



## CONSUMER'S PERCEPTION REGARDING SUNSCREEN PRODUCTS: A SURVEY OF NCR, INDIA

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### ABSTRACT

**Introduction:** Nowadays a healthy skin doesn't defy a dark complexion with higher or lower melanin levels of a person. A continuous exposure to sun and its radiations are causing skin disorders that you don't even see until it turns into a major disease like skin cancer, premature wrinkles, psoriasis, vitiligo, etc. Topical sunscreens are one of the source of protection for various skin types that helps by absorbing the harmful UV radiations and thermally dissipate the rays innocuously. The present study was carried out in two districts, Ghaziabad and Gautam Buddha Nagar of Uttar Pradesh, constituents of National Capital Region (NCR), created under the National Capital Region Planning Board Act 1985. **Objectives:** The objectives of present study were i) To study the demographic profile of consumers. ii) To study the awareness about the skin problems and sunscreens iii) To study the factors affecting consumer's decision for purchasing sunscreen and iv) To study the brand preference for sunscreens. **Method:** Data obtained through survey method from 176 respondents. **Results:** The results of the study revealed that working females and students are prominent consumers of sunscreens. The awareness about skin problems and sunscreen products in the selected region was fare. **Conclusions:** Sunscreens having natural components were preferred and VLCC and Lakme were the choice of brands in selected populations.

**KEYWORDS:** Sunscreen, Survey, Consumer perception, Cosmetics.

### INTRODUCTION

Cosmetics have been widely accepted in the markets all around the world. From beautifying to whitening or protecting, when it comes to skin people tend to believe in its benefits as long as gives what it promises.<sup>[1]</sup> Sunscreen is a topical agent that is applied on the skin for the protection from harmful rays in the environment. These are in form of lotion, gel, spray, cream, etc.<sup>[2,3]</sup> that can be found in the market as sun tan lotion, sun block, sunburn cream which soak up the harmful ultraviolet (UV) radiations emitted by the sun and protects the skin from sunburns and skin damage.<sup>[4,5,6,7,10]</sup> Many sunscreens are available in the market for separate use for eyes in the form of eye cream, for lips in the form of lip balm, which contains different SPF's for the pigmentation caused by the sun rays.

**Factors regulating sunscreen performance**<sup>[17,18,19,20,21,22]</sup>

**SPF:** SPF is the major factor determining the protection and effectiveness of the sunscreen. Maximum photons can enter the skin if no sunscreen is applied. Similarly

SPF 15 can give 93% protection, as 7 photons can enter the skin out of 100. Same way SPF 30 can give 97% protection, where only 3 photons can enter out of 100. SPF stands for sun protection factor which means ratio between MED (minimal erythema dose) of the sun protected skin to the MED (minimal erythema dose) of unprotected skin.

SPF= MED of protected skin/unprotected skin, MED is minimal erythema dose.

This means if a sunscreen with SPF 50 is applied on the skin, the UV radiation will protect the skin until exposed to more than 50 times of the UVB radiations.

**UVAPF:** It stands for UVA protection factor, which is measured in exposure with sample of UVA radiation. It can be calculated with the in-vitro transmittance of this factor after the exposure, and then it is weighted with the persistent pigment darkening (PPD) action spectrum along with the standard output spectrum of the UVA filtered solar simulator. Higher the UVAPF value, higher will be the UVA protection.

**PFA:** It stands for protection factor UVA or also known as UVA protection factor. It is the ratio between PPD of protected skin and PPD of unprotected skin. It is mainly used to measure UVAPF because it is induced by UVA radiation and not UVB.

**Critical wavelength value:** It determines the value of the sunscreen, where the wavelength should allow only 10% of the rays to penetrate the skin. Approved by the FDA, a sunscreen to be considered as excellent UVA protection should have wavelength over 370nm. 90% of the absorbance area comes under this wavelength.

**Immune protection factor:** It is the factor which determines the immune protection ability of the sunscreen to prevent UV induced immune suppression; it is evaluated by the ability of the sunscreen, to protect the skin from sensitisation towards allergens like DNCB (dinitrochlorobenzene) or nickel.

**Broad spectrum sunscreen:** The sunscreen which comes under this category should have critical wavelength >370nm and UVA protection factor >4.

**Water resistant sunscreen:** The sunscreen which comes under this category should be able to maintain the SPF value after a 2 sequential immersion in water upto 20 min that is 40 mins for 2<sup>nd</sup> time whereas for the very water-resistant sunscreen should be able to maintain the SPF value after 4 sequential immersion in water upto 20 mins (80mins).

**Ultraviolet radiations:** An energy emerging from any source like sun, or any industries and commercial source that is in the form of electromagnetic radiations is called an ultraviolet radiation. U.V radiation covers the part of electromagnetic radiations that has a wavelength from 100 to 400 nm and may lie between X- rays and visible light. They fall under 3 categories.<sup>[8,9]</sup>

**UV A rays-** it has wavelength between 320 to 400 nm and it affects the skin by increasing the melanin production that leads to skin darkening, pigmentation and aging. It also subdues the endothelial cells which results in premature death of living cells hence causing necrosis.

**UV B rays-** it has wavelength between 280 to 320 nm and are also called as burning rays as it is related to skin burning, causes the damage in D.N.A. of the skin cells directly and are the reason for causing sunburn and most of the skin cancers.

**UV C rays-** it has wavelength between 200-280 nm. Since it has shorter wavelength and is filtered by the stratospheric ozone layer so it causes acute or short term damages to the skin which is less harmful like ulceration as well as redness on skin.

### **Mechanism of phototoxic and photo-allergic reaction:**

UV radiation is the most harmful environmental stress that humans are exposed to. The different photochemical and photo allergic reaction includes the electromagnetic portion of UV radiations and are divided into UVA, UVB, UVC that can penetrate the skin and blood. These toxic reaction interact with the human skin and tissues and enhance the physiological reaction like skin photo aging and carcinogenesis.<sup>[11,12]</sup> The UV rays causes the photo oxidative damage to the skin by thickening of the epidermal layers and increase the melanogenesis. For the occurrence of photosensitive reaction, UV radiation must be absorbed by the skin and tissues to start the allergic reaction. The molecules which absorbs these kinds of light radiations are called chromophores or photosensitizers.<sup>[13]</sup>

The different chromophores present in the skin are lipids, substantial proteins, nucleic acids, etc. Oxidation of these chromophores occurs in upper layers of skin like epidermis and dermis which depletes the enzymatic as well as the non-enzymatic antioxidants in the layers of the skin. Wavelengths above 300 nm can penetrate the skin deeply.<sup>[14]</sup>

The photons that are absorbed by the skin help the electrons to move from ground state to excited state known as singlet or triplet state. These electrons when come from excited state to ground state, the absorbed energy discharges fluorescence, heat or photoproduct. All the complex reactions are started by these photoproducts, and may conclude to photo allergic or phototoxic reactions. The most common skin indications caused by these reactions are edema caused due to sunburns, blisters, hyper pigmentation, elastosis, etc.<sup>[15,16]</sup>

**Cosmetic and toiletries: Global scenario:** In 2003, the World market for cosmetic and toiletries was valued as US\$ 201 billion, up 4.8% by 2002 (in fixed exchange rate terms). Though mature hair care maintains its position as the most valuable sector in global cosmetics & toiletries. According to Global cosmetic industry report (August 2004) the advanced education provided by brands about the product's ingredients and benefits have made today's consumer more aware of what they are putting on their bodies, and making them more willing to pay.

**Indian skin care industry:** The skin care industry in India is booming, with a tremendous potential for growth in 2018. In fact, it is said to be growing twice as fast as markets in the United States and Europe. India is also the second largest consumer market in the world. The size of India's beauty and wellness market may touch Rs. 80,370 crores by 2017-18. This includes the beauty products, beauty salon and spa business. This can be ascribed to revelation to global trends, rising disposable incomes, changing life styles, increasing number of women in the work force and so on.<sup>[23]</sup> The Indian cosmetic industry is growing in terms of product

development and marketing. The performance of Indian consumers is changing from the merely functional products to more advanced and specialized cosmetic items. The entry of many multinationals into the Indian cosmetics from 2011 has made it extremely challenging and dynamic market. Foreign players have focused more on innovations, re- launches and brand extensions spread across multiple price points, and enhanced product penetration by extending their distribution networks.<sup>[24]</sup>

#### Objectives of the study

- To study the demographic profile of the consumers buying sunscreen products
- To study the awareness about skin problems and sunscreen products
- To study factors affecting consumers decision for purchasing sunscreen products
- To study brand preference for sunscreen products

#### MATERIAL AND METHODS

Survey method was adopted in this present study to describe the subject under investigation. The data was collected from the randomly selected population residing in Ghaziabad and Gautam Buddha Nagar in NCR. The

questionnaire was designed in such a way to collect the information of gender, age, employment status, number of hours spending out in summer, whether profession demands for outdoor standing, reference of UV index level forecast, burning of skin, usage of sunscreen, awareness of importance of sunscreen, favorite brand of sunscreen, factors affecting brand selection, actual buyer, whether for baby, body & face same or different, preference of packing, label reading behavior, contents, SPF, site of application.

#### RESULTS AND DISCUSSION

A Total of 200 questionnaires were given to the target group and 176 were returned giving a response rate of 76%. The study reported that most of the consumers of sunscreen products were females 64.3% and 35.7 % were males. It is evident from the study that awareness about skin problems and sunscreen products was 75-78 %. While studying factors affecting buying decision, it was found that natural or herbal component was preferred more. For studying brand preference VLCC was responded by 43% and Lakme by 46%. The summary of the results is presented in table 1.

#### Figures

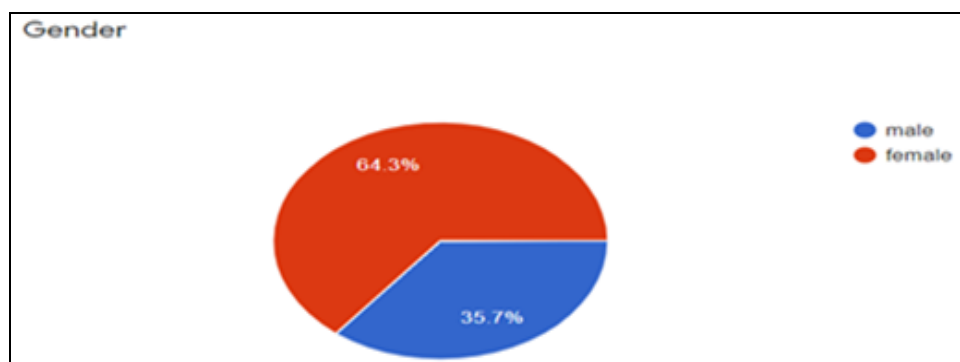


Fig.1: Gender.

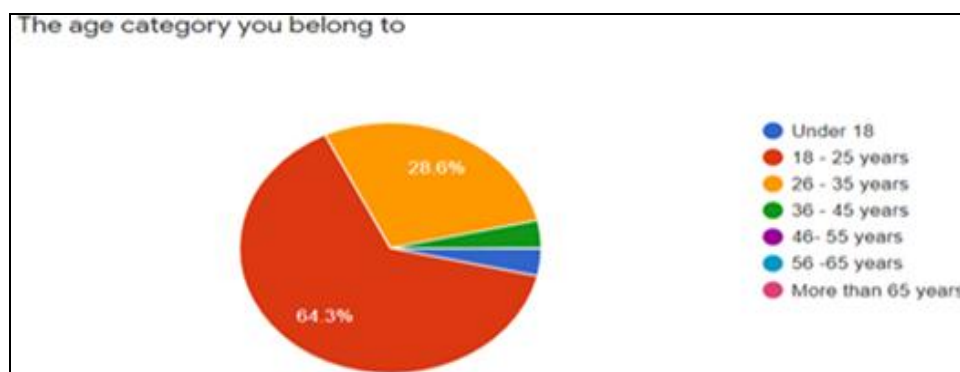


Fig.2: The age category you belong to.

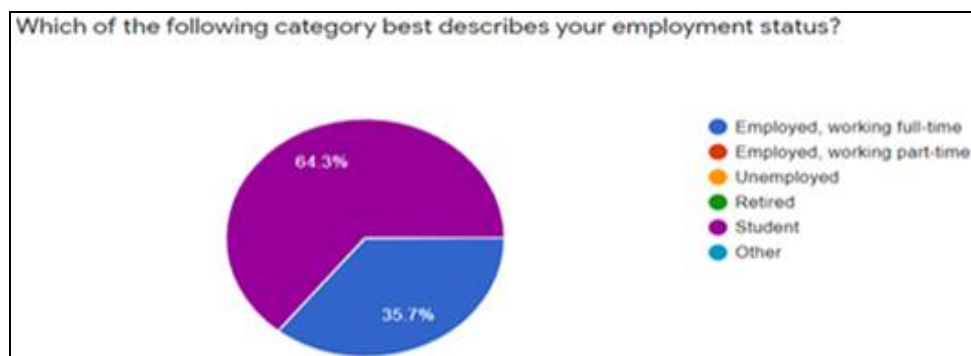


Fig.3: Which of the following category best describes your employment status.

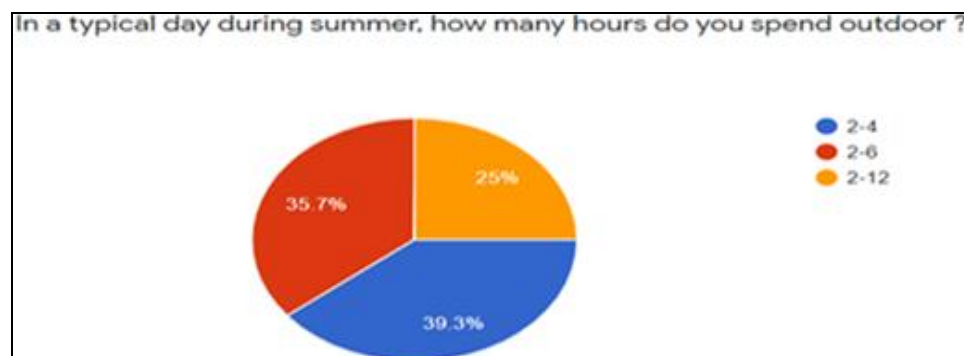


Fig.4: In a typical day during summer, how many hours do you spend outdoor.

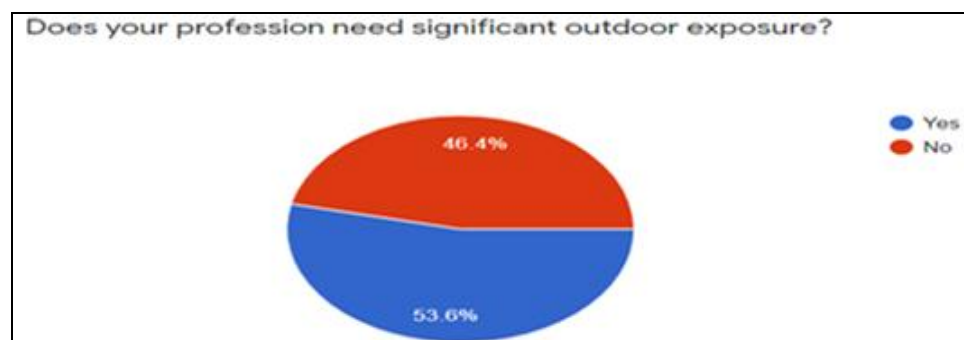


Fig.5: Does your profession need significant outdoor exposure.

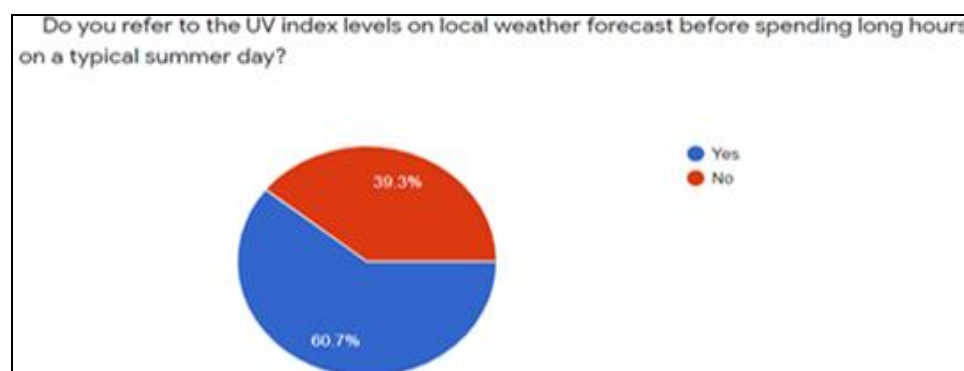


Fig.6: Do you refer to the uv index levels on local weather forecast before spending long hours on a typical summer day.

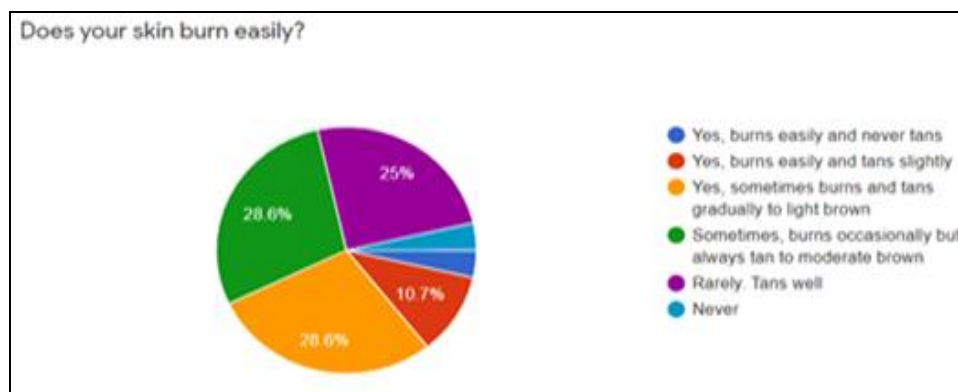


Fig.7: Does your skin burn easily.

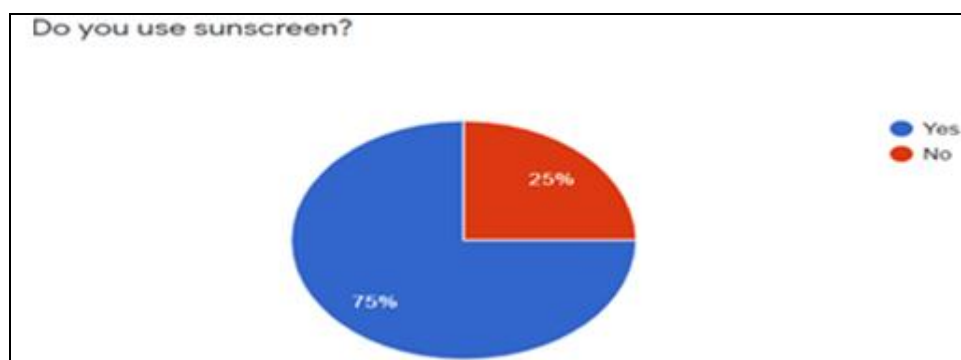


Fig.8: Do you use sunscreen.

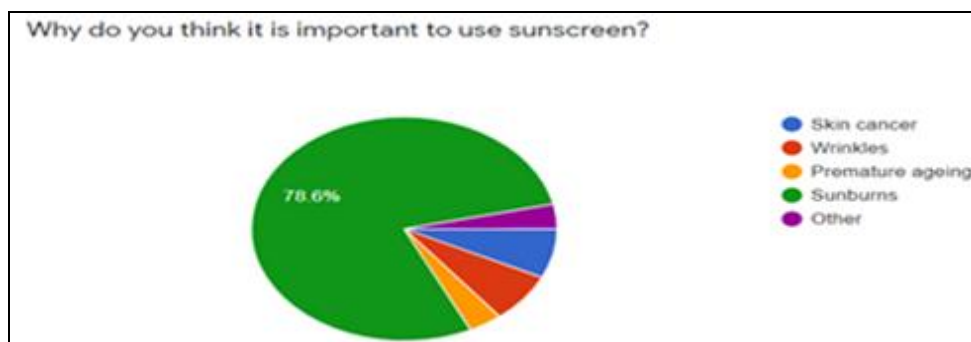


Fig.9: Why do you think it is important to use sunscreen.

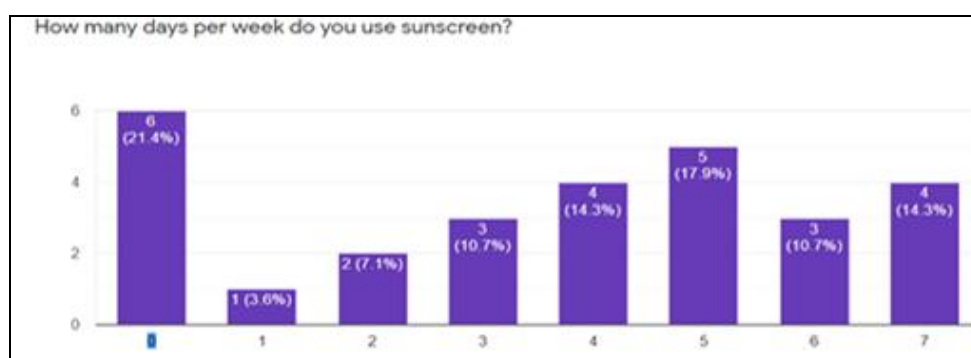


Fig.10: How many days per week do you use sunscreen.

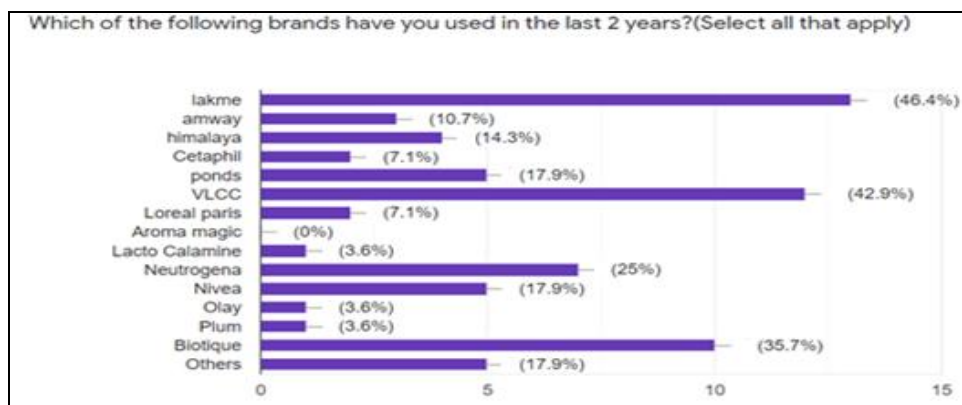


Fig.11: Which of the following brands have you used in the last 2 years.

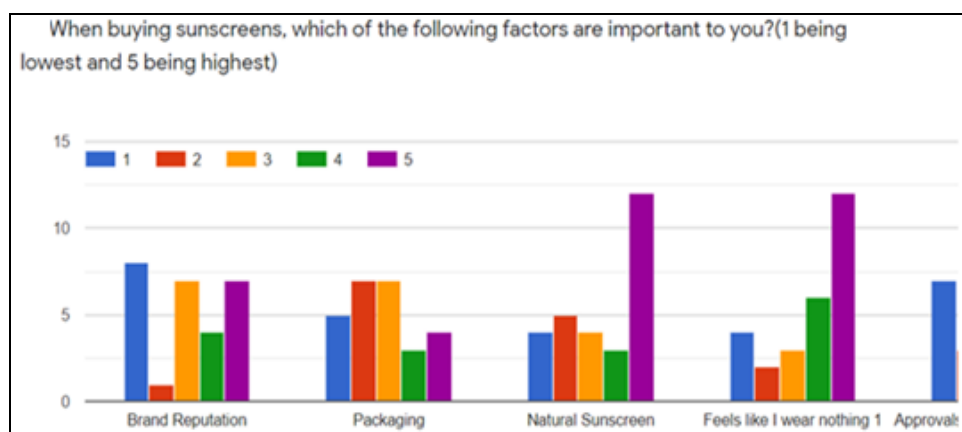


Fig.12: When buying sunscreens, which of the following factors are important to you.

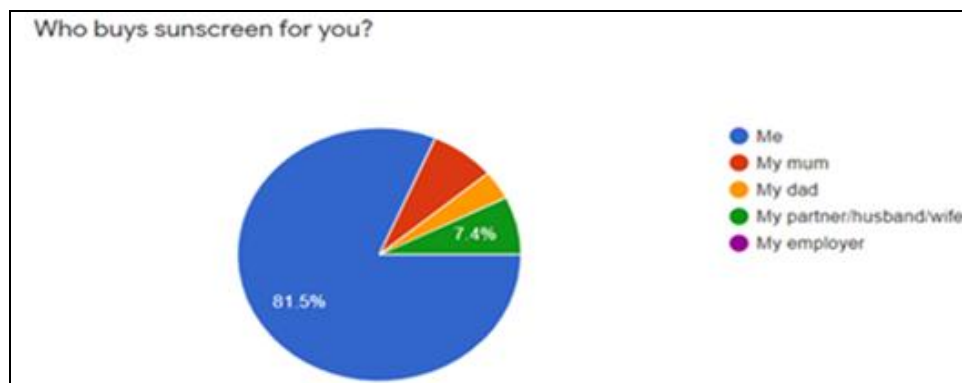


Fig. 13: Who buys sunscreen for you.

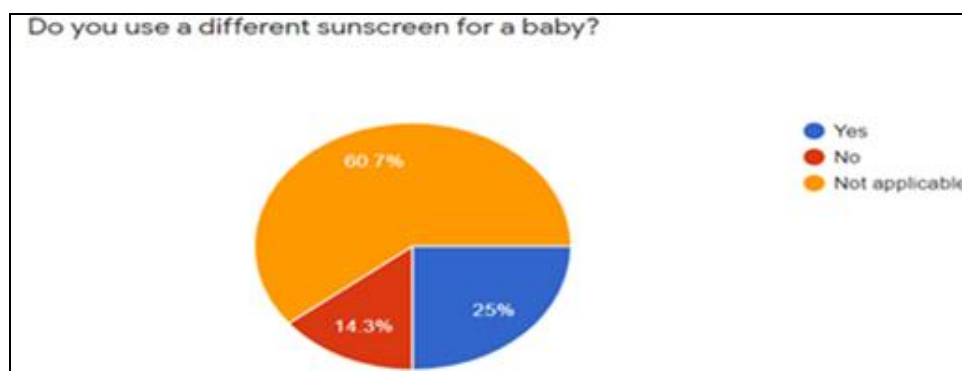


Fig. 14: Do you use a different sunscreen for a baby.

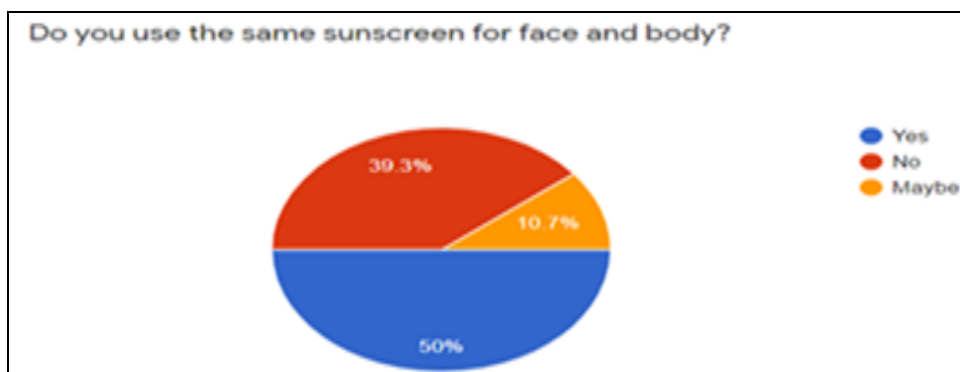


Fig.15: Do you use the same sunscreen for face and body.

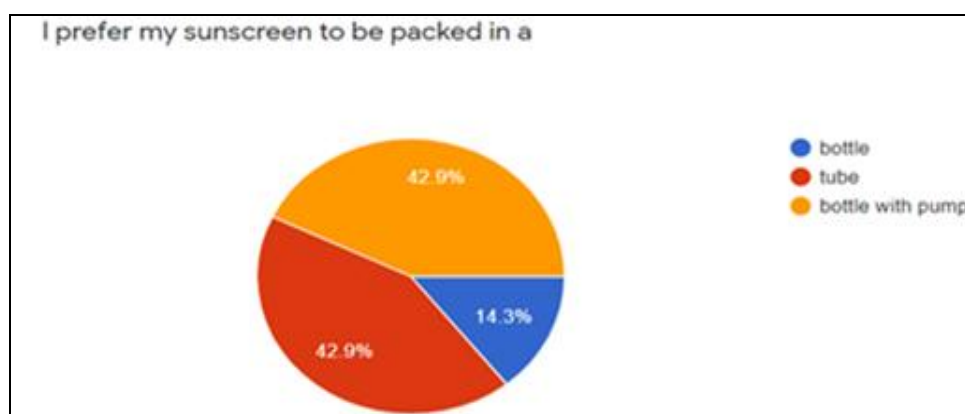


Fig.16: I Prefer my sunscreen to be packed in a.

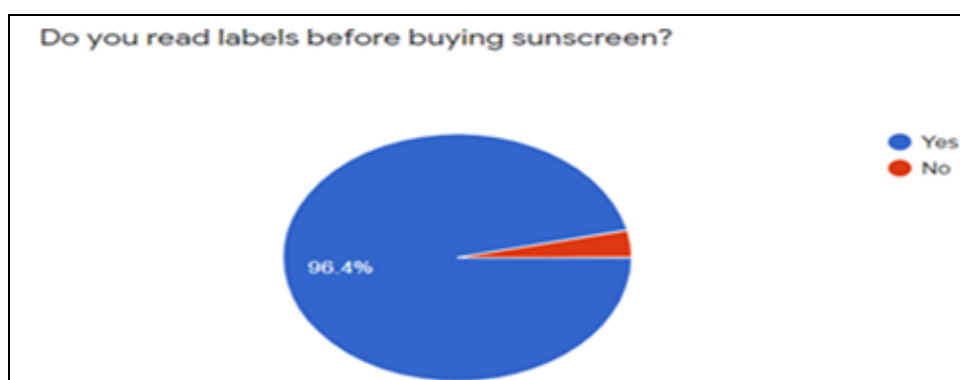


Fig.17: Do you read labels before buying sunscreen

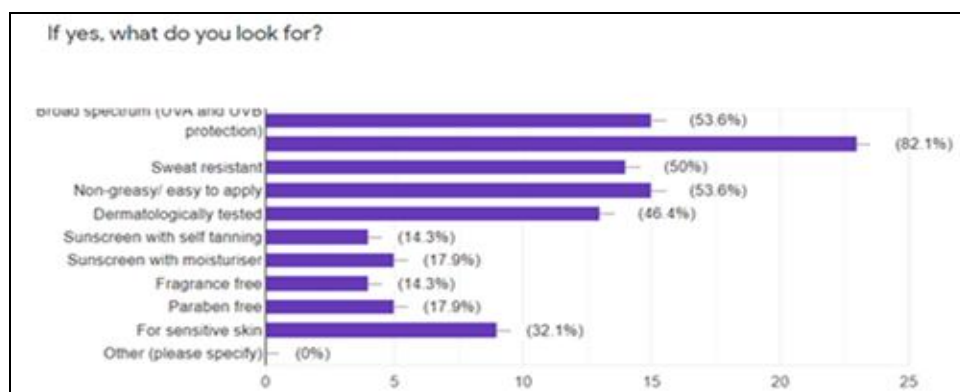


Fig.18: If yes, what do you look for.

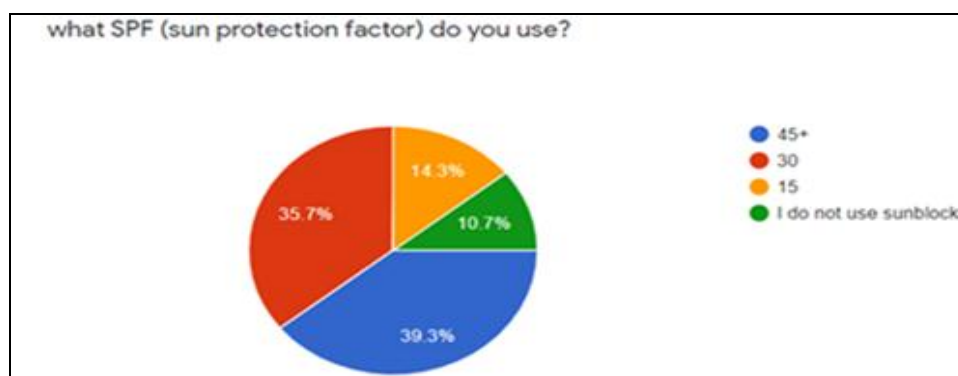


Fig.19: What spf (sun protection factor) do you use.

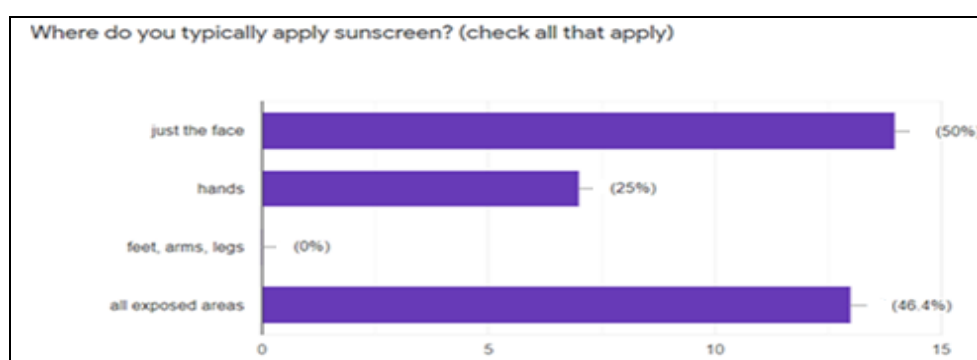


Fig.20: Where do you typically apply sunscreen.

Table1: Summary of results from consumer's survey questionnaire.

| S.No. | Questions                                                                                                         | Results                                                                      |
|-------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1     | Gender                                                                                                            | 64.3% Females & 35.7 % male                                                  |
| 2     | The age category you belong to?                                                                                   | 64.3% customers belonged to the age group of 18-25                           |
| 3     | Which of the following category best describes your employment status?                                            | Students were 64.3% & employed 35.7%                                         |
| 4     | In a typical day during summer, how many hours do you spend outdoor?                                              | 39.3% were for 2-4 hours                                                     |
| 5     | Does your profession need significant outdoor exposure?                                                           | 53.6% responded yes                                                          |
| 6     | Do you refer to the UV index levels on local weather forecast before spending long hours on a typical summer day? | 60.7% responded for yes                                                      |
| 7     | Does your skin burn easily?                                                                                       | 28.6% responded for tanning sometimes, gradually to light brown              |
| 8     | Do you use sunscreen?                                                                                             | 75% responded for yes                                                        |
| 9     | Why do you think it is important to use sunscreen?                                                                | 78.6% responded because of sunburns                                          |
| 10    | How many days per week do you use sunscreen?                                                                      | 21.4% doesn't use sunscreen on a daily basis                                 |
| 11    | Which of the following brands have you used in the last 2 years?(Select all that apply)                           | 46.4% of the customers selected lakme brand                                  |
| 12    | When buying sunscreens, which of the following factors are important to you?                                      | Majority customers responded for natural sunscreens                          |
| 13    | Who buys sunscreen for you?                                                                                       | 81.5% buy the sunscreen themselves                                           |
| 14    | Do you use a different sunscreen for a baby?                                                                      | 60.7% responded for not applicable                                           |
| 15    | Do you use the same sunscreen for face and body?                                                                  | 50% responded for yes                                                        |
| 16    | I prefer my sunscreen to be packed in a                                                                           | 42.9% of the customers responded for bottle with pump as well as just bottle |
| 17    | Do you read labels before buying sunscreen?                                                                       | 96.4% responded for yes                                                      |
| 18    | If yes, what do you look for?                                                                                     | 82.1% of them responded for SPF                                              |
| 19    | What SPF (sun protection factor) do you use?                                                                      | 39.3% use 45+ SPF                                                            |
| 20    | Where do you typically apply sunscreen? (check all that apply)                                                    | 50% of the customers apply just on face                                      |

## CONCLUSION

It is so evident from the research study that in NCR, people who are using sunscreen products more are employed females and students ranging in the age group of 18-25 years. The awareness about skin problems and sunscreen products in the selected region is fare. While studying factors affecting consumers decision for purchasing sunscreen products it was found that people are more tend to buy a sunscreen having natural ingredients. Although there was not a clear cut shift for any particular brand for studying brand preference for sunscreen products but Lakme was marginally leading.

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**Conflict of interest:** The authors confirm that there is no conflict of interest in relevance to this study.

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