

Skin Lightening Among University Students: Knowledge, Attitudes and Reasons for Use

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ABSTRACT

Introduction: Skin lightening (SL) is considered a serious public health issue affecting the dark-skin population. There is a paucity of data on SL among university students in Nigeria. The aim of this study is to document the knowledge, attitudes and reasons for use of SL products among university students.

Methods: This was a cross-sectional questionnaire-based survey conducted among University of Abuja, Nigeria students. Information on sociodemographic characteristics, brand of skincare products used and reasons for use was sought. Market survey on the lightening agent and cost of skincare products was obtained and analysed.

Results: A total of 200 students completed a pre-tested questionnaire, 24 males and 176 females. Mean age was 21.5 ± 4.6 years. Most of the students interviewed reside in-campus. The rates of use of SL soaps and body creams were 25.5% and 46% respectively. Males used more SL body creams than soaps. Students who used SL body creams are 2.6 times as likely to use lightening bath soap than students who do not use SL body creams (95% CI = 1.29, 5.11). Skin lightening product was mostly recommended by a friend. Only 19.6% of the students who used SL body creams have ever applied sunscreen lotions on body and face.

Conclusion: The use of SL products is quite popular among University of Abuja students. Friendship is a strong motivating factor that contributes to SL practice. Education on proper SL terminologies and importance of sunscreens use is necessary in our universities.

Keywords: Skin lightening, skin bleaching, skincare products, university students, Abuja

INTRODUCTION

Nigerian cosmetics and beauty industry was estimated at approximately US140 billion in 2018 and is projected to grow in line with the global market. [1] Although skincare products are in high demand, studies in Nigeria have shown that most of these products contain high concentrations of heavy metals and chemicals which pose threat to health and environment after a prolonged and chronic use. [2-4] Mercury, hydroquinone and corticosteroids are the most commonly identified skin lightening (SL) agents; associated with destructive side effects.

Mercury compounds are linked with toxic damage to the brain and kidneys, prolonged use of hydroquinone have been connected with exogenous ochronosis, fish odour syndrome and nephropathy while corticosteroids is known for steroid-induced acne, steroid addiction syndrome, telangiectasia, atrophy, striae and opportunistic infections. [5-7] Meanwhile, the ban by the Nigerian National Agency for Food and Drug Administration and Control (NAFDAC) on the manufacture, sale and import of mercury containing cosmetics as well as the restriction of the use of hydroquinone to less than 1% in cosmetic

preparations have given rise to increase of natural lightening products; [8] the safety of which needs to be verified. Although, manufacturers are expected to display an ingredient list on their product label, studies by Dlova et al. [5] and Gbetoh et al. [7] have shown some lists to be incomplete or inaccurate.

Generally, skin bleaching products are popular because of high social pressure to have a white complexion, which is seen as more attractive. [9] According to a recent review, age, gender, marital status, level of education and employment do not have any significant influence on skin lightening practices. [10] A study in India showed that herbal content and brand name of skin care products influence the purchase and use of skincare products especially among the male gender. [11] Advertisement is an important factor that can affect choice of skincare products among college students. [12] Studies have revealed that branding of skin care products can have huge influence on the consumer since most people tend to buy a product which promises to make the user as beautiful as the model pictured on the label. [12-14]

We have noticed an increase in skincare products (bath soaps/body wash and body lotions/creams) being marketed as 'natural' skin lightening products. Some do not state the lightening agent in the product label but instead declares 'a noticeable skin colour change will be observed in seven days'. Most of the patients who use these products present with steroid-induced and hydroquinone complications. The purpose of this research was to investigate the proportion of University of Abuja students using skin lightening skincare products, identify the lightening agent in the brands listed, to document the knowledge, attitudes and reasons for use of SL products.

MATERIALS AND METHODS

This was a cross-sectional, descriptive study carried out in June 2019 at the University of Abuja, Nigeria during a public enlightenment campaign titled "the

use and abuse of bleaching/whitening creams" organised by members of the Nigerian Association of Dermatologists. University of Abuja students who were present at the rally were given a well-structured pre-tested questionnaire to fill. Only those who voluntarily gave an informed consent took part in the study. The study was conducted in full conformance with principles of the "Declaration of Helsinki", Good Clinical Practice (GCP) and within the laws and regulations of Nigeria.

Information on their socio-demographic characteristics, choice and reason for use of body soaps and creams was elicited from the respondents. Students were asked to write the name of the bath soap and body cream they were currently using as well as provide information on their attitude and knowledge on lightening creams and sunscreens. A market survey was then conducted to identify the label content and cost of the brands listed by the students. The brands were categorized as skin lightening based on the label and ingredients stated by the manufacturers and various authors.

Statistical Analysis:

Data was coded and analysed using SPSS version 22 statistical package. Results were presented as frequency (percentage) or mean±standard deviation where appropriate. Bivariate analysis was used to explore the association between use of skin lightening products and socio-demographic characteristics, attitude and knowledge toward skin lightening. Prevalence Odds ratio was used to measure the association between use of SL soap and SL lotion/cream. The mean cost of SL and non-SL soap and body lotion/cream was calculated and difference in cost between these two categories was analysed using Mann-Whitey U-test since it was not normally distributed. P value <0.05 was considered as statistically significant.

RESULTS

Students’ demographics: A total of 200 students completed the questionnaire, 24 males and 176 females. The male female ratio was 1:7. The average age of the respondents was 21.5 ±4.6 years; most of the students were pursuing non science-

based degrees in the university as shown in Table 1. Science-based degree included Medicine, Veterinary medicine, Agricultural science, Engineering, Biological science and computer science. Only 85% of the students reside in-campus.

Table 1: Demographic Profile of Respondents

Variable	Freq (%)	Variable	Freq (%)	Variable	Freq (%)
Gender		Place of residence		Course	
Male	24 (12%)	In-campus	170 (85%)	SB	83 (42.3%)
Female	176 (88%)	Off-campus	30 (15%)	NSB	113 (57.7%)
Total	200		200		196
Age		Study year		Marital status	
18 – 20 years	96 (48%)	1 st year	74 (37%)	Single	146 (73%)
21 – 25 years	92 (46%)	2 nd and 3 rd	77 (38.5%)	Married	54 (27%)
26 and above	12 (6%)	4 th and above	49 (24.5%)	Divorced	0
Total	200		200		200

Proportion of students using skin lightening products: Following a market survey of active ingredients of bath soaps/body wash and body lotions/creams listed by the students as the current names of skincare products being used at the time of the study, the enlisted brands were categorized into SL and non-SL products. From this categorization, 51 and 92 students were identified to be using lightening bath soaps and body creams respectively. The proportion of students using SL soaps was estimated to be 0.255 (95% CI 0.194 – 0.315) and SL body creams as 0.46(95% CI 0.352 – 0.529). Among the 23 different types of SL bath soap listed by the students, kojic acid, hydroquinone, betamethasone dipropionate, iodide mercury, licorice among others were listed as the active lightening agent; singly or in combination. The active depigmenting agent in 4 SL bath soaps could not be identified (Table 2). The three most popular SL soaps were Extract, Idole papaya and Asantee. Forty-two (42) brands of SL body creams were listed and found to contain hydroquinone, kojic acid, betamethasone dipropionate, licorice, glutathione, arbutin, salicylic acid amongst others as the active lightening agent. We could not identify the active depigmenting agent in 10 products (Table 3). The three most popular SL body creams were Nivea natural fairness, Lemon extract and Caro white.

Table 2: List of Skin lightening bath soaps used by the students

	Brands	Active depigmenting agent (conc. if stated)	Cost (₦)
1.	Asantee	Kojic acid	500
2.	Bronze tone Maxi tone	Betamethasone dipropionate	1900
3.	CT plus	Carrot oil + Kojic acid + Hydroquinone (2%)	1300
4.	Caro tone	Carrot oil + Kojic acid + Hydroquinone (2%)	530
5.	Clinic clear	Carrot oil + Kojic acid	800
6.	Crusader	Hydroquinone	1850
7.	Eva gold soap	Silk Protein GW extract	350
8.	Extract	Papaya Calamansi	1000
9.	Funbact A	Betamethasone dipropionate	600
10.	Gold skin	Kojic acid	1300
11.	Hawaii	Beta Carotene	1800
12.	Idole papaya	Iodide mercury	900
13.	K brothers	-	1000
14.	Nano pure white	Arbutin, Kojic acid + Glutathione	1000
15.	Natural beauty Carrot oil	Beta carotene	2500
16.	Olay sparkling white	-	1000
17.	Papaya	Papain extract	650
18.	Perfect white	Carrot	1200
19.	Skin success	Licorice extract	1800
20.	Smooth as silk	-	1800
21.	Supreme white	-	3375
22.	Tura	Mercury	560
23.	White care lightening	Licorice extract	1800

Active depigmenting agent not stated

Table 3: List of Skin lightening body creams used by the students

	Brands	Active depigmenting agent (conc. if stated)	Cost (₦)
1.	Active white	L-Glutathione, Kojic acid	1700
2.	Allure beautifying	Licorice extract	4900
3.	Bb clear	-	2500
4.	Beauty fair	-	4000
5.	Bio lotion	Hydroquinone	5000
6.	Bronze tone maxi tone	Betamethasone dipropionate	3500
7.	Caro tone	Hydroquinone	1500
8.	Caro white	Hydroquinone (1.5%)	1200
9.	Carrot lightening body	-	2500
10.	Citro clear	Clobetasol propionate	1500
11.	Clair Liss	Hydroquinone, Clobetasol propionate	2900
12.	Clear nature	Hydroquinone (2%)	6500
13.	Clinic clear	Kojic acid	2000
14.	Ct+	Hydroquinone (2%)	3000
15.	D.e.s	Hydroquinone	4500
16.	Darkspot remover	-	2000
17.	Dayby day	Betamethasone dipropionate	2500
18.	E6	Licorice extract	6200
19.	Eto beauty cream	-	
20.	Extract	Papaya calamas	7000
21.	Extreme glow	Vegeclairine, Kojic acid, Glutathione	2150
22.	Fair classic	-	5800
23.	Fair &white	Hydroquinone	5800
24.	Gold glow	-	2500
25.	Gold-skin	Clobetasol propionate, Hydroquinone	2800
26.	Likas skin lightening herbal body lotion	Glutathione, Kojic acid	3500
27.	Irish gold	Clobetasol propionate	4900
28.	Lemon extract	Hydroquinone	6000
29.	Lighten up	Hydroquinone 1.9%	9500
30.	Miss Caroline skin toning	-	1700
31.	Miss Cherie fair	-	1800
32.	Nature secrete tone	Kojic acid, Arbutin	3000
33.	New light	Salicylic acid	3500
34.	Nivea natural fairness	Liquorice extract	2500
35.	Otentika	Licorice extract	5800
36.	Perfect white	Kojic acid+Clobetasol, Hydroquinone	2300
37.	Pure white gold	Kojic acid	3600
38.	QEI	Hydroquinone (4%)	6700
39.	Radiant glow lotion	Fruit extract, AHA	6000
40.	Secret white	Hydroquinone, Kojic acid	4000
41.	Skin light	Hydroquinone (6.7%)	6500
42.	White beauty	Vitamin b3	-

Active depigmenting agent not stated

Factors influencing use of skin lightening products:

A chi-square test of independence was done to assess the relation between gender and use of SL bath soap. More female students used lightening bath soaps than males ($X^2=6.59, p=0.01$). There was no significant association between age group, tribe, religion, course of study, year of study, marital status, and residence off/in campus and use of lightening soaps.

Analysis showed that students who reside in-campus were more likely to be users of SL body creams than those who reside off-campus ($X^2=6.29, p=0.02$). There was no significant relationship observed

between gender, age group, tribe, religion, and course of study, year of study, marital status and use of skin lightening body creams. Students who use lightening body creams are 2.6 times as likely to use lightening bath soap than students who do not use lightening body creams (95% CI = 1.29, 5.11)

Reasons motivating choice of lightening bath soap and body cream. Most of the students using lightening soap (60.7%) were on recommendation by a friend. Parents, cost of soap and desire to improve/maintain skin colour were not significant reasons for using lightening bath soap (Figure 1).

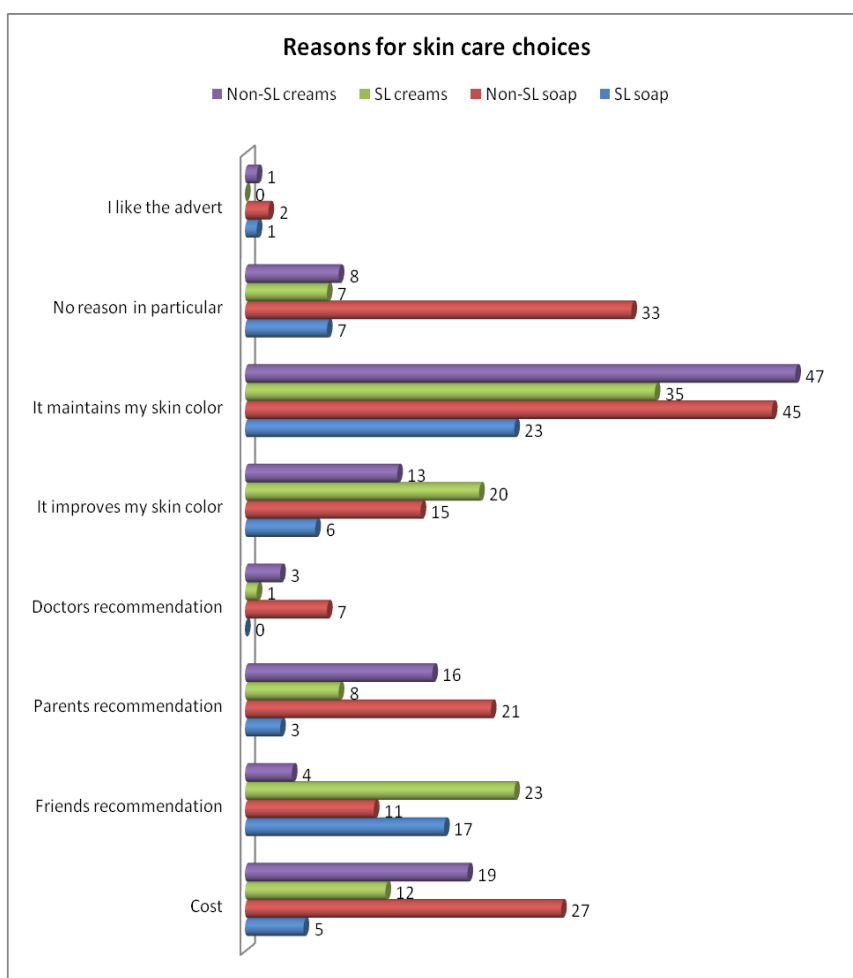


Figure 1: Reasons given for their choice of bath soap and moisturizers by the students

Similarly, recommendation by friends was the most informed reason for use of SL body creams by the students when compared with those not using SL body creams ($X^2=15.9$, $p<0.001$). Although, more students stated that their main reason for using SL body creams (Figure 1) was to maintain skin colour (38%) or improve skin colour (22%), these reasons were not significant when compared with the reasons given by those not using SL body creams ($X^2=2.9$, $p=0.1$ and $X^2=2.0$, $p=0.2$ respectively)

Further analysis comparing the cost per unit of SL soaps against non-SL soaps showed the mean cost of SL soap was significantly more expensive (1283.26 ± 731 naira) than an average non-SL soap which costs 753.04 ± 499 naira; z -score = 3.05, $p=0.002$. Also, the mean cost of SL body creams in Abuja was significantly higher (3963.75 ± 1976.07 naira) as against 2587.63

± 1488.97 naira for non-SL body cream; z -score=2.45, $p=0.014$.

Knowledge on bleaching creams: One hundred and seventy-two (86%) of the respondents have heard of bleaching cream and only 84 (42%) admits to have applied lightening cream in the past. Interestingly, 129 (69.7%) do not agree that toning the skin is the same as bleaching. Further analysis revealed that significantly more of the students who did not equate toning with bleaching were those using SL body creams ($X^2=6.31$, $p=0.02$). About 71% of the students check the product label and content of their body creams before purchase and there was no difference when compared between those using SL body creams and non-SL body cream users. Slightly more than 50% of the respondents agreed that there are dangers associated with the use of lightening creams/lotions. Most recurring dangers listed include cancer, skin damage

and abnormal pigmentation. Finally, 55.4% of the students using lightening creams have heard of sunscreen; however, only 19.6% of them have ever applied sunscreen lotions on body and face.

DISCUSSION

This study revealed the widespread use of lightening bath soaps and emollients among university students. The proportion of students using SL skincare products in this study is slightly lower than those reported by Adebimpe et al.,^[15] Amodu et al.^[16] and Offili et al.^[17] which were 60.5%, 48.1% and 64.9% respectively. This is probably due to the difference in methodology of each study. However, Amodu et al.^[16] similarly revealed a lower proportion of students using SL soaps as compared to SL lotions/creams. This is in contrast to a study in Sudan where 76.2% of undergraduate female students used SL soaps compared to 30.6% who used SL creams.^[18] Interestingly, our study showed that students who use SL body creams are 2.6 times as likely to use lightening bath soap as students who do not use SL body creams. Although, the reason for this trend cannot be provided in this study, we can only postulate that; persons who use SL creams are more likely to know about SL soaps and adding a lightening soap to their skincare regimen shows their level of commitment to lightening their skin. It is presently unknown in the literature how SL soap compares with SL creams in terms of effectiveness, efficacy and safety. Some of the lightening soaps contain harmful products such as mercury, corticosteroids and hydroquinone. Study by Harada et al^[19] reported that the wide use of skin-lightening soap may have caused mercury poisoning in Kenya. Their investigation revealed significantly high total mercury content in some Kenyan-made soaps and their users were associated with various symptoms such as vertigo, lassitude, tremor, neurasthenia and dyspigmentation.^[19]

We observed that some skincare products used by the students in this study

contained glutathione, kojic acid and arbutin as their SL agent. While there is little unbiased data on glutathione as a SL agent;^[20] kojic acid is known to induce contact dermatitis and depigmentation in concentrations greater than 1%.^[21] Arbutin is considered safe in concentrations up to 2% for face creams and 0.5% for body lotions.^[22] Unfortunately, most of these products did not state the concentration of their lightening agent. Studies are needed to investigate the contents and concentration of lightening agents in SL products to ensure proper regulations and safety. Other products contained botanical and natural ingredients as skin lightening agents. Some of these natural products such as azelaic acid, soy, licorice extracts, mulberry, green tea, turmeric and ascorbic acid are being portrayed as depigmenting agents. However, review of the literature has shown paucity of clinical trials, rather there are more in-vivo studies with short length trials and lack of evidence on long-term efficacy and safety.^[23] Some of the lightening agents in the skincare products identified in this study were not known; despite being tagged as natural and botanical in nature. The use of botanical extracts as topical skin lightening agents is being seen as the safer alternative to the side-effects-associated traditional depigmenting agents such as hydroquinone, mercury, corticosteroids and kojic acid; thus, the need for transparency and full disclosure by manufacturers of these products.^[24]

This study shows the significant influence of friends, synonymously, social pressure in the need to whiten one's skin. Friends most commonly introduce skin lightening products as seen in some studies.^[5,9,16, 25-26] This is a strong motivating factor that can make a change in skin lightening practice very difficult. This study showed that advertisement, cost and checking product labels are not as significant as friendship with SL practices. Although the mean cost of SL soaps and body lotions/creams was higher than their non-SL counterpart, this was not enough to

influence their use among the students. It is possible that students who wish to lighten their skin are prepared to pay more for it. Moreover, SL creams are expected to cost more than non-SL creams. Although, this theory would have been further explored by comparing the average income of students using SL products with those using non-SL products. Since most of the students in this study reside in-campus, it is not surprising that more in-campus students used SL products. This is probably due to limitation in the available skincare products they have to choose from, since there are smaller numbers of cosmetic shops in-campus than out-campus. On the switch side, this can be an avenue for control and regulation by the university health authority.

There was a general misconception by the students that skin toning is not the same as skin bleaching. A significant number of students using SL body creams did not agree that skin toning is the same as skin bleaching/skin lightening. This is probably why they are comfortable using these creams despite their fair understanding of the side effects of skin lightening. Most students are usually not aware of the effect of chronic sun exposure on a whitened skin. [6] Finally, there was a generally poor knowledge and use of sunscreens among the students. The low use of sun protection creams with lightening agents has also been documented in South Africa. [27] This is probably because the information on the beneficial effects of sun protection creams among persons residing in the tropical region of the world has not been widely received.

CONCLUSION

This study has revealed the popular use of SL bath soaps and body creams among university students in Abuja. Mercury, hydroquinone and corticosteroids, and botanical and natural depigmenting agents such as arbutin, licorice and fruit extracts are active SL agents used by the students. Social peer pressure is extrinsically linked to perpetuation of SL

practice. Since most of the students do not understand that skin toning is same as skin lightening/bleaching/whitening, it is pertinent for an extensive education on these terminologies and on the importance of sun protection creams be carried out in our universities. Also, studies are needed to investigate the content and concentration of lightening agents in the available SL products in our locality as well as to address the long term effects and safety of using botanical and natural ingredients.

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