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From Awareness to Adoption: Determinants of Sunscreen Use and Willingness to Pay among Urban Indian Consumers

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ABSTRACT

Sun exposure is a major public health concern due to its association with skin cancer, premature skin aging, and other dermatological conditions. Despite increasing awareness of the harmful effects of ultraviolet (UV) radiation, the adoption of sun-protective behaviours remains inconsistent. This study examines consumer awareness, sunscreen usage behaviour, purchase preferences, and willingness to pay among urban Indian consumers. A quantitative cross-sectional research design was employed using primary data collected through a structured online questionnaire. A total of 93 valid responses were analysed using descriptive statistics, Spearman's rank correlation, Mann–Whitney U tests, Kruskal–Wallis tests, and Ordinary Least Squares (OLS) regression. The findings indicate that respondents generally possess high awareness of UV-related risks and the protective benefits of sunscreen. However, a significant awareness–behaviour gap persists, as awareness does not always translate into regular sunscreen use. A positive and statistically significant relationship was observed between awareness and usage frequency. Female respondents reported significantly higher sunscreen usage than males, while age differences were not statistically significant. Brand reputation, SPF level, and skin compatibility emerged as the most influential purchase drivers, whereas price and discounts were comparatively less important in product selection. The willingness-to-pay analysis revealed the presence of a substantial premium consumer segment, with a majority of respondents willing to spend ₹600 or more on sunscreen products. Regression results identified price sensitivity as the strongest determinant of willingness to pay, while skin compatibility exhibited a positive influence on premium purchasing behaviour. Furthermore, professional recommendation and integration of sunscreen into daily routines were identified as the most important facilitators of sunscreen adoption. The study contributes to the understanding of preventive health-product consumption and provides insights for marketers, dermatologists, and public health practitioners seeking to encourage effective sun-protection behaviour in urban India.

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Keywords: Awareness–Behaviour Gap; Consumer Behaviour; Sunscreen Adoption; Urban India; Willingness to Pay.

1. Introduction

Sun exposure is one of the most widespread and avoidable environmental health threats to human populations today. Exposure to UV radiation over extended periods or without protection is known to cause a range of skin diseases, most importantly skin cancer, photoaging, and hyperpigmentation [1]. The United States Environmental Protection Agency (US EPA) states that unprotected exposure to the sun is the single most preventable risk factor for skin cancer, and melanoma, the most serious type, is one of the most common cancers in adolescents and young adults (ages 15-29) [2]. The damage mechanism is cumulative: DNA damage in skin cells accumulates over time, and when the body's repair mechanisms are overwhelmed, the genetic mutations can cause cells to multiply out of control, resulting in malignant tumors [3]. Importantly, childhood and adolescence are the most biologically vulnerable periods for UV damage, and studies have shown that the use of high-SPF sun cream before the age of 25 is correlated with significantly reduced risks of developing basal cell carcinoma later in life [4]. Despite this evidence, the worldwide uptake of UV risk awareness into consistent sun-protection behaviour is still low, especially in South Asia.

The geographical location of India exposes a significant part of the country to high solar radiation throughout the year, with UV index levels exceeding 10 being common in major cities like Delhi and Mumbai [5]. Although the incidence of skin cancer is lower than in Western countries, partly because of the higher melanin content in the skin, the Indian Council of Medical Research (ICMR) estimates that there are around 1.5 million cases of skin cancer each year, which is a significant public health problem [5]. However, a cross-sectional study of 324 patients in a dermatology outpatient department in India revealed that overall awareness and knowledge about sun protection was low, and only 14% of the respondents used sunscreen regularly [6]. In November 2022, Zhao et al. conducted a larger nationally representative survey of 1,560 Indian adults, which also found that there is a need for scalable and targeted sun-safety interventions, as protective behaviours are still not adequate across the population [7]. Together, these results indicate a significant disconnect between information and protective daily practices. In this context, the Indian sunscreen market is witnessing a major shift. Sunscreen was once a niche cosmetic product, but as disposable income in urban areas has increased, dermatologists have been promoting the use of sunscreen, and social media beauty content has taken off like wildfire [8]. The market is estimated at USD 481.2 million in 2024 and is expected to expand at a CAGR of 9.1% till 2030 [9]. However, market growth does not automatically translate into population-level health behaviour change: premium and SPF-differentiated products can be reaching urban

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consumers, while large populations, including adolescent males, lower-income groups, and rural populations, are largely inaccessible to the market and public health messaging.

Sun-protection research should be focused on adolescents and young adults. Research on high school students shows that they have the lowest rates of skin protection of any age group, are exposed to a disproportionately high amount of UV radiation compared to older age groups, and are more likely to increase their UV exposure as they get older and out of the reach of their parents [10]. Importantly, regular sunscreen use during childhood and adolescence could reduce lifetime incidence of non-melanoma skin cancers by approximately 78% [10]. Gender is a constant moderating factor in the literature: females across a variety of cross-cultural studies have been found to use sunscreen more often, be more prepared to engage in sun-protective behaviours, and more consistently choose higher SPF products than males [11]. This difference has been attributed to the dual cosmetic and health reasons behind the use of sunscreen by women, such as anti-aging, tanning prevention, and skin tone management, as well as the marketing of sunscreen in India and around the world, which is largely targeted at women. The influence of information channels on sun-protection attitudes and behaviour is also important. Consultation with a dermatologist has long been recognized as a high-trust, high-impact pathway for health behaviour change, especially in collectivist cultural settings where professional authority is highly valued and has significant social influence [7].

Over the last ten years, however, social media has become a co-equal player in consumer health education, with beauty bloggers and skin care content creators on platforms like Instagram and YouTube sharing sunscreen tips with large urban populations [8]. In spite of this dual ecosystem of information, the attitudes and behaviours of urban youth, who are both the primary target of the growing skin care industry and are essential for long-term skin cancer prevention, have been largely under-researched in India. This study aims to fill this gap by studying the pattern of sunscreen use, awareness of risks and consumer purchasing behaviour among an urban Indian population comprising students, working professionals, and homemakers. It aims to provide evidence that is relevant to public health communicators, dermatologists, and skin care marketers and to help develop a more nuanced understanding of the factors that influence and might improve sun-protection behaviour in modern urban India, both descriptively and inferentially.

2. Literature Review

The research on sun protection has increased significantly in the last 20 years, ranging from clinical dermatology to consumer behavior, public health communication, and product development. One of the core issues that emerged from this literature is that knowledge of the health risks associated with UV exposure does not always lead to consistent protective actions. In a systematic review of literature published from 2015 to 2022, Reis-Mansur et al. concluded

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that while many people are aware of the dangers of UV radiation, the use of sunscreen is far from uniform among populations [12]. The authors report that age, gender, education level, and skin phototype are important factors that mediate the relationship between knowledge and practice, and that common misconceptions, such as the belief that sunscreen is not necessary on overcast days, are a structural barrier to adoption. This awareness–behaviour gap is similar to that observed in the Indian context, where a nationally representative survey of 1560 adults revealed that awareness of sun risks was not enough to motivate protective behaviours, and that scalable behaviour change interventions were a priority [7].

The inconsistency is not just among non-users, but among regular users of sunscreen as well. A nationwide survey of 2,283 self-identified regular sunscreen users in the United States conducted by Norman et al. revealed that the most common time for people to use sunscreen was when they were outdoors for a long period of time during sunny summer weather, but that usage was significantly reduced when the weather was cloudy or partly cloudy. Between 20% and 60% of users reported that they never reapply sunscreen, and reapplication was based on informal cues (water exposure, perspiration, or perceived time outdoors) rather than standardized clinical guidelines [13]. The other layer of complexity is the lack of consumer understanding of SPF values. Lichon and Ruiz de Luzuriaga discovered that many people believe that higher SPF numbers mean more protection, which can lead to counterproductive behaviours like using less product or waiting longer to reapply, which both significantly reduce the actual amount of protection received [14]. This is especially significant in the Indian market scenario where high SPF ratings can lead to under-application and lower actual performance.

Demographic factors are also known to influence sunscreen use. In an empirical study of 203 consumers, Keck and Leyer determined that convenience was the most important factor in choosing a sunscreen, with consumers favouring products that are easy to apply and fit into their daily routines [15]. The study also revealed that younger consumers were more open to new sunscreen technologies, and that there were measurable differences in usage behaviour based on demographic factors such as age and gender, with consumers giving comparatively little consideration to ingredients, health benefits, or reapplication effectiveness. Gender differences in sunscreen use are observed across cultures, with females consistently reporting greater frequency of use and more careful selection of SPF than males [11]. In South Asian settings, however, the issue of sun protection is further complicated by the interaction between sun protection and colourism, as motivations for using sunscreen among women are often related to social norms about skin fairness, rather than cancer prevention, which can lead to increased uptake among some groups while simultaneously making it harder to promote health messages to others. In a social media content analysis of 208 Reddit posts from 2019 to 2022, Mineroff et al. identified parallel trends among people with skin of colour in Western contexts, including that most of the

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posts (57.7%) focused on asking for sunscreen recommendations, indicating significant gaps in knowledge and unmet needs regarding photoprotection for darker skin tones. The study found that peer-driven online communities can provide valuable information for clinical education and product development for underserved populations [16].

As significant as knowing how people use sunscreen is knowing what motivates them to buy it, especially in a growing market. Rizwana and Nasarulla conducted a survey of 275 young adult respondents and concluded that psychological factors play a significant role in the purchasing decision, with brand association being the most important factor, followed by persuasion, motivation and perception [17]. The results of this study are consistent with those of Bachleda, Fakhar and Hlimi who conducted a study on the extended Theory of Planned Behaviour (TPB) among young Moroccan adults and concluded that attitude toward sunscreen, social influence and perceived behavioural control were all significant predictors of purchase intention, whereas price was not statistically significant . The authors conclude that psychological and social factors are more influential than economic factors in determining sunscreen purchasing behaviour among young adults [18] which is directly relevant to the Indian urban consumer context where premium brand preference and willingness to pay seems to be more influential than price sensitivity even among the student population. Xu et al. analysed the top-rated sunscreen products on a major online retail platform and found that cosmetic elegance (texture, finish, and sensory experience) was the most common positive attribute mentioned in consumer reviews, followed by product performance and skin type compatibility. Importantly, about 40% of highly rated products were not in line with standard dermatological guidelines for broad-spectrum protection, SPF $\geq$ 30, and water resistance [19] suggesting a large gap between consumer preference and clinical efficacy that has implications for the way sunscreen efficacy is communicated to the public.

Over time, the formulation of sunscreens has also had a major impact on consumer uptake and public perception. Kalia's extensive review covers the evolution of sunscreens from simple early protection products to today's complex formulations that include UVA and UVB filters, cosmetic and skin care properties, and the controversy surrounding the safety of some of the chemical UV filters, as well as the varying requirements of consumers with different skin tones [20]. This shift towards lighter, non-comedogenic, and tinted products is especially significant in the Indian context, where issues of white cast, skin tone matching, and heavy texture have long been mentioned as obstacles to regular use. One new facet of this picture is environmental and sustainability issues. Sajinči et al. surveyed 230 consumers and found that those who were more environmentally and health conscious had more positive attitudes towards the ingredients of bio-based sunscreens and were more likely to buy sustainable alternatives. But a large percentage of

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respondents did not know about alternative UV-filter ingredients, suggesting that consumer education is a prerequisite for meaningful market uptake of eco-friendly formulations [21].

The literature as a whole confirms that health knowledge, psychological motivation, social norms, demographic characteristics, and product-related factors all influence sunscreen adoption. Awareness alone is often insufficient to motivate consistent use, while gender and age differences in usage patterns have been widely documented. Existing studies also suggest that brand trust, social influence, and product experience frequently play a greater role in purchase decisions than price considerations, and that cosmetic attributes are often valued more highly by consumers than clinical efficacy. Most of this research, however, has been conducted in Western or other developed-market settings. Although previous studies have examined awareness of sun protection and sunscreen usage in India, limited research has simultaneously investigated awareness, adoption behaviour, purchase preferences, barriers to use, and willingness to pay within a single analytical framework. Furthermore, evidence on the determinants of premium sunscreen purchasing among urban Indian consumers remains limited. Given the rapid growth of the Indian skincare market and increasing consumer exposure to dermatological and social-media-based skincare information, further research is needed to understand how awareness, product perceptions, and behavioural factors jointly influence sunscreen adoption and spending decisions. This study seeks to address this gap by examining sunscreen awareness, usage behaviour, purchase preferences, and willingness to pay among urban Indian consumers.

3. Methodology

3.1 Objectives of the Study

The present study aims to examine consumer awareness, purchasing behaviour, and willingness to pay in the sunscreen market. Specifically, the study seeks to:

1. Assess consumer awareness, usage patterns, and adoption behaviour related to sunscreen products.
2. Identify the key factors influencing sunscreen purchase decisions and willingness to pay, with particular emphasis on product attributes, quality perceptions, and price sensitivity.
3. Examine the relationships among awareness, purchase preferences, usage behaviour, and willingness to pay, while identifying the barriers and facilitators that influence sunscreen adoption.

3.2 Research Design

This study adopts a quantitative, cross-sectional research design to investigate consumer awareness, usage behaviour, purchasing preferences, and willingness to pay for sunscreen

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products. A survey-based approach was employed to collect primary data from respondents at a single point in time. The quantitative design was considered appropriate because it enables the systematic measurement and analysis of consumer attitudes and behaviours using standardized survey instruments. The study is both descriptive and analytical in nature. It is descriptive because it documents existing patterns of sunscreen awareness, usage, and purchasing preferences, and analytical because it examines relationships among key variables such as awareness, usage behaviour, price sensitivity, and willingness to pay.

3.3 Sampling and Sample Participants

The study employed a non-probability convenience sampling technique due to accessibility considerations and the exploratory nature of the research. Participants were recruited through online distribution channels, including social media platforms and personal networks. A total of 93 valid responses were collected and included in the final analysis. The sample consisted of respondents from diverse demographic backgrounds in terms of age, gender, and occupation. Female respondents constituted the majority of the sample, followed by male respondents and a small proportion of non-binary participants. Students represented the largest occupational category, followed by working professionals and homemakers. Although the sample is not nationally representative, it provides valuable insights into consumer attitudes and behaviours regarding sunscreen usage and purchasing decisions.

3.4 Data Collection

Primary data were collected through a structured online questionnaire administered using Google Forms. The survey link was distributed electronically through social media platforms and personal networks. Participation was voluntary, and respondents completed the survey anonymously. The questionnaire remained open until an adequate number of responses had been obtained. The online format enabled efficient data collection while facilitating participation from respondents belonging to different demographic groups. The survey collected information relating to consumer awareness, sunscreen usage behaviour, purchase preferences, willingness to pay, and factors influencing sunscreen adoption.

3.5 Survey Instrument

A structured questionnaire was developed to collect information on consumers' awareness, usage behavior, purchasing preferences, and willingness to pay for sunscreen products. The instrument comprised both demographic and attitudinal questions and included items related to awareness of ultraviolet (UV) radiation and sun protection, frequency of sunscreen use, factors influencing purchase decisions, willingness to pay for sunscreen products, and perceived barriers and facilitators of sunscreen adoption. Several items were measured using five-point Likert scales to

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assess the importance of product attributes such as brand reputation, SPF level, skin compatibility, texture, online reviews, price, and discounts. The questionnaire was designed to capture both behavioral and economic dimensions of sunscreen consumption and to facilitate statistical analysis of consumer preferences and purchasing decisions.

3.6 Ethical Considerations

To ensure protection of the rights and privacy of the participants, ethical principles were followed throughout the research process. The study was voluntary and all the respondents were briefed on the academic objective of the study before filling the questionnaire. There was no personally identifiable information collected, and the answers were all anonymous, which ensured confidentiality. There was no harm in a participant stopping or leaving at any time. Data collected were analysed as a whole and only for academic and research purposes. These steps ensured that informed consent was obtained, participants were protected with respect to privacy, and research data was handled ethically during the study.

3.7 Analytical Framework

The collected data were coded, cleaned, and analysed using statistical techniques appropriate for survey-based consumer research. Prior to hypothesis testing, the dataset was screened for missing values, inconsistencies, and response errors. Reliability analysis was conducted to assess the internal consistency of the survey instrument, and the results indicated acceptable reliability for subsequent statistical analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize demographic characteristics, sunscreen usage patterns, willingness-to-pay distributions, and purchase preferences.

Spearman's rank correlation analysis was employed to examine relationships among key variables, particularly the association between awareness and sunscreen usage, price importance and willingness to pay, and the interrelationships among purchase attributes. Since several variables were measured using ordinal scales, non-parametric statistical tests were utilized. A Mann–Whitney U test was conducted to examine differences in sunscreen usage between male and female respondents, while a Kruskal–Wallis test was employed to assess differences across age groups.

To identify the determinants of willingness to pay, an Ordinary Least Squares (OLS) regression model was estimated. The dependent variable was willingness to pay, while the independent variables included awareness, usage frequency, brand reputation, SPF importance, skin compatibility, texture/finish, and price importance. The regression model is represented as:

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$WTP_i = \beta_0 + \beta_1(Awareness_i) + \beta_2(UsageFrequency_i) + \beta_3(BrandReputation_i) + \beta_4(SPFImportance_i) + \beta_5(SkinCompatibility_i) + \beta_6(Texture_i) + \beta_7(PriceImportance_i) + \varepsilon_i$

The combination of descriptive, correlational, comparative, and regression analyses enabled a comprehensive examination of consumer awareness, sunscreen adoption behaviour, purchasing preferences, and willingness to pay, thereby addressing the objectives of the study.

4. Results and Findings

4.1 Consumer Characteristics and Descriptive Statistics

The study analysed responses from 93 participants. Female respondents constituted the majority of the sample (63.4%), while males represented 35.5%. Students accounted for the largest occupational category, followed by working professionals and homemakers. More than half of the respondents belonged to the under-18 age group, indicating substantial representation from younger consumers.

Descriptive analysis revealed relatively high awareness regarding the harmful effects of ultraviolet (UV) radiation and the protective role of sunscreen. Respondents generally exhibited favourable attitudes toward sunscreen products, particularly those perceived as effective and compatible with individual skincare needs. Product quality attributes consistently received higher importance ratings than economic attributes, suggesting that purchasing decisions are influenced more strongly by perceptions of effectiveness and trust than by affordability considerations alone.

4.2 Sunscreen Adoption and the Awareness–Behaviour Gap

Despite relatively high awareness levels, sunscreen adoption was not universal. Approximately 68.9% of respondents reported either daily sunscreen use or use when outdoors for extended periods, while the remaining respondents reported occasional, rare, or no usage.

Table 1. Sunscreen Usage Frequency Distribution

Usage Category	Frequency	Percentage (%)
Daily	42	45.2
Only When Outdoors for Long Periods	22	23.7
Occasionally	10	10.8

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Rarely	9	9.7
Never	10	10.8

To examine whether awareness translated into behavioural adoption, a Spearman rank correlation was estimated between awareness and sunscreen usage frequency. The analysis revealed a statistically significant positive relationship ($r = 0.443$, $p < 0.001$), indicating that individuals with higher awareness levels were more likely to use sunscreen regularly.

However, the moderate strength of the relationship suggests that awareness alone is insufficient to ensure adoption. The coexistence of relatively high awareness and incomplete usage indicates the presence of an awareness–behaviour gap, highlighting the importance of behavioural factors such as routine formation, convenience, and perceived necessity in shaping actual sunscreen usage.

4.3 Gender and Age Differences in Sunscreen Consumption

Substantial gender differences were observed in sunscreen usage patterns. Female respondents reported significantly higher levels of sunscreen use than male respondents. Daily usage was considerably more common among females, while males were disproportionately represented among infrequent users and non-users.

A Mann–Whitney U test confirmed that these differences were statistically significant ($p < 0.001$), suggesting that behavioural norms and lifestyle factors may influence sunscreen consumption patterns.

In contrast, age did not emerge as a significant determinant of sunscreen usage. A Kruskal–Wallis test revealed no statistically significant differences across age groups ($H = 5.518$, $p = 0.238$), indicating that sunscreen adoption is influenced more strongly by behavioural and attitudinal factors than by demographic characteristics alone.

4.4 Purchase Drivers and Consumer Preferences

Respondents evaluated several factors that influence sunscreen purchasing decisions. Brand reputation emerged as the most important purchase driver, followed closely by SPF level and skin compatibility. Texture and finish, peer recommendations, and online reviews also received relatively high ratings.

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Table 2. Ranking of Purchase Drivers

Rank	Factor	Mean Score
1	Brand Reputation	4.00
2	SPF Level	3.92
3	Skin Compatibility	3.69
4	Texture / Finish	3.55
5	Peer Recommendations	3.46
6	Online Reviews	3.20
7	Advertising	2.62
8	Packaging	2.54
9	Sustainability	2.40
10	Price	2.33
11	Discounts	2.05

The findings indicate that consumers evaluate sunscreen products primarily on the basis of perceived effectiveness, reliability, and suitability rather than solely on economic considerations. Product quality and trust-related attributes appear to function as important signals influencing consumer choice.

4.5 Willingness to Pay and Premium Market Potential

The willingness-to-pay distribution revealed a strong preference for mid-to-premium sunscreen products.

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Table 3. Willingness-to-Pay Distribution

Price Category	Frequency	Percentage (%)
Less than ₹200	2	2.2
₹200–₹400	10	10.8
₹400–₹600	16	17.2
₹600–₹800	27	29.0
More than ₹800	38	40.9

Approximately 70% of respondents indicated a willingness to pay ₹600 or more for a sunscreen product, while over 40% selected the highest available price category. These findings reveal the presence of a differentiated premium market segment and suggest that consumers are willing to pay higher prices for products perceived as effective, trustworthy, and compatible with their skincare requirements.

4.6 Barriers and Facilitators to Sunscreen Adoption

Respondents were asked to identify factors that would encourage more regular sunscreen use.

Table 4. Factors Encouraging Increased Sunscreen Usage

Facilitator	Percentage (%)
Professional Recommendation	67.7
Integration into Daily Routine	65.6
Greater Affordability	25.8
Awareness Campaigns	24.7
Better Advertising	21.5
Free Samples	16.1

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Professional recommendation emerged as the strongest facilitator, followed closely by integration into daily routines. Notably, affordability ranked substantially lower than behavioural and informational factors.

These findings suggest that barriers to sunscreen adoption are driven less by financial constraints and more by behavioural and psychological factors. Consequently, interventions focused on routine formation, consumer education, and professional endorsement may be more effective than purely price-based promotional strategies.

4.7 Price Sensitivity and Consumer Demand

A statistically significant negative relationship was observed between price importance and willingness to pay ($r = -0.353$, $p = 0.001$). Respondents who attached greater importance to affordability were less willing to pay premium prices for sunscreen products.

Importantly, this finding does not imply that price is the most important factor influencing product selection. Rather, the results suggest that while consumers generally prioritize quality-related attributes when choosing products, individual differences in price sensitivity influence the maximum amount consumers are willing to spend.

Thus, product choice appears to be driven primarily by quality and trust considerations, whereas expenditure decisions are influenced by affordability preferences.

4.8 Structural Relationships Among Purchase Factors

Correlation analysis revealed several meaningful relationships among purchase attributes. SPF level, skin compatibility, and texture exhibited strong positive associations, indicating that consumers evaluate these quality-related characteristics jointly when assessing product performance.

Similarly, brand reputation, online reviews, and peer recommendations formed a trust-based cluster, highlighting the importance of credibility and social validation in consumer decision-making.

These findings suggest that sunscreen purchasing behaviour is multidimensional and influenced by interconnected perceptions of product quality, trustworthiness, and user experience.

4.9 Determinants of Willingness to Pay

To identify factors associated with willingness to pay, an Ordinary Least Squares (OLS) regression model was estimated.

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Table 5. OLS Regression Results (Dependent Variable: Willingness to Pay)

Variable	Coefficient (β)	p-value
Constant	4.780	<0.001
Usage Frequency	0.050	0.573
Price Importance	-0.318	0.003***
Brand Reputation	-0.250	0.124
SPF Importance	-0.102	0.497
Skin Compatibility	0.231	0.088*
Texture / Finish	-0.039	0.764
Awareness	0.130	0.137

Model Statistics

Statistic	Value
R^2	0.221
F-statistic	3.446
Model p-value	0.003

*p < 0.10, ***p < 0.01

The regression model was statistically significant and explained approximately 22.1% of the variation in willingness to pay. Price importance emerged as the strongest statistically significant

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predictor of willingness to pay. Consumers who attached greater importance to affordability were significantly less willing to purchase premium sunscreen products.

Skin compatibility exhibited a positive marginal effect, suggesting that consumers who prioritize dermatological suitability are more willing to spend on sunscreen products. In contrast, awareness, usage frequency, SPF importance, texture, and brand reputation did not emerge as statistically significant predictors after controlling for other variables.

These findings indicate that while quality-related attributes influence product selection, spending decisions are shaped primarily by consumers' price sensitivity and perceptions of personal suitability.

4.10 Key Findings

First, awareness is positively associated with sunscreen usage, although a clear awareness–behaviour gap remains. Second, product quality and trust-related attributes dominate sunscreen purchase decisions, with brand reputation, SPF level, and skin compatibility emerging as the most influential purchase drivers. Third, the willingness-to-pay distribution reveals the existence of a substantial premium consumer segment, indicating strong market potential for higher-value sunscreen products. Fourth, behavioural and informational factors, particularly professional recommendation and routine integration, appear more important than affordability in encouraging regular sunscreen use. Finally, regression analysis demonstrates that price sensitivity is the primary determinant of willingness to pay, while skin compatibility represents the most important quality-related predictor of premium purchasing behaviour.

Overall, the findings indicate that sunscreen demand is shaped by a combination of awareness, perceived product quality, trust, and behavioural factors. Product selection is driven primarily by quality-related attributes such as brand reputation, SPF effectiveness, and skin compatibility, whereas price sensitivity influences the maximum amount consumers are willing to spend. The coexistence of relatively high awareness, strong willingness to pay, and incomplete adoption highlights the importance of behavioural barriers in health-related consumption decisions. These findings contribute to the broader literature on consumer behaviour by demonstrating how information, quality perceptions, and behavioural factors interact to shape purchasing decisions within the personal-care market.

5. Discussion

The results of this study give insight into what factors affect sunscreen consumption behavior, what consumers buy and how much they would be willing to pay for a sunscreen. A main result is that there is a positive association between awareness and the use of sunscreen. Those who

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were aware of the negative effects of ultraviolet radiation (UV) were more likely to regularly use sunscreen. Even though awareness was relatively high in the sample, however, a significant portion of the sample reported inconsistent or infrequent use of sunscreens. This indicates that there was an awareness–behaviour gap, meaning that there was knowledge that did not necessarily lead to consistent preventive health behaviour. Although awareness is a critical component of adoption, habits, convenience and perceived need seem to play a role in whether consumers adopt the use of sunscreen as a habit.

The study also shows that quality attributes play a larger role in purchase decisions than do economic factors. Purchase drivers such as brand reputation, skin compatibility, and SPF level received higher importance scores, while price and discounts received were given lower scores. The results indicate that consumers primarily perceive sunscreen as a health and skin care product and that the factors that influence their purchasing decisions include their perceptions of effectiveness, reliability and suitability. Consumer trust seems to be a particularly important factor, as brand reputation and product performance could be used to gauge protection and quality for consumers.

Overall, the willingness-to-pay analysis uncovered an existing large premium consumer segment. The majority of respondents stated that they would be willing to pay ₹600 or more for sun cream products, indicating that most consumers are willing to invest more in products that they believe to be more effective and compatible. This discovery implies that consumers become more aware of skin care products and provides a chance for manufacturers to build their products around quality and efficacy instead of price alone and also dermatological suitability too.

One of the key findings of the research is the separation of product choice decisions and expenditure decisions. While price was not a major factor in the purchase decision, the results of the regression revealed that price sensitivity was the strongest predictor of willingness to pay. This discovery suggests that consumers first consider quality attributes of the products including skin compatibility, brand reputation and SPF protection. After purchase decision, personal attitudes toward price do affect the amount of money consumers are willing to spend. There is therefore a strong link between product choice and perception of quality and expenditure and the affordability of the product.

The positive correlation between skin compatibility and willingness to pay just further reinforces the increasing significance of custom-made skin care products. One of the factors that impacted consumer willingness to pay increased price was the consideration of skin compatibility, indicating that the suitability of the product is a good indicator of value perception. This discovery is in line with the rest of the personal-care sector, where customers are more and more inquisitive about products that are fine-tuned to their own skin variety and issues.

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The barriers and facilitators analysis showed that the two most important barriers to sunscreen use are professional recommendation and integration into daily routine. A smaller percentage of respondents noted the cost of the technology as a factor that would increase adoption rates, while a larger percentage mentioned affordability as a factor that would not increase adoption rates. The results highlight the importance of non-financial factors including behavioural and informational factors, compared with financial factors, to impact sunscreen use. Therefore, interventions to promote uptake of sunscreen are likely to be more successful if they focus on habit formation, education and trusted professional advice rather than just on price reductions or promotional discounts.

There were also differences in sunscreen use between females and males; females indicated significantly greater use than males. This is to be expected based on previous studies that have shown that women tend to be more engaged in their skincare and preventive health practices. But there were no significant age differences, which indicates that attitudes and behavioural norms may have more of an impact on sunscreen use than age alone.

Overall, the results show that the awareness, perceived quality, trust, behavioural habit and economic issues are the factors that influence the consumption of sunscreen. The study draws attention to the need to take both the 'behavioural' and the 'economic' aspects into account when looking at preventive health-product consumption, and provides information on how consumers weigh up the quality perceptions and price elements when making their purchase.

6. Conclusion

The aim of this study was to explore the awareness of the consumers, their behaviour towards using sunscreens, their buying preferences and willingness to pay for sunscreen products. The study findings show that awareness is important in promoting sunscreen usage, but awareness alone is not enough to ensure consistent sunscreen adoption. An awareness–behaviour gap that persists indicates that behaviour is influenced by many factors, including the formation of routines and perceived necessity, and that these factors are not fully understood. The analysis also showed that customers are more concerned about the quality attributes of the products, including brand reputation, SPF level, and skin compatibility, than about price. Results show that the perceptions of effectiveness, reliability and personal suitability are important in the consumer choice of sunscreen products. Based on the willingness-to-pay analysis, there was a high level of premium price willing customers, indicating many consumers are willing to pay more for products they believe provide greater protection and compatibility.

Although price is not the main factor determining product selection, regression analysis indicated that price sensitivity continues to be a key factor in willingness to pay. This separation points out

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the various roles of quality perceptions and cost in consumer decision making. Quality-related characteristics will affect the decision of which product to purchase, while price sensitivity will affect the price that consumers are willing to pay. The study also found that 2 factors – professional recommendation and integration into daily routine – were the top 2 facilitators to adopting sunscreen. The results indicate that the use of behavioral interventions, habit formation strategies, and trusted sources of information might be more effective in raising sunscreen use than price-based incentives. The findings are thus important for manufacturers, health care professionals, and policymakers interested in supporting and encouraging the prevention of skin cancer through more effective sun-protection behaviour among consumers.

Nevertheless, there are some limitations in the study. Limitations may be the use of convenience sampling and the relative small sample size. Also, there is a possibility of the recall bias and social desirability bias in self-reported responses. The cross-sectional design also limits the ability to make causal inferences between the variables studied. Besides, future studies could tackle these drawbacks by using larger and more representative samples among different geographic and demographic groups. Other factors that could be explored in future research include income, education, skin care knowledge, social media exposure, and dermatological issues, as these can have an impact on sunscreen purchasing and willingness to pay for sunscreen. Longitudinal and comparative studies can also offer more insight into the trends of sunscreen awareness, use and preferences over time. This study would help to understand the preventive skin care behaviour and consumers decision making in personal care market on a broader scale.

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