.8%) but remained the fifth most frequent diagnosis in our subjects (4.8%) (Table 5), likely reflecting a greater capacity for diagnosis and treatment for basic care in the SUS system.

Psoriasis was the tenth most frequent diagnosis in 2006 (2.5% of patients) but the sixth most frequent cause of consultations (4.4%) in 2018. This increase is likely due to greater awareness by the patients, generating greater demand for diagnosis and better adherence to treatment.[42] Disease chronicity, associated with population aging, also contributes to the increased need for specialized care.[43,44] The distribution of diagnoses between regions reflects the survey of capital cities in 2014, in which psoriasis was more prevalent in the south and southeast.[34] Our regional differences in the rates of

Table 10: Multivariate analysis (multiple logistic regression) comparing the frequency of Hansen disease, psoriasis, and nonmelanoma skin cancer by region in Brazil, gender, age group, city size, skin color, funding type, and consultation type

		LEPROSY		PSORIASIS		NONMELANOMA CA	
		OR*	p	OR*	p	OR*	p
Region	N	2.07	0.02	0.78	0.37	1.62	0.07
	NE	4.52	0.00	0.83	0.70	1.30	0.95
	S	0.25	0.00	1.16	0.02	1.22	0.60
	MW	1.24	0.99	0.74	0.17	1.35	0.66
	SE	1		1		1	
Funding type	Coverage / health insurance	0.01	0.00	0.31	0.00	0.32	0.00
	Private /out of pocket payment	0.03	0.03	0.42	0.03	0.42	0.01
	SUS	1		1		1	
Gender	Female	0.44	0.00	0.69	0.00	0.50	0.00
	Male	1		1		1	
Age group (years)	0-12	0.30	0.02	0.50	0.01	0.02	0.00
	13-24	0.78	0.95	0.72	0.37	0.02	0.00
	25-59	1.50	0.00	1.24	0.00	0.19	0.00
	>60	1		1		1	
City	<100,000 inhabitants	0.74	0.53	0.57	0.24	1.62	0.01
	100-300,000 inhabitants	1.07	0.54	0.54	0.05	1.24	0.86
	>300,000 inhabitants	1		1		1	
Skin color	White	0.53	0.01	0.85	0.15	3.94	0.00
	Non-white	1					
Consultation type	First appointment	0.51	0.00	0.47	0.00	0.98	0.83
	Second appointment	1		1		1	

* OR: odds ratio

vitiligo, leprosy, and hidradenitis suppurativa also reproduced the findings of population-based studies in Brazil, which might be attributed to the regional ethnic composition.[45-48]

The differences in diagnoses regarding funding source (public, health insurance, and out of pocket payment) reflect the socioeconomic variation in patients and the need for referrals to specialists in comparing those who are covered by SUS and health insurance. Regarding socioeconomic differences, leprosy constituted 5.2% of diagnoses in SUS subjects (third most frequent) but was absent from the 20 most frequent diagnoses in health insurance and private consultations. The initial cause in diagnoses among private consultations was photoaging, with 20.5% of diagnoses, demonstrating the importance of the demand for cosmetic consultations in self-financed private practice. This pattern is reflected in the procedures that were performed, wherein the use of botulinum toxin and fillers was much more prevalent in private versus SUS and health insurance consultations. There were also more prescriptions for topical cosmeceuticals among insurance-based consultations (24.1% of patients) and for private patients (21.8%).

Before we discuss the logistic regression results, we must highlight the proposal to consider the data as a case control study — ie, considering the diagnoses for leprosy (and psoriasis and nonmelanoma cancer, analyzed separately) as "cases" and the other diagnoses as their "controls," assuming that these groups are comparable if their selection has not been biased. To have a bias, the selection of the patient pool should alter the proportion of cases and other aspects of interest (eg, age, gender, region in Brazil). The regression results, expressed as odds ratios as a measure of association, are controlled by other items (covariables) that are included. These non-biased results can be extrapolated to the general population.

Leprosy and psoriasis were more frequent in second appointments, which is consistent with the fact that they are chronic diseases. As expected, the risk of leprosy was greater among the population that was covered by the SUS, males, non-whites, and those aged over 24 years. Unexpectedly, the northeast region of Brazil was at greater risk than those in the midwest, in contrast to published epidemiological data, although the detection rates in northeast have risen significantly.[47,48] Another interpretation is that there was selection bias, because the northeast region was the least adherent in this study.

By regression analysis, there was a higher risk of psoriasis consultations in the southern region, the SUS-covered population, and those aged between 25 and 59 years, whereas for non-melanoma cancers, there was no statistically significant difference between regions, with a higher risk among those aged over 60 years and cities with fewer than 100,000 inhabitants. The latter association - a greater risk for cities - can be explained by such cities harboring populations with a history of outdoor work, such as agriculture and livestock.[30,37]

Finally, it is important to highlight the high proportion of patients with prescriptions for sunscreen (44%), which demonstrates a preventive approach and an attitude toward health education that are adopted by professionals.[49] Diagnostic and therapeutic surgical procedures were indicated in 26.4% of visits, highlighting the prevalence of such methods in the actual clinical practice of Brazilian dermatologists.

Cosmetic/aesthetic procedures, such as the application of botulinum toxin and fillers, were more frequent among private consultations than those that were funded by health insurance or the SUS. Conversely, prescriptions for immunobiologicals were more common in SUS-based consultations, although it is unusual (1.3% of SUS patients, 0.7% of private patients, and 0.3% of health insurance-covered patients), likely reflecting their high cost, which is dependent on public funding.

The study limitations primarily concern the lack of randomization due to the spontaneous and heterogeneous adherence of dermatologists; however, all covariates (demographic, geography, and care) were considered. Another limitation was that the sample comprised only one epidemiologic week, which might have influenced the frequency of diseases with seasonal characteristics, such as psoriasis, leishmaniasis, and mycoses.[50] Nevertheless, the same epidemiological week was chosen as in the 2006 study to allow comparisons to be made, constituting the main source of information on the demand for dermatological services in Latin America.

CONCLUSION

This research has allowed us to determine the epidemiological profile of outpatient demand for Brazilian dermatologists in various contexts. The results also highlight the importance of the demand for surgical and cosmetic procedures for private consultations and the significant of such diseases as nonmelanoma skin cancer, leprosy, and psoriasis to the public health. ❑

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