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The use of the Internet by outpatients in Dermatology: a multicentric, observational and cross-sectional study on frequency, motivations and feedback

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The use of the Internet is a widespread practice, for medical information as well.^{1,2} This habit can be detrimental as it is related both to the quality of the information and to the users' critical analysis.^{3,4} Limited data are available on the attitude for Internet consultation among dermatological patients.⁵⁻⁸

The aim of this multicentre, observational and cross-sectional study was to provide a comprehensive picture of the use of the Internet by dermatological outpatients, specifically for medical reasons.

From October 2019 to March 2020, all consecutive outpatients attending five Dermatology Clinics homogeneously distributed in Italy for any dermatological referral were included. For each patient we collected the data listed in Table 1. Through statistical analysis, we researched the existence of a dependence relationship between the demographic, social and clinical characteristics of the patients and some variables, such as the use of the Internet for dermatological problems and for searching do-it-yourself therapies before the visit, the habit of carrying out research on the doctors of the department before the visit and the willingness to carry out further online research after the visit. For multivariate analysis we grouped the "diagnosis" variable in 4 categories: infectious, inflammatory, adnexal and neoplastic.

We enrolled 4002 patients, mainly affected with chronic diseases (76.4%). Among them, 3339 (83.4%) were Internet users and 2684 (67.1%) used it for health problems (Internet Users in the field of Dermatology, DIU, i.e. Dermatology Internet Users).

Among DIU, 1831 patients (68.2%) consulted online forums, 1777 (66.2%) carried out a research for their current dermatological problem and 761 (28.3%) looked for a do-it-yourself therapy before the visit.

Regarding the feedback about the online research, 553 patients (20.6%) said they felt reassured, while 944 (35.2%) were frightened. One thousand and eleven patients (37.7%) declared themselves satisfied with what they had found on the web.

Most patients (1691, i.e. 63.0%) stated that they had used the Internet as it is fast or easily manageable, while 1020 (38.0%) had used it to contact other people affected by the same health

problem. Far fewer patients used the Internet because they felt it was more up-to-date (271, 10.1%) or more reliable than the doctor (59, 2.2%).

The associations between the main study variables are reported in Table 2. By multiple logistic regression analysis, among DIU the habit of carrying out research for the dermatological problem before the visit was significantly associated with a fair level of education and inversely with age. Infectious diseases, in particular sexually transmitted diseases, and acne, hidradenitis suppurativa and psoriasis, among inflammatory disorders, were strongly associated with this habit. Hair diseases led the patient to search online too. Neoplastic diseases showed the lowest numbers in association with this variable.

A research to find a do-it-yourself therapy for the dermatological problem before the visit was strongly influenced by high educational level and low age (14-45yrs). Adnexal diseases were the most correlated to this type of research, especially those of the hair, while acne, hidradenitis suppurativa and parasitosis/entomodermatosis were the most correlated to a do-it-yourself therapy among infectious and inflammatory diseases.

We observed a significant association between the habit of carrying out online research on the doctors of the department before the visit and the female gender and middle age (from 26 to 65 yrs).

Being affected by adnexal diseases significantly increased the likelihood of using the Internet after the visit.

In conclusion, our study highlights the widespread use of the Internet for medical purposes in the dermatological patient, especially in young and highly educated people affected by skin diseases burdened by high social impact. The Internet contents are fast and easily manageable and offer the possibility of contacting people affected by the same disease. Since online research is rarely reassuring, sometimes frightening and more often unsatisfactory, the Dermatologist must not only clarify all the patient's questions and needs during the visit, but also direct him to the most suitable web contents.

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Table I. The enrolled population

Variable	Category	Frequency (%)
		N = 4002 (100)
Gender	Male	1892 (47.3)
	Female	2110 (52.7)
Age	14-25	804 (20.1)
	26-45	1132 (28.3)
	46-65	1176 (29.4)
	>65	890 (22.2)
Educational attainment	Primary school	457 (11.4)
	Middle school	823 (20.6)
	High school	1650 (41.2)
	University Degree or more	994 (24.9)
	Missing data	78 (1.9)
Type of dermatological disease	Acute	867 (21.7)
	Chronic	3059 (76.4)
	Missing data	76 (1.9)
Diagnosis	Acne	213 (5.3)
	Autoimmune bullous disease	61 (1.5)
	Blemishes, imperfections and skin sequelae	101 (2.5)
	Cutaneous lymphoma	39 (1)
	Eczema	363 (9.1)
	Genodermatosis	15 (0.4)
	Hair disease	124 (3.1)
	Hidradenitis suppurativa	84 (2.1)
	Lichen planus or sclerosus	56 (1.4)
	Melanocytic nevi	759 (19)
	Melanoma	151 (3.8)
	Mycosis	101 (2.5)
	Nail disease	88 (2.2)
	Non melanoma skin cancer	398 (9.9)
	Parasitosis/entomodermatosis	62 (1.5)
	Psoriasis	340 (8.5)
	Sexually transmitted disease	211 (5.3)
	Urticaria	182 (4.5)
	Other chronic inflammatory disease	143 (3.6)
	Other infectious disease	237 (5.9)
	Other skin neoplasm	147 (3.7)
	Other	119 (3)
Missing data	8 (0.2)	
Do you use the Internet?	Yes	3339 (83.4)
	No	663 (16.6)
		N = 3339
Have you ever used the Internet for health problems?	Yes	2684
	No	655

		N (DIU) = 2684
Frequency of use	Mild user	635 (23.7)
	Strong user	2048 (76.3)
	Missing data	1 (0.01)
Have you ever consulted online forums?	Yes	1831 (68.2)
	No	853 (31.8)
Have you ever carried out a research to find a do-it-yourself therapy?	Yes	1178 (43.9)
	No	1505 (56.1)
	Missing data	1 (0.04)
Did you carry out a research for your dermatological problem before the visit?	Yes	1777 (66.2)
	No	904 (33.7)
	Missing data	3 (0.1)
Did you carry out a research to find a do-it-yourself therapy for your dermatological problem before the visit?	Yes	761 (28.3)
	No	1918 (71.5)
	Missing data	5 (0.2)
Did the Internet reassure you?	Yes	553 (20.6)
	No	2058 (76.7)
	Missing data	73 (2.7)
Did the Internet scare you?	Yes	944 (35.2)
	No	1660 (61.8)
	Missing data	80 (3)
Are you satisfied with what you found on the web?	Yes	1011 (37.7)
	No	1616 (60.2)
	Missing data	57 (2.1)
Why did you surf the Internet? (multiple answers possible)	For comparison with patients affected by the same problem	1020 (38)
	More reliable than the doctor	60 (2.2)
	More up-to-date	273 (10.1)
	Faster/easily manageable	1692 (63)
	Missing data	61
Did you carry out a research on the doctors of the ward before the visit?	Yes	444 (16.5)
	No	2232 (83.2)
	Missing data	8 (0.3)
Will you carry out further online research after the visit?	Yes	779 (29)
	No	1895 (70.6)
	Missing data	10 (0.4)

(a) N, number of patients; (b) DIU, Internet Users in the field of Dermatology

Table II. Association between the main study variables assessed with Chi-squared test

Variable	Category	Did you carry out a research for your dermatological problem before the visit?		Pvalue	Did you carry out a research to find a do-it-yourself therapy for your dermatological problem before the visit?		Pvalue	Did you carry out a research on the doctors of the ward before the visit?		Pvalue	Will you carry out further online research after the visit?		Pvalue
		Yes=1777(%)	No=904(%)		Yes=761(%)	No=1918(%)		Yes=444(%)	No=2232(%)		Yes=779(%)	No=1895(%)	
Gender	Male	793 (44.6)	404 (44.7)	0.975	344 (45.2)	852 (44.4)	0.737	217 (48.9)	977 (43.8)	0.048	361 (46.3)	833 (44.0)	0.260
	Female	984 (55.4)	500 (55.3)		417 (54.8)	1066 (55.6)		227 (51.1)	1255 (56.2)		418 (53.7)	1062 (56.0)	
Age	14-25 yrs	447 (25.2)	205 (22.7)	0.157	233 (30.6)	416 (21.7)	<0.001	94 (21.2)	555 (24.9)	0.097	193 (24.8)	455 (24.0)	0.675
	26-45 yrs	673 (37.9)	290 (32.1)	0.003	299 (39.3)	664 (34.6)	0.023	172 (38.7)	789 (35.3)	0.174	296 (38.0)	664 (35.0)	0.147
	46-65 yrs	532 (29.9)	294 (32.5)	0.171	194 (25.5)	633 (33.0)	<0.001	150 (33.8)	677 (30.3)	0.151	232 (29.8)	594 (31.4)	0.426
	>65 yrs	125 (7.0)	115 (12.7)	<0.001	35 (4.6)	205 (10.7)	<0.001	28 (6.3)	211 (9.5)	0.034	58 (7.4)	182 (9.6)	0.076
Educational attainment	Primary school	19 (1.1)	37 (4.1)	<0.001	3 (0.4)	53 (2.8)	<0.001	8 (1.8)	48 (2.1)	0.639	8 (1.0)	48 (2.5)	0.013
	Middle school	286 (16.1)	136 (15.0)	0.480	111 (14.6)	311 (16.2)	0.297	52 (11.7)	369 (16.5)	0.011	132 (16.9)	290 (15.3)	0.290
	High school	894 (50.3)	413 (45.7)	0.024	396 (52.0)	909 (47.4)	0.030	238 (53.6)	1066 (47.8)	0.024	377 (48.4)	926 (48.9)	0.825
	University degree or more	550 (30.9)	300 (33.2)	0.240	244 (32.1)	606 (31.6)	0.815	140 (31.5)	709 (31.8)	0.923	251 (32.2)	597 (31.5)	0.717
	Missing data	28 (1.6)	18 (2.0)		7 (0.9)	39 (2.0)		6 (1.3)	40 (1.8)		11 (1.4)	34 (1.8)	
Type of dermatological disease	Acute	494 (27.8)	203 (22.5)	0.006	213 (28.0)	484 (25.2)	0.183	99 (22.3)	596 (26.7)	0.043	211 (27.1)	484 (25.5)	0.357
	Chronic	1269 (71.4)	679 (75.1)		543 (71.3)	1403 (73.1)		342 (77.0)	1603 (71.8)		554 (71.1)	1389 (73.3)	
	Missing data	14 (0.8)	22 (2.4)		5 (0.7)	31 (1.6)		3 (0.7)	33 (1.5)		14 (1.8)	22 (1.2)	
Diagnosis	Acne	154 (8.7)	36 (4.0)	<0.001	97 (12.7)	93 (4.9)	<0.001	50 (11.3)	139 (6.2)	<0.001	62 (8.0)	127 (6.7)	0.239
	Autoimmune bullous disease	40 (2.3)	7 (0.8)	0.006	10 (1.3)	37 (1.9)	0.272	7 (1.6)	40 (1.8)	0.750	14 (1.8)	33 (1.7)	0.911
	Blemishes, imperfections and skin sequelae	41 (2.3)	32 (3.5)	0.064	23 (3.0)	51 (2.7)	0.609	13 (2.9)	61 (2.7)	0.823	29 (3.7)	45 (2.4)	0.051
	Cutaneous lymphoma	18 (1.0)	2 (0.2)	0.024	9 (1.2)	11 (0.6)	0.099	10 (2.2)	10 (0.5)	<0.001	13 (1.7)	7 (0.4)	<0.001
	Eczema	203 (11.4)	77 (8.5)	0.020	100 (13.1)	180 (9.4)	0.004	63 (14.2)	217 (9.7)	0.005	110 (14.1)	168 (8.9)	<0.001
	Genodermatosis	6 (0.3)	3 (0.3)	0.980	6 (0.8)	3 (0.2)	0.011	1 (0.2)	8 (0.4)	0.999	4 (0.5)	5 (0.3)	0.294
	Hair disease	77 (4.3)	20 (2.2)	0.005	48 (6.3)	48 (2.5)	<0.001	20 (4.5)	77 (3.5)	0.280	42 (5.4)	55 (2.9)	0.002
	Hidradenitis suppurativa	57 (3.2)	9 (1.0)	<0.001	30 (3.9)	36 (1.9)	0.002	16 (3.6)	50 (2.2)	0.092	25 (3.2)	41 (2.2)	0.110
	Lichen planus or sclerosus	23 (1.3)	12 (1.3)	0.943	8 (1.0)	27 (1.4)	0.461	8 (1.8)	27 (1.2)	0.318	12 (1.5)	23 (1.2)	0.492
	Melanocytic nevi	189 (10.6)	334 (37.0)	<0.001	57 (7.5)	466 (24.3)	<0.001	50 (11.3)	473 (21.2)	<0.001	71 (9.1)	451 (23.8)	<0.001
	Melanoma	52 (2.9)	30 (3.3)	0.577	7 (0.9)	75 (3.9)	<0.001	13 (2.9)	69 (3.1)	0.852	27 (3.5)	55 (2.9)	0.433
	Mycosis	46 (2.6)	25 (2.8)	0.787	16 (2.1)	55 (2.9)	0.264	6 (1.3)	65 (2.9)	0.061	19 (2.4)	52 (2.7)	0.666
	Nail disease	48 (2.7)	20 (2.2)	0.447	25 (3.3)	43 (2.2)	0.123	9 (2.0)	59 (2.6)	0.449	23 (2.9)	44 (2.3)	0.335

Non melanoma skin cancer	74 (4.2)	49 (5.4)	0.142	13 (1.7)	110 (5.7)	<0.001	22 (4.9)	101 (4.5)	0.697	20 (2.6)	103 (5.4)	0.001
Parasitosis/entomodermatitis	36 (2.0)	9 (1.0)	0.050	25 (3.3)	20 (1.0)	<0.001	5 (1.1)	40 (1.8)	0.317	8 (1.0)	37 (1.9)	0.093
Psoriasis	182 (10.2)	48 (5.3)	<0.001	63 (8.3)	165 (8.6)	0.778	38 (8.6)	190 (8.5)	0.981	67 (8.6)	163 (8.6)	0.978
Sexually transmitted disease	166 (9.3)	30 (3.3)	<0.001	73 (9.6)	123 (6.4)	0.005	28 (6.3)	166 (7.4)	0.397	65 (8.3)	129 (6.8)	0.156
Urticaria	104 (5.9)	46 (5.1)	0.416	58 (7.6)	92 (4.8)	0.004	33 (7.4)	116 (5.2)	0.062	52 (6.7)	97 (5.1)	0.106
Other chronic inflammatory disease	52 (2.9)	20 (2.2)	0.280	18 (2.4)	54 (2.8)	0.512	9 (2.0)	63 (2.8)	0.342	18 (2.3)	54 (2.8)	0.443
Other infectious disease	129 (7.3)	42 (4.7)	0.009	42 (5.5)	129 (6.7)	0.245	24 (5.4)	147 (6.6)	0.350	56 (7.2)	115 (6.1)	0.271
Other skin neoplasm	40 (2.3)	26 (2.9)	0.323	18 (2.4)	48 (2.5)	0.832	9 (2.0)	57 (2.5)	0.511	25 (3.2)	41 (2.2)	0.110
Other	37 (2.1)	27 (3.0)	0.305	15 (2.0)	49 (2.6)	0.369	10 (2.3)	54 (2.4)	0.830	14 (1.8)	50 (2.6)	0.200
Missing data	3 (0.2)	0 (0)		0 (0)	3 (0.2)		0 (0)	3 (0.1)		3 (0.4)	0 (0)	

Yrs, years; in bold: significant values