

## Discovery

## To Cite:

Ologun B, Amoo K, Moradeyo K, Ogra W, Oripelaye M. The prevalence, risk factors and predictors of use of bleaching creams in children: a neglected topical issue. *Discovery* 2025; 61: e27d3201 doi: <https://doi.org/10.54905/disssi.v61i339.e27d3201>

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## Peer-Review History

Received: 07 August 2025

Reviewed & Revised: 18/August/2025 to 27/November/2025

Accepted: 05 December 2025

Published: 12 December 2025

## Peer-Review Model

External peer-review was done through double-blind method.

Discovery

pISSN 2278-5469; eISSN 2278-5450



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# The prevalence, risk factors and predictors of use of bleaching creams in children: a neglected topical issue

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## ABSTRACT

Skin bleaching has been a common practice over the decades globally with its attendant local, and systemic complications. Several authors have investigated the practice of skin bleaching among the adult population. But there is a paucity of data among the paediatric age group as regards this practice. This study aims to look at the prevalence, associated factors and the likely predictors of use of bleaching creams among children attending the out-patient clinic of the Wesley Guild Hospital, Ilesa, South-west Nigeria. This was a cross-sectional observational study conducted among 300 children attending the paediatric out-patient clinic of the Wesley Guild Hospital, Ilesa, South-west Nigeria. Data obtained include: sociodemographic variables, types of cream being used by both the children and their mothers, duration of use, mothers' preference for skin color, and mothers' knowledge on skin bleaching. This study found that 29.3% of the children were using bleaching creams. The Median (IQR) duration of using skin-lightening creams was 14 (6-59) months. Moreso, 52.0% of the mothers were using bleaching creams. Factors that were found to be significantly associated with use of bleaching cream on the were: maternal use of bleaching creams, mothers' preference for light skin color, reasons for using the creams and mothers' perception of the type of skin color that confers beauty (P 0.000, 0.001, 0.007 and 0.001 respectively). Awareness of side effects of skin bleaching creams and sociodemographic variables were not significantly associated with the use of skin bleaching creams on the study participants. Beta-carotene extracts and hydroquinone were the commonly used skin bleaching agents. Significant factors that predicted the use of bleaching creams on children in this study were the use of bleaching cream by the mothers, reasons for using the creams and the skin color preferred by the mothers. Health education of the care givers on the danger of skin bleaching on children would likely go a long way to mitigate this societal menace.

**Keywords:** skin, bleaching, lightening, children

## 1. INTRODUCTION

The skin is one of the vital organs of the body and serves as the primary interface between an individual and the external environment. It serves various functions ranging from protection, thermoregulation, sensation, water storage, absorption, expression of emotion, synthesis of vitamin D and also of importance is the cosmetic

relevance (McKnight et al., 2022; Ibrahim et al., 2021). Although it mainly acts as a barrier, the skin also has the ability to absorb various substances, particularly lipophilic compounds.

Skin bleaching refers to the loss of skin color, which can occur due to various factors ranging from genetic to cosmetic factors. However, for cosmetic purposes, commonly used bleaching agents include hydroquinone, arbutin, azelaic acid, kojic acid, ascorbic acid and resveratrol (Liyanage et al., 2022). Though these agents have their therapeutic functions, they have been widely abused across different races, age groups, and socioeconomic strata.

Their mechanisms of action cover (i) tyrosinase inhibition, (ii) maturation and enhancement of tyrosinase degradation (iii) Mitf (Microphthalmia-associated transcription factor) inhibition; (iv) downregulation of MC1R activity; (v) interference with melanosome maturation and transfer; (vi) melanocyte loss, desquamation, and chemical peeling (Solano et al., 2006).

Skin bleaching is associated with profound negative impacts on the well-being of the skin. Some of the side effects include acne, thinning of the skin, ulcers, and onychomycosis (Mahe et al., 2003; Olumide et al., 2008; Yusuf et al., 2019). In spite of the current regulations on the use of skin bleaching agents, they continue to thrive and dominate the cosmetic industry for myriads of reasons (Pollock et al., 2020). The desire for an even skin tone pervades all cultures and regions of the world. Uniform skin color is considered a sign of beauty and youth (Saade et al., 2012).

According to the World Health Organization (WHO), 77% of women in Nigeria use skin lightening products, which was adjudged to be about the highest percentage in the world (WHO, 2023). Atadokpédé et al., (2015) found among secondary school students in central Benin the prevalence of voluntary skin depigmentation (VD) as 36.6%. Most studies about the burden and impact of skin lightening were performed among the adult population and adolescents, with a paucity of such studies in children. However, anecdotal reports have shown that skin-lightening agents are also being used among children.

Skin barrier function matures and reaches adult levels of transepidermal water loss, lipid compactness, stratum corneum thickness, and corneocyte size by the average age of about 6 years, while the melanin content in the skin also increases with age (Stamatas et al., 2023; Stamatas et al., 2011). Therefore, interrupting the skin structure and function at this developmental stage may cause more harm in children than in the adult population. However, there is paucity of data on the pattern of use of skin bleaching agents among children and hence this study.

This study aims to assess the proportion of children using bleaching creams, the type skin bleaching agents being used, risk factors and the predictors of use of skin bleaching creams among children seen at the Paediatrics department of Wesley Guild Hospital, Ilesa, Nigeria.

## 2. MATERIALS AND METHODS

This is a cross-sectional hospital-based study that was conducted among children attending the out-patient clinic and children emergency ward of the Wesley Guild Hospital Ilesa, Osun state, southwest, Nigeria.

**Sample size:** Was determined using the formula for determining prevalence (Kasiulevicius *et al.* 2006)

$$N = Z^2 P(1-P) / d^2$$

N= sample size

Z= confidence level at 95% confidence interval

P= expected prevalence (77% from WHO reports among Nigerian women)

D= desired precision

A minimum sample size of 272 was calculated, and with 10 % attrition, 300 participants were recruited into the study. Ethical approval was obtained from the ethics and research committee of the Obafemi Awolowo University Teaching Hospitals Complex, with the reference number: ERC/2025/06/05. Children between the ages of 6 months and 17 years were consecutively recruited into the study as they presented for the out-patient clinic consultation. Signed written consent was obtained from the caregivers, and an interviewer-administered questionnaire was used to get information about their socio-demographic details, names of creams used and duration of use, their knowledge about the constituents of the cream being used by the child and caregiver, skin color preference, and knowledge of the side effects of skin bleaching agents. Socioeconomic class was determined using the Olusanya social classification system; this uses the father's occupation and mother's highest level of formal education (Olusanya *et al.*, 1985). Children who were not using any cream were excluded from the study. The constituents of each cream used by the subjects were sought from online products

information, and from retail cosmetic shops to seek further information on the composition of these products. Creams were classified into bleaching and non-bleaching based on their product labels. Confidentiality was maintained at different stages of the study. Caregivers using bleaching creams were counseled on the possible outcomes of using skin bleaching creams, both on their children and themselves. Results were analyzed using Statistical Product and Service Solutions (SPSS) version 22.0 (IBM IL, Chicago, USA). Descriptive and inferential statistics were used, and p-value less than 0.05 was considered statistically significant.

3. RESULTS

Pattern of cream use among study participants

Three hundred mother-child pairs were recruited into this study. The median (IQR) age of the study participants was 4.3 (2.0-8.0) years. About half (51.3%) of the studied children were between the ages of 6 months and 59 months, with a male: female ratio of 1.2:1, and 72.3% of the study participants were from the middle social class. Among the study participants, 29.3% of them used creams that were found to contain skin-lightening/bleaching agents (Figure 1). The Median (IQR) duration of using skin lightening creams was 14 (6-36) months, ranging between 1-84 months. The sociodemographic details of the participants are shown in Table 1.

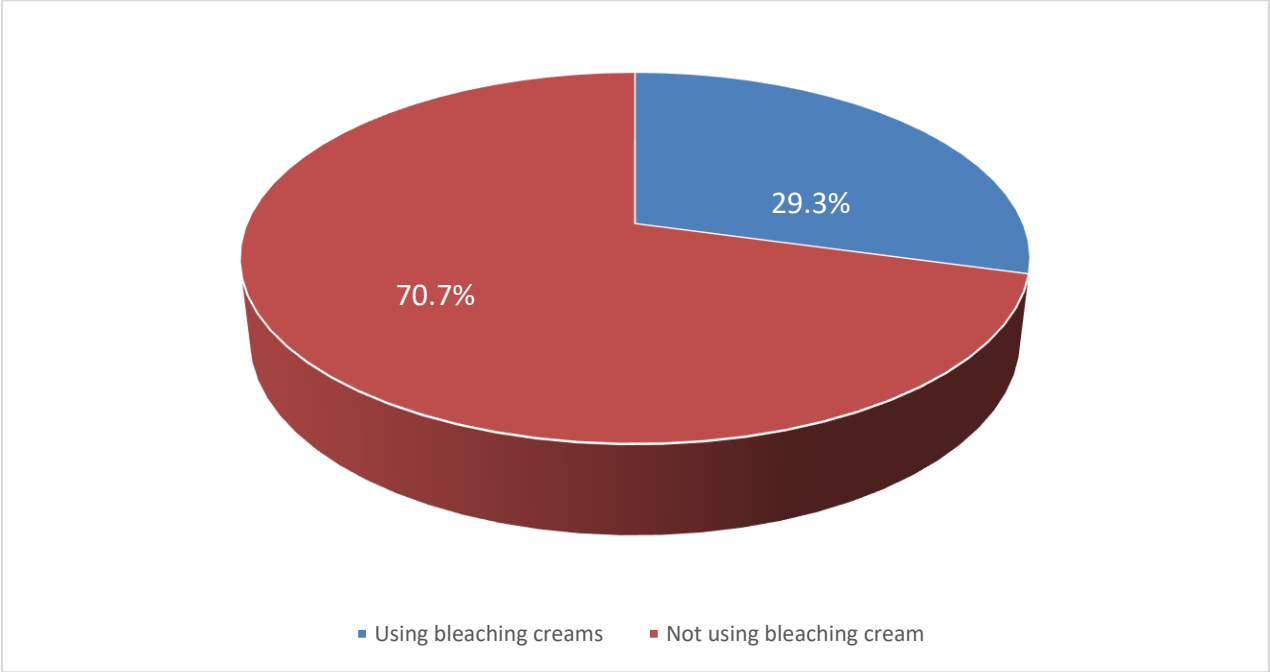


Figure 1: pie chart showing the type cream used by the children in this study

Table 1: Sociodemographic of the study participants

Variables	Frequencies N=300	Percentages
Age group		
6 months– 59 months	154	51.3
5 – <12 years	121	40.3
>12 – 18 years	25	8.3
Sex		
Male	165	55.0
Female	135	45.0

<b>Mothers' level of education</b>		
No formal education	3	1.0
Primary education	17	5.7
Secondary education	130	43.2
Post-secondary education	150	50.0
<b>Social class</b>		
Upper	47	15.7
Middle	217	72.3
Lower	36	12.0
<b>Ethnicity</b>		
Yoruba	275	91.7
Ibo	12	4.0
Hausa	4	1.3
Others	9	3.0
<b>Religion</b>		
Christianity	250	83.3
Islam	50	16.7

**Bleaching agents found in the cream labels used by the study participants.**

From Table 2, fifteen different bleaching agents were found in 32 branded creams. They either occur singly or as combination of more than one bleaching agents in each cream. The commonest of these bleaching agents was beta-carotene extract that accounted for 33.3% of these bleaching agents. Twelve children from this study were using medicated creams containing the combination of steroids, antifungal and antibacterial which they routinely applied as body creams.

**Table 2:** Bleaching agents found in the cream labels used by the study participants

Skin bleaching ingredients	Frequencies	Percentages
Beta-carotene extracts	40	33.3
Hydroquinone	31	25.8
Alpha hydroxy acid	10	8.3
Kojic acid	7	5.8
Ascorbic acid	7	5.8
Clobetasol	6	5.0
Beclomethasone	6	5.0
Arbutin	3	2.5
Glutathione	3	2.5
Betamethasone	2	1.7
Mometasone	1	0.8
Tretinoin	1	0.8
Hexylresorcinol	1	0.8
Niacinamide	1	0.8
Tranexamic Acid	1	0.8
Total	120	100.00

**Factors associated with the pattern of cream use among children**

No significance association observed between sociodemographic variable and the type of cream mothers used on their children as shown in Table 3a. However, Table 3b shows that over half of the mothers in this study use skin-lightening agents and almost a quarter of the mothers in this study preferred light skin color to other skin colors and 64.7 % of the mothers were aware of the side effects of using bleaching creams. Moreso, majority (79.7%) of the mothers were not aware of the constituents of the cream they use on their

children. There was also a significant relationship between the type of cream used among the children and mothers' skin colour of preference, the type of cream used by their mothers, reasons for using body creams, and the skin colour that mothers think confers beauty. However, no significant difference was observed between the type of cream used by the subjects and sharing of cream with parents, and the mothers' knowledge of the side effects of skin-lightening creams.

**Table 3a:** Relationship between sociodemographic variables and the type of cream used by the subjects (children)

Variables	Not using bleaching cream N=212	Using bleaching cream N=88	Total N=300	$\chi^2$	p-value
<b>Age group</b>					
6 months– 59 months	117 (55.2)	37 (42.0)	154 (51.3)	5.497	0.064
5 – <12 years	81 (38.2)	40 (45.5)	121 (40.3)		
>12 – 18 years	14 (6.6)	11 (12.5)	25 (8.3)		
<b>Sex</b>					
Male	113 (53.3)	52 (59.1)	165 (55.0)	0.842	0.359
Female	99 (46.7)	36 (40.9)	135 (45.0)		
<b>Mothers' level of education</b>					
No formal education	3 (1.4)	0 (0.0)	3 (1.0)	2.500	0.475
Primary education	13 (6.1)	4 (4.5)	17 (5.7)		
Secondary education	90 (42.5)	40 (45.5)	130 (43.2)		
Post-secondary education	106 (50.0)	44 (50.0)	150 (50.0)		
<b>Social class</b>					
Upper	37 (17.5)	10 (11.4)	47 (15.7)	3.245	0.197
Middle	147 (69.3)	70 (79.5)	217 (72.3)		
Lower	28 (13.2)	8 (9.1)	36 (12.0)		

**Table 3b:** Relationship between maternal-related factors and types of creams among study participants

Variables	Not using bleaching cream N=212	Using bleaching cream N=88	Total N=300	$\chi^2$	p-value
<b>Using the same cream with child</b>					
Yes	113 (53.3)	56 (63.6)	169 (56.3)	2.700	0.100
No	99 (46.7)	32 (36.4)	131 (43.7)		
<b>Type of mother's cream</b>					
Non-bleaching	123 (58.0)	9 (10.2)	132 (44.0)	67.581	0.000
Bleaching	80 (37.7)	76 (86.4)	156 (52.0)		
Not using cream	9 (4.3)	3 (3.4)	12 (4.0)		

<b>Awareness of the side effects of bleaching cream</b>					
Yes	139 (65.6)	55 (62.5)	194 (64.7)	0.256	0.613
No	73 (34.4)	33 (37.5)	106 (35.3)		
<b>Skin colour that confers beauty</b>					
Dark	56 (26.4)	8 (9.1)	64 (21.3)		
Chocolate	77 (36.3)	39 (44.3)	116 (38.7)	17.127	0.001
Light	38 (17.9)	28 (31.8)	66 (22.0)		
Any	41 (19.3)	13 (14.8)	54 (18.0)		
<b>Skin colour of preference</b>					
Dark	66 (31.1)	9 (10.2)	75 (25.0)		
Chocolate	77 (36.3)	38 (43.2)	115 (38.3)	16.826	0.001
Light	48 (22.6)	29 (33.0)	77 (25.7)		
Any	21 (9.9)	12 (13.6)	33 (11.0)		
<b>Reasons for using cream</b>					
Tone the body	15 (7.1)	12 (13.6)	27 (9.0)		
Treat skin blemishes	23 (10.8)	20 (22.7)	43 (14.3)		
A fashionable trend	9 (4.2)	8 (9.2)	17 (5.7)		
Make the child attractive	12 (5.7)	4 (4.5)	16 (5.3)		
Personal preference	37 (17.5)	11 (12.5)	48 (16.0)	15.818	0.007
No specific reason	116 (54.7)	33 (37.5)	149 (49.7)		
<b>Do you know the cream component</b>					
Yes	49 (23.1)	12 (13.6)	61 (20.3)		
No	163 (76.9)	76 (86.4)	239 (79.7)	3.448	0.063

#### Regression analysis of maternal-related factors on the use of cream among children in this study

Binary logistic regression was used for factors that had significant relationship with the type of cream among the study participants at  $p < 0.05$ , which are: the type of mothers' cream, preferred skin colour, the skin colour that was thought to confer beauty, and reasons for using the cream on the child, as seen in Table 4. The dependent variable was the type of cream the children were using and the predicted probability was the use of bleaching cream on children. The odd of using bleaching cream on children by mothers who uses bleaching creams on themselves was 37.7 times that of the mothers that were not using bleaching creams on themselves. (OR-37.727, CI: 13.222-107.652;  $p = 0.000$ ). Also, mothers whose reasons for using specific cream for their children were "to treat skin blemishes" had 4.551 odds of using bleaching creams on their children when compared to the mothers who had no specific reasons for using the creams they were applying on their wards. However, mothers whose skin colour of preference was dark colour were less likely to use bleaching cream on their wards (OR= 0.239; CI- 0.088-0.645;  $p = 0.005$ ).

**Table 4:** Regression analysis of maternal-related factors on the use of cream among children in this study.

Variables	B	S.E	Wald	Sig	Odds Ratio (OR)	95% C.I. for OR	
						Lower	Upper
<b>Type of mothers' cream</b>							
Depigmenting	3.630	0.535	46.052	0.000	37.727	13.222	107.652
Non depigmenting (ref)							

<b>Skin colour that confers beauty</b>							
Dark	-1.331	0.736	3.273	0.070	0.264	0.062	1.117
Chocolate	0.205	0.521	0.155	0.694	1.228	0.442	3.410
Light	1.040	0.580	3.216	0.077	2.830	0.908	8.822
Any (ref)							
<b>Reasons for using this cream for your child</b>							
Tone the body		0.678	3.391	0.066	3.487		
Treat skin blemishes	1.249	0.531	8.152	<b>0.004</b>	4.551	0.923	13.178
A fashionable trend	1.515	0.730	3.193	0.074	3.684	1.608	12.878
Make the child attractive	1.304	0.854	0.132	0.717	0.734	0.881	15.401
Personal preference	-0.310	0.561	0.057	0.811	0.874	0.138	3.912
No specific reason (ref)	-0.135					0.291	2.626
<b>Age group</b>							
0-5 (ref)							
6-12	1.231	0.487	6.390	<b>0.011</b>	3.424	1.319	8.892
12.1-17 yr	1.692	1.171	2.087	0.149	5.432	0.547	53.954
<b>Skin colour of preference</b>							
Dark							
Chocolate	-1.433	0.507	7.981	<b>0.005</b>	0.239	0.088	0.645
Light	-0.147	0.413	0.126	0.722	0.864	0.385	1.939
Any (ref)	0.056	0.432	0.017	0.897	1.057	0.454	2.464

#### 4. DISCUSSION

This study shows that about a third of the children studied were using skin-lightening creams and this is probably an involuntary act, as these children may not fully understand the impact and consequence of early commencement of skin-lightening agents in them. Moreover, the early exposure of children to the use of skin-lightening agents, coupled with their relative immature skin compare to adult, makes this practice potentially fatal for the paediatric population.

In this study, about half of the mothers use bleaching creams, which is similar to findings of Bakare et al., (2023) in a community-based study in Lagos, Nigeria, who reported the prevalence of skin depigmentation among adult population to be 52.7%. However, the finding is lower than the WHO report of 77% in Nigerian women. This might be as a result of the intensive campaign against the use of skin-lightening creams among the populace (Vanguard Newspaper, Nigeria, 2023).

It is worthy of note that 87.3% of children who use skin bleaching creams also have mothers that use bleaching creams which is statistically significantly higher than in children that don't use bleaching creams. This reflects the possible influence of maternal use of bleaching creams on their wards, as children cannot make informed decision on whether to use such products or not.

However, only 20.3% of the respondents knew the constituents of the cream they were using on their children, a worrying trend that is worse among the mothers of children using bleaching creams. Possibly they were instead attracted to these products based on other factors such as advertisement pictures, recommendation from other users rather than informed knowledge.

In this study, 69.1% of the mothers were aware of the side effects of bleaching creams but no significant relationship in the level of this knowledge in mothers and the types of cream used on their children. This shows that the knowledge of the harms associated with skin bleaching does not necessarily deter them from using bleaching creams on the children, as seen in this study. A similar finding was seen in the study of Asumah *et al.*, (2022) where knowledge of side effects of skin bleaching products among young adults in Ghana was found to be 76.5%.



Preference for light skin was significantly more among mothers who use bleaching creams on their children. This further buttresses the reports from previous studies in adult population where the light skin colour were perceived to confer more beauty, attraction to opposite sex and confer better advantages in life (Amodu, 2018; Asumah *et al* 2022).

The main reasons for using bleaching cream on children were: mothers' preference, toning of the body, and to "treat skin blemishes". This was consistent with reasons given in previous works by Bakare *et al.*, (2023), Apuke (2018) and Lewis *et al.*, (2011). These reasons though appear innocuous can serve as nidus to crave for skin bleaching in children. Therefore, intense health education regarding skin care should be carried out among mothers and caregivers to further mitigate this dangerous trend among the paediatric population.

Skin bleaching in children was significantly predicted by the types of cream mothers used on themselves, skin colour of preference, and the reason for the choice of cream on their children. Therefore, intense health education against skin bleaching practice among mothers will positively impact their children and the future generation at large.

## 5. CONCLUSION

The study found out the practice of use of skin bleaching agent in children is unacceptably high from this study. Maternal skin colour preferences, reasons behind the use of these products, and the practice of skin depigmentation by mothers themselves were the factors associated with skin-lightening practice among the children studied. Therefore, to mitigate this ugly trend, there must be a concerted effort among the paediatricians, dermatologists, civil society organisations, regulatory bodies and the government to increase awareness among the populace, enforce safety regulation in order to safeguard the paediatric population from this dangerous practice and its unintended health consequences.

### Acknowledgement

The authors have no acknowledgments to disclose.

### Authors contribution

This manuscript has been read and approved by all the authors, and the requirements for authorship as stated earlier in this document have been met, and each of the authors believes that this manuscript represents honest work done by us.

Busayo Ologun: Conceptualising the research, Collecting and curating data, conducting formal analysis, writing original draft, critically revising the manuscript.

Kazeem Amoo: Collecting and curating data, conducting formal analysis, writing original draft, critically revising the manuscript.

Khalimat Moradeyo: Collecting and curating data, critically revising the manuscript

Wando Ogra: Collecting and curating data, critically revising the manuscript.

Mufutau Oripelaye: Writing original draft, critically revising the manuscript.

### Informed consent

Written & Oral informed consent was obtained from individual participants included in the study.

### Conflicts of interests

The authors declare that they have no conflicts of interests, competing financial interests or personal relationships that could have influenced the work reported in this paper.

### Ethical approval & declaration

The study was done in conformity with ethical guidelines. Participation was entirely voluntary, and all respondents provided informed consent. The participants' anonymity and confidentiality were ensured, and the data obtained were utilized purely for the study. The ethical guidelines for Human Subjects are followed in the study.

### Funding

This research did not receive any external funding like specific grant from funding agencies in the public, commercial, or nonprofit sectors.



**Data and materials availability**

All data associated with this study will be available based on the reasonable request to corresponding author.

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