

Patient interest in and familiarity with anti-aging therapies: A survey of the general dermatology clinic population

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Summary

Background: The appearance of aging skin is a common complaint among dermatology patients. There is an expanding market for anti-aging therapies, but little information is available regarding which patients utilize these treatments and patient preferences regarding treatment.

Aims: To describe the patient population utilizing anti-aging therapies, assess patient familiarity with treatment options, and learn where treatment information is most often obtained.

Patients/Methods: Three hundred patients were surveyed in the University of Michigan General Dermatology Clinic.

Results: Fifty-three percent of the general dermatology patient population has used an anti-aging treatment in the past; 66% reported interest in the future use. Interest is high among all genders, ages, and incomes. Most subjects obtained treatment information from magazines, but subjects were more likely to pursue treatment if information was obtained from a dermatologist.

Conclusion: Demographics of anti-aging therapy are changing, and a wide variety of patients pursue treatment. Patients are largely unfamiliar with most treatment options and are more likely to pursue treatment after receiving treatment information from a dermatologist. The information presented in this study is helpful to both dermatologists and marketers of anti-aging products.

KEYWORDS

anti-aging, cosmeceuticals, patient interest, patient knowledge, survey

1 | INTRODUCTION

The appearance of aging skin is a common complaint among general dermatology clinic patients. Therapies currently available for the treatment of aging skin are numerous and include sun protection, topical therapies, systemic treatments, neurotoxin injections, soft-tissue fillers, chemical peels, laser treatments, and surgery.¹⁻⁷

There has been a drastic increase in the demand for anti-aging products and procedures in recent years.⁸⁻¹¹ The use of cosmeceuticals, non-FDA regulated cosmetic products with drug-like, but not biologic, therapeutic benefits,^{1,2,12} has shown a particularly rapid

increase. The United States is currently the largest market for cosmeceuticals in the world, with sales exceeding \$5 billion in 2007⁸ and increasing to \$9.7 billion in 2011.⁹ The total global market for all anti-aging therapies has been projected to be an impressive \$216.52 billion in 2021.¹³

Despite the fast growing market for anti-aging therapies, surprisingly little research has been carried out to describe specific patient groups that are most interested in utilizing these therapies. Generally, women and older individuals are thought to be the primary users; however, new market research shows that this is changing.⁸ And while little research has been performed to show who is using

these products, even less research has been carried out to assess patient familiarity with different therapies and where patients are most likely to obtain treatment information.

As use of anti-aging therapies continues to expand, it will become increasingly important to understand which patient groups are interested in pursuing anti-aging skin treatments. In addition to looking at treatment use in our patient population, we assessed the level of intervention that patients are taking in order to reverse the signs of aging skin. Rather than asking about specific treatments, we inquired about treatment use in broad, general categories including sun protection, creams and lotions (topicals), oral supplements, neurotoxin injections, soft-tissue fillers, chemical peels, laser treatments, and cosmetic surgery. This allows us to evaluate what method of therapy patients is most likely to pursue whether it be primary prevention with sunscreen, damage reversal with a daily skin care routine, or more involved and expensive interventions with peels, injections, or surgery. In a sense, this allows us to see how aggressively patients are willing to pursue younger looking skin.

2 | MATERIALS AND METHODS

2.1 | Targeted population and survey methodology

Three hundred subjects, aged 18 or older, were recruited at the University of Michigan General Dermatology Clinic. Patients were approached in person by the survey author and asked to complete the survey document. Patients who declined to participate were not included in our data set. The survey period ended upon achieving our goal of 300 completed patient surveys. University of Michigan Institutional Review Board approval was obtained (HUM00077172, June 3, 2013) prior to administration of the survey.

2.2 | Survey

Our survey (Data S1) consisted of 25 questions on anti-aging treatment use (sun protection, topicals, systemic treatments, injections, fillers, chemical peels, laser treatments, and surgery). Subjects answered questions about past, present, and future use of specific anti-aging treatment options and qualified their level of future interest in treatment options as "very," "moderately," "mildly," or "not at all" interested.

Additionally, subjects described their familiarity with treatment options as "very," "moderately," "mildly," or "not at all" familiar and identified sources of treatment information. Subjects reported barriers to treatment (cost, complications, short duration of effect, interference with "natural aging," belief that treatments are not needed, and stigma), reporting how significantly they play a role in preventing use.

Finally, a variety of demographic information was collected in addition to information on sunscreen use, diet, and exercise habits.

2.3 | Statistical analysis

Descriptive statistics were calculated to summarize the survey population. Analyses were performed using SAS version 9.3 (SAS Institute

Inc, Cary, NC, USA). Correlations with r -values of $>.2$ were considered significant when P -values were $<.0001$.

3 | RESULTS

Patient demographics are summarized in Table 1.

3.1 | Past, current, and future use of anti-aging therapies

Over half of subjects reported using anti-aging therapies at some point in the past (53%). This includes the use of sun protection when used at least in part to prevent premature skin aging (in addition to other goals such as avoiding a painful sunburn). Women were more likely to have utilized treatments in the past ($r=.30$, $<.0001$) with 65% of women and 35% of men reporting past use (Table 2). Most commonly used therapies included sun protection (51%) and topical therapies (33%) while very few subjects reported a history of using other treatments (3% or less for all other options; Table 3). Slightly less than half (48%) of the survey population were currently using treatments, with past users being more likely to also be current users ($r=.84$, $<.0001$).

Most subjects (66%) were interested in the future use of anti-aging therapies, again with sun protection and topical treatments being most popular (52% and 37% describing themselves as "very interested" in use, respectively). Other treatment modalities were much less popular among future users (7% or less as "very interested" for all remaining options). Women were more likely than men to be interested (75% vs 51%; $r=.25$, $<.0001$; Table 2). Both past and current users were more likely to have interest in the future use ($r=.57$, $<.0001$ and $r=.58$, $<.0001$, respectively).

While the largest proportion of subjects aged 41-50 and 61-70 reported using anti-aging treatments in the past (58% of both groups), there was no statistically significant difference in treatment history between any age groups. Additionally, there is no significant difference in interest in the future use among age groups. Past use appeared to be highest among those reporting a household income of \$150 000 to \$200 000 per year (68%) and least among those making less than \$15 000 per year (30%). The highest level of interest in the future use was reported by those making \$15 000 to \$24 999 per year (80%; Table 2). No significant difference was found between income brackets regarding past use and interest in the future use.

3.2 | Patient familiarity with current treatment options

Sun protection (using either sunscreen, protective clothing, or sun avoidance) was overwhelmingly the therapy which subjects had the most familiarity. Seventy percent of subjects reported being "very familiar" with sun protection use specifically as an anti-aging therapy versus only 9% who reported that they are "not at all familiar" with

TABLE 1 Patient demographics

	n	%
Gender		
Male	121	40
Female	179	60
Age		
18-30	52	17
31-40	37	12
41-50	48	16
51-60	54	18
61-70	58	20
>70	51	17
Race		
African American	23	8
American Indian/Alaskan	1	1
Caucasian	253	85
East Asian	3	1
Latino/Hispanic	4	1
Mediterranean	4	1
Southeast Asian/Indian	8	2
Other	2	1
Skin type		
Type I	47	16
Type II	129	43
Type III	86	29
Type IV	26	9
Type V	7	2
Type VI	3	1
Education		
<High school degree	5	1
High school/GED	30	10
Some college	59	20
Associate's degree	23	8
Bachelor's degree	80	27
Master's degree	62	21
Doctorate degree	39	13
Income		
<\$15 000	23	9
\$15 000 to \$24 999	10	4
\$25 000 to \$49 999	44	16
\$50 000 to \$74 999	50	19
\$75 000 to \$99 999	34	13
\$100 000 to \$149 999	47	18
\$150 000 to \$200 000	31	12
>\$200 000	24	9

this option. Thirty percent of subjects reported being "very familiar" with topical therapies, but appeared to be much less familiar with other therapies such as neurotoxin injections, soft-tissue fillers,

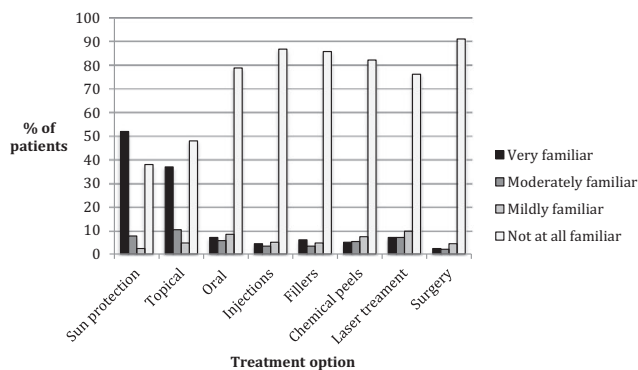
TABLE 2 Past, current, and future treatment use

	n	%		
Past use (sunscreen included)				
Yes	158	53		
No	142	47		
Past use (sunscreen not included)				
Yes	102	34		
No	198	66		
Past treatment options				
Sun protection	154	51		
Creams/lotions	99	33		
Oral meds/supplements	5	2		
Injections	6	2		
Fillers	4	1		
Chemical peels	10	3		
Laser treatments	5	2		
Surgery	2	1		
Current use (sunscreen included)				
Yes	143	48		
No	157	52		
Current use (sunscreen not included)				
Yes	90	30		
No	210	70		
Interest in the future use (sunscreen included)				
Yes	197	66		
No	103	34		
Interest in the future use (sunscreen not included)				
Yes	171	57		
No	129	43		
	Very	Mod.	Mild	Not at all (%)
Future treatment options				
Sun protection	52	8	2	38
Creams/lotions	37	10	5	48
Oral meds/supplements	7	6	8	79
Injections	5	3	5	87
Fillers	6	3	5	86
Chemical peels	5	6	7	82
Laser treatments	7	7	10	76
Surgery	3	2	4	91

chemical peels, laser treatments, surgery, and systemic oral therapies (Figure 1). There was a statistically significant positive correlation between past use and familiarity with specific treatments including sun protection ($r=.34$, $<.0001$), topicals ($r=.56$, $<.0001$), injections ($r=.24$, $<.0001$), fillers ($r=.22$, $<.0001$), and chemical peels ($r=.25$, $<.0001$), showing that subjects who had used these treatments in the past knew more about them. No such correlation existed for oral supplements, lasers, or surgery, suggesting that even subjects utilizing these therapies did not feel as though they had adequate

TABLE 3 Interest by gender, age, and income

	Past		Future	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)
Gender (sunscreen included)				
Male	42 (35)		62 (51)	
Female	116 (65)	3.46 (2.13, 5.62)	135 (75)	2.92 (1.78, 4.78)
Gender (sunscreen not included)				
Male	18 (15)		46 (38)	
Female	84 (47)	5.17 (2.90, 9.24)	125 (70)	3.77 (2.32, 6.14)
Age				
18-30	20 (37)		34 (65)	
31-40	20 (54)		28 (76)	
41-50	28 (58)		37 (77)	
51-60	28 (52)		29 (54)	
61-70	34 (58)		41 (71)	
>70	23 (45)		28 (55)	
Income				
<\$15 000	7 (30)		13 (57)	
\$15 000 to \$24 999	5 (50)		8 (80)	
\$25 000 to \$49 999	24 (55)		30 (68)	
\$50 000 to \$74 999	27 (54)		33 (66)	
\$75 000 to \$99 999	15 (44)		22 (65)	
\$100 000 to \$149 999	29 (62)		35 (74)	
\$150 000 to \$200 000	21 (68)		21 (68)	
>\$200 000	13 (54)		14 (58)	

**FIGURE 1** Patient familiarity with treatment options

information about them; however, it is important to note that the number of subjects with a history of using these specific treatments was quite low.

3.3 | Sources of information regarding possible treatments

The most commonly reported source of information regarding anti-aging therapies was magazines (51%). Other common sources include television commercials (49%), a dermatologist (40%), and friends or family (39%). Subjects were least likely to obtain treatment

information from their primary care physician, with only 18% reporting this as a source (Table 4).

Among subjects who identified their dermatologist as a major information provider, 85% indicated interest in the future use of anti-aging therapies. A smaller proportion of subjects who identified friends and family, a primary care doctor, the Internet, magazines, and TV commercials as a major source of treatment information were also interested in seeking treatment in the future (80%, 79%, 74%, 72%, and 60%, respectively).

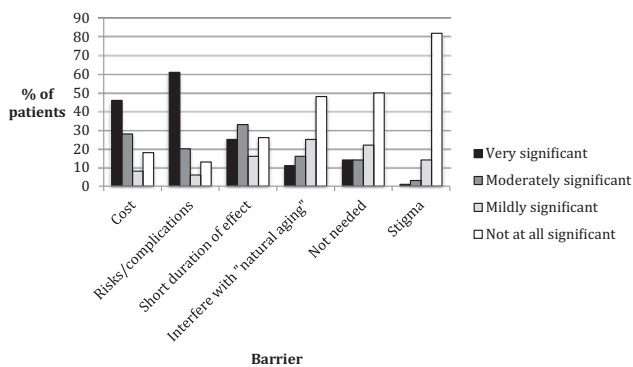
3.4 | Barriers to treatment use

Barriers to anti-aging therapy use were assessed. The most significant barrier reported was potential risks and complications, with 61% citing this as a "very significant" reason to avoid seeking treatment and only 13% saying this was "not at all significant" (Figure 2). Among past, present, and future users specifically, these subjects were more likely to report risks as a barrier ($r=.23$, $<.0001$; $r=.28$, $<.0001$; $r=.37$, $<.0001$) compared to nonusers.

Another common barrier was concern over cost, with 46% of subjects reporting this as a "very significant" factor in the decision to avoid any particular treatment. A negative correlation was observed between age and cost as a barrier ($r=-.25$, $<.0001$), showing that cost is a less significant barrier as age increases. Less common

TABLE 4 Source of information regarding anti-aging therapies

	n	%	% interested in the future use
Source providing any treatment info			
Primary care	53	18	
Dermatologist	121	40	
Friends/family	116	39	
Magazine/newspaper	153	51	
Internet	102	34	
TV commercials	147	49	
Other	28	9	
Source providing the majority of treatment info			
Primary care	29	10	79 (23 of 29)
Dermatologist	78	26	85 (66 of 78)
Friends/family	59	20	80 (47 of 59)
Magazine/newspaper	79	26	72 (57 of 79)
Internet	50	17	74 (37 of 50)
TV commercials	97	32	60 (58 of 97)

**FIGURE 2** Barriers to seeking treatment

barriers to treatment include short duration of effects, believing that treatments are not needed, belief that treatment is unnatural, and stigma with only 25%, 14%, 11%, and 1% of subjects rating these reasons as "very significant," respectively (Figure 2).

3.5 | Association of anti-aging therapy use with "healthy habits"

Subjects were asked to report on healthy habits that could also be considered appearance-improving behaviors (healthy diet, exercise routine, and sunscreen use). Most subjects described their diet as "somewhat healthy" (62%). Exercise habits were described as "occasional," "frequent," and "daily" by 35%, 21%, and 18% of subjects, respectively (Table 5).

The majority of our patient population (31%) reported using sunscreen only occasionally (Table 5). A negative correlation was found between skin type and sunscreen use, showing that with increasing pigmentation (Fitzpatrick skin type value), subjects were less likely to use sunscreen ($r = -.27, <.0001$).

TABLE 5 Health habits

	n	%	% interested in the future use
Diet			
Very healthy	86	29	70
Somewhat healthy	187	62	65
Not very healthy	24	8	54
Unhealthy	2	1	100
Exercise			
Daily	55	18	75
4-6 times per week	62	21	66
2-3 times per week	105	35	64
0-1 times per week	62	22	64
Never	13	4	54
Sunscreen use			
Daily, year-round	62	21	80
Daily, spring/summer	36	12	83
Most days	36	12	83
Occasionally	94	31	56
Rarely	45	15	58
Never	26	19	27

There was a positive correlation between past, current, and future use of anti-aging treatments and more frequent sunscreen use ($r = .47, <.0001$; $r = .49, <.0001$; $r = .31, <.0001$). Subjects reporting sunscreen use as "daily, year-round," "daily, spring/summer only," and "frequently, most days per week" were interested in pursuing anti-aging treatments 80%, 83%, and 83% of the time, respectively. Among those who never use sunscreen, only 27% reported interest in the future anti-aging treatments (Table 5).

Seventy-five percent of subjects who exercised daily were interested in the future use of anti-aging therapy, while only 54% of those who never exercised showed interest. Subjects who consumed a "very healthy" diet were interested in the future treatment 70% of the time, versus only 58% of combined "not very healthy" and altogether "unhealthy" eaters (Table 5). These trends suggest that healthier habits are associated with increased treatment interest, but were not found to be statistically significant.

4 | DISCUSSION

Our study demonstrates that over half of our general dermatology clinic patients have used some form of anti-aging therapy and almost two-thirds are interested in the future use. This is substantially higher than the percentages reported from surveys of the general population. A 2012 consumer survey reported that only 28% of the population is using anti-aging therapies.⁹ One possible explanation for this discrepancy is that interest in treatments, in both the general population and dermatology patient population, is continuing to increase as time progresses. Additionally, it is possible that

dermatology patients may be more interested in seeking treatment compared to the general population. They may in some way be "more aware" of the appearance of their skin, as they are actively seeking treatment for skin conditions.

Women are by far the group most targeted by anti-aging product marketers, with past studies showing that women are over 10 times more likely to use anti-aging therapies than men.¹⁴ Among our population, women were only 3.46 times more likely to report previous use of anti-aging treatments (95% CI 2.13, 5.62) and only 2.92 times more likely to desire future treatment (95% CI 2.13, 5.62). This supports the assertion that men are a growing population of skin care consumers.⁸

Past studies have shown that the use of anti-aging therapies increases with age, with one study reporting that 50-59 year olds are six times more likely to use some anti-aging therapy than 18-29 year olds.¹⁴ The odds ratio for a similar age grouping in our study (51-60 vs 18-30 year olds) was 1.05, but not significant. There was no difference in use between any age groupings in our study. These data suggest that anti-aging treatments are commonly used by individuals of all ages, with no particular group being more likely to have used therapies in the past and is consistent with newer market trends showing that it is not only the older population that is seeking anti-aging skin therapy.¹³ Our study suggests that even those in their teens and twenties are seeking to keep skin looking young. We found that an impressive 65% of those aged 18-30 are planning to use treatments in the future and 48% are already current users.

Our data suggest that while patients with a higher annual household income may be more likely to report prior use, patients from all economic backgrounds reported interest in future use. Appearance may be something that patients are willing to spend money on, even in hard economic times.

It is not surprising that sun protection is the anti-aging therapy with which our patient group is most familiar, as this is the most commonly used treatment in this population. Subjects seem to be most familiar with treatments that are more commonly advertised on television and in magazines (shown by our survey to be the most common sources of treatment information), such as sun protection and creams, and less familiar with treatments such as surgery, neurotoxin injections, and soft-tissue fillers, which are less commonly advertised here. The treatment that subjects are least familiar with is systemic therapies. It is important to note that oral supplementation is a relatively new trend, and this potential therapy remains a controversial topic among researchers without strong evidence of effectiveness.^{15,16}

Although doctors are reported as the most trusted source for health information, the internet remains the most commonly used first source¹⁷ and a striking 55% of American adults use the Internet for medical information.¹⁴ With this in mind, it is somewhat surprising that only 35% reported the Internet to be an anti-aging treatment information source (5th most common source).

Our study showed that 85% of subjects who cited a dermatologist as providing "a majority" of their treatment information were interested in using anti-aging treatments in the future. Subjects who cited the television commercials or magazines as a major information

source were less interested in the future use. While patients may be more likely to obtain information from other sources, they may be more likely to trust information provided by a dermatologist.

The most significant barrier to seeking anti-aging treatment among subjects was concern over risks and complications, with 61% reporting this as being "very significant." In keeping with this concern, subjects were least interested in surgical therapies (only 3% as "very interested"), which have the highest complication rates and longest post-treatment recovery period.⁴ Topical therapies and less invasive procedures with fewer side effects were preferable to subjects.

A 2010 study showed that cost and short duration of effect were factors in deciding to pursue treatment in 60% and 68% of women.¹⁸ Our study data suggest that cost is the second most common barrier to pursuing treatment with 46% of subjects citing cost as a "very significant" deterrent and only 18% saying that it would not impact their decision at all. Cost as a barrier was found to have a relationship with lower income ($P=.0007$) and appears to be a greater concern to subjects making less than \$15 000 per year, compared to those with higher annual income.

As anti-aging therapies aim to improve appearance, it would make sense that patients using these treatments may also participate in other appearance-improving behaviors as well; however, healthy diet and exercise habits were not significantly associated with increased treatment use or treatment interest. On the other hand, healthier sunscreen habits were associated with an increased interest in the future anti-aging treatments. Interestingly, past studies have suggested that increasing sunscreen use among patients can, in part, be attributed to the media advertising its anti-aging properties.¹⁹ Our data show that subjects with the most frequent sunscreen use are more likely to pursue anti-aging treatments. Of note, the majority of our patient population (31%) reported using sunscreen only occasionally, consistent with previous studies suggest that less than half of the general population uses sunscreen on a regular basis.⁷

In conclusion, these data demonstrate that the demographics of anti-aging therapy are changing, and that a wide variety of patients are now pursuing anti-aging treatments. Most patients are largely unfamiliar with many treatment options. It is important to note that those individuals who received a majority of their treatment information from a dermatologist are more likely to pursue treatment. Therefore, it is important for dermatologists to inquire about patient interest in anti-aging therapies and to provide information about available treatment options. We believe the data presented in this study provides valuable information to dermatologists and product marketers alike.

CONFLICTS OF INTEREST

None.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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