Original Article :

Knowledge Attitude and Practice Towards Skin-Lightening Products Among Females of The General Population in Saudi Arabia

Mohammed Abdullah Alahmadi[1], Shahad Mohammed AlShehri[2], Albatool abdullah almajhad[3], Razan Ali Alfakher[4], Abdulaziz Jabr Alsulami[5], Sara Mahfoud Hassan Alghamdi[6], Salha Mohammad Hakami[7]

1. College of Medicine, Taibah University, Medina, Saudi Arabia
2. College of Medicine, King Faisal University, Al Ahsa, Saudi Arabia
3. College of Medicine, Princess Nora bint Abdulrhman University, Riyadh, Saudi Arabia
4. Service resident, Dammam Medical Complex
5. College of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia.
6. College of Medicine, Al-Baha University, Saudi Arabia
7. Consultant Dermatologist, Department of Dermatology, King Salman Hospital.

Received on Jul 08, 2024, accepted for publication on Feb 11, 2025,doi: 10.5455/mjhs.2025.03.006

Corresponding Author:
Mohammed Abdullah Alahmadi, College of Medicine, Taibah University, Medina, Saudi Arabia.
Postal Address: Madinah, 42354, Saudi Arabia, Email: mohammedaalahmadi20@gmail.com

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Abstract

Background and Aims:
Skin-lightening product usage is a prevalent practice among women. This study investigated the prevalence, characteristics, and perceptions of skin-lightening product usage among adult females in Saudi Arabia, exploring demographic influences and the potential adverse effects associated with these products.

Methods:
An observational, cross-sectional study was conducted over seven months from September 2023 to April 2024, using a pre-validated online questionnaire. The study targeted adult females aged 18 and above across five regions of Saudi Arabia. The sample size was 385 participants, determined using OpenEpi. Data were collected via social media platforms and analyzed using IBM SPSS version 20.0.0. Descriptive and inferential statistics were applied, with a significance level set at $p \leq 0.05$.

Result:
Out of 598 respondents, 81.4% reported using skin-lightening products. Usage was significantly associated with age, region, and marital status. Commonly reported side effects included redness (23.4%), acne (9.0%), and sun sensitivity (8.9%). Participants' perceptions of lighter skin being associated with beauty, higher self-esteem, and better job opportunities significantly influenced their product usage.

Conclusion:
The study highlights the high prevalence of skin-lightening product usage among adult females in Saudi Arabia and its association with demographic factors and societal perceptions. The findings underscore the need for increased awareness of these products' potential risks and safe usage practices. Further research is recommended to explore additional factors influencing product usage and to develop interventions for safer skincare practices.

Keywords:
Skin-Lighting, Females, Saudi Arabia, Consumer behavior, Beauty products

Introduction:

Skin-lightening products (SLP) are an aesthetic practice, they are very common, especially in Africa and Asia[1]. It improves the appearance of dark patches on the skin by lowering the concentration of melanin. The practice of skin-lightening is widespread and is associated with perception of increased beauty, attractiveness, self-esteem, and wealth[2].

SLP comes in a variety of forms, including gels, lotions, soaps, and creams[3,4]. Skin-lightening products have active ingredients such as mercury, hydroquinone, and corticosteroids, and they're highly toxic, especially after prolonged application[5]. High exposure to these toxins may induce dermatological, cardiovascular, and neurological complications[1]. Despite the potential risks involved with using SLP, the practice of skin-lightening is still significantly increasing due to the preference for white and light skin.

Skin-lightening is considered a common practice among women from Africa, South Asia, East Asia, the Middle East, South America, and North America[6]. For instance, SLPs are commonly used in Africa. However, South Africa has a lower rate of skin lightening than other African countries. Moreover, it has been found that in East Asia, 40% of South Koreans use skin-lightening products. In South Asia, half of all skin care spending b y Indian women is for skin lightening. In the Middle East, 43.4% of Saudi women and more than 60% of Jordanians use SL products, and the demand for SLP continues to increase in the region[6].

There are a number of products sold in Saudi Arabia that contain mercury. In fact, one study conducted in Saudi Arabia showed that many of the skin lightening products that are sold in Saudi markets had toxic ingredients that, in most cases, were not listed on the packaging [7].

To the authors' knowledge, the previous study has primarily focused on one region of Saudi Arabia, which is the Western region. The study included 409 participants and reported 35,8% of the participants have used SLP[8]. In response to this, the current study aimed to assess the knowledge, attitude, and practice towards skin-lightening products among females of the general population in Saudi Arabia.

Material and Methods:

An observational, questionnaire-based, cross-sectional study was conducted over seven months from September 2023 to April 2024. A pre-validated questionnaire, adapted from a previous study, was utilized to collect research data[8]. Ethical approval was given by the Research Ethics Committee at King Faisal University, Saudi Arabia (Approval Number: KFU-REC-

2023-NOV-ETHICS1424).

The study targeted adult females in Saudi Arabia's Central, Eastern, Western, Southern, and Northern regions who were at least 18 years old and willing to participate. Non-Arabic speakers were excluded from the study to ensure comprehension and accuracy in responses.

Inclusion criteria encompassed adult females aged 18 and above who agreed to participate and completed the questionnaire. Exclusion criteria included male participants, those who did not consent to participate, and those who submitted incomplete questionnaires.

A non-probability convenience sampling method was employed to select participants. According to the 2022 census, there were approximately 4,140,951 females aged 18 years or older in Saudi Arabia. Using OpenEpi (Version 3.0) with a 95% confidence interval, a 5% margin of error, a 50% expected frequency, and a design effect of 1.0, the estimated minimum sample size was calculated to be 385 participants.

Based on a literature review of related studies, the authors developed an online questionnaire using Google Forms. This questionnaire was distributed via social media platforms. Designed in Arabic to cater to the primary language of the country, the questionnaire comprised 36 items divided into five sections. Section 1 included four items on sociodemographic characteristics (age group, educational level, marital status, and skin tone). Section 2 consisted of four items exploring perceptions of lighter skin tone. Section 3 contained sixteen items focusing on prevalence, knowledge, reasons, applications, and sources of SLPs. Section 4 had five items evaluating the usage of a triple mixture. The fifth section included seven items assessing participants' awareness of the risks and side effects associated with SLP use.

Data was collected using a self-administered online questionnaire, which included informed consent on the first page. Upon distribution through social media channels and collection, the data were manipulated, cleaned, and checked for completeness before being entered into Microsoft Excel. Confidentiality was maintained by avoiding the use of names or any identifiable information. Data were sorted, coded, and secured with password protection and stored in a safe place, with access limited to the researchers.

The data were analyzed using the IBM SPSS Statistics program version 20.0.0. A statistically significant p-value was set at ≤0.05. Categorical data were expressed as percentages and frequencies, while numerical data were analyzed as mean ± standard deviation (SD). Multiple response analysis

was applied to items with more than one variable. The prevalence of SLP usage was assessed using a one-sample proportions test with continuity correction. Factors associated with SLP usage were evaluated using Chi-squared tests or Fisher's exact tests as appropriate.

The study adhered to strict ethical guidelines to ensure the confidentiality of participants' information throughout and after the study. Data were solely used for research purposes. Informed consent included a clear description of the study's nature, objectives, and voluntary participation, allowing participants to withdraw without any pressure

Results:

The study included a total of 598 participants. The majority of participants were between 20 and 30 years old (46.2%), followed by those aged 41-50 (21.9%), 31-40 (14.0%), older than 50 years (10.5%), and less than 20 years old (7.4%). Participants were distributed across various regions of Saudi Arabia, with the Western region accounting for the highest proportion (34.6%), followed by the Southern region (22.1%), Eastern region (16.9%), Central region (14.4%), and Northern region (12.0%). In terms of marital status, 49.2% of the participants were single, 43.5% were married, 5.9% were divorced, and 1.5% were widowed. Regarding skin tone, the majority of participants identified as having a light brown complexion (63.9%), followed by light (31.4%), dark brown (4.5%), and black (0.2%). Educational attainment among the participants was predominantly high, with 68.9% holding a bachelor's degree, 22.4% having completed high school or a diploma, 4.8% possessing a postgraduate degree (master's or PhD), and 3.8% having an educational level below high school. Of the 598 respondents, 81.4% reported using skin-lightening products, while 18.6% had not. Regarding age, there was a statistically significant relationship between age groups and the use of skin-lightening products ($p = 0.003$). Participants aged 20-30 years had the highest proportion of product usage (74.6%), followed by those aged 31-40 years (89.3%), 41-50 years (87.8%), and older than 50 years (84.1%). Similarly, region showed a significant association with product usage ($p = 0.001$). Participants from the Central region had the highest proportion of product usage (89.5%), followed by the Southern region (72.7%), Northern region (93.1%), Eastern region (84.2%), and Western region (78.3%). Marital status also exhibited a significant relationship with product usage ($p = 0.001$). Single participants had the lowest proportion of usage (74.8%), followed by married individuals (87.7%), divorced individuals (88.6%), and widows

(88.9%). There was no significant relationship between skin tone and product usage (p = 0.429). Similarly, the educational level did not show a significant association with product usage (p = 0.214) (Table 1).

Table 1: Demographic factors of the participants.

		Count	Column N %	Count	Row N %	Count	Row N %	P-value
Age	Less than 20 years	44	7.4%	6	13.6%	38	86.4%	0.003*
	20-30	276	46.2%	70	25.4%	206	74.6%	
	31-40	84	14.0%	9	10.7%	75	89.3%	
	41-50	131	21.9%	16	12.2%	115	87.8%	
	Older than 50 years	63	10.5%	10	15.9%	53	84.1%	
Region	Central region	86	14.4%	9	10.5%	77	89.5%	0.001*
	Southern region	132	22.1%	36	27.3%	96	72.7%	
	Northern region	72	12.0%	5	6.9%	67	93.1%	
	Eastern region	101	16.9%	16	15.8%	85	84.2%	
	Western region	207	34.6%	45	21.7%	162	78.3%	
Marital status	Single	294	49.2%	74	25.2%	220	74.8%	0.001*
	Married	260	43.5%	32	12.3%	228	87.7%	
	Widow	9	1.5%	1	11.1%	8	88.9%	
	Divorced	35	5.9%	4	11.4%	31	88.6%	
Skin Tone	Light	188	31.4%	34	18.1%	154	81.9%	0.429
	Light brown	382	63.9%	75	19.6%	307	80.4%	
	Dark brown	27	4.5%	2	7.4%	25	92.6%	
	Black	1	0.2%	0	0.0%	1	100.0%	
Educational level	Below high school	23	3.8%	2	8.7%	21	91.3%	0.214
	High school or diploma	134	22.4%	26	19.4%	108	80.6%	
	Bachelor's degree	412	68.9%	81	19.7%	331	80.3%	
	Postgraduate degree (Master's, PhD)	29	4.8%	2	6.9%	27	93.1%	

The perception of participants toward skin tone revealed varied opinions. When asked if a lighter skin tone is considered more beautiful, 40.8% disagreed and 9.9% strongly disagreed, whereas 31.3% agreed and 14.5% strongly agreed, with 3.5% remaining neutral. Regarding whether a lighter skin tone provides women with higher self-esteem, 41.3% disagreed and 11.4% strongly disagreed, while 29.6% agreed and 14.9% strongly agreed, with 2.8% being neutral. When considering if a lighter skin tone helps women secure better job opportunities, 38.6% disagreed

and 12.4% strongly disagreed, contrasted by 27.6% who agreed,17.2% who strongly agreed, and 4.2% who were neutral. Lastly, in terms of whether a lighter skin tone increases a woman's chances of getting married, 27.4% disagreed and 8.5% strongly disagreed, whereas 37.1% agreed and 24.1% strongly agreed, with 2.8% expressing neutrality (Table 2).

Table 2: Perception of the participants toward skin tone.

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Do you think that a lighter skin tone is more beautiful?	59	9.9%	244	40.8%	21	3.5%	187	31.3%	87	14.5%
Do you think that lighter skin tone provides women with higher self-esteem?	68	11.4%	247	41.3%	17	2.8%	177	29.6%	89	14.9%
Do you think that lighter skin tone helps a woman get a better job opportunity?	74	12.4%	231	38.6%	25	4.2%	165	27.6%	103	17.2%
Do you think that lighter skin tone increases a woman's chances of getting married?	51	8.5%	164	27.4%	17	2.8%	222	37.1%	144	24.1%

Among those who had used such products, 71.9% had been using them for less than a year, while 28.1% had used them for more than a year. In terms of application timing, 48.3% applied for the products in the evening, 9.9% in the morning, 18.5% both morning and evening, and 23.4% at other times. Regarding the purchase location, 61.4% acquired the products from pharmacies, 17.7% from small stores specializing in makeup and skincare products, 0.8% from street vendors, 9.0% from other sources, and 11.1% from all of the above. In terms of expenditure, 28.1% spent less than 50 Saudi Riyals (SR) per month, 27.3% spent between 50 and 100 SR, 21.1% spent between 100 and 150 SR, and 23.4% spent more than 150 SR per month on skin lightening products. The choice of skin-lightening products was influenced by various factors, with 24.0% seeking advice from a physician, 6.0% from sellers in small makeup and skincare stores, 8.6% from pharmacists, 14.4% from friends,

5.5% from television advertisements, 33.9% from more than one source, and 7.6% from other factors. Of the respondents, 27.9% reported having used the triple mixture, while 72.1% had not. Among those who used the mixture, 70.7% consulted a doctor before use, while 29.3% did not seek medical advice. Regarding awareness of the active substances in the triple mixture, 22.2% of participants knew the types of active substances, while 77.8% did not. In the event of complications arising from the use of the mixture, 53.7% of respondents sought medical assistance from a doctor, 12.5% visited a pharmacy, 25.9% ignored the complication, and 7.9% sought advice from friends or relatives (Table 3).

Table 3: Prevalence and characteristics of using lightening products.

		Count	Column N %
Have you ever used skin lightening products?	No	111	18.6%
	Yes	487	81.4%
How long have you been using these products or have used these products	Less than a year	350	71.9%
	More than a year	137	28.1%
What time of the day do you apply the skin lightening products?	Evening	235	48.3%
	Morning	48	9.9%
	Morning and evening	90	18.5%
	Other	114	23.4%
Where do you buy the skin lightening product you use?	Pharmacy	299	61.4%
	Small stores for makeup and skin care products	86	17.7%
	People selling in the street	4	0.8%
	Other	44	9.0%
	All of the above	54	11.1%
How much you spend on skin lightening products each month (in SR)	Less than 50 SR	137	28.1%
	50-100 SR	133	27.3%
	100-150 SR	103	21.1%
	More than 150 SR	114	23.4%
The choice for the skin lightening product you use is based on	Advice from a physician	117	24.0%
	Advice from the seller in the small stores for makeup and skin care products	29	6.0%
	Advice from a pharmacist	42	8.6%
	Advice from a friend	70	14.4%
	TV ads	27	5.5%
	More than one	165	33.9%
	Other	37	7.6%
Have you ever used the triple mixture to lighten the skin (Hi-Quin cream, Acretin cream, Al Facort cream)?	No	431	72.1%
	Yes	167	27.9%
Did you use the mixture without consulting a doctor?	No	423	70.7%
	Yes	175	29.3%

Do you know the types of active substances in the triple mixture?	No	465	77.8%
	Yes	133	22.2%
If you had a complication, how did you deal with it?	I went to a doctor	321	53.7%
	I went to a pharmacy	75	12.5%
	I ignore the complication	155	25.9%
	I asked a friend (relative),how to deal with it	47	7.9%

Figure 1 illustrates the distribution of sites where lightening preparations were applied by users. Among the respondents, 60.0% reported applying these preparations on their face, followed by 33.5% on their knees, 24.1% on their elbows, 17.4% on their armpits, 10.7% in the pubic area, and 16.5% on other parts of the body. Figure 2 presents the compositions of lightning preparations as reported by users. Hydroquinone was the most commonly reported ingredient, accounting for 21.4% of responses, followed by licorice extract (22.4%), fruit acids (AHA) (18.3%), and niacinamide (vitamin B3) (17.7%). Kojic acid, corticosteroids, and soya extract were less frequently reported, with proportions of 4.5%, 5.1%, and 2.5%, respectively. Additionally, 48.9% of respondents indicated that they were unsure of the composition of the lightening preparations they used.

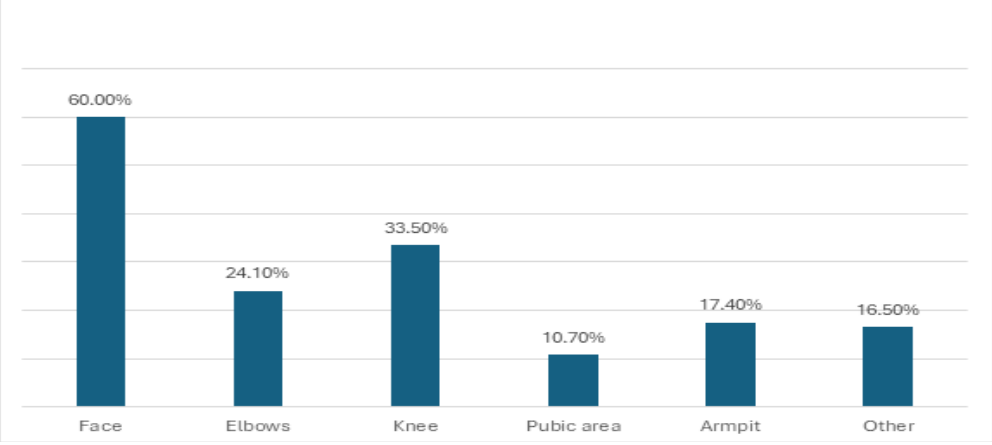


Figure 1: Sites of using lightening preparation.

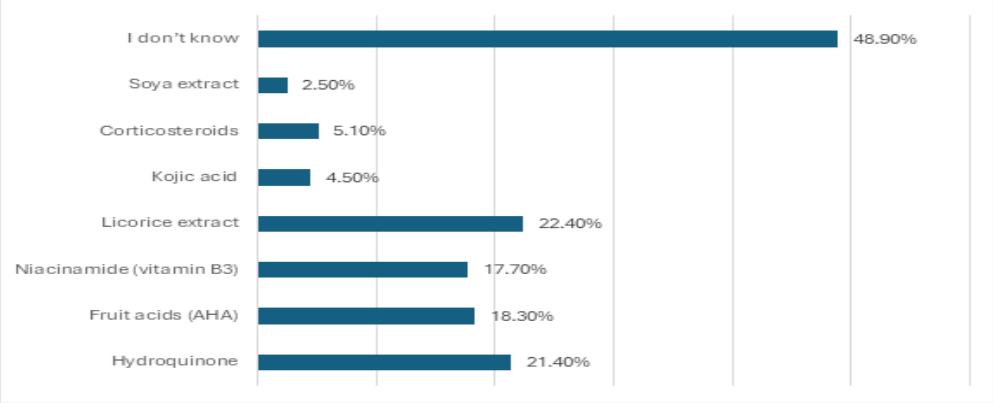


Figure 2: Compositions of lightening preparations as reported by the users.

importance. However, when considering the active ingredient, 43.8% agreed, and 33.9% strongly agreed on its significance, with only 2.7% strongly disagreeing and 11% disagreeing.

Regarding the importance of applying sunscreen when using skin-lightening products outdoors during the day, 53.7% strongly agreed, and 36.1% agreed. Only 1.8% strongly disagreed and 4.5% disagreed and believed it was not necessary. Participants also expressed views on whether sun exposure reduces the effectiveness of skin-lightening products, with 43.5% strongly agreeing and 36.1% agreeing, compared to 2.7% who strongly disagreed and 10.2% who disagreed.

Regarding potential side effects of skin-lightening products, 41.5% strongly agreed, and 41% agreed that they could cause undesirable effects, with just 2.7% strongly disagreeing and 9.9% disagreeing. On whether the products achieved the desired results, 39.5% agreed, and 19.2% strongly agreed that they did, though 4.3% strongly disagreed, and 26.8% disagreed.

Finally, when asked about the use of skin-lightening products containing hydroquinone for more than three months, 61.9% reported being unsure, 29.6% said they would not use it for that duration, and 8.5% indicated they would.

Figure 3 displays the side effects reported by participants considering the use of lightening preparations. Among respondents, 59.4% reported not experiencing any side effects. However, some reported adverse reactions, including redness (23.4%), acne (9.0%), sun sensitivity (8.9%), pain (5.0%), skin cracks (6.4%), appearance of capillaries (4.2%), increase in hair (2.3%), atrophy of the skin (2.0%), and bacterial infection (1.0%).

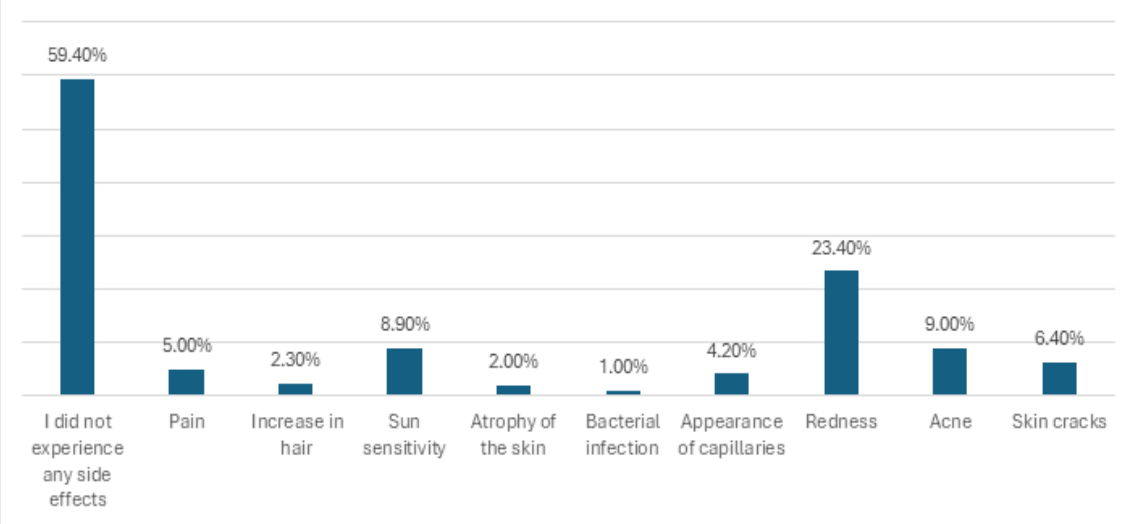


Figure 3: The side effects reported by the participants considering using of lightening preparation.

Table 4 presents the relationship between the usage of skin lightening products and perceptions regarding skin tone. The table includes counts and percentages of respondents who have and have not used such products, along with associated p-values. When considering whether a lighter skin tone is perceived as more beautiful, there was no statistically significant relationship between this perception and product usage ($p = 0.086$). Similar findings were observed for the perceptions regarding whether a lighter skin tone provides women with higher self-esteem ($p = 0.004$) and whether it helps women get better job opportunities ($p = 0.031$). However, there was no significant relationship between the perception that a lighter skin tone increases a woman's chances of getting married and product usage ($p = 0.209$).

Table 4: The relation between usage of skin lightening products and perception considering skin tone.

		Have you ever used skin lightening products?				
		No		Yes		P-value
		Count	Row N %	Count	Row N %	
Do you think that a lighter skin tone is more beautiful?	Strongly disagree	16	27.1%	43	72.9%	0.086
	Disagree	51	20.9%	193	79.1%	
	Neutral	5	23.8%	16	76.2%	
	Agree	29	15.5%	158	84.5%	
	Strongly agree	10	11.5%	77	88.5%	
Do you think that lighter skin tone provides women with higher self-esteem?	Strongly disagree	18	26.5%	50	73.5%	0.004*
	Disagree	53	21.5%	194	78.5%	
	Neutral	6	35.3%	11	64.7%	
	Agree	27	15.3%	150	84.7%	
	Strongly agree	7	7.9%	82	92.1%	
Do you think that lighter skin tone helps a woman get a better job opportunity?	Strongly disagree	16	21.6%	58	78.4%	0.031*
	Disagree	46	19.9%	185	80.1%	
	Neutral	7	28.0%	18	72.0%	
	Agree	34	20.6%	131	79.4%	
	Strongly agree	8	7.8%	95	92.2%	
Do you think that lighter skin tone increases a woman's chances of getting married?	Strongly disagree	10	19.6%	41	80.4%	0.209
	Disagree	38	23.2%	126	76.8%	
	Neutral	3	17.6%	14	82.4%	
	Agree	42	18.9%	180	81.1%	
	Strongly agree	18	12.5%	126	87.5%	

Discussion:

The study aimed to investigate various aspects related to the usage of skin-lightening products among adult females in different regions of Saudi Arabia. The findings provide valuable insights into demographic factors influencing product usage, perceptions towards skin tone, characteristics of product usage, reported side effects, and the relationship between product usage and perceptions regarding skin tone.

Prevalence of Using Lightening Cream and its Relation to Demographic Factors

The prevalence of skin-lightening product usage among adult females in Saudi Arabia was notable, with 81.4% of respondents reporting having used such products at some point. This was higher than reported in several studies that showed that the prevalence of using skin-lightening products among Saudi women was around 40 %[3,9,10]. Significant associations were observed between demographic factors and product usage, with age, region, and marital status emerging as key determinants. Younger age groups, particularly those aged 20-30 years, exhibited a higher prevalence of usage, highlighting the influence of age-related factors on skincare behaviors, which was also reported in some previous studies[10,11]. This finding is in disagreement with a study conducted in Ghana, which showed that participants under the age of 40 were 1.42 times more likely to use skin-lightening cosmetics than those over that age[12] as well as a study conducted in Saudi Arabia3. However, another study showed no significant difference according to age [13]. Additionally, participants from the Central and Northern regions demonstrated a higher prevalence of product usage compared to other regions, suggesting regional variations in cosmetic preferences and cultural norms.

Perceptions Towards Skin Tone

Participants' perceptions of skin tone significantly influenced their attitudes toward product usage. The majority believed that a lighter skin tone is associated with beauty, higher self-esteem, and improved job opportunities for women. These findings underscore the pervasive influence of societal beauty standards, where lighter skin is often equated with attractiveness and success[14,15]. Interestingly, the perception that a lighter skin tone increases marriage prospects did not significantly influence product usage. This suggests that factors beyond marriage prospects may drive individuals' decisions to use skin-lightening products [16].

Characteristics of Product Usage

The study shed light on the characteristics of product usage, including duration of use, application timing, purchasing sources, expenditure, and factors influencing product selection. Most participants had

been using skin-lightening products for less than a year, primarily applying them in the evening. In a study conducted in South Africa, the majority (62%) used a lightening cream for many years. A quarter of the women said they had used a lightning cream for more than three to six months and (40.1%) of the women reported using the product in the morning, and almost half (55.1%) used the product both morning and evening[17]. Pharmacies emerged as the primary source of purchase, highlighting the accessibility of these products in retail settings. In a study conducted in Jordan, most users of SLPs get their products from pharmacies (52.6%) or small cosmetics and skin care shops (31.8%)[18]. Additionally, participants reported spending varying amounts on skin-lightening products, with a considerable proportion allocating significant financial resources to maintain their skincare regimen. A previous study in Saudi Arabia reported similar results that the monthly cost of the bleaching products varied between 5 and 3000 Saudi Riyals (SR). Of the women, 16.7% reported spending more than SR200 per month on bleaching products ($53.4)[19].

Reported Side Effects

While a substantial number of participants reported experiencing no side effects, others reported adverse reactions such as redness, acne, and sun sensitivity. These findings underscore the importance of recognizing the potential risks associated with the indiscriminate use of skin-lightening products. Previous studies have documented a range of adverse effects, including skin irritation, hyperpigmentation, and long-term skin damage[20,21]. This finding mirrors a study that was conducted in South Africa. The majority of participants (89%) agreed that SLP could have a negative impact on the skin15. On the other hand, research carried out in the northern region of Saudi Arabia revealed that just 39.2% thought that SLPs could cause damage to their skin13. Therefore, healthcare professionals must educate individuals about the risks associated with these products and encourage safe and informed usage practices.

Relationship Between Product Usage and Perceptions Regarding Skin Tone

The study revealed mixed findings regarding the relationship between product usage and perceptions regarding skin tone. While perceptions of beauty, self-esteem, and job opportunities were associated with product usage, the belief that a lighter skin tone increases marriage prospects did not significantly influence usage patterns. These findings suggest that societal perceptions of beauty and success may exert a stronger influence on individuals' decisions to use skin-lightening products compared to marriage prospects alone[22,23].

The study's limitations include reliance on self-reported data, potential sampling bias due to online-only data collection, and a cross-sectional design that limits causal insights. The sample may not fully represent Saudi women across all socio-economic backgrounds, and the lack of clinical verification for side effects and limited exploration of cultural influences restrict generalizability. Future research addressing these factors could deepen understanding of skin-lightening practices.

Conclusion:

This study underscores the significant prevalence of skin-lightening product usage among adult females in Saudi Arabia and highlights the implications of societal perceptions and individual preferences on these behaviors. Many participants equate lighter skin with beauty, self-esteem, and enhanced job prospects, indicating that societal standards profoundly influence their skincare choices. The observed lack of awareness regarding potential adverse effects emphasizes the necessity for targeted education on safe usage practices. Dermatologists and healthcare professionals must address these risks while promoting the acceptance of diverse beauty standards. Future research should delve deeper into the psychological and cultural factors that drive these preferences and evaluate the effectiveness of public health interventions aimed at fostering safer skincare practices. Future research should explore cultural and societal factors influencing skin-lightening product usage in Saudi Arabia, along with the psychological impact on users' self-esteem and body image. Longitudinal studies could assess changes in attitudes following public health interventions. Additionally, investigating consumer purchasing behaviors and the effectiveness of regulations, along with qualitative methods to understand personal motivations, would provide valuable insights into these practices.

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