

Sunscreen Use Among South Asian Women: A Survey

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Abstract—The purpose of the study was to identify the use of sunscreen in South Asian women and to understand the amount of knowledge they have about sunscreen usage, by means of an online survey. A total of 29 questions were part of the survey, including application of sunscreen, frequency of sunscreen usage, and improvements they would like in their sunscreen, among others. All around 131 responses were collected, out of which 53.8% (n=70) participants stated that they use sunscreen, and 46.2 (n=61) stated the opposite. Most of the sunscreen users used SPF 30 or above, and also tended to wear it indoors. Unfortunately, 87.1% of the sunscreen users did not consider re-application necessary. Many women were found to apply an unsatisfactory amount during regular use. When asked about improvements they would like, a majority of the participants expected cost effectiveness, lesser white-cast and lesser greasiness in their sunscreens. Additionally, it was found that other products used by the participants, such as moisturizers and make-up products majorly did not provide SPF protection. However, most of the women were satisfied with their sunscreen, with 68% of women finding sunscreen beneficial. A good lot also agreed that social media had helped eliminate their apprehension towards the product. Through this survey, we would like to steer attention towards the improved, positive outlook of South Asian women with regard to sunscreen, and their willingness to use sunscreen more proactively and efficiently, if more awareness were to be generated, and certain enhancements made by the cosmetic enterprises.

Keywords—*sunscreen; South-Asian; survey;*

I. INTRODUCTION

Sunscreen is a product that has for a long time been familiar to the collective consciousness of the general population as the product that is constantly being recommended, while being used only by a very few percentages of the population.

To reestablish, even just 5-10 minutes of unprotected sun exposure can be harmful to sensitive skin areas such as your face, ears, and neck. The UV part of the invisible spectrum is responsible for a lot of damage and can cause sunburn, photoaging reactions, erythema, and inflammation. UV light can be broken down into two categories: UVA (in the wavelength range 320-400 nanometers) and UVB (in the wavelength range 280-320 nm).[1]

(UVA) light, which is primarily responsible for chronic effects such as photoaging, wrinkling, and age spots. UVA radiation can cause nuclear and mitochondrial DNA damage, gene mutations and skin cancer, dysregulation of enzymatic chain reactions, immune suppression, lipid peroxidation (membrane damage), and photoallergic and phototoxic effects.[1]

Ultraviolet B (UVB) rays make up a smaller percentage and are the primary cause of sunburns. UVB radiation can also cause acute changes, such as pigmentation and sunburn, and chronic changes, such as immune suppression and photocarcinogenesis.[1][6]

The end result of all of these photoreactions is photodamage that accumulates over the course of a lifetime from repeated exposure. Both UVA and UVB may cause skin cancer.

Sunscreens work because they contain filters that reflect, scatter, or absorb UV radiation that otherwise would reach your skin. Sunscreens can be organic(chemical) or inorganic(physical or mineral).

Organic filters work by absorbing UV radiation and converting it into a small amount of heat. Octisalate and avobenzone are common examples of this.[7]

Inorganic filters are mineral compounds such as zinc oxide and titanium dioxide that theoretically work by reflecting and scattering UV light to protect your skin. These sunscreens tend to offer more broad-spectrum protection against both UVA and UVB light. [2]

Historically, sunscreen companies have targeted and catered to the white population, while largely ignoring people of color. That marketing strategy may have helped further the idea that sun care wasn't important in the dark-skinned community. Research suggests that many patients and physicians also falsely believe that non-white people are "immune" to common skin cancers, due to having more melanin[3][5]. Patients with darker skin tones may find that sunscreen products have typically been formulated with lighter-skinned patients in mind.[9]

Patients with darker skin tones have a natural SPF of 13" — but when it comes to the sun's damaging effects, the power of melanin is hugely overstated. For one, daily use of SPF 30 or more is recommended for sun protection.

Melanin in darker skin can only protect from some (UV) damage. Melanin may not be able to protect the skin from UVA rays as well as it protects skin from UVB rays.

The purpose of this survey is to look into the use of sunscreen by people of color, particularly South-Asian women, and the level of awareness they possess about its benefits.

II. METHODS

This study was conducted by means of an online survey on google forms,distributed via social media, the questionnaire consisting of around 40 questions.

The primary question was whether or not the participant used sunscreen. The subsequent questions asked were based on whether the participant answered with a 'Yes' or 'No'.

To participants that answered 'Yes', the following questions were asked.

1. How much SPF do you use?
2. What kind of SPF do you use?
3. On what parts of your body do you apply it?
4. How much sunscreen do you apply?
5. How long before leaving the house do you apply sunscreen?
6. Do you reapply sunscreen?
 - How many times a day do you reapply?
 - Do you reapply after water activities? (at the beach, after water sports, in water parks)
7. Normally a tube of sunscreen should last 20 days. How long does your sunscreen last?
8. Do you use other means of sun protection along with sunscreen?
9. Do you get tan-removal or anti-aging treatments along with using sunscreen (at home, or beauty parlors). If yes, how often do you undergo these treatments?
10. Do you work/study by a window without curtains/blinds during daytime?

11. Do you wear sunscreen indoors?
12. Does the moisturizer you use contain SPF?
13. Do your makeup products have SPF?
14. How did you gain awareness of sunscreen usage?
15. Is your sunscreen beneficial to you?
16. Are you planning to change your sunscreen brand or SPF protection soon?
17. Do you find your desired sunscreen in the market?
18. What improvements would you like in your existing sunscreen?
19. Has the pandemic influenced your sunscreen preferences in any way?

The participants that answered with a 'No' to the primary question of whether or not they used sunscreen, were asked the following set of questions

1. Why don't you use sunscreen?
2. Do you have any following complaints mentioned below while using sunscreen ?
3. Have you used sunscreen before?
4. Do you use any Herbal/Ayurveda remedies for sun protection instead?
5. Do you use tan-removal or anti-aging treatments(at home, or beauty parlors)?
6. Do you use other means of sun protection instead of sunscreen?
7. Does your moisturizer contain SPF?
8. Do your makeup products have SPF?
9. What would most likely influence you to start using sunscreen?
10. Despite popular belief, sunscreen is not only used for UV-protection(protection from harmful UV rays), It significantly helps in preventing harmful effects of sun radiation such as early aging signs (hyperpigmentation, wrinkles, fine lines) and skin cancer. Neither does it cause Vitamin-D deficiency on regular application. Knowing these facts, would you venture to change your outlook towards using sunscreen, and consider using it in the future?

III. RESULTS

A total of 131 responses were collected. The ages of participants ranged between 15 to 30 years. 64.6% (n=84) of the participants were students.

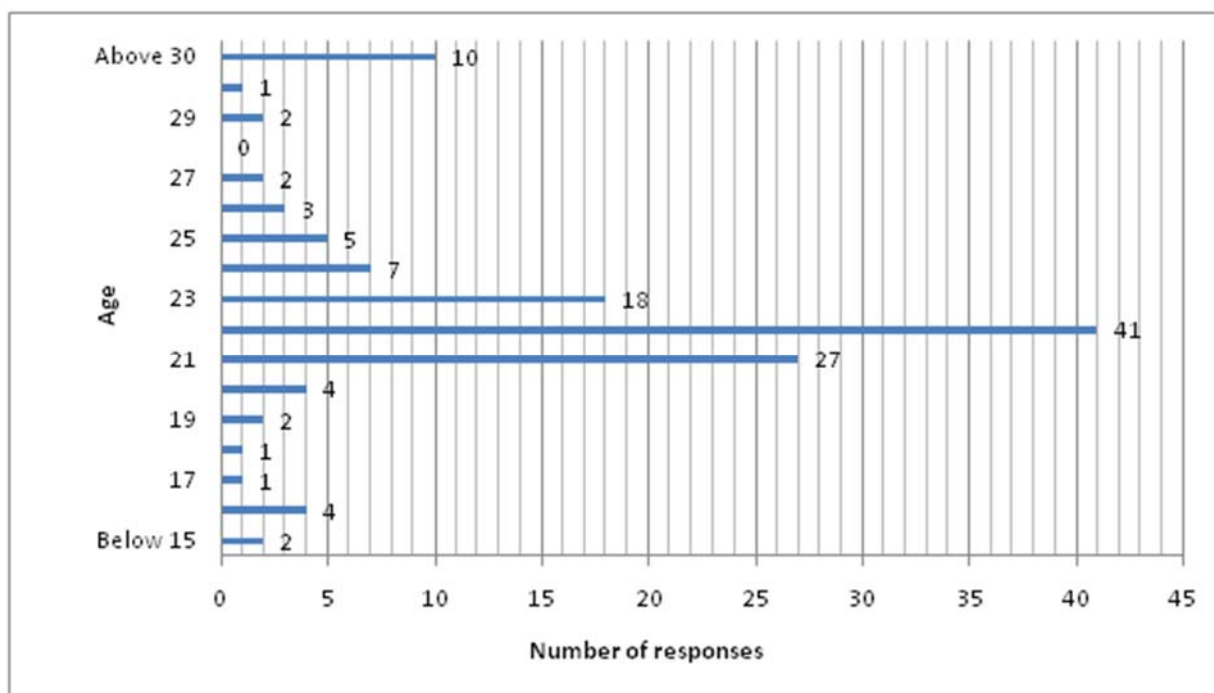


Figure1: Age of participants

37.7%(n=49) participants had combination skin type.

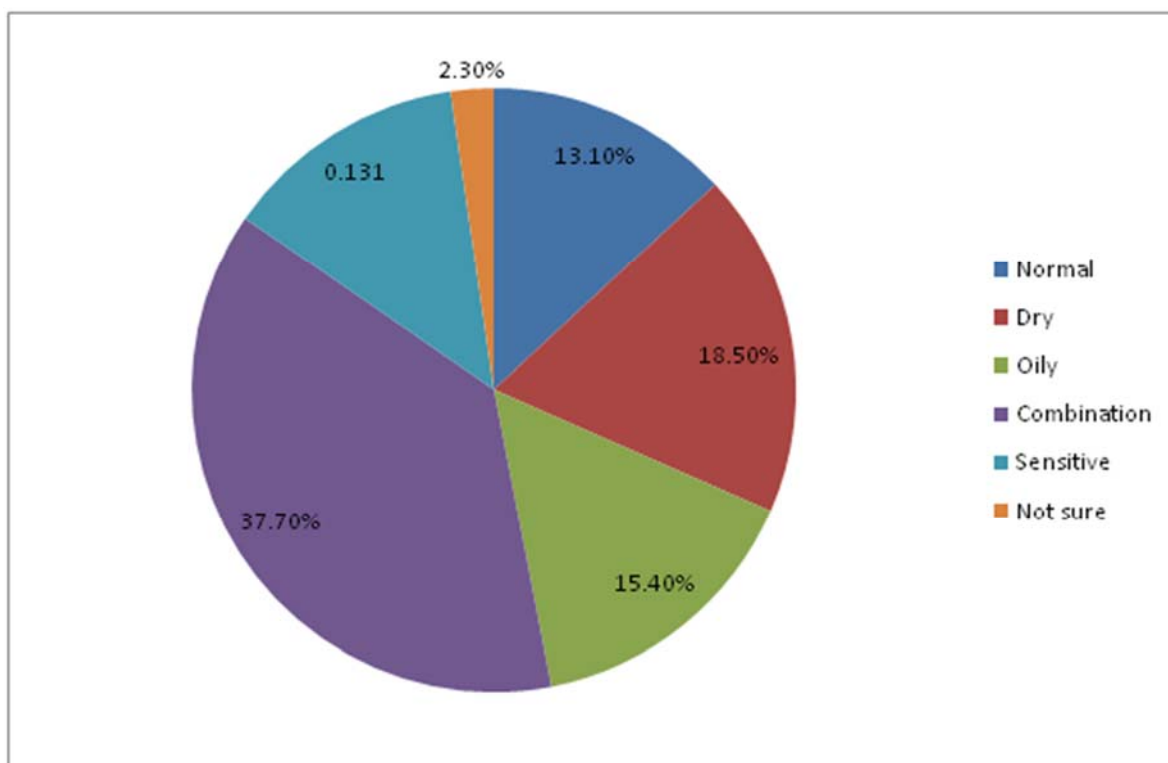


Figure 2: Skin type

41.5%(n=54) stated that they got less than 1 hour of daily sun exposure.

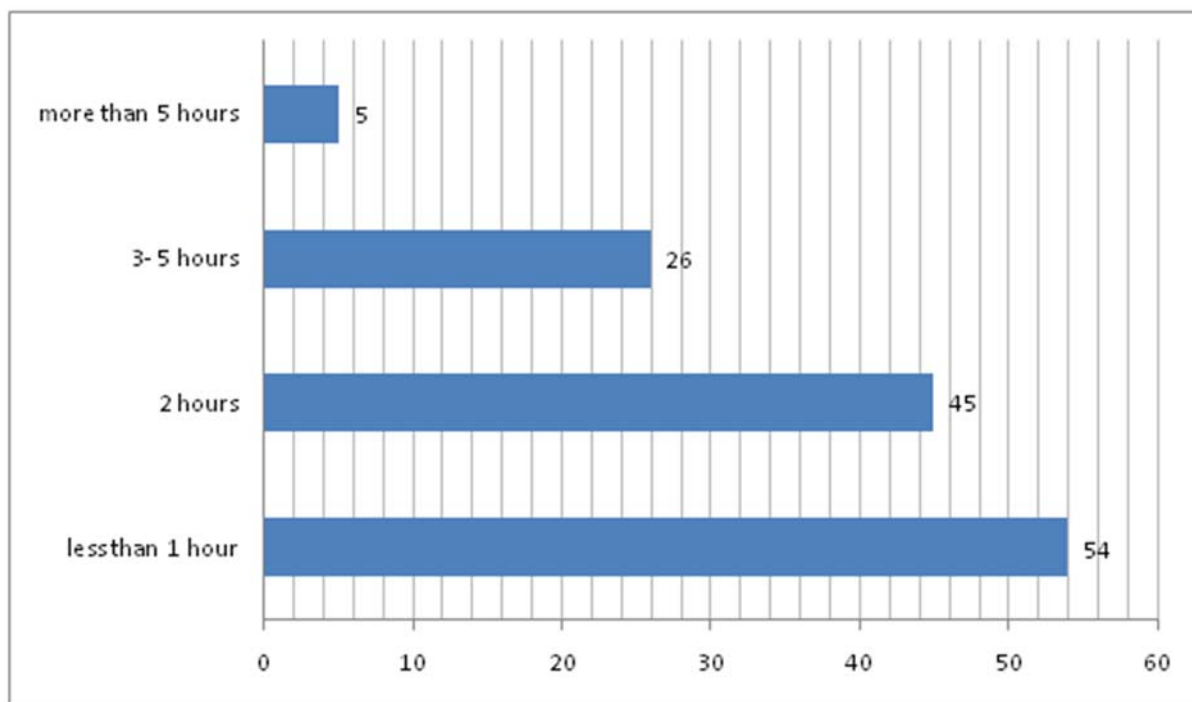


Figure 3: Amount of sun exposure daily

58.5%(n=76) stated they did not experience sunburn from sun exposure. 73.1%(n=95) stated they get tanned easily

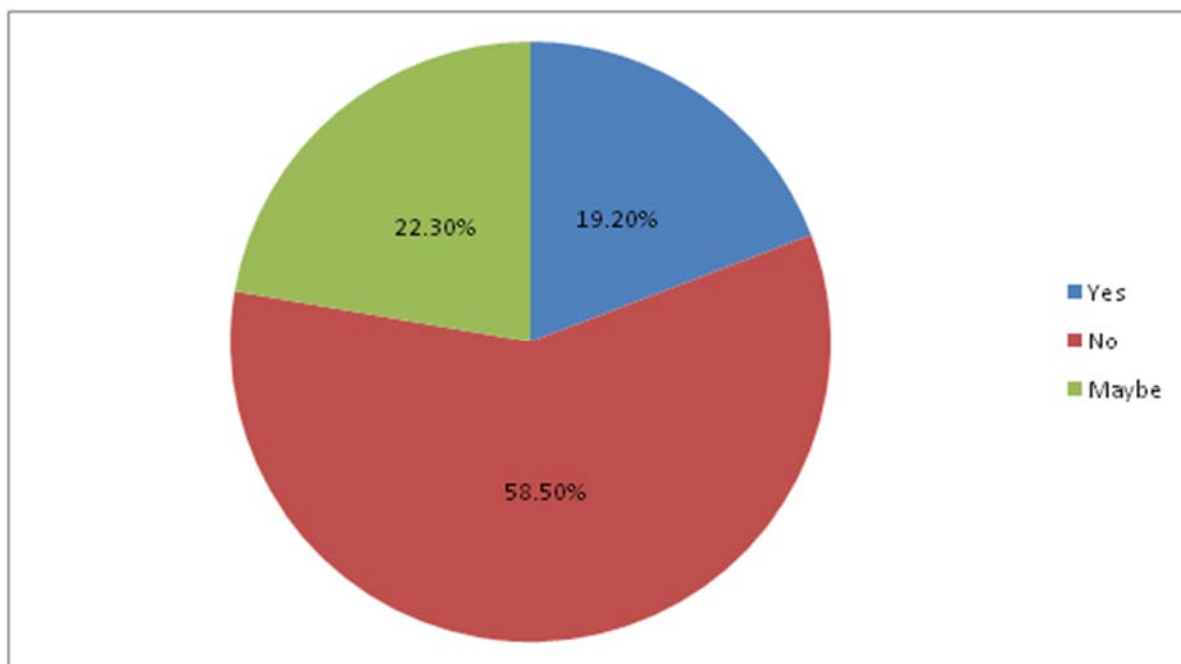


Figure 4: Do you experience sunburn

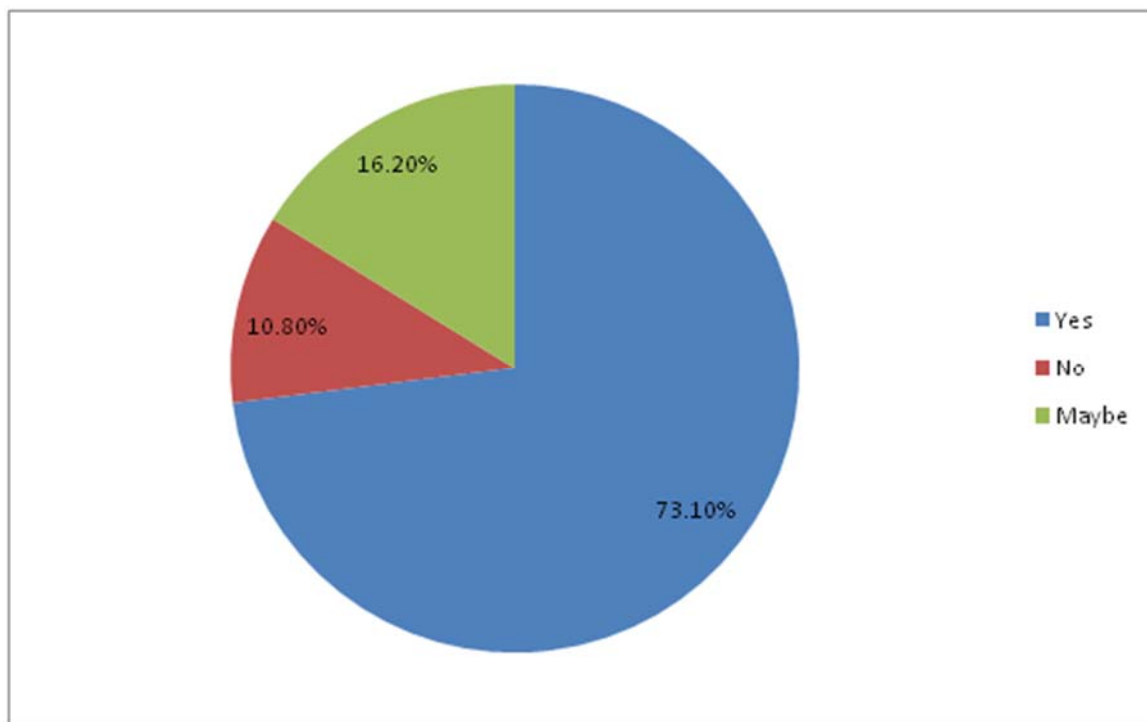


Figure 5: Do you tan easily?

Participants that used sunscreen-

53.8%(n=70) participants stated that they use sunscreen .

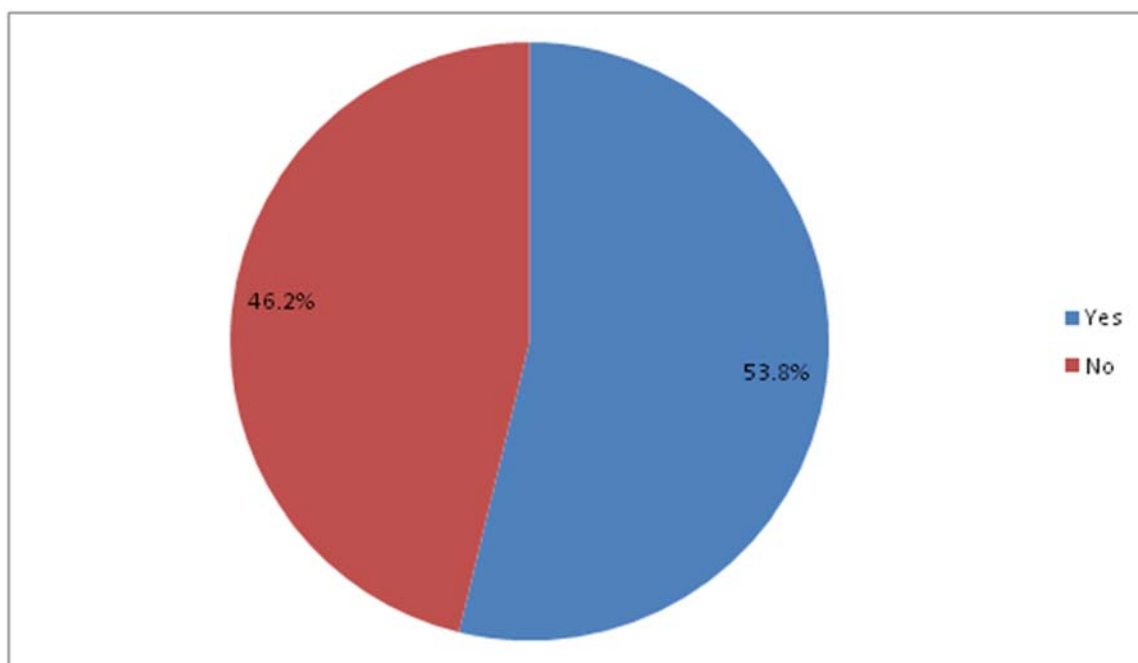


Figure 6: Usage of sunscreen

42.9%(n=30) of participants stated that they used sunscreens with an SPF of around 50..

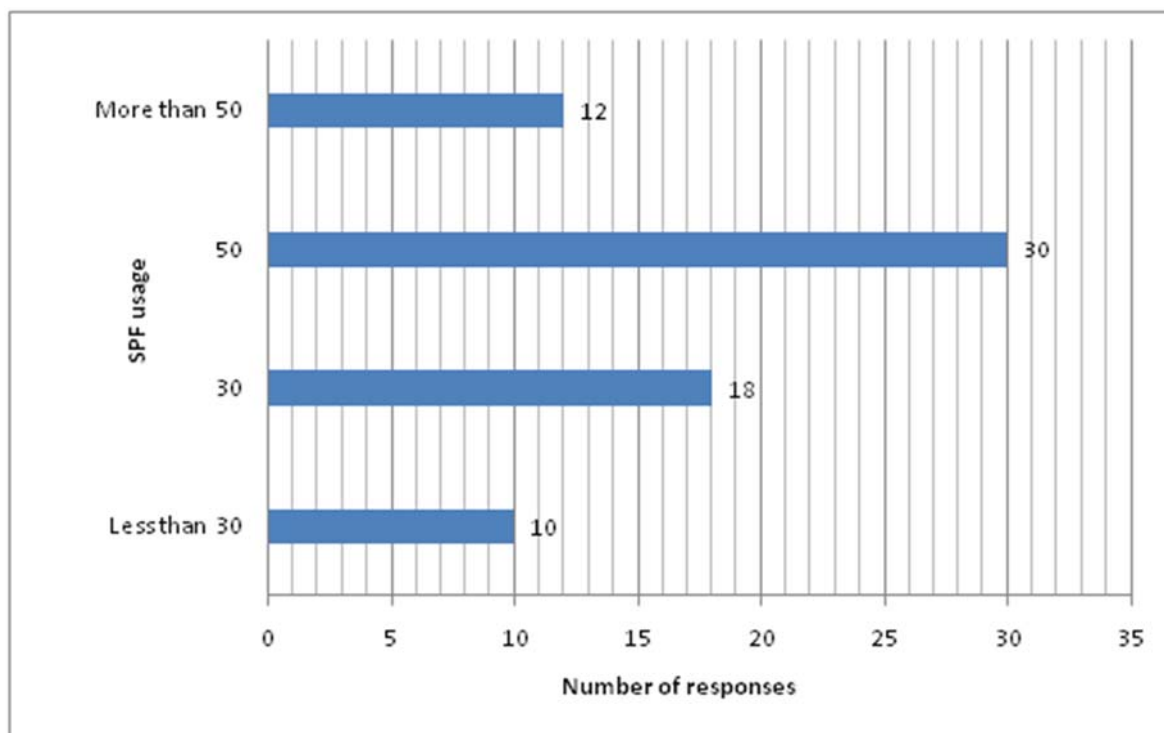


Figure 7: Amount of SPF used in sunscreen

Participants didn't have a clear idea of the kind of sunscreen they were using, but many recognised that it was a mineral sunscreen .

Figure 8: Types of sunscreen

kinds of SPF	Number of responses
Mineral sunscreen (They contain ingredients such as zinc oxide and titanium dioxide)	20
Chemical sunscreen (They contain one or more of the following active ingredients, oxybenzone, avobenzone, octisalate, octocrylene, homosalate, octinoxate)	14
Not sure about the kind of sunscreen	36

30% of participants used a pea-size amount of sunscreen to cover their face.

Figure 9: Parts of body where sunscreen is applied

Body parts where sunscreen is applied	Number of responses
Only face	32
Face and Body	1
Only exposed area	36
All areas of body	1

Figure 10: Amount of sunscreen applied

Amount of sunscreen applied	Number of responses
Pea size amount of sunscreen	21
Two fingers worth of sunscreen to cover face and more than two fingers to cover body	9
Two fingers worth of sunscreen to cover face	18
Desert spoon amount when applying SPF	1
However I feel like using	13
Not sure about how much to be applied	8

70% of participants (n=30) apply sunscreen 10-15 minutes before going out in the sun. 87.1%(n=61) of participants do not reapply sunscreen

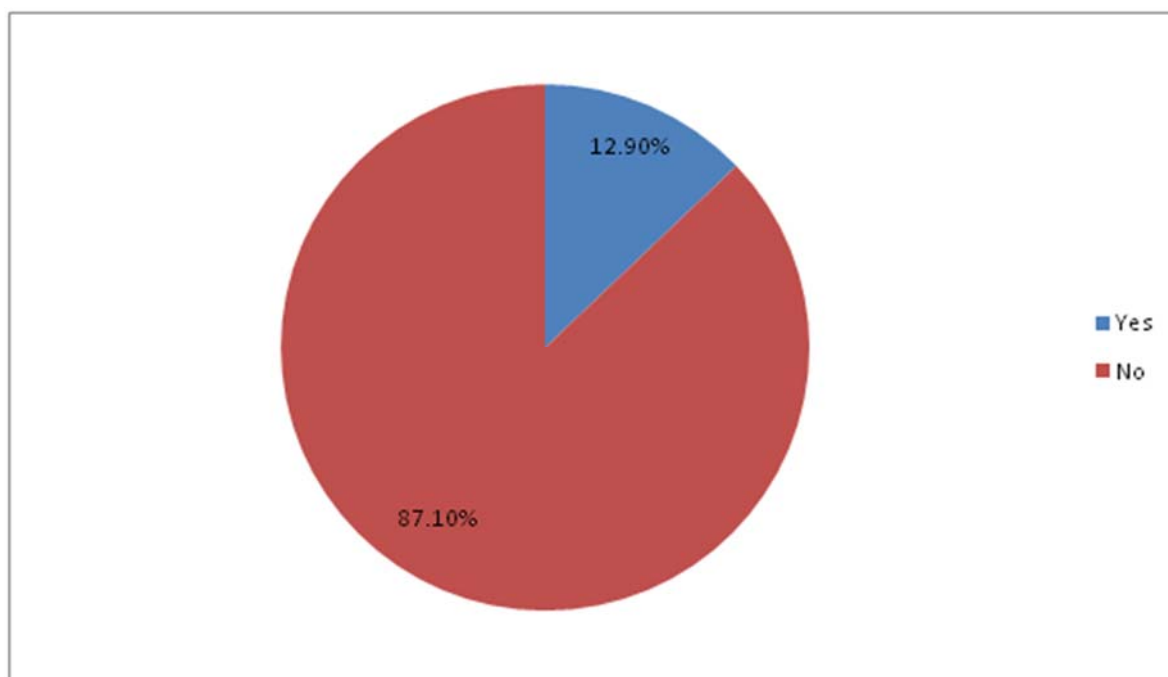


Figure 11: Do you reapply sunscreen?

48.6%(n=34) of participants stated that their sunscreen lasts about 1-2 months.

Figure 12: How long does your sunscreen last

Days /Months	Number of responses
Less than a month	8
1-2 months	34
More than 3 months	17
I'm not sure I use different products of sunscreen , but I complete all of them within 6 months	7
If I don't like the one I'm using then I never finish it and try a new one	4

42.9%(n=30) of participants used full clothing as other means of sun protection. Several participants preferred to not undergo tan-removal treatments or use after-sun products. They also preferred not to use moisturizers and makeup products without SPF in them.

77.1%(n=54) did not wear sunscreen indoors.

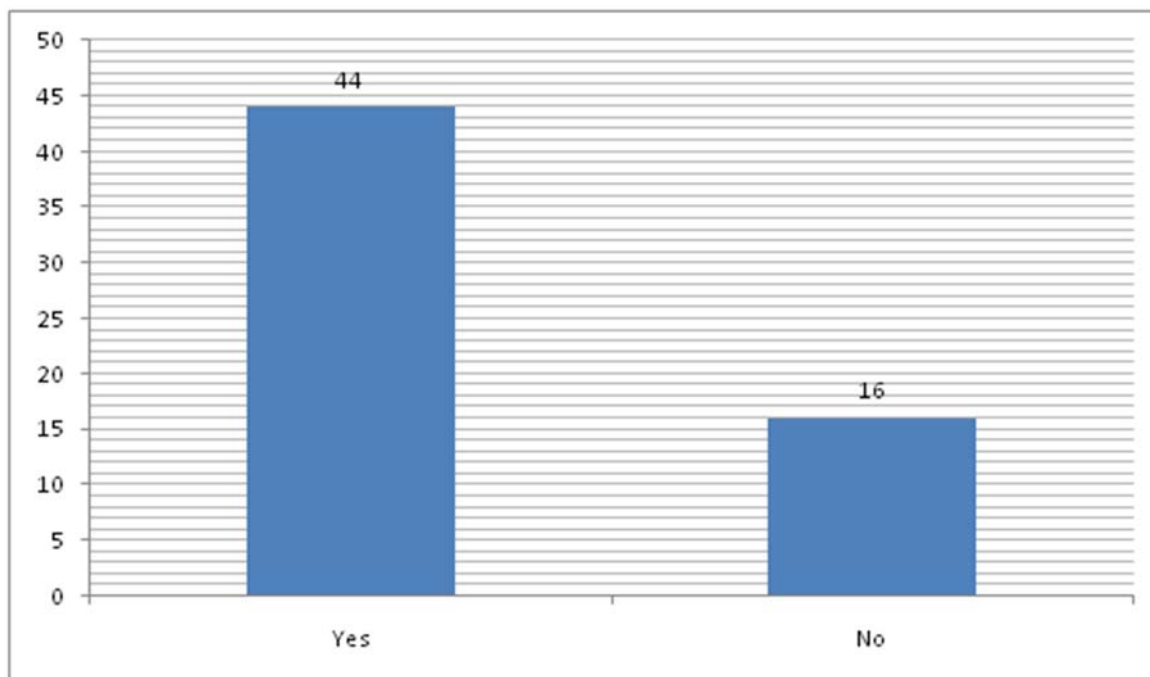


Figure 13: Do you wear sunscreen indoors?

Many participants gained awareness of sunscreen through social media.

Figure 14: Awareness about sunscreen usage

Awareness of sunscreen usage	Number of responses
Through my doctors	12
Through my friends	13
Advertisements	03
Social media	22
Celebrity Endorsement	03

Books	02
Using sunscreen from young age and it is apart of daily routine	14
Use them only when they are really required otherwise , I don't use them usually when I go out	01

97.1%(n-68) were satisfied with the sunscreen they were using.

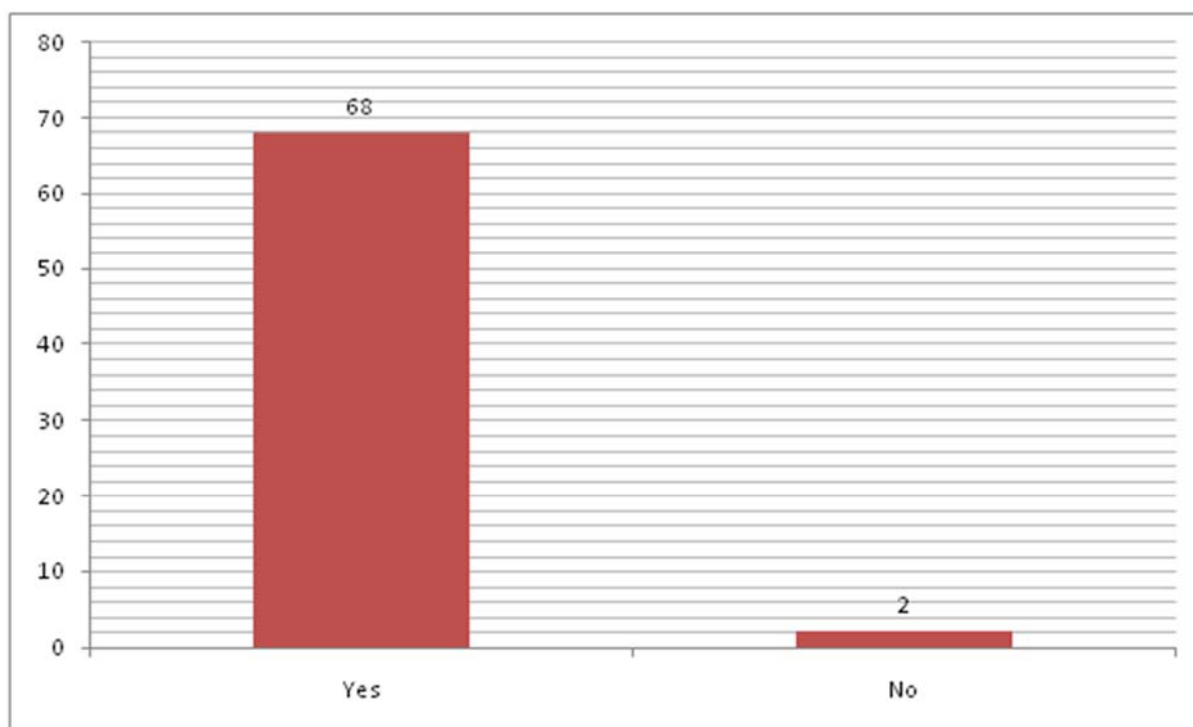


Figure 15: Is your sunscreen beneficial to you?

Many participants stopped using sunscreen once the pandemic started.

Figure 16: Pandemic influence on sunscreen preferences

Pandemic influence on sunscreen preferences	Number of responses
Yes, I continued using sunscreen during the pandemic	19

Yes , I continued using sunscreen sometimes during the pandemic	06
No ,I have stopped using sunscreen once the pandemic started as I was staying indoors most of the time	19
No , I have stopped using sunscreen once the pandemic started as I was staying indoors most of the time and I started reusing it once I started going out again.	26

Many participants preferred that their sunscreen be cost-effective.

Figure 17: Improvements that can be made in your existing sunscreen

Improvements to be made	Number of responses
To be more cost effective	28
Need lesser of white cast appearance	19
Need a more light-weight option	13
Need better consistency	06
Should be Slightly less greasy	01
Less oily	02
Satisfied with sunscreen	01

Participants that did not use sunscreen-

Several participants did not find a brand of sunscreen that suits their skin. Several others found it to be too greasy on their skin.

Figure 18: Reasons not to use sunscreen

Reasons not to use sunscreen	Number of responses
I didn't find the right product	18
My skin doesn't react well	09
I don't see any benefits	12
I usually don't put any products on me	01
I get lazy and I forget to use it	20

Figure 19: Complaints while using a sunscreen

Complaints while using a sunscreen	Number of responses
I get rashes when I use sunscreen	01
I get allergies when I am using sunscreen	01
My skin gets too oily when I am using sunscreen	10
I tend to get acne when I am using sunscreen	02
My pores get clogged when I am using sunscreen	01
Too thick and greasy on my skin	14

No I don't have any complaints	31
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58.7%(n-37) have used sunscreen before, and discontinued.

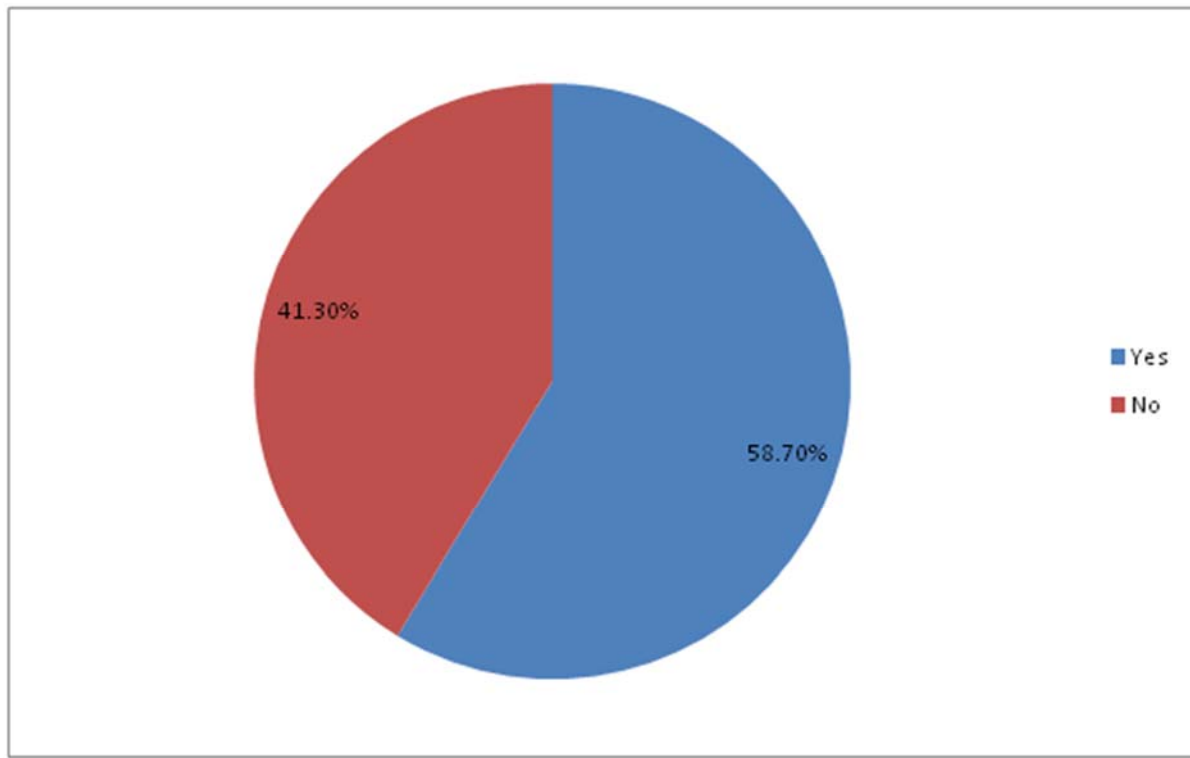


Figure 20: Have you used sunscreen before?

25.4%(n-16) used scarfs as other means of sun protection.

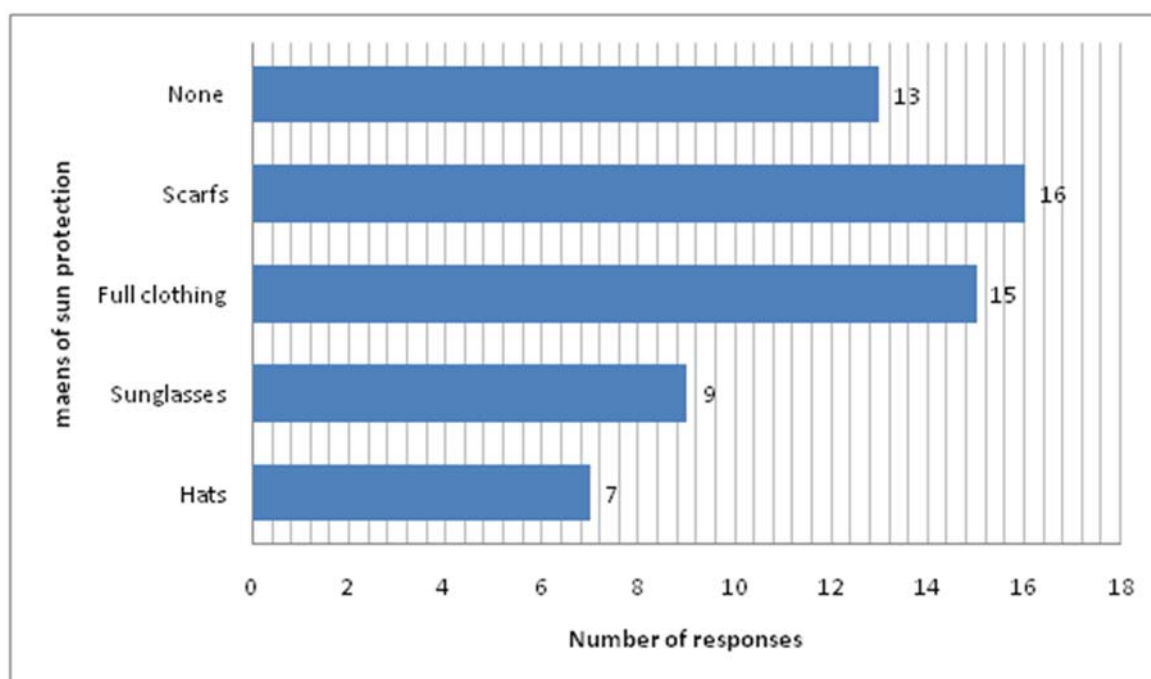


Figure 21: Usage of other means of sun protection

Many of these participants stated that they did not use moisturizers or make-up products that have SPF in them, either.

47.6%(n- 30) stated that they would consider using sunscreen if more information concerning its benefits were to be provided to them.

Figure 22: Influence to start using sunscreen

Influence to start using sunscreen	Number of responses
I don't use sunscreen	01
Finding a sunscreen better suited for my skin , in an affordable price range	01
When I get right product that doesn't leave white cast on colored skin at right price range	01
A sunscreen that works	01

I don't feel the necessity	01
Free consultation from dermatologist	12
If friends from my social circle are using	06
More information and awareness on sunscreen usage	30
Discounts on sunscreen	05
Personalized ads on social media	01
Celebrity endorsements(including social media influencers)	01

After a part of the questionnaire established briefly the benefits of sunscreen, 33.9%(n=21) of the participants that were averse to sunscreen said that they would consider using it.

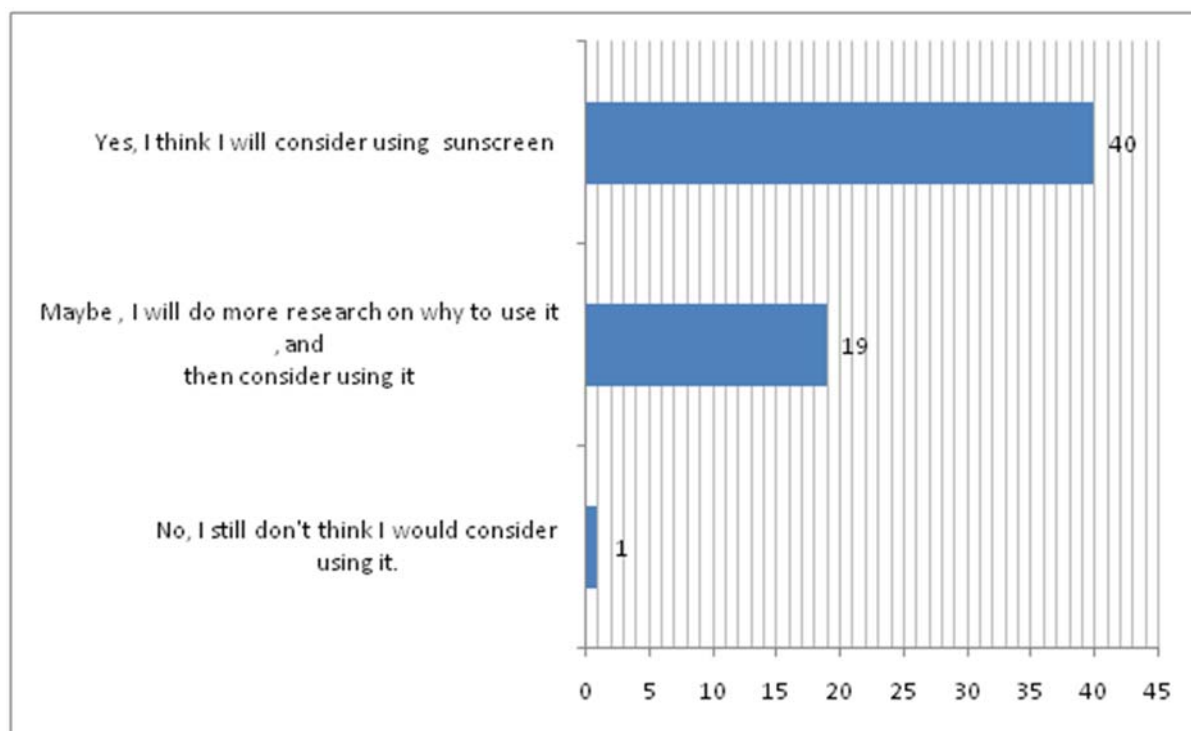


Figure 23: Would knowing the fact that sunscreen, apart from UV protection, helps significantly w prevention of harmful effects of sun radiation, as well as skin cancer, and, the fact that it doesn't cause vitamin d deficiency, cause you to change your Outlook on sunscreen usage?

IV. DISCUSSION

The importance of sunscreen use to protect one from UV damage needs no introduction. Ingredients in sunscreens provide a wide range of benefits [1].

The aim of this survey was to evaluate the knowledge of South Asian women on the usage of sunscreen. Most participants were students in their early twenties. Irrespective of their skin type, most of them responded that they tan easily.

The fact that more than 50% of the participants in this study used sunscreen on a regular basis was a pleasant finding. It was interesting to note that roughly 50% of participants tended to use SPF lower than 50. It was evident from the results that participants were mostly unaware of the kind of sunscreen that they are using. Unlike our Caucasian counterparts, for whom the application of sunscreen is very custom, South Asian women have been found to use sunscreen scantily; it can be said that for South Asian, women particularly Indian women, sunscreen is a choice rather than a necessity. This can be understood from the data, as many participants stated that they use sunscreen on the exposed areas of the body only. It is not surprising to find from this survey, that for many participants, the act of reapplication was deemed unimportant, which can be ascribed to multiple reasons. Primarily, it is the fact that South Asian women do not experience sunburn, unlike Caucasian women, and they tend to use other means of sun protection excessively rather than using sunscreen.

Seemingly, the concept of sunscreen came into existence in South Asia only a decade ago, for multiple reasons. It can be assumed thus, as South Asian women have recently become more proactive about self-care [10]. With access to social media, beauty magazines, and aesthetic dermatologists, many of these women have started to use sunscreen as part of their daily routines. This still being a fresh notion, South Asian women are still lacking in adequate knowledge of how to use sunscreen more efficiently, and to their advantage. This is supported by the data from the survey as well. Many participants stated that they do not use sufficient amounts to cover their face and body. Despite all this, quite satisfactorily, many participants who use sunscreen have managed to find the right products that suit their skin, and are not willing to change the product that they are currently using.

As the saying goes, 'Something is still better than nothing'. Despite inefficient use, women who use sunscreen are not the focus here. It is the women who don't use sunscreen at all that raise the bar for concern. Through this survey, multiple reasons were

found, for many women still not using sunscreen: lack of awareness, a sluggish approach towards sunscreen, problems due to budget, and not finding a product that suits their skin. It is not that these participants never tried sunscreen before, but that many women don't find sunscreen to be to their liking, and don't see it as a necessity. Many women said that they find sunscreen to be too greasy on their skin which is a very common concern that many consumers express. While conducting the survey, it was assumed that women who won't use sunscreen, at least use skincare products with SPF in them. Innovative as the cosmetics industry is today, it is not difficult to find moisturizers and make-up containing SPF. It was indeed a surprising discovery that SPF was missing from their other skin-care products as well, particularly daytime moisturizers and make-up products. The only relief was that some of the participants who didn't use sunscreen were, at least, still using sun-protecting accessories like hats, scarves and umbrellas.

Based on previous studies, what can be gleaned is that women are more conscious about the way they look than men are. Despite decent knowledge of the effects of sun-exposure among participants, the use of sunscreen among women is unsatisfactory. Towards the end of the survey, information was shared with participants regarding the benefits of sunscreen and misconceptions around it, who were then asked if they were willing to now use sunscreen. Pleasantly enough, many responded by saying that they were willing to use sunscreen. It comes as no surprise, that when provided with the right information, people tend to change their beliefs. Positive as that shift is, and is people's willingness to adapt to a better lifestyle, by no means does the problem end there.

Over the years the knowledge on the use of sunscreen in South Asians, particularly that in people with darker skin tones, has evolved. With more research, undoubtedly, more information will be available in the future. As the skincare industry expands its markets in South Asia with innovative products, it can be assumed that manufacturers will be releasing improved products, which would serve to intrigue consumers, especially women, making sunscreen use more probable among the population, and consequently healthier skin and lifestyles. With increasing globalization, international manufacturers should be producing products that can be used by women of all skin types. It is also extremely important that sunscreens are affordable.

From previous studies, it is clear that the current pandemic has caused many people to change their skincare routines [11][12][13]. It is seen in this particular study as well—many women have stopped using sunscreens since lockdown came into place in March of 2020, leading to people staying indoors. It has been found that many participants lack awareness that sunscreen can be used indoors as well.

V. CONCLUSION

Although 53.8% of participants in this study do use sunscreen, it can be noted that several of them do not use it efficiently enough to attain the benefits of protecting their skin from UV damage. Several participants don't reapply sunscreen. Other participants don't use sunscreen primarily because they can't find one that suits their skin. Often, participants don't see it as a necessity. With the right knowledge about sunscreen use, more awareness, skin-friendly products, and more accessibility to different varieties of sunscreen, South Asian women are more likely to use sunscreen, and thus prevent skin problems caused by UV rays.

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