

# Demographics of Dietary Supplement Use for Skin: An Analysis of NHANES Cross-Sectional Data

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## ABSTRACT

Dietary supplement use is common, with reported use by over half of US adults. This cross-sectional study utilized 2015–2016 National Health and Nutrition Examination Survey data. A total of 9971 respondents were surveyed, of which 3704 reported taking dietary supplements for "healthy skin, hair, and nails." Of those reporting skin supplement use, the majority had health insurance and some college education or above. Many respondents were 19 or younger, were of non-Hispanic White race, had a household income of more than \$100,000 per year, and some were pregnant. More than two-thirds of the respondents decided to take the supplements on their own rather than at the advice of a healthcare professional, which is quite alarming. This study helps identify demographic groups more likely to consume skin, hair, and nail supplements. Overall, physicians should educate their patients on dietary supplements to avoid drug-supplement interactions and address the factors that influence the use of over-the-counter skin supplements.

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## INTRODUCTION

Dietary supplements are popular, with reported use by over half of US adults.<sup>1</sup> They may be marketed for specific purposes, including purported skin benefits. Despite widespread use, these products do not require FDA approval prior to sale. Manufacturers are not required to prove safety or efficacy, and patients may be unaware of potential risks.<sup>2</sup> To better educate patients, it is important to understand factors associated with supplement use.

This study used 2015–2016 National Health and Nutrition Examination Survey (NHANES) data. NHANES is comprised of interviews and examinations of a nationally representative sample of the US population. Demographic and dietary questionnaire responses were used to examine the prevalence of dietary supplement use for skin, hair, and nails among various sociodemographic populations as well as among pregnant women (Table I). These covariates were self-reported by respondents, and sample weights were applied to raw data to estimate prevalence. All statistical analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC).

Over 40% of respondents reported taking dietary supplements in the past 30 days. Out of 27 potential options (Table II), the overwhelming majority (87.86%) chose "healthy skin, hair, and nails" when asked, "for what reason or reasons do you take

[product name]?" Most of these respondents (69.82%) decided to consume these supplements "for reasons of my own," rather than at the advice of a healthcare professional. Further, 92.42% of individuals who reported taking skin supplements had health insurance, indicating likely access to physicians (Table I).

Interestingly, 31.41% of children under 19 years surveyed (as reported by an adult proxy for those younger than 16) took supplements. Of all children surveyed, 19.43% specifically took skin supplements. Of respondents taking skin supplements, a majority had some college education or above (71.55%). Many had an income above \$100,000 (32.91%) and were of White race (67.63%). Finally, 10.33% were pregnant (Table I).

Of concern, most respondents chose to use supplements on their own, corroborated by 2007–2010 NHANES findings in which only 23% of supplements were used based on health provider recommendation.<sup>3</sup> This trend suggests patients are educating themselves on dietary supplements. Indeed, in previous national opinion surveys, supplement users believed physicians know little about supplements and are biased against them.<sup>4</sup>

Findings from this cross-sectional study illustrate supplement use in the US population is common and is predominantly for the purposes of "healthy skin, hair, and nails." Of those reporting

**TABLE 1.**

Demographic Distribution of Respondents Taking Supplements for Healthy Hair, Skin, and Nails Among 3704 Respondents	
Variable	Breakdown of Respondents Who Report Using Supplements for Skin, Hair, and Nails (%)
<b>Gender</b>	
Male	43.91
Female	56.09
<b>Age (Years)</b>	
0-19	19.43
20-30	11.58
31-40	11.19
41-50	13.39
51-60	16.01
61-70	14.73
71-80	8.16
Above 80	5.51
<b>Race</b>	
Mexican American	7.02
Other Hispanic	5.15
Non-Hispanic White	67.63
Non-Hispanic Black	9.17
Other, including multi-racial	11.03
<b>Education</b>	
Less than 9th grade	4.33
9-11th grade, including 12th Grade with no diploma	6.11
High school graduate and GED or equivalent	18.00
Some college or AA degree	31.95
College graduate or above	39.60
Do not know	0.010
<b>Total Household Income</b>	
Under \$20,000*	9.53
\$20,000 and over*	3.71
Less than \$35,000	11.87
\$35,000-\$44,999	8.18
\$45,000-\$74,999	21.07
\$75,000-\$99,999	10.64
More than \$100,000	32.91
Refused	1.46
Missing	0.63
<b>Health Insurance Coverage</b>	
Yes	92.42
No	7.44
Do not know	0.12
Refused	0.02
<b>Reason for Taking Dietary Supplement</b>	
Decided to take it for reasons of my own	69.82
A doctor or other health provider told me to	30.18
<b>Pregnancy Status</b>	
Yes	10.33
No	87.22
Do not know	2.45

\*The "under \$20,000" and "\$20,000 and over" categories were used when more specific value estimates were not provided.

TABLE 2.

Options Respondents Could Choose from When Asked "For What Reason or Reasons Do You Take [Dietary Supplement Name]?"	
For:	To:
Anemia, such as low iron	Build muscle
Bone health, build strong bones, osteoporosis	Gain weight
Eye health	Get more energy
Good bowel/colon health	Improve digestion
Healthy Joints, arthritis	Improve my overall health
Healthy skin, hair, and nails	Maintain health (to stay healthy)
Heart health, cholesterol	Maintain healthy blood sugar level, diabetes
Kidney and bladder health, urinary tract health	Prevent colds, boost immune system
Liver health, detoxification, cleanse system	Prevent health problems
Menopause, hot flashes	Supplement my diet (because I don't get enough from food)
Mental health	
Muscle related issues, muscle cramps	
Pregnancy/breastfeeding	
Prostate health	
Relaxation, decrease stress, improve sleep	
Teeth, prevent cavities	
Weight loss	

skin supplement use, the majority had health insurance and had some college education or above. Many respondents were 19 or younger and some were pregnant. This is concerning, as many supplements lack research on efficacy and safety, including information on teratogenicity and effects in children.<sup>2</sup> There is evidence to suggest individuals between 13 and 18 years utilize social media to search for health related information, including material on dietary supplements.<sup>5</sup> Further research on whether such information plays a role in supplement use in children is needed.

Physicians or other health care providers should routinely ask patients which supplements they take or are considering taking, in order to provide education as well as to prevent drug-supplement and lab test-supplement interactions. Supplement ingredients such as calcium and magnesium interact with antibiotics, corticosteroids, and levothyroxine, impairing drug efficacy.<sup>6</sup> Supplemental biotin ingestion may also interfere with lab diagnostic tests, resulting in potentially inaccurate clinical interpretations.<sup>7</sup> Hence, it is crucial for providers to monitor patient dietary supplement use to thwart potential interactions.

Study limitations include self-reported data, cross-sectional survey limitations, and that only supplement use in the past 30 days was examined. Results highlight that physicians should inquire about patient supplement use.<sup>8</sup> Doing so may allow more communication about supplement risks, benefits, and unknowns.

## DISCLOSURES

Dr Katta serves on the Advisory Board for Vichy Laboratories and is the author of a book for the general public on dermatology.

Dina Zamil, Anjana Mohan, and Dr Perez-Sanchez do not declare any conflicts of interest.

Disclaimers: The views expressed in the submitted article are the views of the authors and not an official position of their respective institutions.

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