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Awareness and Prevalence of Skin Bleaching Among Female University Students in Garowe City, Somalia

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ABSTRACT

Background: Skin bleaching (SB), also referred to as skin lightening (SL), is a growing public health concern affecting individuals across skin tones. Despite its increasing popularity, data on SL practices among university students in Somalia particularly in Garowe City remain limited. This study aimed to assess the prevalence, awareness, attitudes, and associated factors related to the use of skin bleaching products among female university students. Methods: A cross-sectional, questionnaire-based survey was conducted among female students at the University of Bosaso campuses in Garowe City. The survey collected data on sociodemographic characteristics, knowledge, attitudes, commonly used skincare products, and motivations for product use. A market assessment was also carried out to identify the types of skin lightening agents, active ingredients, and pricing of available products. Results: A total of 322 female students completed the survey. The prevalence of self-reported skin bleaching was 95.3%, with 67.1% of users reporting the use of more than two products. The average age of respondents was 23 ± 3.3 years, with the majority (36.3%) aged between 21 and 24. Peer recommendations were the most common influence on SL product use. The primary motivations included enhancing beauty and achieving healthy skin (97.3%), portraying a higher social status (27.7%), and treating skin disorders (24.1%). Most participants obtained products from cosmetic shops (69.8%) and open markets (60.5%). Conclusion: Skin bleaching practices are alarmingly prevalent among female university students in Garowe City, largely influenced by peer networks. These findings highlight the urgent need for health education campaigns focusing on the risks of skin bleaching, clarification of misconceptions, and stricter regulation of harmful cosmetic products.

Keywords: Skin bleaching, skin lightening, prevalence, awareness, female university students, Somalia, public health, cosmetic practices.

INTRODUCTION

Skin whitening, often referred to as skin lightening or bleaching, is a cosmetic practice that involves using chemical substances to reduce melanin concentration in the skin, aiming for a

lighter or more even complexion [1]. Historically, this practice emerged from cultural and colonial beauty standards, tracing back to 16th-century Asia and the Elizabethan era in Europe [2]. Currently, it is a pervasive global phenomenon, particularly common in Africa and parts of Asia [3]. It is fueled by sociocultural factors such as colorism, which promotes the belief that lighter skin is linked to beauty, wealth, and social advantages [4].

In several African nations, between 25% and 80% of women report using skin-lightening products, with the highest rates observed in Nigeria (77%), Senegal (52–67%), and Cameroon [5, 6]. Similar patterns are evident in India and Pakistan, where most skincare products are designed for skin lightening and frequently contain dangerous levels of mercury and hydroquinone [7]. In Somalia, despite growing public health warnings, up to 70% of women continue to use these products, often purchased from pharmacies and local markets [8, 9].

Commonly used ingredients include hydroquinone, corticosteroids, mercury compounds, glutathione, kojic acid, and alpha hydroxy acids [10]. While some, like kojic acid, are legally used in cosmetics, others such as hydroquinone and tretinoin are prohibited in many countries due to their potential for severe adverse effects [11]. These agents can lead to various health complications, including exogenous ochronosis, steroid-induced acne, skin atrophy, and systemic toxicity affecting organs like the kidneys and nervous system [12].

The use of unregulated skin-lightening products, especially those with undisclosed or banned ingredients, poses a growing public health risk in low- and middle-income countries. The persistent popularity of skin bleaching products, despite well-documented dangers, is partly due to inadequate regulatory oversight, societal pressures, and limited awareness [13]. Among university students, a demographic often susceptible to image concerns, the use of skin-lightening products might indicate deeper issues related to identity, societal expectations, and misinformation [14]. In Somalia, recent studies show usage rates as high as 52% among female health science students [15].

This study aims to investigate the awareness and prevalence of skin bleaching practices among female university students at Bosaso University–Garowe. Understanding these trends is crucial for developing targeted health education programs and informing public health policies to mitigate the risks associated with unsafe cosmetic practices.

METHODOLOGY

Study Design and Setting

A descriptive, cross-sectional study was conducted in March to September 2024 at the University of Bosaso Garowe, located in Puntland State, Somalia. The study took place during the second semester of the 2023/2024 academic year and utilized both quantitative and qualitative approaches to assess the prevalence of skin bleaching and associated factors among female students.

Study Population and Sampling

The target population comprised female students aged 18–30 years enrolled at the University of Bosaso Garowe main campus, including all colleges and health faculties. A multi-stage sampling technique was employed. Initially, a comprehensive count of the total female student population was undertaken to guide stratification. Pre-selection observational assessments

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were also conducted to ensure adequate sample representation. Based on inclusion criteria, socially active, mentally sound students who voluntarily agreed to participate were selected. Students not present at the time of data collection or not affiliated with the university were excluded.

Inclusion and Exclusion Criteria

The inclusion criteria for this study were as follows: only female students aged between 18 and 30 years who were currently enrolled at the University of Bosaso Garowe main campus (including all colleges and health faculties) were eligible. Participants had to be present on campus during the data collection period March-June, 2024, be socially interactive and mentally sound, and voluntarily agree to participate by providing signed informed consent. The exclusion criteria included individuals not enrolled at the University of Bosaso–Garowe, male students, and female students outside the specified age range, those absent during data collection, those who declined to participate or did not provide informed consent, and those who submitted incomplete questionnaires or failed to sign the consent form.

Sample Size Determination

The required sample size was calculated using an online calculator with the following the parameters: a 95% confidence level, 5% margin of error (e), 50% assumed population size (N) is 2000 students. This yielded 323 responses. Only 322 students were included in the final analysis and one student with missing information was excluded during the final analysis.

Data Collection Instrument

Data were gathered using a self-administered, structured questionnaire developed by the research team after reviewing existing literature on skin bleaching practices [16, 17]. The questionnaire contained 27 items across three main sections first sections includes socio-demographic information (age, marital status, skin tone, place of origin, family income, academic year, and college type), followed by awareness and knowledge about skin bleaching, and in the last section includes the prevalence, usage patterns, and perceptions of skin-lightening products.

Data Analysis

Data were entered and managed using Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows. Basic descriptive statistics, including frequencies and percentages, were computed to summarize the sociodemographic characteristics and skin-lightening product usage patterns. The results were systematically organized and presented in tables and figures for clear interpretation.

Ethical Considerations

This study received ethical clearance from the Institutional Review Board (IRB) of the University of Bosaso. Prior to participation, all respondents provided informed consent after being briefed on the study's objectives, procedures, and their rights to withdraw at any time [18].

RESULTS

Table 1: Sociodemographic characteristics of study populations

Characteristics		Frequency, n (%)
Age (Years)		
	≤20	104 (32.30)
	21-24	117 (36.30)
	25-30	101 (31.40)
Marital status		
	Single	149 (46.30)
	Married	105 (32.60)
	Others	68 (21.10)
College classification		
	Health Science	109 (33.90)
	Computer Science	88 (27.30)
	Social Work	88 (27.30)
	Public Administration	37 (11.50)
Skin tone		
	Light skinned	180 (55.9)
	Dark skinned	142 (44.1)
Original location of respondents		
	Urban	209 (64.90)
	Rural	113 (35.10)
Year of study		
	Year one	55 (17.10)
	Year two	90 (28.00)
	Year three	44 (13.30)
	Year four	133 (41.30)
Family income (USD)		
	$ 100-200	145 (45.0)
	$ 300-400	150 (46.6)
	$ 500-600	10 (3.10)
	$ 600 above	17 (5.30)

Sociodemographic Characteristics

Table 1. Summarize the key sociodemographic characteristics of female students at the University of Bosaso in Garowe City. Based on the outcome, the majority of respondents (36.3%) were aged 21–24 years, followed closely by those ≤20 years (32.3%) and 25–30 years (31.4%). Most of the student's came from low-to-middle-income families where the average income was $100–200 with 45.0%, followed $300–400 with 46.6% frequently. Majority of the respondents were live in urban area 209 (64.90) compared with 113 (35.10%) from rural area of Garowe City, Nugal Region, Puntland State of Somalia.

Table 2: Common Skin bleaching or SL bath soaps used by female students in Garowe City.

Brand Name	**Effective Ingredients**	**Price (USD)**
Leema soap	Sodium Palmate, Sodium Palm Kernelate, Sodium Chloride	1.0
Cleanser soap	Sodium cocoate, sodium palm	1.0
Acne soap type 2*	Sodium Palmitate,Sodium Cocoate, Aqua	1.0

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Papaya soap	Coconut Oil-95%, Castor Oil-3%, Hydno Carpus Oil-0.5%, Turmeric Extract-1%, Cinnamomum Zeylanicum-0.5%	1.5
White balance soap	Sodium Laurate, Sodium Stearate, Glycenne Pop lene Glycol, Triethanol Amine,	1.5
Rose soap	Sodium Palmate, Sodim PalraKeelate, Aqua, Parfum	1.5
Acne soap type 1*	Deionized water, soap base, eliminating the bai, brightening, disodium, fragrance, emollient. disodiune fragrance, emoit	2.0
Palmolive soap	Sodium Palmate, Aqua, Sodium Palm Kernelate, Parfum	2.0
Pears soap	Water (Eau), Sorbitol, Sodium Palm Kerelate, Sodium Rosinate, Glycerin, Sodium Palmate, Sodium Stearate, Propylene Glycol, Sodium Laury/ Sulfate	2.5
Nivea soap Ingredients	Sodium Tallowate, Sodium Cocoate	3.0
Snail white soap	Cocónut (Cocos Nucifera) Oil, Water	3.0
Collagen soap	Sodium palmitic, sodium palm kernelate, glycerin	4.0
Coco batter soap	Cocoa Oil, Water Sodium Hydroxis Glycerin Sorbitan Stearat	4.5
kojic acid soap	Sorbitol, Sucrose, Stearic ACID, Water, Propylene Glycol, Glycerin, Cocamidopropyl Betaine, Sodium Lauryl Sulfate	5.0
Cucumber soap	Aqua, Sodium Palmate, Sodium Cocoate	5.0
Fitso	Unknown*	6.0

Common Skin Bleaching or SL Bath Soaps Used by Female Students

Table 1 shows the frequency analysis of skin-bleaching or SL bath soaps used by female students at the University of Bosaso. The findings reveal that the cost range is between $1.00 and $6.00, with Fitso being the most expensive, even though it is not known what makes it up, and the least expensive among them are Leema, Cleanser, and Acne Soap Type 2*, each going for $1.00.

Common active ingredients included Sodium Palmate (employed in Palmolive, Leema, and Collagen soaps), glycerin (found in Pears and Kojic Acid soaps), and coconut oil (most commonly found in Papaya and Snail White soaps). Significant skin-whitening substances identified were kojic acid in Kojic Acid Soap, turmeric extract in Papaya Soap, and collagen in Collagen Soap, with additional "brightening" claims in White Balance and Acne Soap Type 1*. The absence of ingredient disclosure by Fitso poses safety concerns, such as the need for higher vigilance and awareness among consumers regarding such products (Table 2). The detailed list of skin bleaching or skin-lightening (SL) bath and face creams used product by female students presented in **supplementary table S1.**

Table 3: Awareness and knowledge of skin bleaching among student

Characteristics	Frequency, N (%)
Heard about skin bleaching	
Yes	302 (93.8)
First source of information on bleaching	
Friends	122 (37.9)
Family member	77 (23.99)
Media /Tv /radio	88 (27.30)
Teacher /literature	35 (10.90)
Knowledge about skin bleaching	
Yes	262 (81.49)
What does skin bleaching means to you?	

Change human color	171 (53.10)
Using chemical on the skin	74 (23.10)
Making the skin smooth	77 (23.90)
Skin bleaching causes stretch marks	
Yes	288 (89.40)
Skin bleaching causes cancer	
Yes	293 (91.00)

Awareness and Knowledge of Skin Bleaching Among Student

Awareness and Knowledge of Skin Bleaching: All respondents were aware of skin bleaching with the source of first information on skin bleaching from friends (n=122, 37.9%). The majority of respondents were knowledgeable in skin bleaching (n=262, 81.4%). About 53.1% of respondents said that skin bleaching involved changing human color, while about 23.9% said that it involved making the skin smooth. A higher proportion of the respondents (91.0%) indicated that skin cancer and (89.4%) stretch marks are largely caused by skin bleaching (Table 3).

Table 4: Prevalence and use of skin bleaching product among female students

Responses/Answers	**Frequency**	**Percent %**
Have you used skin bleaching?		
Yes	307	95.3
No	15	4.7
Number of Skin toning product used last 12 months*		
≤2	101	32.9
>2	206	67.1
Preferred skin toning product*		
Local	61	19.8
International	230	74.9
Both	16	5.0
Factors you consider in choosing bleaching product**		
Friends' recommendation	299	97.4
Affordability	162	52.7
Effectiveness of product	178	57.9
Ingredients	88	28.6
Do you know danger of using skin bleaching toning product?		
Yes	291	90.4
No	31	9.6
Danger of skin bleaching**		
Skin cancer	125	38.8
Loss of life	61	18.9
Easy cut	45	14
Multi-color skin	81	25.1
Do you know ingredient in cosmetic product?		
Yes	291	90.3
No	31	9.6
Do you usually examine cosmetic before purchased?		
Yes	119	36.9
No	203	63.0

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Do you usually check expire date buying cosmetic?		
Yes	252	78.2
No	70	21.7
Do you know about safety requirement in using cosmetics?		
Yes	130	40.5
No	192	59.6
What makes people bleach their skin**?		
Enhance beauty health skin	299	97.3
Treat skin disorder	74	24.1
Show higher social class	85	27.7
Get better job	63	20.5
Where to get skin bleaching toning product?		
Cosmetic shops	225	69.8
Online portal	75	23.2
Pharmaceutical shop	35	10.8
Open market	195	60.5
Traditional medical practitioners	26	8.7
Which of the following cosmetics you prefer to use*? (most common in market)		
Derma glow (local brand)	52	16.9
Diamond white (local brand)	34	11.1
Bio Carrol (local brand)	41	13.3
Miss white (international brand)	58	18.9
Abu walled cream (international brand)	62	20.2
Defacto whitening cream (international brand)	60	19.5
Do you feel side effects when you apply the bleaching product*?		
Yes	61	19.9
No	246	80.1

* Refers to n=307 & ** Refers to multiple responses.

Prevalence and Use of Skin Bleaching Products:

As clearly shown in Table 4, Self-reported use of skin bleaching products was 95.3% with majority (67.1%) using more than two skin bleaching products. Users of skin bleaching products preferred international brand skin toning products (74.9%). Major factors users of skin bleaching products consider in the selection of the skin products comprised friend recommendation (97.4%) effectiveness of product (57.9%), affordability (52.7%), ingredients and brand of the product (28.6%). Majority of the respondents (90.4%) had knowledge of the dangers of skin bleaching or toning products. The common dangers identified by respondents include skin cancer (38.8%), multi-color skin (25.1%), loss of life (18.9%) and easy cut of skin (14%). Most of the respondents had knowledge of the ingredients used in the bleaching products (90.3%), and checked the expiry date before buying (78.2%). Reasons attributed to skin bleaching included enhance beauty and healthy skin (97.3%), show higher social class (27.7%), and treatment of skin disorders (24.1%). Majority of the respondents (69.8% and 60.5%) said the skin bleaching products are obtained from cosmetic shops and open market, respectively (Figure 3). As shown in Figure 3., the market survey show, six cosmetic products were the most commonly available and used by people in Garowe City. Out of the six brands, the most commonly used by participants were found to be Abu walled cream (international brand, 20.2%) and Defacto whitening cream (international brand, 19.5%).

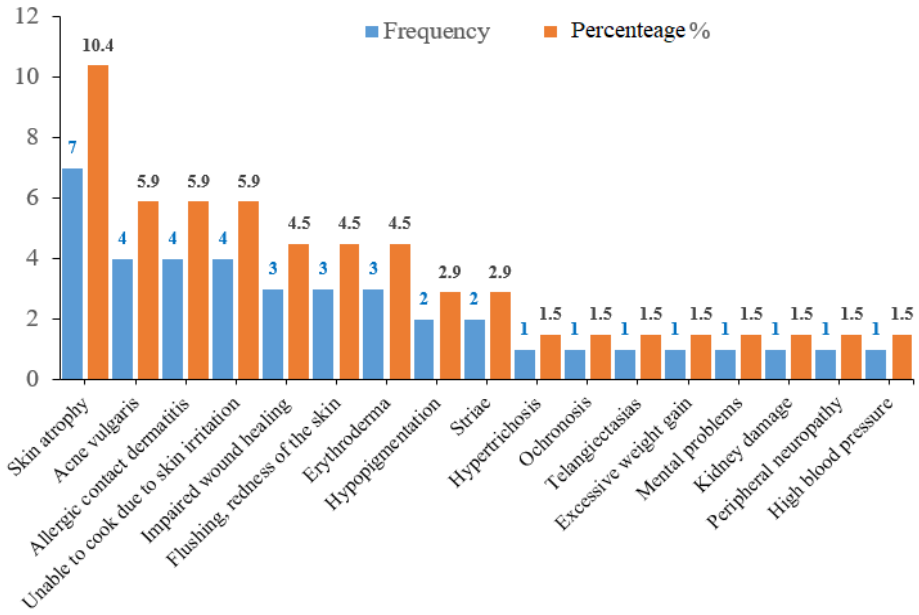

Figure 1: Side effects (adverse reactions) said by respondents upon use of the different skin bleaching products (soaps and creams). n = 67 out of 307 students.

As shown in Figure 1, only 67 (21.8%) respondents out of the 307 students who used skin bleaching tonic products from our total sample size n=322. Most commonly side effects observed among respondents was skin atrophy 7(10.4%). Among the respondents, only three groups each 4(5.9) experienced Acne vulgaris, Allergic Contact Dermatitis (ACD) and skin irritation as side effects. The other 13 side effects were observed with less percentages (4.4-1.5%) among remaining 48 respondents.

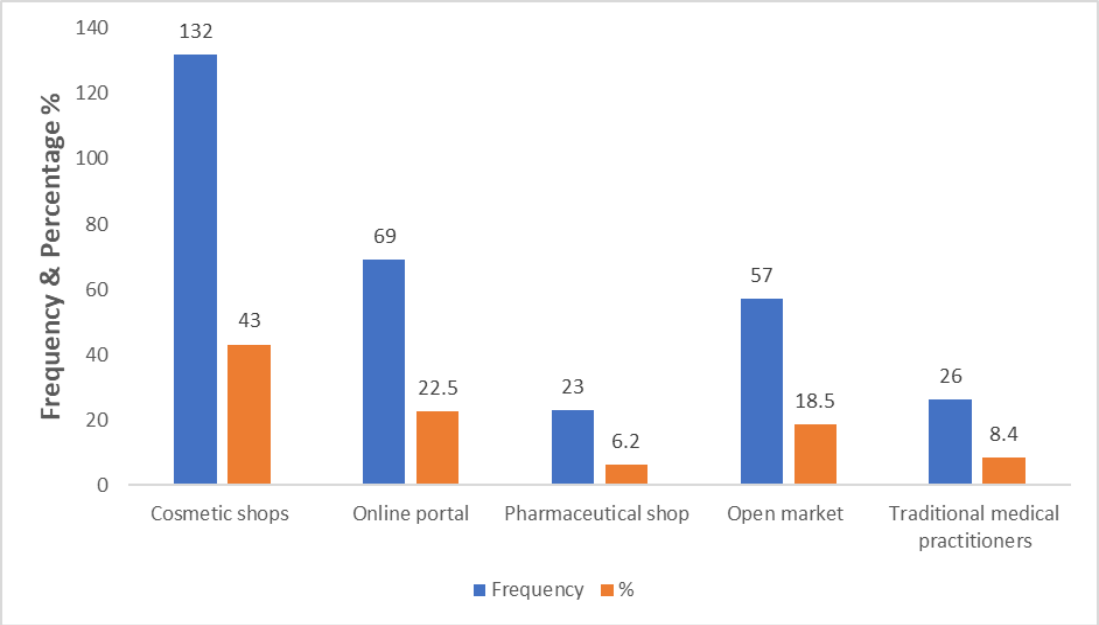

Figure 2: Variation in sources of getting the skin bleaching tonic products among female students.

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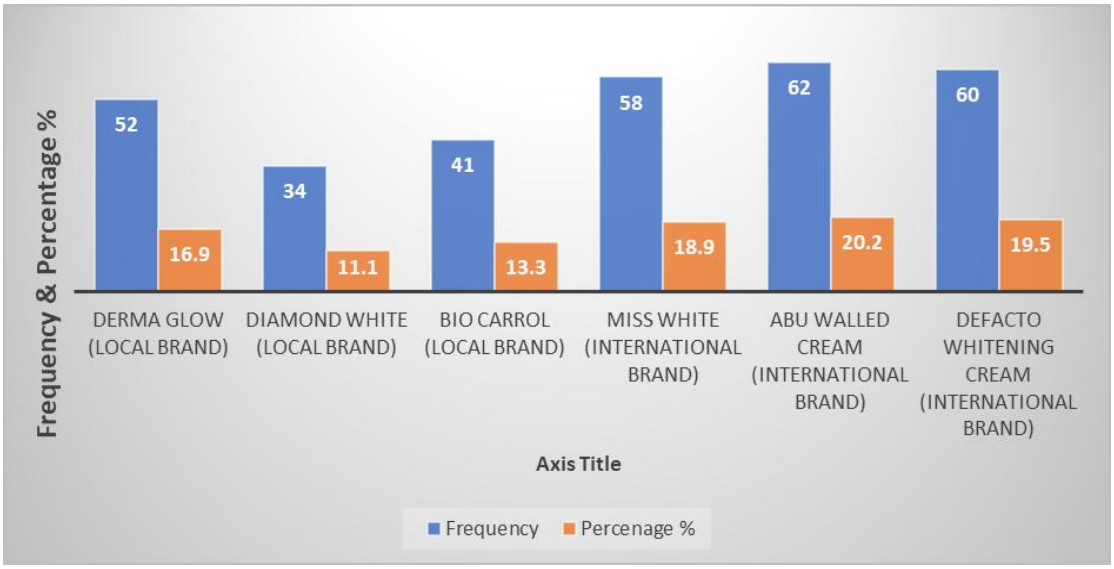

Figure 3: The most commonly available and used skin bleaching cosmetics (local and international brands) among female students.

DISCUSSION

Despite the ban on skin bleaching creams and products, our study recorded relatively high usage among respondents. Other studies reported higher prevalence in Somalia [9]. The use of skin bleaching products is pervasive in African Countries [14]. With inter-African trade agreements, Somalia may continue to witness an influx of skin bleaching products and agents due to the nature of our porous inland borders. It is therefore important to strengthen Somalia's borders against the importation of skin bleaching products [19].

What's important in this study is the recognition of awareness and knowledge of skin bleaching among respondents. However, these are not enough to achieve zero skin bleaching product use. Somalia's Food and Drug Authority should be adequately resourced to carry out its role effectively in relation to the enforcement of the ban on the use of skin bleaching products.

Consistent with finding from previous studies [20, 21], participants in our study demonstrated awareness of the health risks associated with skin bleaching products, including an increased risk of skin cancer and premature skin aging. Given the predominantly young age of the respondents—as well as the youthful demographic profile of Somalia overall [9] the use of such products poses significant long-term health concerns. It is therefore advisable for individuals to thoroughly review product labels and ingredients before purchasing or applying skin lightening creams [17].

Most of our respondents indicated examining the content of cosmetic products, including expiry dates and safety requirements. This finding is particularly important as reading the content label of creams allows individuals to identify and avoid creams that are likely to cause bleaching.

Equally important insights from the present study included significant differences between marital status, skin complexion, location of respondents (rural/urban), average monthly income, and skin bleaching product use. Nonetheless, targeted public health interventions,

including education, should be directed at university student females. Marital status was significantly associated with the use of skin bleaching products; being single had higher odds and was positively associated with the use of skin bleaching products. This might partly explain a reason for the use of skin bleaching products such as beautification. Multiple studies have asserted that most individuals use skin bleaching products to look more beautiful and attractive [22].

Skin complexion, especially fair-colored individuals, were more likely to use skin bleaching. This might be because fair-colored individuals may want to preserve their complexion. This is contrary to other studies that reported that dark-colored individuals were more likely to use skin bleaching products [23]. Nevertheless, it is important to know that the skin is an essential protective covering of the body, liable to external threats and irritations. It is therefore important not to disturb the integrity of the skin so it is able to perform its protective function. Occupation and average monthly income were associated with the use of skin bleaching products. Being unemployed was positively associated with the use of skin bleaching products. According to [22], users of skin bleaching products spend almost 4% of their total monthly income on skin bleaching products.

CONCLUSION

Despite regulatory bans on skin bleaching products, this study found a persistently high prevalence of use among female university students in Garowe, Somalia. While a significant proportion of participants demonstrated awareness of the health risks associated with skin bleaching including skin cancer and premature aging this knowledge alone has not translated into reduced usage. The findings highlight the urgent need for comprehensive, multi-sectoral interventions. We recommend that universities and community organizations implement targeted education and awareness programs emphasizing the dangers of skin bleaching and promoting healthier skin care practices. Regulatory bodies, such as the Somalia Food and Drug Authority, should be strengthened and better resourced to enforce bans, regulate product imports, and conduct routine market surveillance. Further research is essential to investigate the long-term health consequences of skin bleaching and understand the socio-cultural drivers sustaining this practice. Healthcare professionals must be empowered to educate and counsel patients, while community leaders and policymakers should work collaboratively to challenge harmful beauty norms and promote inclusive standards that value diverse skin tones. Addressing these issues holistically will be critical to reducing the prevalence of skin bleaching and safeguarding public health.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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Supplementary Table

Table S1. List of skin bleaching or SL bath creams used by the University of Bosaso female students (body & face creams) in Garowe City.

No.	Brand Name	Active Depigmenting Agent	Price (USD)
1	White Express	Clobetasol	3
2	Moovate Cream	Clobetasol	3
3	Dermoquin 2% cream	Hydroquinone	2
4	Carotone	Hydroquinone	2.5
5	Faiza Beauty Cream	Kojic acid, vitamin A, zinc oxide	4
6	Perfect White	Alpha hydroxy acid, kojic acid, titanium dioxide	3.5
7	Aneeza Gold Beauty Cream	None listed	2
8	Noor herbal Beauty Cream	Arbutin, kojic acid, licorice extract, vitamin A	2
9	Layla Beauty Cream	Kojic acid, titanium dioxide	2
10	Fairness Cream – Paris collection	Niacinamide, methoxycinnamate	3
11	Fair and Lovely	Titanium dioxide	1.5
12	Natural Face Beauty Cream	Ascorbic acid, vitamin A	3
13	Chandni Whitening Cream	None listed	3
14	Brown Cream face	Unknown*	2
15	Golden	Unknown*	3
16	Derma glow	L-Glutathione, alpha-lipoic acid, grape seed and vitamin C.	5
17	Diamond white	Aqua (Water), Glyceryl Stearate, Mineral Oil	3
18	Bio Carrol	Pure carrot oil, extracts of carrot seed	2.5
19	Miss white	Mineral Oil, Glycerin, Glyceryl Stearate SE, Stearic, Acid, Palmitic Acid	3
20	Abuwalled cream	Wheat flour, sugar, non- hydrogenated vegetable oil	5
21	Defacto whitening cream	Vitamin Extracts, Alpha Arbutin, Licorice Extract, Sodium Ascorbyl Phosphate, Lactic Acid	3.5

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