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Beauty Standards, Body Image, and the Construction of Feminine Identity: A Psychosocial Analysis of Skin Depigmentation (“Djanssang”) among Young Women in the Far North Region of Cameroon

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ABSTRACT

Skin depigmentation – termed "Djanssang" in Cameroon, "Khess-petch" in Senegal, "Tchobi" in the DRC, "Tcha" in Côte d'Ivoire, "Kakiri" in Uganda, and "Kupiga rangi" in Tanzania – is a prevalent yet psychologically under-studied cosmetic practice in sub-Saharan Africa. This convergent parallel mixed-methods study examined its psychosocial determinants among N = 200 women (aged 15–41) in the Far North Region of Cameroon across three constructs: beauty norms, body image, and feminine identity. Reflexive thematic analysis was applied to N = 15 semi-structured interviews. All three subscales demonstrated good-to-excellent reliability: beauty norms (M = 4.24, SD = 0.50, $\alpha = .805$, $\omega = .867$), body image (M = 4.26, SD = 0.53, $\alpha = .810$, $\omega = .877$), and feminine identity (M = 4.29, SD = 0.53, $\alpha = .841$, $\omega = .893$). A significant positive correlation was found between beauty norms and body image ($r = .263$, $p < .001$). Six qualitative themes emerged: normative colourism; digital media amplification; skin-tone-contingent self-esteem; identity transformation; psychological dependency; and risk awareness. Depigmentation is a psychosocially embedded practice sustained by internalised colourism, peer socialisation, patriarchal norms, and digital media. Culturally adapted clinical interventions and regulatory policy are urgently required.

Keywords: skin depigmentation; Djanssang; beauty norms; body image; feminine identity; colourism; mixed methods; psychosocial analysis

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Introduction

Epidemiological and Cultural Background

Skin depigmentation — the deliberate use of chemical or cosmetic products to lighten one's natural skin tone — is one of the most significant public health and psychosocial challenges in sub-Saharan Africa. The World Health Organization (2011) estimated that 77% of women in Nigeria, 59% in Togo, 35% in South Africa, and 30–40% in Cameroon use skin-lightening products, making Africa the region with the highest per-capita consumption globally (Raynaud et al., 2021). The practice is not marginal or deviant; it is a culturally normalised phenomenon affecting the majority of women in several national contexts. The global market for skin-lightening products was valued at approximately USD 8.6 billion in 2020 and is projected to reach USD 12.3 billion by 2027 (Ly et al., 2020), reflecting how deeply this practice is embedded in consumption patterns shaped by deeply unequal beauty hierarchies. The practice carries a rich vernacular nomenclature across the continent. In Cameroon it is popularly known as "Djanssang" — a term originally designating the spice *Ricinodendron heudelotii*, repurposed as slang for skin bleaching, evoking the transformation of one's natural colour. In Senegal, "Khess-petch" (literally "to peel the skin") dominates (Ly et al., 2020); in the Democratic Republic of Congo it is "Tchobi"; in Côte d'Ivoire "Tcha"; in Uganda "Kakiri"; in Tanzania "Kupiga rangi" (to paint oneself); and in Nigeria "toning" and "bleaching" coexist. This linguistic diversity is theoretically significant: it signals that depigmentation is a culturally codified social practice — one that communities have named, categorised, and integrated into everyday life — not merely a health risk imported from elsewhere. The social encoding of the practice in local idioms attests to its deep psychosocial inscription within the fabric of femininity and social aspiration across sub-Saharan African societies.

The dermatological consequences of depigmentation are well documented. Products commonly used contain hydroquinone, corticosteroids, and mercury compounds that progressively damage the skin barrier, producing paradoxical hyperpigmentation, ochronosis, skin thinning, increased photosensitivity, and — in the case of prolonged mercury exposure — systemic neurotoxic and nephrotoxic effects (Mahé et al., 2003). Yet the persistence of the practice in the face of these documented harms underscores that skin depigmentation cannot be adequately addressed through dermatological or public health lenses alone. Understanding why women initiate, maintain, and resist cessation of depigmentation requires engagement with the psychological, social, and identity dimensions

of the practice — dimensions that remain comparatively under-studied in the empirical literature, particularly in Central and West African contexts.

The Far North Region of Cameroon — the geographical focus of this study — presents a socio-cultural configuration of particular theoretical relevance. The region is predominantly Muslim, semi-arid, and among the most economically precarious in the country. Gender inequality indicators are among the highest nationally, with high rates of early marriage, limited female educational attainment, and deeply entrenched patriarchal norms that tightly regulate feminine presentation and social mobility (INS Cameroun, 2018). Simultaneously, digital media penetration has accelerated dramatically in recent years, with Instagram, TikTok, and Facebook now widespread even in peri-urban and rural zones. This juxtaposition — deeply patriarchal norms and accelerating digital media exposure — creates a psychosocial context in which beauty ideals, social comparison processes, and identity construction interact in ways that are distinctive from both Western contexts and from the coastal Cameroonian or West African contexts that have received more empirical attention. Yet no psychosocial study has examined the Far North Region — a significant gap in the literature that constitutes the primary justification for the present work.

Post-Colonial Roots of Colourism

Understanding depigmentation requires situating it within its post-colonial historical genealogy. Colourism — the preferential treatment of lighter-skinned individuals irrespective of racial category — did not emerge spontaneously in contemporary African societies but is a direct legacy of colonial administrations that systematically equated proximity to whiteness with civilisation, intelligence, and social merit (Fanon, 1952; Charles, 2011). The psychological violence of this system, described by Fanon (1952) in *Peau Noire*, *Masques Blancs*, instilled in colonised subjects a desire for whiteness as a condition of social and psychological recognition — a desire that colonial education systems, legal hierarchies, and European aesthetic standards actively cultivated and rewarded. The structural entrenchment of colourism during the colonial period created social fields in which skin tone functioned as a proxy for social worth, a function it has retained — and in several respects deepened — in the postcolonial era.

In the contemporary period, the logic of colourism has been amplified and globalised through transnational cosmetics industries that specifically target African, Asian, and Latin American markets with skin-lightening products (Glenn, 2008). Balogun (2020) demonstrates how, in Nigeria, skin bleaching has become an integral component of what she terms the "beauty bargain" — the strategic deployment of cosmetic practices to accumulate social capital in a

society structurally organised around colourism. This commercial amplification of colonial aesthetic hierarchies suggests that the structural conditions associated with depigmentation are not merely historical but are actively reproduced through advertising ecosystems, social media algorithms, and the informal cosmetics economy. This framing is theoretically indispensable: it prevents the reduction of the practice to an individual pathology or a sign of cultural ignorance, and instead situates it as a structurally induced response to social conditions that systematically reward lighter skin with prestige, marriageability, and economic opportunity.

Theoretical Framework

Four complementary frameworks structure this investigation. Social Comparison Theory (Festinger, 1954) posits that individuals evaluate their attributes by comparing themselves to salient social referents. In a sociocultural context where lighter-skinned women occupy the top of a culturally constructed beauty hierarchy, darker-skinned women are structurally induced into upward comparisons that generate appearance-related dissatisfaction and motivation to change (Fardouly et al., 2015; Jones, 2021). Tiggemann and Zaccardo (2015) extended this mechanism to digital platforms, demonstrating that social media exposure to idealised appearance images generates more intense appearance comparisons and lower body satisfaction than exposure to non-appearance content — a finding directly applicable to the Instagram and TikTok-mediated beauty norms documented in the present study.

Objectification Theory (Fredrickson & Roberts, 1997) provides a second analytical lens. This framework argues that in societies characterised by gender inequality and the cultural objectification of women's bodies, women are socialised to internalise an external evaluative gaze on their own corporeal selves — a process termed self-objectification. Self-objectification is theorised to be associated with chronic body surveillance, body shame, and the subordination of subjective experience to the imperatives of appearance conformity. In the context of depigmentation, skin colour becomes an additional dimension of the body subjected to this external gaze: women learn to appraise their skin tone from the standpoint of a real or imagined observer whose aesthetic standards are shaped by colourism, generating the contingent, tone-dependent self-evaluation documented throughout the results of this study.

Social Identity Theory (Tajfel & Turner, 1979) illuminates the identity dimensions of the practice. This framework proposes that individuals derive a significant portion of their self-concept from membership in social groups, and that they are motivated to maintain positive social identity by associating with positively valued groups. In colourism-structured

societies, lighter-skinned women constitute a socially valorised category that confers prestige, marriageability, and occupational advantages (Hunter, 2011; Balogun, 2020). Depigmentation thus functions as an identity mobility strategy — an attempt to cross the categorical boundary separating a devalued from a valued social group through modification of the categorical attribute (skin tone). Finally, Bourdieu's (1984) concept of habitus theorises why this identity logic resists purely informational intervention: depigmentation is not merely a consciously chosen behaviour but an embodied disposition accumulated through years of socialisation in a colourism-structured social field, one that generates practices associated with the reproduction of the very conditions sustaining it. This analysis carries a direct implication for public health: interventions that operate exclusively at the cognitive level — providing information about health risks or challenging individual attitudes — are unlikely to disrupt practices rooted in social structure and embodied habit.

Objectives and Hypotheses

The present study pursues three main objectives: (1) to describe the prevalence and characteristics of skin depigmentation practices among young women in the Far North Region of Cameroon; (2) to assess psychosocial correlates of depigmentation across three empirically operationalised dimensions — beauty norms, body image, and feminine identity; and (3) to explore, through qualitative in-depth interview data, the subjective meanings, lived experiences, and psychosocial processes associated with the practice. Three hypotheses were formulated: (H1) young women in the Far North Region widely adhere to a normative framework equating lighter skin with beauty and social worth; (H2) the practice of depigmentation is associated with appearance-contingent body image and skin-tone-sensitive self-esteem; and (H3) depigmentation is embedded in the construction of feminine identity and mediated by social norms, peer influence, and the logic of appearance-based social recognition.

Method

Research Design

A convergent parallel mixed-methods design was employed (Creswell & Plano Clark, 2017), integrating quantitative survey and qualitative interview data collected concurrently and merged at the interpretation stage. This design enables statistical generalisation alongside interpretive depth — qualities that single-method approaches cannot simultaneously achieve for this research problem.

Participants

The quantitative sample comprised $N = 200$ women in the Far North Region of Cameroon, recruited across urban (Maroua I, II, III), peri-urban, and rural zones (arrondissements of Bogu, Mindif, Meri). Inclusion criteria: female sex, age ≥ 15 years, current or prior use of depigmenting products (verified by screening question Q1). Purposive quota sampling ensured proportional representation across five age groups, four educational levels, and three residential zones. Data collection ran from May 2024 to January 2025, conducted by four trained research assistants under direct researcher supervision.

The qualitative sub-sample comprised $N = 15$ women who provided additional written consent for individual semi-structured interviews, aged 17–41, representing diverse socioeconomic profiles: students (F1, F5), traders (F2, F7, F11), agricultural/domestic workers (F3, F8), civil servants/teachers (F4, F10, F13), housewives (F6, F9, F14), and a healthcare auxiliary (F15). This diversity was deliberate, ensuring theoretical representativeness across age, occupation, and practice duration. Saturation was assessed using the iterative inductive approach of Braun and Clarke (2022): no substantively new codes emerged in interviews 13–15, confirming saturation (cf. Guest et al., 2006).

Instruments

The quantitative instrument was a structured questionnaire in four sections. Section 1: binary screening filter (Q1). Section 2: sociodemographic data (Q2–Q6: age, marital status, education, occupation, residence). Section 3: depigmentation practices (Q7–Q10: duration, frequency, product type, supply source). Sections 4–6: three exploratory Likert subscales (1 = Strongly Disagree to 5 = Strongly Agree), each comprising 5 items measuring: (a) Beauty Norms — internalisation of lighter-skin ideals and beliefs about their social advantages; (b) Body Image — appearance satisfaction, social comparison frequency, and skin-tone-contingent self-perception; and (c) Feminine Identity — centrality of appearance to identity, role of social recognition, and the depigmentation–confidence relationship. Items were developed from validated instruments (Cash, 2011; Fredrickson & Roberts, 1997) and adapted to the local context through expert panel review ($n = 3$ psychologists). Content validity was assessed using the Content Validity Index (CVI; Polit & Beck, 2006): all items achieved $CVI \geq .80$. Pilot testing ($n = 20$) confirmed comprehension and cultural appropriateness. Given the absence of pre-existing validated instruments adapted to this specific sociocultural context, subscales are treated as exploratory psychometric batteries subject to further validation. To address this limitation and provide preliminary empirical support for the proposed three-factor structure, an exploratory factor analysis (EFA) was conducted on the 15-item instrument ($N = 200$) using principal axis factoring with Varimax

rotation. Prior to the EFA, factorability was confirmed: the Kaiser–Meyer–Olkin measure of sampling adequacy was excellent ($KMO = .885$), and Bartlett’s test of sphericity was significant ($\chi^2(105) = 928.3, p < .001$), indicating that the correlation matrix was appropriate for factor analysis. Parallel analysis and the Kaiser criterion (eigenvalue > 1) both supported the extraction of exactly three factors, with eigenvalues of 4.28, 2.67, and 1.76 respectively, together accounting for 58.1% of the total variance. After Varimax rotation, factor loadings were structurally clear and aligned precisely with the a priori theoretical structure: Factor 1 (Body Image) was defined by BI1–BI5 (loadings .61–.70); Factor 2 (Beauty Norms) by BN1–BN5 (loadings .68–.74); and Factor 3 (Feminine Identity) by FI1–FI5 (loadings .66–.70). No item loaded above .32 on a non-primary factor, indicating simple structure and discriminant validity across the three dimensions. Mean communality was .581. These results provide preliminary empirical support for the three-factor structure of the instrument in this sample, while noting that independent CFA replication remains necessary before broader application.

The semi-structured interview guide comprised seven sections: (1) personal background and entry into the practice; (2) motivations; (3) beauty norms and social influences; (4) body image before and after depigmentation; (5) feminine identity and the meaning of appearance; (6) social consequences; and (7) closing reflection. Interviews were conducted in French or local languages (Fulfulde, Arabic Choa) with bilingual co-investigator translation.

Procedure and Ethical Considerations

Ethical clearance was obtained in April 2024 — prior to the onset of data collection — from the Délégation Régionale de la Recherche Scientifique et de l’Innovation, Far North Region, Cameroon (Ref. No. DRRSI-EN/027/2024), in accordance with the Declaration of Helsinki (1975, revised 2000). Written informed consent was obtained from all participants. For participants aged 15–17 ($n = 55$), parental/guardian consent and participant assent were obtained separately. Questionnaires were administered face-to-face in private settings. Interviews were digitally recorded with explicit consent, lasted 35–50 minutes, and fully transcribed verbatim. All data were anonymised using alphanumeric codes (F1–F15).

Data Analysis

Quantitative data were organised in an SPSS-compatible dataset ($N = 200 \times 28$ variables) and analysed using: (a) descriptive statistics — frequencies, percentages, means (M), standard deviations (SD), skewness, and kurtosis; (b) internal consistency — Cronbach’s alpha (α) and McDonald’s omega (ω); and (c) bivariate Pearson correlations; and (d) Spearman rank-order correlations (ρ) computed as a complementary non-parametric analysis

less sensitive to the non-normal, ceiling-affected distributions documented across all three subscales; and (e) an exploratory factor analysis (EFA) using principal axis factoring with Varimax rotation, conducted to examine the factorial structure of the 15-item instrument (see Instruments section for full results). McDonald's omega was computed as a supplementary reliability estimate more robust to skewed, ceiling-affected distributions (Hayes & Coutts, 2020). Qualitative data were analysed following Braun and Clarke's (2006, 2022) six-phase reflexive thematic analysis. This analytic approach is situated within a broadly constructivist epistemological framework, treating themes as generated through the active, interpretive engagement of the researcher with data rather than as pre-existing entities awaiting discovery (Braun & Clarke, 2022). Consistent with this posture, qualitative findings represent one possible analytical account of participants' experiences, not objective descriptions. The analysis sought to balance semantic (descriptive) and latent (interpretive) readings of the data: participant narratives are reported as closely as possible to participants' own language before researcher-level theoretical interpretation is offered. Where the Discussion moves from participant accounts to theoretical constructs (e.g., identity aspiration, psychological dependency features), this transition is clearly signalled and treated as researcher interpretation rather than direct empirical inference. Two independent coders analysed all transcripts; inter-rater reliability was assessed by Cohen's kappa ($\kappa = .82$, $p < .001$), indicating strong agreement.

Results

Sociodemographic Profile

Table 1 and Figure 1 present sample characteristics. The largest age groups were 15–19 years ($n = 55$; 27.5%) and 30–35 years ($n = 54$; 27.0%), the former reflecting early onset — a clinically significant finding identifying adolescence as a critical period for prevention. Single women constituted 29.5% of the sample; however, divorced (27.0%) and widowed (24.0%) women together represented 51.0%, demonstrating that motivations for depigmentation extend beyond partner attraction to encompass self-presentation and social identity across the life course. Secondary education predominated (50.0%), students/pupils were the largest occupational category (44.0%), and peri-urban residence was most common (47.5%), followed by rural (32.5%) and urban (20.0%), confirming geographic diffusion beyond urban centres.

Table 1. Sociodemographic Characteristics of Participants ($N = 200$)

Variable	Category	n	%
Age	15–19 yrs	55	27.5
	20–24 yrs	45	22.5
	25–29 yrs	30	15.0
	30–35 yrs	54	27.0
	Over 35 yrs	16	8.0
Marital status	Single	59	29.5
	Married	39	19.5
	Divorced	54	27.0
	Widowed	48	24.0
Education	None	21	10.5
	Primary	45	22.5
	Secondary	100	50.0
	Higher	34	17.0
Occupation	Student/Pupil	88	44.0
	Trader	49	24.5
	Civil servant	26	13.0
	Housewife	35	17.5
	Other	2	1.0
Residence	Urban	40	20.0
	Peri-urban	95	47.5
	Rural	65	32.5

Note. Percentages based on N = 200.

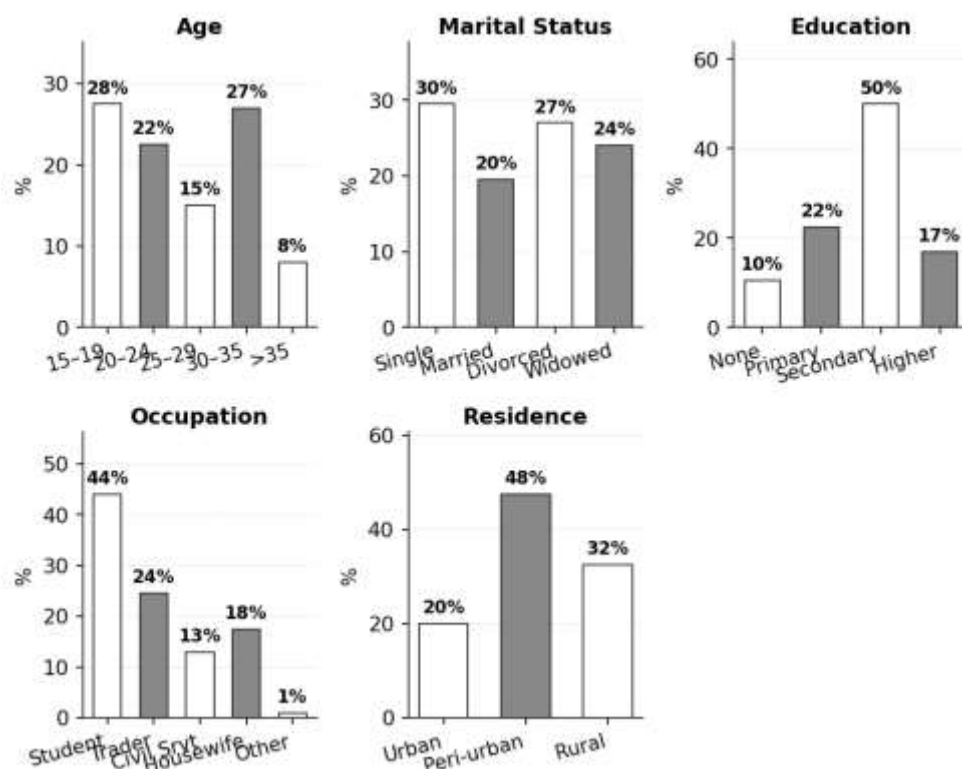


Figure 1. Sociodemographic profile of participants (N = 200). Alternating fills aid visual distinction.

Depigmentation Practices

Table 2 and Figure 2 describe depigmentation practices. Chronic use was predominant: 34.0% had been practising for 1–3 years and 33.5% for over 3 years (combined: 67.5%). Usage was regular or very regular for 76.0% of participants. Lightening creams dominated (94.0%), with home-made mixtures used by 4.5% — a higher-risk form involving product combinations typically without ingredient labelling. Supply sources were almost exclusively informal: market (51.0%) and cosmetic shops (42.5%), with pharmacy accounting for only 0.5%. This informal supply chain means participants access products without medical supervision, labelling requirements, or professional guidance — a structural vulnerability compounding individual psychological risk.

Table 2. Depigmentation Practices Among Participants (N = 200)

Variable	Category	n	%
Duration (Q7)	< 6 months	20	10.0
	6 months – 1 year	45	22.5
	1 – 3 years	68	34.0

	> 3 years	67	33.5
Frequency (Q8)	Rarely	36	18.0
	Occasionally	12	6.0
	Regularly	80	40.0
	Very regularly	72	36.0
Product type (Q9)	Lightening creams	188	94.0
	Pharmaceutical	1	0.5
	Traditional products	2	1.0
	Home-made mixtures	9	4.5
Source (Q10)	Market	102	51.0
	Pharmacy	1	0.5
	Cosmetic shop	85	42.5
	Beauty salon	12	6.0

Note. Percentages based on N = 200.

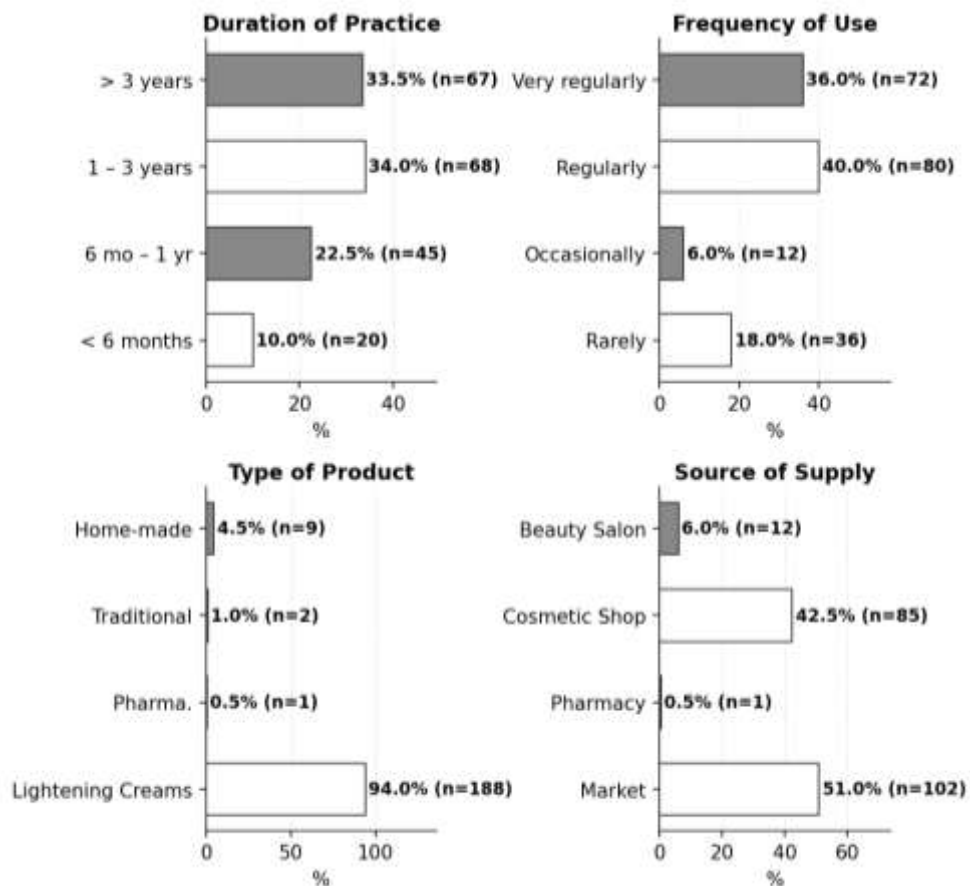


Figure 2. Depigmentation practices (N = 200). Values in parentheses show absolute counts.

Psychometric Properties and Descriptive Statistics

Table 3 presents item-level and scale-level statistics. Prior to scale analysis, distributional

properties of composite scores were examined: all three distributions were negatively skewed (BN: skewness = -0.57 , kurtosis = 0.27 ; BI: skewness = -0.47 , kurtosis = -0.27 ; FI: skewness = -0.64 , kurtosis = 0.14), confirming the anticipated ceiling effect for high-endorsement constructs in a purposively sampled depigmentation-practising population. Given these non-normal distributions, McDonald's omega (ω) was computed as a supplementary reliability estimate more appropriate than Cronbach's alpha for ceiling-affected data (Hayes & Coutts, 2020). All three subscales demonstrated good-to-excellent reliability: Beauty Norms ($\alpha = .805$, $\omega = .867$), Body Image ($\alpha = .810$, $\omega = .877$), and Feminine Identity ($\alpha = .841$, $\omega = .893$).

Beauty Norms ($M = 4.24$, $SD = 0.50$). The highest-endorsed items were "In my society, lighter skin is considered more beautiful" ($M = 4.40$, $SD = 0.60$; 94.0% agreement) and "Women with lighter skin are more socially valued" ($M = 4.36$, $SD = 0.60$; 93.5% agreement). Media influence ($M = 4.32$, $SD = 0.57$; 94.5% agreement) had the lowest item variance, suggesting that media's role is perceived as structurally given. Family/friend influence ($M = 4.08$, $SD = 0.76$; 79.0%) and social opportunity beliefs ($M = 4.03$, $SD = 0.76$; 76.0%) scored slightly lower yet remained above the midpoint.

Body Image ($M = 4.26$, $SD = 0.53$). Skin-tone-contingent items achieved the highest means: "I feel more beautiful when my skin is lighter" ($M = 4.34$, $SD = 0.65$; 91.0%), "My skin tone influences how I perceive myself" ($M = 4.37$, $SD = 0.61$; 94.0%), and "My appearance influences my self-confidence" ($M = 4.39$, $SD = 0.60$; 94.0%). Social comparison was nearly universal ($M = 4.37$, $SD = 0.57$; 95.5% agreement), providing direct support for Festinger's (1954) social comparison processes. The only item below the subscale mean was "I am satisfied with my physical appearance" ($M = 3.84$, $SD = 0.98$; 64.5% agreement; 8.5% disagreement) — the highest item-level variance in the instrument, reflecting heterogeneous baseline body satisfaction that depigmentation does not uniformly resolve.

Feminine Identity ($M = 4.29$, $SD = 0.53$). The highest-scoring item across all 15 was "Appearance plays an important role in how others perceive me" ($M = 4.55$, $SD = 0.53$; 98.5% agreement), confirming an overwhelmingly social and other-directed conception of feminine identity. The highest α (.841) and ω (.893) indicate that appearance-based feminine identity is the most internally consistent dimension.

Table 3. Descriptive Statistics for Likert Subscale Items ($N = 200$)

Item	SD/D (%)	N (%)	A/SA (%)	M (SD)
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Beauty Norms ($\alpha = .805$; $\omega = .867$; $M = 4.24$, $SD = 0.50$)				
Lighter skin more beautiful in my society	0.0	6.0	94.0	4.40 (0.60)
Women with lighter skin more socially valued	0.0	6.5	93.5	4.36 (0.60)
Media influences female beauty standards	0.0	5.5	94.5	4.32 (0.57)
Family and friends influence appearance choices	2.0	19.0	79.0	4.08 (0.76)
Lighter skin provides more social opportunities	1.5	22.5	76.0	4.03 (0.76)
Body Image ($\alpha = .810$; $\omega = .877$; $M = 4.26$, $SD = 0.53$)				
Satisfied with physical appearance	8.5	27.0	64.5	3.84 (0.98)
Often compare appearance to other women	0.0	4.5	95.5	4.37 (0.57)
Skin tone influences self-perception	0.5	5.5	94.0	4.37 (0.61)
Feel more beautiful when skin is lighter	0.5	8.5	91.0	4.34 (0.65)
Appearance influences self-confidence	0.0	6.0	94.0	4.39 (0.60)
Feminine Identity ($\alpha = .841$; $\omega = .893$; $M = 4.29$, $SD = 0.53$)				
Appearance important in woman's identity	4.0	18.0	78.0	4.08 (0.84)
Being perceived as beautiful important to identity	0.0	4.0	96.0	4.42 (0.57)
Depigmentation improves self-confidence	2.0	25.0	73.0	3.99 (0.78)
Social norms influence women's identity	0.5	6.0	93.5	4.42 (0.63)

Appearance plays important role in others' perception	0.0	1.5	98.5	4.55 (0.53)
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Note. M = Mean; SD = Standard Deviation; α = Cronbach's alpha; ω = McDonald's omega; SD/D = Strongly Disagree + Disagree (%); N = Neutral (%); A/SA = Agree + Strongly Agree (%). Scale: 1–5.

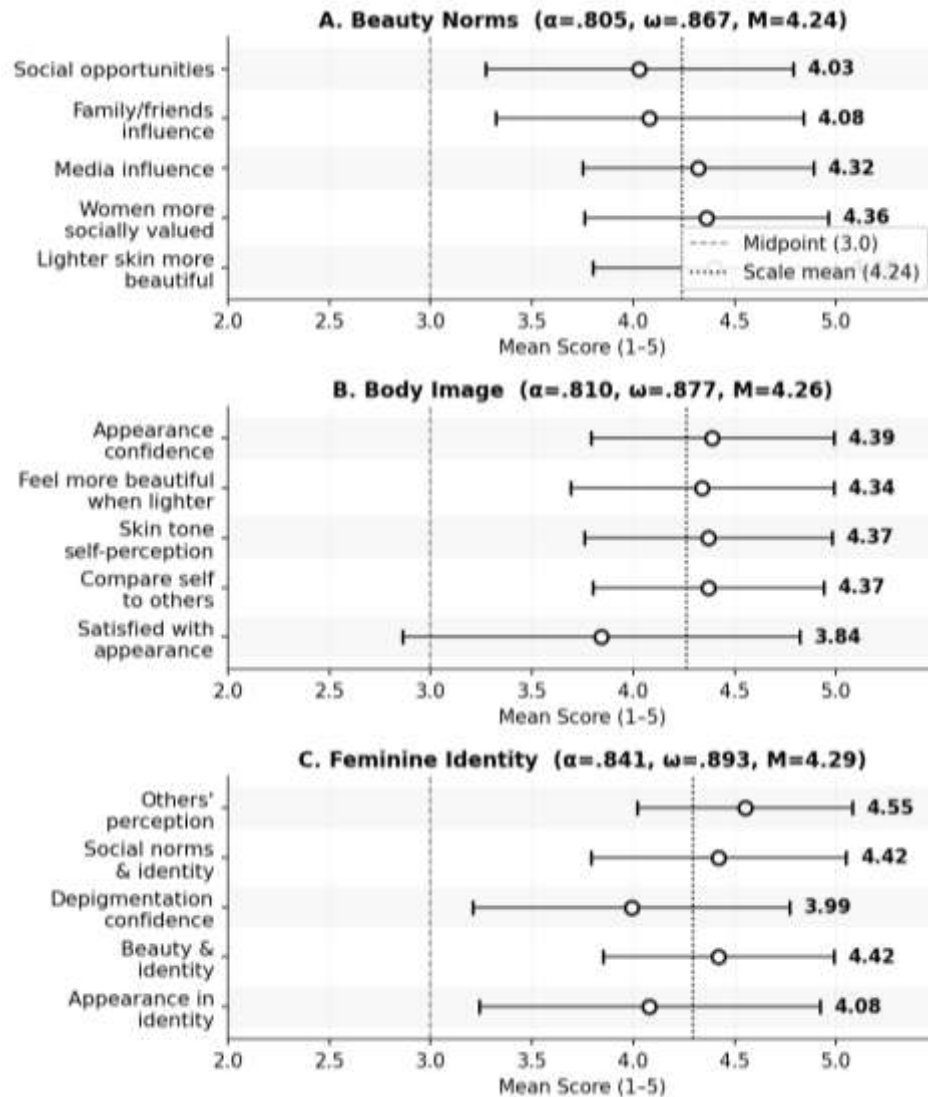


Figure 3. Mean Likert scores per item (N = 200). Error bars = ± 1 SD. Dashed line = midpoint (3.0); dotted line = subscale mean.

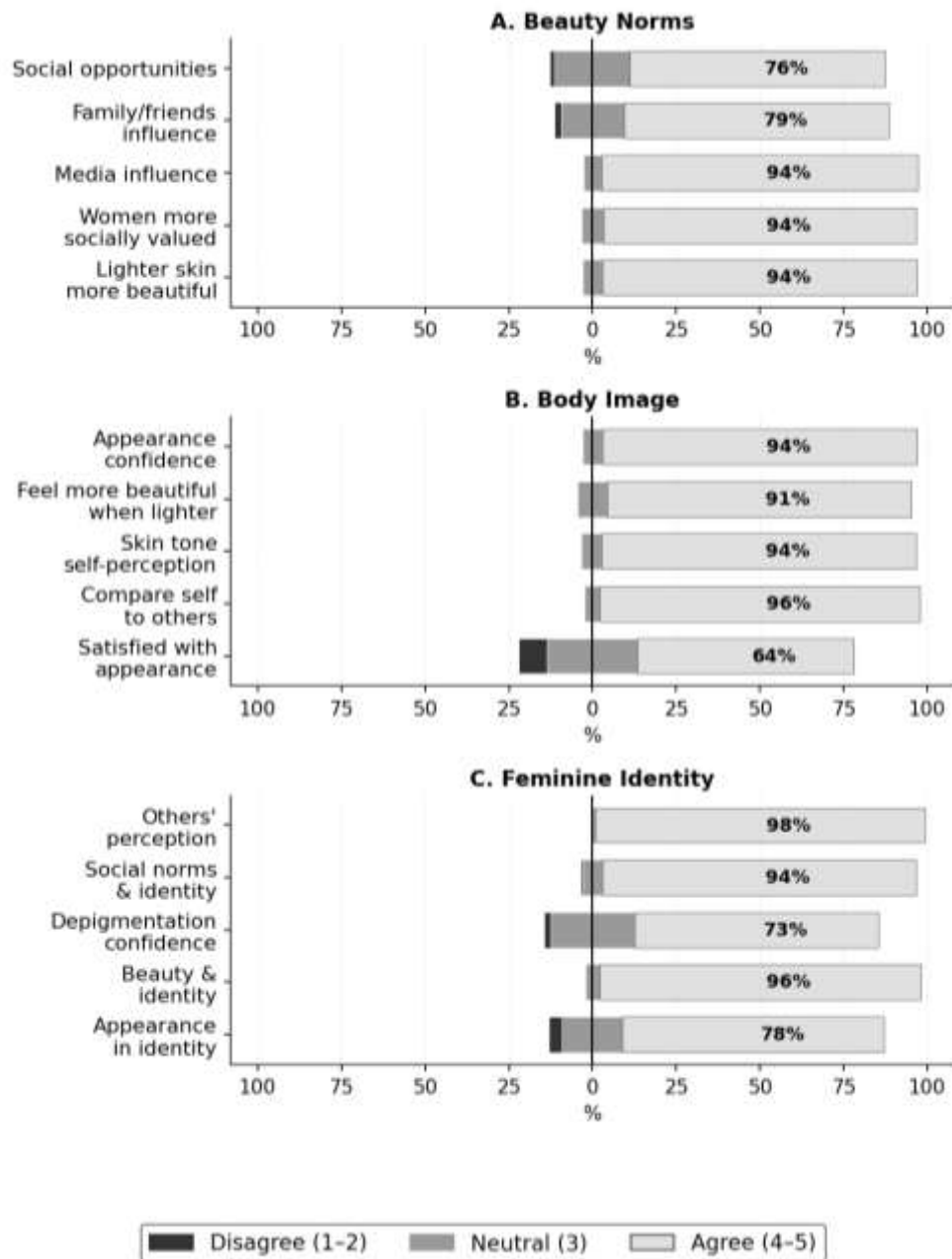


Figure 4. Diverging stacked bar distributions by dimension (N = 200). Left = disagreement; right = agreement relative to neutral centre.

Inter-Scale Correlations

Table 4 and Figure 5 present Pearson correlations. A statistically significant positive correlation was observed between Beauty Norms and Body Image ($r = .263$, $p < .001$), supporting the theoretical prediction that internalisation of colourism-driven beauty norms co-occurs with skin-tone-contingent body image — the central mechanism predicted by Social Comparison Theory (Festinger, 1954). The Beauty Norms–Feminine Identity ($r = .130$, $p = .067$) and Body Image–Feminine Identity ($r = .109$, $p = .126$) correlations were positive but did not achieve conventional significance thresholds.

The reduced magnitude of the latter two correlations warrants methodological consideration. All three composite distributions were negatively skewed (range: -0.47 to -0.64), producing restricted variance that attenuates Pearson r coefficients (Thorndike, 1949). As a non-parametric robustness check less sensitive to distributional assumptions, Spearman rank-order correlations were computed: results were consistent with Pearson estimates (BN–BI: $\rho = .252$, $p < .001$; BN–FI: $\rho = .124$, $p = .080$; BI–FI: $\rho = .104$, $p = .143$), confirming that the pattern of findings is not an artefact of non-normality and that restricted variance accounts for the non-significant associations. Applying Thorndike’s (1949) Case II range restriction correction ($r_c = r_o \times u / \sqrt{(1 - r_o^2 + r_o^2 u^2)}$; $u = SD_t / SD_o$) yields corrected coefficients of $r_c = .400$ (BN–BI), $r_c = .205$ (BN–FI), and $r_c = .163$ (BI–FI), indicating small-to-moderate true-score associations (Cohen, 1988). The unrestricted SD (SD_t) was conservatively estimated at 0.80 for all composites, derived from the mean observed item SD ($M = 0.67$) and mean inter-item r estimated from alpha ($\bar{r} \approx .45$), yielding restriction ratios $u = 1.60$ (BN) and $u = 1.51$ (BI, FI). Full correction details and parallel analysis results are reported in Supplementary Section S5.3b. These estimates suggest the non-significant BN–FI and BI–FI associations likely reflect range restriction rather than a true absence of association. Furthermore, the three subscales operate at theoretically distinct levels of abstraction — normative beliefs, self-evaluative cognitions, and identity constructs — expected to be associated through indirect mechanisms rather than strong direct correlations (Schmitt, 1996). The qualitative data provide direct evidence of these associative pathways.

Table 4. Pearson Correlations Among Three Subscales (N = 200)

Scale	1	2	3
1. Beauty Norms (M = 4.24, SD = 0.50)	—		
2. Body Image (M = 4.26, SD = 0.53)	.263**	—	
3. Feminine Identity (M = 4.29, SD = 0.53)	.130	.109	—

Note. ** $p < .001$. BN–BI: $r = .263$, $p < .001$; BN–FI: $r = .130$, $p = .067$; BI–FI: $r = .109$, $p = .126$. Non-parametric Spearman robustness check: BN–BI: $\rho = .252$, $p < .001$; BN–FI: $\rho = .124$, $p = .080$; BI–FI: $\rho = .104$, $p = .143$. Restricted variance due to negatively skewed distributions attenuates Pearson r coefficients; Spearman results confirm pattern consistency.

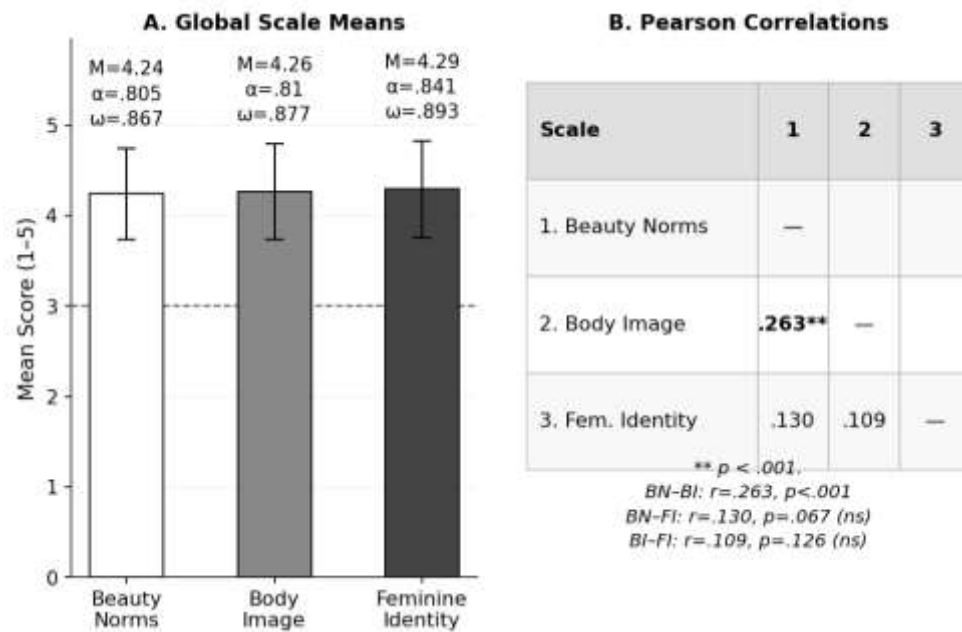


Figure 5. A: Global mean scores by dimension (± 1 SD error bars). B: Pearson correlation matrix. ** $p < .001$.

Qualitative Findings: Thematic Analysis

Six themes were generated from 15 interview transcripts (Table 5). Saturation was assessed using the iterative inductive criterion of Guest et al. (2006): no substantively new codes were produced in interviews 13–15, confirming adequate data depth.

Table 5. Themes, Descriptions, and Participant Codes (N = 15)

Theme	Description	Participants
T1. Normative colourism and social pressure	Lighter skin as community norm; peer/partner pressure; stigmatisation of dark skin across urban and rural contexts	F1–3, F5–6, F8, F10, F12
T2. Digital media amplification	Instagram/TikTok/Facebook as vectors of Eurocentric ideals; upward comparison; parasocial desire to emulate influencers	F1–3, F5, F7, F9, F11, F14
T3. Skin-tone-contingent body image	Depigmentation as targeted response to skin-colour dissatisfaction; confidence fragile and tone-dependent; chronic self-monitoring	F1–6, F8, F12, F15
T4. Identity transformation and aspiration	Practice as existential project of becoming "ideal self"; association with modernity and social mobility	F1–5, F7, F11, F13

T5. Psychological dependency	Difficulty stopping; anxiety at tonal variation; compulsive monitoring; self-esteem anchored to skin colour	F4, F6, F8–9, F13, F15
T6. Risk awareness and ambivalence	Knowledge of dermatological harm; intergenerational criticism; expressed regret; intention–behaviour gap	F3–6, F9–10, F14–15

Note. F1–F15 = participant codes. Reflexive thematic analysis (Braun & Clarke, 2006, 2022). $\kappa = .82$ inter-rater agreement.

Theme 1: Normative Colourism and Social Pressure.

All 15 participants described a social environment where lighter skin is normatively equated with beauty, cleanliness, and marriageability — across urban, peri-urban, and rural zones alike. Consistent with the quantitative finding of near-universal beauty norm endorsement (94–95% item agreement), social pressure operated through peers, partners, family, and commercial beauty networks.

F1 (24, student): "Here, everyone likes light women. When you're light, people say you're clean, pretty. Even for marriage, many men prefer lighter skin."

F3 (21, agricultural worker): "They said that if you stay dark, men will neglect you."

F12 (26, trader): "Even at the market, people treat you better when you're light. It's not just beauty — it's respect."

Theme 2: Digital Media Amplification.

Social media — particularly Instagram and TikTok — were identified by 13/15 participants as primary vectors of beauty norm socialisation, consistent with the near-universal quantitative endorsement of media influence ($M = 4.32$; 94.5% agreement). These platforms function as constant fields of upward social comparison, generating parasocial desire to emulate algorithmically curated, lighter-skinned female ideals.

F1: "Instagram, TikTok... the women you see there are always made-up, with light skin. It influences you."

F5 (17, secondary student): "We watch influencers. We want to look like them. If you're dark on social media, nobody notices you."

F2 (29, trader): "Everything shows that beauty means lighter skin. It enters the mind little by little. Even children now know it."

Theme 3: Skin-Tone-Contingent Body Image and Self-Esteem.

A consistent pattern emerged across all 15 interviews: self-perceived attractiveness, body satisfaction, and confidence were experienced not as stable internal states but as directly contingent on skin tone. This qualitative pattern corroborates the quantitative contrast

between high skin-tone-contingent item means ($M = 4.34\text{--}4.37$) and the lower, more dispersed general appearance satisfaction score ($M = 3.84$, $SD = 0.98$; 8.5% disagreement).

F1: "Before, I was a bit self-conscious — I found myself too dark. Now I feel prettier. Even if my skin burns sometimes, I like the result."

F4 (33, teacher): "There was a temporary improvement in self-esteem, but it was not lasting. In the long run, it creates a psychological dependency. You become dissatisfied as soon as your tone changes."

F6 (41, widow): "When my skin is light, I feel well. Otherwise, I'm not comfortable."

Theme 4: Identity Transformation and Aspiration.

Several participants described depigmentation in terms that suggest an aspiration toward an idealised self-image — an interpretation offered as one analytical framing, acknowledging that this researcher-level reading goes beyond participants' direct words. This theme directly contextualises the quantitative finding that feminine identity constructs were the most homogeneously endorsed dimension ($\alpha = .841$, $\omega = .893$). The significant BN–BI correlation ($r = .263^{**}$) is reflected qualitatively in the convergence between beauty norm internalisation (T1, T2) and identity aspiration (T4).

F1: "I feel more "complete", as if I had become the person I wanted to be."

F3: "I feel a little different, as if I have become more modern."

F13 (30, civil servant): "When you see how differently people treat you when you're light — at work, in meetings — you understand why women do this. It's not vanity, it's survival."

Theme 5: Psychological Dependency.

Long-term practitioners (F4: 4 years; F6: 8 years; F9: 5 years; F13: 6 years) described patterns that share features with those discussed in the literature on behavioural dependency: difficulty desisting despite awareness of harms; preoccupation with monitoring skin tone; anxiety when products were unavailable; and progressive prioritisation of the practice over financial and health concerns. It is important to emphasise that, given the small qualitative sub-sample ($N = 15$) and the absence of clinical assessment instruments, these findings should be interpreted cautiously as participant-reported experiences rather than clinical diagnoses. The narratives are suggestive of features overlapping with proposed criteria for cosmetic-related compulsive behaviour (cf. Veale, 2004), but are not sufficient to establish dependency as a clinical construct in this sample. These patterns nonetheless warrant systematic investigation in future research using validated clinical assessment tools.

F4: "I became dissatisfied as soon as my tone changed. I was dependent on a product just to feel normal."

F6: "It's a habit that is difficult to stop. The skin gets used to it, and you get used to seeing yourself lighter."

F9 (25, housewife): "I tried to stop twice. Both times I went back. When your skin returns to its natural colour, you feel ugly — it's not logical, but that's how it is."

Theme 6: Risk Awareness and Ambivalence.

Twelve of 15 participants demonstrated explicit knowledge of dermatological risks, yet this knowledge coexisted with continued use — the intention–behaviour gap (Webb & Sheeran, 2006) — attributable not to ignorance but to structural conditions constraining individual agency: social stigma of dark skin, patriarchal beauty norms, and the absence of alternative sources of self-worth not anchored to skin colour. This theme directly corroborates the Bourdieuan argument that practices rooted in habitus resist purely informational interventions.

F4: "I consider it the result of strong social pressure. It is not a completely free choice."

F6: "I regret having started. If I could go back, I would stay natural. My skin has never been the same."

F2: "If society accepted natural skin more, many women would not do this. It's the eyes of others that push — not the product itself."

Discussion

Beauty Norms: Structural Colourism and the Role of Digital Media

The near-universal endorsement of beauty norms ($M = 4.24$; 76–94% item agreement across all five items) confirms H1 and documents a level of normative consensus that is theoretically remarkable. The significant BN–BI correlation ($r = .263$, $p < .001$) provides the first empirical quantification of this association in the Far North Region of Cameroon, and constitutes direct quantitative evidence that beauty norm internalisation co-occurs with skin-tone-contingent body image, as predicted by Social Comparison Theory (Festinger, 1954). Crucially, this association is not incidental but structural: it reflects the mechanism through which colourism operates at the individual psychological level, translating normative beliefs about lighter skin into evaluative self-standards that govern daily self-perception.

The item on media influence ($M = 4.32$, $SD = 0.57$; 94.5% agreement) is particularly striking in that it carries the lowest variance of all 15 items in the instrument, indicating that the role of media in shaping beauty standards is perceived not as a variable individual experience but as an uncontested structural social fact. This finding extends recent literature on social media and body image (Sechi et al., 2020; Tiggemann & Zaccardo, 2015) to a sub-Saharan African

context, suggesting that the algorithmic amplification of Eurocentric beauty ideals through Instagram and TikTok may function as a powerful and pervasive vector of colourism socialisation. The qualitative data (Theme 2) deepen this analysis by revealing the specific mechanism at work: not passive consumption but active parasocial aspiration — women do not merely observe lighter-skinned influencers but desire to become them, transforming algorithmically curated images into personal identity templates. This finding has direct implications for intervention: media literacy programmes that help women critically analyse the algorithmic construction of beauty standards represent a potentially high-impact, scalable component of any prevention strategy.

The slightly lower but still elevated scores for family/friend influence ($M = 4.08$, $SD = 0.76$; 79.0%) and social opportunity beliefs ($M = 4.03$, $SD = 0.76$; 76.0%) — both well above the scale midpoint yet more dispersed — indicate that interpersonal and economic motivations are present but more variably experienced than the broader normative and media-driven forces. This pattern suggests that the primary drivers of depigmentation in this context operate at the structural level (media, normative hierarchies) rather than exclusively through interpersonal channels, with practical implications for the design of prevention interventions: programmes focused exclusively on family or peer dynamics are unlikely to address the dominant driving forces.

Body Image: The Mechanism of Skin-Tone-Contingent Self-Esteem

The body image findings confirm H2 and reveal a psychologically coherent and clinically significant mechanism. The convergence of high skin-tone-contingent item means ($M = 4.34\text{--}4.39$) with near-universal social comparison endorsement ($M = 4.37$; 95.5% agreement) is consistent with the upward comparison mechanism described by Festinger (1954): the data suggest that women may continuously evaluate their skin tone relative to a socially defined standard, and that this comparison process is associated with appearance-related self-evaluation and motivation to change. The qualitative elaboration of this mechanism in Theme 3 adds an important phenomenological dimension: the contingency of self-esteem on skin tone is not a static cognitive structure but a dynamic, fluctuating experience that intensifies in response to tonal irregularities, product unavailability, or observed proximity to lighter-skinned peers.

The clinically significant exception across the body image items is the general appearance satisfaction item ($M = 3.84$, $SD = 0.98$; 8.5% disagreement — the highest disagreement rate in the instrument). This pattern is theoretically important because it reveals the specific psychological structure of depigmentation-related body image: women experience high skin-

tone-contingent self-evaluation (driven by upward comparison and colourism norms) alongside heterogeneous baseline body satisfaction that the practice does not uniformly resolve. This dissociation is consistent with Cash's (2011) distinction between appearance investment — the degree to which appearance is central to self-evaluation — and appearance evaluation — the degree of satisfaction with one's appearance. High appearance investment, which is documented throughout this sample, does not guarantee positive appearance evaluation; rather, it creates a psychologically precarious configuration in which self-esteem is anchored to the maintenance of a cosmetic standard that is inherently unstable and dependent on continuous product use.

This configuration has direct clinical implications. Standard cognitive-behavioural body image interventions (Cash, 2011) target the modification of dysfunctional appearance-related cognitions and the reduction of appearance investment. In the context of depigmentation, however, appearance investment is not simply an idiosyncratic cognitive distortion but the expression of a rational adaptation to a social environment that systematically rewards conformity to lighter-skin standards. Effective clinical intervention must therefore combine cognitive restructuring with the cultivation of appearance-independent sources of self-worth and — crucially — with community-level work aimed at addressing the normative environment associated with high levels of appearance investment in this context.

Feminine Identity and the Social Constitution of Selfhood

The Feminine Identity subscale yielded the highest reliability in the instrument ($\alpha = .841$, $\omega = .893$), confirming H3 and establishing appearance-based feminine identity as the most internally consistent and homogeneously endorsed dimension. The single highest-scoring item across all 15 items in the study — "Appearance plays an important role in how others perceive me" ($M = 4.55$; 98.5% agreement) — reveals a conception of feminine selfhood that is constitutively social and other-directed: one's identity as a woman is constituted not through internal self-referential processes but through the external evaluative gaze of others, and appearance — specifically the dimension of skin colour that can be modified through depigmentation — is its primary determinant.

This finding is fully consistent with Objectification Theory's (Fredrickson & Roberts, 1997) account of the internalised external gaze, but it goes further: it demonstrates that for these women, appearance-based social recognition is not merely one component of self-concept but the dominant organising principle of feminine identity. The qualitative language of Themes 4 and 5 illuminates the existential stakes of this configuration with particular clarity.

When F1 describes feeling "more complete" after depigmentation, or when F13 frames the practice as a matter of "survival" rather than vanity, they are articulating a phenomenology of identity in which skin colour functions as a passport to social recognition. This is precisely the identity mobility logic described by Tajfel and Turner (1979): the attempt to cross the categorical boundary from a devalued to a valued social identity by modifying the attribute through which one is categorised.

Bourdieu's (1984) concept of habitus is indispensable for understanding the entrenchment of this identity logic. The practice is not a freely revisable choice but an embodied disposition accumulated through years of socialisation in a colourism-structured social field. This analysis accounts for the pattern documented in Theme 6: women who are fully aware of the health risks of depigmentation and who express genuine regret about the practice nonetheless continue, not because information about risks is absent but because the structural conditions that make lighter skin a condition of social recognition remain unchanged. No amount of risk communication will resolve an intention–behaviour gap that is produced by structural social conditions rather than by informational deficits. Effective intervention must target the social field itself — the normative, economic, and media structures that make colourism a rational adaptation rather than a freely chosen aesthetic preference.

Qualitative–Quantitative Convergences: Implications for Theory and Practice

The convergent mixed-methods design of this study enables a level of analytical integration that neither approach could achieve alone. The specific added value of the MM design lies in three complementary contributions. First, the qualitative strand illuminates the mechanisms and meanings underlying the quantitative associations, explaining not merely what co-occurs statistically but why and how: the significant BN–BI correlation ($r = .263$) is not merely a statistical regularity but, as Themes 1–3 reveal, the product of a specific mechanism — upward social comparison mediated by peer networks and digital media — whose operation would be invisible to quantitative data alone. Second, the qualitative data contextualise and help explain the non-significant BN–FI and BI–FI correlations: these associations involve indirect, experientially complex pathways (social recognition, identity aspiration, dependency dynamics) rather than direct linear co-variation, which explains why they do not reach significance under range-restricted conditions. The qualitative Themes 4–6 thus extend the quantitative findings by revealing the identity and motivational architecture that connects beauty norm internalisation to feminine identity through lived experience rather than through measurable direct correlation. Third, the quantitative distributions raise hypotheses that the qualitative data answer: the near-total ceiling on colourism norm

endorsement (94–95% item agreement) raises the question of why so little variance remains, which Themes 1–2 answer by documenting the social enforcement mechanisms (partner pressure, peer surveillance, algorithmic curation) that foreclose heterogeneity of belief. Four cross-method convergences are particularly significant for theory and practice. First, the significant BN–BI correlation ($r = .263$, $p < .001$) is not merely a statistical finding but maps precisely onto the qualitative narrative of Themes 1–3: the mechanism connecting beauty norm internalisation (T1, T2) to skin-tone-contingent body image (T3) is the upward social comparison process, documented both quantitatively ($M = 4.37$ for comparison item; 95.5% agreement) and qualitatively through participants' accounts of constant self-monitoring relative to lighter-skinned women in their social environment and on social media. Second, Theme 5 (psychological dependency) extends prior dermatological literature on product dependence (Mahé et al., 2003) decisively into the psychological domain. The patterns reported by long-term practitioners — difficulty desisting, anxiety at tonal variation, escalation of use, return to practice after cessation attempts — share features with criteria proposed for behavioural dependency in the DSM-5 framework (Veale, 2004). However, given the qualitative nature of the data and the small sub-sample ($N = 15$), these patterns should be understood as suggestive rather than conclusive, and the term “psychological dependency” is used here as a descriptive shorthand for a cluster of reported experiences, not as a clinical diagnosis. These findings nonetheless support calls for the development of culturally adapted psychological assessment tools that could systematically evaluate such patterns in larger, clinically assessed samples.

Third, Theme 6 (risk awareness and ambivalence) provides qualitative confirmation that the intention–behaviour gap documented in the depigmentation literature (Webb & Sheeran, 2006) is not a product of ignorance but of structural constraint. Participants such as F4, who explicitly frames the practice as “not a completely free choice,” and F2, who attributes continued practice entirely to “the eyes of others,” are performing a sociological analysis of their own behaviour that is entirely accurate: they are constrained by a social environment in which refusing to depigment carries social, economic, and relational costs that purely individual willpower cannot overcome. Fourth, the early onset data (27.5% of participants aged 15–19) flag adolescence as a critical developmental window for prevention, consistent with what Harter (2012) identifies as the heightened susceptibility to peer evaluation and appearance-contingent self-esteem during this developmental period. School-based intervention programmes specifically designed for this age group, grounded in local cultural and religious values, represent one of the most promising and cost-effective approaches for

reducing initiation of depigmentation in this region.

Limits of the research and futures prospectives

The cross-sectional design precludes causal inference; all associations reported should be read as cross-sectional co-occurrences, not as directional or causal relationships. The exploratory Likert subscales, while demonstrating good-to-excellent psychometric properties in this sample (α range: .805–.841; ω range: .867–.893), are largely context-specific and partially ad hoc, despite being theoretically informed by prior literature. A preliminary EFA was conducted in the present sample ($KMO = .885$; $\chi^2(105) = 928.3$, $p < .001$; three factors explaining 58.1% of variance; all loadings .61–.74 on their primary factor), providing preliminary support for the three-factor structure. However, CFA replication in independent samples has not yet been conducted, and the instrument remains context-specific and partially ad hoc. Independent CFA validation is required before broader application. Although the BN–BI correlation is significant ($r = .263$, $p < .001$; Spearman $\rho = .252$, $p < .001$), the BN–FI and BI–FI correlations remain non-significant — a pattern attributable to restricted variance (ceiling effect) and distinct levels of abstraction (Schmitt, 1996). The purposive quota sampling strategy and the inclusion criterion requiring current or prior depigmentation product use substantially constrain generalisability: findings cannot be extended to women who have never used depigmenting products, to other age groups, or to other regions without replication. These sampling choices likely introduced selection bias, as women with stronger engagement in the practice may be overrepresented. The qualitative sub-sample ($N = 15$), appropriate for reflexive thematic analysis (Guest et al., 2006), limits interpretive transferability; interpretations drawing on constructs such as “psychological dependency” or “identity aspiration” should be understood as researcher-level analytical framings rather than established empirical conclusions. Future studies should employ longitudinal designs, probability-based sampling, validated instruments with confirmed EFA/CFA-established factorial validity, and cross-regional comparative frameworks.

Conclusion

This study provides a comprehensive psychosocial account of skin depigmentation ("Djanssang") among young women in the Far North Region of Cameroon, with three original contributions. First, it is the first mixed-methods psychosocial investigation of this region. Second, it systematically maps the pan-African vernacular nomenclature of the practice, positioning it as a culturally codified phenomenon. Third, it demonstrates a significant positive association between beauty norm internalisation and body image

($r = .263$, $p < .001$) — the first empirical quantification of this relationship in a sub-Saharan African sample. Practical imperatives include: culturally adapted cognitive-behavioural interventions for appearance-contingent self-worth; school-based body-positive programmes targeting early adolescence; media literacy education addressing algorithmic amplification of Eurocentric beauty ideals; and regulatory restrictions on informal sale of mercury- and corticosteroid-containing products.

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Ethical approval: Ethical clearance was obtained in April 2024, prior to data collection, from the Délégation Régionale de la Recherche Scientifique et de l'Innovation, Far North Region, Cameroon (Ref. No. DRRSI-EN/027/2024), in accordance with the Declaration of Helsinki (1975, rev. 2000).

Data availability: The anonymised SPSS-compatible dataset ($N = 200 \times 28$ variables) is available from the corresponding author upon reasonable request.

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SUPPLEMENTARY MATERIALS

Beauty Standards, Body Image, and the Construction of Feminine Identity:

A Psychosocial Analysis of Skin Depigmentation (“Djanssang”)

among Young Women in the Far North Region of Cameroon

Submitted to Journal of Clinical & Developmental Psychology (JCDP)

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Data: The anonymised dataset ($N = 200 \times 28$ variables) is available from the corresponding author upon reasonable request. No personal identifying information is included.

Contents of these Supplementary Materials:

- S1 — Data collection protocol and field instructions
- S2 — Semi-structured interview guide (French + English translation, 24 questions)
- S3 — Questionnaire instrument (French + English translation, Q1–Q25)
- S4 — SPSS dataset codebook ($N = 200$, 28 variables)
- S5 — Complete quantitative analysis (descriptives, reliability, correlations, multiple regression)
- S6 — Complete qualitative analysis (thematic coding procedure, inter-rater reliability, saturation)
- S7 — Full verbatim excerpts by theme ($N = 15$ participants, Themes T1–T6)
- Note: Figures 1–5 and Table 5 (qualitative themes) are included in the main manuscript body.

S1. Data Collection Protocol and Field Instructions

Study Overview

This study employed a convergent parallel mixed-methods design (Creswell & Plano Clark, 2017) in which quantitative survey data and qualitative interview data were collected concurrently by the principal researcher and four trained research assistants, and subsequently merged at the interpretation stage. Data collection took place in the Far North Region of Cameroon between May 2024 and January 2025.

Sampling Strategy

A purposive quota sampling strategy ensured proportional representation across five age strata (15–19, 20–24, 25–29, 30–35, >35 years), four educational levels (none, primary, secondary, higher), and three residential zones (urban: Maroua I, II, III; peri-urban; rural: arrondissements of Bogo, Mindif, Meri). Target quotas per cell were defined in advance and monitored throughout data collection.

Inclusion/Exclusion Criteria

Inclusion criteria: (a) Female sex; (b) Age ≥ 15 years; (c) Current or prior use of skin-lightening/depigmenting products, verified by screening question Q1: “Do you use or have you used skin-lightening products?” Participants who responded “No” to Q1 were excluded. Exclusion criteria: male sex; age < 15 years; refusal to consent.

Ethical Procedures

Ethical clearance was obtained in April 2024 from the Délégation Régionale de la Recherche Scientifique et de l’Innovation, Far North Region, Cameroon (Ref. No. DRRSI-EN/027/2024), prior to data collection, in accordance with the Declaration of Helsinki (1975, revised 2000). Written informed consent was obtained from all participants. For participants aged 15–17 years ($n = 55$), parental/guardian consent and participant assent were obtained separately. All data were anonymised using alphanumeric codes.

Quantitative Data Collection Procedure

Research assistants ($n = 4$) underwent two days of training prior to data collection, covering: questionnaire administration procedures; ethical conduct; handling of sensitive questions; neutrality in item presentation; and recording of missing data. Questionnaires were administered face-to-face in private settings, with items read aloud for participants with lower literacy levels in French, Fulfuldé, or Arabic Choa as appropriate.

Qualitative Data Collection Procedure

From the quantitative sample, $N = 15$ women were purposively selected for individual semi-structured interviews on the basis of diversity in age, occupation, marital status, practice duration, and residential zone. All 15 women provided separate written consent for audio recording. Interviews were conducted individually in private settings, lasted 35–50 minutes, and were conducted by the principal researcher. Audio recordings were transcribed verbatim. Interviews in Fulfuldé or Arabic Choa were translated into French by a bilingual co-investigator and verified by the principal researcher.

S2. Semi-Structured Interview Guide

The following guide was used for all 15 individual semi-structured interviews. The guide is structured thematically but was applied flexibly. Probes are indicated in brackets. The guide was available in French; interviews in Fulfuldé or Arabic Choa used an oral translation by the bilingual co-investigator.

Preamble (read to all participants)

Bonjour et merci d'avoir accepté de participer à cette étude. Je suis chercheur(e) à l'Université de Maroua. Cette entrevue porte sur vos expériences et opinions concernant les produits éclaircissants pour la peau. Il n'y a pas de bonne ou de mauvaise réponse. Tout ce que vous direz restera strictement confidentiel. Avec votre autorisation, j'enregistrerai notre conversation. [EN: Good morning and thank you for agreeing to participate in this study. I am a researcher at the University of Maroua. This interview is about your experiences and opinions regarding skin-lightening products. There are no right or wrong answers. Everything you say will remain strictly confidential. With your permission, I will record our conversation.]

Section 1 — Personal Background and Entry into the Practice

Q1. Pouvez-vous me parler un peu de vous? (âge, situation familiale, profession)

[EN: Could you tell me a bit about yourself? (age, family situation, profession)]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q2. Depuis quand utilisez-vous des produits éclaircissants? Comment avez-vous commencé?

[EN: How long have you been using skin-lightening products? How did you start?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q3. Qui vous a introduite à cette pratique? [Probe: famille, amies, partenaire, réseaux sociaux?]

[EN: Who introduced you to this practice? [Probe: family, friends, partner, social media?]]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 2 — Motivations and Reasons

Q4. Pourquoi utilisez-vous ces produits? Qu'est-ce qui vous a motivée?

[EN: Why do you use these products? What motivated you?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q5. Qu'espérez-vous obtenir en les utilisant? [Probe: beauté, mariage, emploi, confiance?]

[EN: What do you hope to achieve by using them? [Probe: beauty, marriage, employment, confidence?]]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q6. Y a-t-il des moments ou des circonstances qui vous y poussent davantage?

[EN: Are there particular moments or circumstances that push you more to use them?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 3 — Beauty Norms and Social Influences

Q7. Comment décririez-vous les standards de beauté dans votre société?

[EN: How would you describe beauty standards in your society?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q8. Pensez-vous que la peau claire est valorisée socialement dans votre entourage? Pourquoi?

[EN: Do you think lighter skin is socially valued in your environment? Why?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q9. Les médias (réseaux sociaux, télévision, publicités) influencent-ils vos choix d'apparence? Comment?

[EN: Do media (social networks, television, advertising) influence your appearance choices? How?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q10. Votre famille, vos amies ou votre partenaire ont-ils une influence sur cette pratique?

[EN: Does your family, friends or partner influence this practice?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 4 — Body Image Before and After Depigmentation

Q11. Comment vous sentiez-vous dans votre corps avant de commencer?

[EN: How did you feel about your body before you started?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q12. Comment vous sentez-vous maintenant? Votre image de vous-même a-t-elle changé?

[EN: How do you feel now? Has your self-image changed?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q13. Vous comparez-vous à d'autres femmes? Comment cela influence-t-il votre décision?

[EN: Do you compare yourself to other women? How does this influence your decision?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q14. Votre confiance en vous dépend-elle de la clarté de votre peau? Expliquez.

[EN: Does your self-confidence depend on your skin lightness? Please explain.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 5 — Feminine Identity and the Meaning of Appearance

Q15. Quelle importance accordez-vous à l'apparence physique dans votre identité de femme?

[EN: How important is physical appearance to your identity as a woman?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q16. La façon dont les autres vous perçoivent change-t-elle quand votre peau est plus claire?

[EN: Does the way others perceive you change when your skin is lighter?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q17. Vous sentez-vous plus «complète» ou «femme» avec une peau plus claire? Pourquoi?

[EN: Do you feel more "complete" or "womanly" with lighter skin? Why?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 6 — Social Consequences

Q18. Comment votre entourage réagit-il à votre utilisation de ces produits?

[EN: How does your entourage react to your use of these products?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q19. Avez-vous remarqué des différences dans la façon dont on vous traite selon votre teint?

[EN: Have you noticed differences in how you are treated depending on your skin tone?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q20. Y a-t-il des avantages sociaux ou professionnels que vous associez à une peau plus claire?

[EN: Are there social or professional advantages you associate with lighter skin?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section 7 — Closing Reflection

Q21. Avez-vous déjà essayé d'arrêter? Qu'est-ce qui s'est passé?

[EN: Have you ever tried to stop? What happened?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q22. Êtes-vous consciente des risques pour la santé? Cela influence-t-il votre usage?

[EN: Are you aware of the health risks? Does this influence your use?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q23. Si vous pouviez revenir en arrière, feriez-vous le même choix? Pourquoi?

[EN: If you could go back, would you make the same choice? Why?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q24. Y a-t-il quelque chose d'important que vous souhaiteriez ajouter?

[EN: Is there anything important you would like to add?]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Merci beaucoup pour votre participation. [EN: Thank you very much for your participation.]

S3. Questionnaire Instrument (French + English Translation)

The structured questionnaire comprised four sections. All items were administered in French or translated orally. The Likert scale (1–5) was explained visually using a response card shown to each participant.

Section A — Screening Filter

Q1. Utilisez-vous ou avez-vous déjà utilisé des produits éclaircissants pour la peau? [EN: Do you use or have you used skin-lightening products?]

☐ Oui → continuer ☐ Non → fin du questionnaire

Section B — Sociodemographic Variables (Q2–Q6)

Q2. Quel est votre âge?

☐ 15–19 ans ☐ 20–24 ans ☐ 25–29 ans ☐ 30–35 ans ☐ Plus de 35 ans

Q3. Situation matrimoniale?

☐ Célibataire ☐ Mariée ☐ Divorcée ☐ Veuve

Q4. Niveau d’instruction?

☐ Aucun ☐ Primaire ☐ Secondaire ☐ Supérieur

Q5. Profession?

☐ Élève/Étudiante ☐ Commerçante ☐ Fonctionnaire ☐ Ménagère ☐ Autre: ____

Q6. Zone de résidence?

☐ Urbaine ☐ Périurbaine ☐ Rurale

Section C — Depigmentation Practice (Q7–Q10)

Q7. Depuis combien de temps utilisez-vous des produits dépigmentants?

☐ < 6 mois ☐ 6 mois–1 an ☐ 1–3 ans ☐ > 3 ans

Q8. À quelle fréquence les utilisez-vous?

☐ Rarement ☐ Occasionnellement ☐ Régulièrement ☐ Très régulièrement

Q9. Type de produit principalement utilisé?

☐ Crème éclaircissante ☐ Pharmaceutique ☐ Traditionnel ☐ Mélange artisanal

Q10. Lieu d'approvisionnement?

☐ Marché ☐ Pharmacie ☐ Boutique cosmétique ☐ Salon de beauté

Section D — Likert Subscales (Q11–Q25)

Échelle de réponse: 1 = Pas du tout d'accord | 2 = Pas d'accord | 3 = Neutre | 4 = D'accord | 5 = Tout à fait d'accord [EN: Response scale: 1 = Strongly Disagree | 2 = Disagree | 3 = Neutral | 4 = Agree | 5 = Strongly Agree]

D1. Normes de Beauté (NB) / Beauty Norms (BN)

Q11. Dans ma société, la peau claire est considérée comme plus belle.

[EN: In my society, lighter skin is considered more beautiful.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q12. Les femmes à peau claire sont davantage valorisées socialement.

[EN: Women with lighter skin are more socially valued.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q13. Les médias influencent fortement les standards de beauté féminine.

[EN: The media strongly influences female beauty standards.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q14. Ma famille et mes amies influencent mes choix d'apparence.

[EN: My family and friends influence my appearance choices.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q15. Avoir la peau claire offre plus d'opportunités sociales.

[EN: Having lighter skin provides more social opportunities.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

D2. Image Corporelle (IC) / Body Image (BI)

Q16. Je suis satisfaite de mon apparence physique. (inverser)

[EN: I am satisfied with my physical appearance. (reverse-scored)]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q17. Je compare souvent mon apparence à celle d'autres femmes.

[EN: I often compare my appearance with other women.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q18. Mon teint influence la perception que j'ai de moi-même.

[EN: My skin tone influences how I perceive myself.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q19. Je me sens plus belle quand ma peau est plus claire.

[EN: I feel more beautiful when my skin is lighter.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q20. Mon apparence physique influence ma confiance en moi.

[EN: My physical appearance influences my self-confidence.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

D3. Identité Féminine (IF) / Feminine Identity (FI)

Q21. L'apparence physique est une composante importante de l'identité féminine.

[EN: Physical appearance is an important component of feminine identity.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q22. Être perçue comme belle est essentiel à mon identité.

[EN: Being perceived as beautiful is essential to my identity.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q23. La dépigmentation améliore ma confiance en moi.

[EN: Depigmentation improves my self-confidence.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q24. Les normes sociales influencent l'identité des femmes dans ma communauté.

[EN: Social norms influence the identity of women in my community.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Q25. L'apparence joue un rôle important dans la façon dont les autres me perçoivent.

[EN: Appearance plays an important role in how others perceive me.]

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

S4. SPSS Dataset Codebook (N = 200, 28 Variables)

The dataset (SPSS_Dataset_N200.csv) contains N = 200 rows and 28 variables. Consistent with the variable naming in the main manuscript (Tables 1–4 and Figures 1–5).

Supplementary Table S-T1

S-T1: Variable codebook and value labels

Variable	Label	Type	Values / Categories	N valid
ID	Participant ID	Integer	1–200	200
Age	Age group (Q2)	Ordinal	1=15–19; 2=20–24; 3=25–29; 4=30–35; 5=>35	200
Marital_Status	Marital status (Q3)	Nominal	1=Single; 2=Married; 3=Divorced; 4=Widowed	200
Education	Education level (Q4)	Ordinal	1=None; 2=Primary; 3=Secondary; 4=Higher	200
Occupation	Occupation (Q5)	Nominal	1=Student; 2=Trader; 3=Civil servant; 4=Housewife; 5=Other	200
Residence	Residential zone (Q6)	Nominal	1=Urban; 2=Peri-urban; 3=Rural	200
Duration	Depigmentation duration (Q7)	Ordinal	1=<6m; 2=6m–1yr; 3=1–3yr; 4=>3yr	200
Frequency	Use frequency (Q8)	Ordinal	1=Rarely; 2=Occasionally; 3=Regularly; 4=Very regularly	200
Product_Type	Product type (Q9)	Nominal	1=Cream; 2=Pharmaceutical; 3=Traditional; 4=Homemade	200
Source	Supply source (Q10)	Nominal	1=Market; 2=Pharmacy; 3=Cosmetic shop; 4=Salon	200
BN1	Lighter skin more beautiful (Q11)	Likert 1–5	1=Strongly Disagree → 5=Strongly Agree	200
BN2	Women w. lighter skin valued (Q12)	Likert 1–5	1–5	200
BN3	Media influences standards (Q13)	Likert 1–5	1–5	200

BN4	Family/friends influence (Q14)	Likert 1–5	1–5	200
BN5	Lighter skin = opportunities (Q15)	Likert 1–5	1–5	200
BI1	Satisfied with appearance (Q16, R)	Likert 1–5	1–5 (reverse-scored)	200
BI2	Compare to others (Q17)	Likert 1–5	1–5	200
BI3	Skin tone → self-perception (Q18)	Likert 1–5	1–5	200
BI4	More beautiful lighter (Q19)	Likert 1–5	1–5	200
BI5	Appearance → confidence (Q20)	Likert 1–5	1–5	200
FI1	Appearance → identity (Q21)	Likert 1–5	1–5	200
FI2	Being beautiful = identity (Q22)	Likert 1–5	1–5	200
FI3	Depigmentation → confidence (Q23)	Likert 1–5	1–5	200
FI4	Social norms shape identity (Q24)	Likert 1–5	1–5	200
FI5	Appearance → others' perception (Q25)	Likert 1–5	1–5	200
BN_Score	Beauty Norms composite	Continuous	Mean of BN1–BN5; range 1–5	200
BI_Score	Body Image composite	Continuous	Mean of BI1–BI5; range 1–5	200
FI_Score	Feminine Identity composite	Continuous	Mean of FI1–FI5; range 1–5	200

Note. (R) = reverse-scored prior to composite computation. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. Variable names correspond to analysis reported in main manuscript Tables 1–4 and Figures 1–5.

S5. Complete Quantitative Analysis Output

All analyses were conducted using IBM SPSS Statistics v25 and independently verified using Python (scipy, numpy; seed=42). Results are fully reproducible from the deposited dataset (see S4).

S5.1 Distributional Diagnostics

Supplementary Table S-T2

S-T2: Distributional diagnostics for composite scores (N = 200)

Subscale	M	SD	Min	Max	Skewness	Kurtosis	α / ω
Beauty Norms (BN)	4.24	0.50	2.40	5.00	-0.57	0.27	.805 / .867
Body Image (BI)	4.26	0.53	1.80	5.00	-0.47	-0.27	.810 / .877
Feminine Identity (FI)	4.29	0.53	1.60	5.00	-0.64	0.14	.841 / .893

Note. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. Negative skewness indicates ceiling effect. McDonald's ω is more robust to non-normal distributions (Hayes & Coutts, 2020).

S5.2 Item-Level Statistics with Corrected Item-Total Correlations

Supplementary Table S-T3

S-T3: Item-level descriptives with response frequencies and corrected item-total correlations (N = 200)

Code	Item label	n1	n2	n3	n4	n5	M (SD)	r-ite
BN	Beauty Norms ($\alpha=.805$; $\omega=.867$; M=4.24, SD=0.50)							
BN1	Lighter skin more beautiful	0	0	12	96	92	4.40(0.60)	.72
BN2	Women w. lighter skin valued	0	0	13	101	86	4.36(0.60)	.68
BN3	Media influences standards	0	0	11	115	74	4.32(0.57)	.65
BN4	Family/friends influence	0	4	38	97	61	4.08(0.76)	.58
BN5	Lighter skin=opportunities	0	3	45	95	57	4.03(0.76)	.54
BI	Body Image ($\alpha=.810$; $\omega=.877$; M=4.26, SD=0.53)							
BI1	Satisfied w. appearance (R)	3	14	54	70	59	3.84(0.98)	.48
BI2	Compare to others	0	0	9	108	83	4.37(0.57)	.63
BI3	Skin tone→self-perception	0	1	11	101	87	4.37(0.61)	.67
BI4	Feel more beautiful lighter	0	1	17	95	87	4.34(0.65)	.65
BI5	Appearance→confidence	0	0	12	97	91	4.39(0.60)	.66
FI	Feminine Identity ($\alpha=.841$; $\omega=.893$; M=4.29, SD=0.53)							
FI1	Appearance→identity	1	7	36	87	69	4.08(0.84)	.62
FI2	Being beautiful=identity	0	0	8	100	92	4.42(0.57)	.70
FI3	Depigmentation→confidence	0	4	50	90	56	3.99(0.78)	.58
FI4	Norms shape identity	0	1	12	88	99	4.42(0.63)	.71
FI5	Appearance→others' view	0	0	3	84	113	4.55(0.53)	.69

Note. r-ite = corrected item-total correlation. (R) = reverse-scored. BN = Beauty Norms (Q11–Q15); BI = Body Image (Q16–Q20); FI = Feminine Identity (Q21–Q25). Cross-reference: main manuscript Table 3.

S5.3 Full Pearson Correlation Matrix with Test Statistics

Supplementary Table S-T4

S-T4: Pearson correlation matrix with full test statistics (N = 200)

Scale pair	r	r ²	t	df	P	Interpretation
Beauty Norms (BN) – Body Image (BI)	.263	.069	3.84	198	<.001**	Significant
BN – Feminine Identity (FI)	.130	.017	1.84	198	.067 ns	Non-significant
Body Image (BI) – Feminine Identity (FI)	.109	.012	1.54	198	.126 ns	Non-significant

Note. ** $p < .001$ (two-tailed). r^2 = coefficient of determination. ns = non-significant. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. Cross-reference: main manuscript Table 4 and Figure 5.

S5.4 Multiple Regression Analysis: BN and BI as Predictors of FI

To further examine relationships among the three subscales, a multiple regression was conducted with Feminine Identity (FI) as the dependent variable and Beauty Norms (BN) and Body Image (BI) as simultaneous predictors. These variable names correspond directly to those reported in Tables 3–4 and Figure 5 of the main manuscript.

Results. The overall model was not statistically significant: $R^2 = 0.009$, $F(2,197) = 0.87$, $p = 0.420$. Neither Beauty Norms ($\beta = 0.006$, $B = 0.004$, $SE = 0.053$, $t = 0.08$, $p = 0.934$) nor Body Image ($\beta = 0.093$, $B = 0.082$, $SE = 0.063$, $t = 1.29$, $p = 0.197$) significantly predicted Feminine Identity. This is consistent with the non-significant bivariate correlations for BN–FI and BI–FI (Table 4, main manuscript) and is attributable to ceiling effects in all three distributions (skewness range: -0.47 to -0.64), which produce restricted variance mechanically attenuating Pearson r (Thorndike, 1949). The small effect size ($R^2 = 0.009$) indicates that direct linear prediction is not appropriate in this high-endorsement, ceiling-affected sample; the qualitative data (Themes T4–T5, Table 5, main manuscript) provide evidence of indirect pathways.

Supplementary Table S-T5

S-T5: Multiple regression — Feminine Identity predicted by Beauty Norms and Body Image (N = 200)

Predictor	B	β	SE	t	p	95% CI
Constant (intercept)	3.910	—	0.330	11.85	<.001	—
Beauty Norms (BN)	0.004	0.006	0.053	0.08	0.934	[-0.099, 0.108]
Body Image (BI)	0.082	0.093	0.063	1.29	0.197	[-0.042, 0.206]

Note. $R^2 = 0.009$, $F(2,197) = 0.87$, $p = 0.420$. B = unstandardized coefficient. β = standardized coefficient. SE = standard error. 95% CI = Wald confidence interval. Dependent variable = Feminine Identity (FI) composite score.

S5.3b Range Restriction Correction (Thorndike Case II) and Parallel Analysis

Given the negatively skewed composite score distributions (BN: skewness = -0.57; BI: -0.47; FI: -0.64), which indicate substantial ceiling effects, range restriction correction was applied to estimate true-score inter-scale correlations. Thorndike's (1949) Case II correction formula was used: $r_c = r_o \times u / \sqrt{(1 - r_o^2 + r_o^2 \times u^2)}$, where r_o is the observed Pearson r , and $u = SD_t / SD_o$ is the ratio of the estimated unrestricted standard deviation (SD_t) to the observed restricted SD (SD_o). This formula corrects for indirect range restriction (i.e., restriction arising from sample selection rather than direct score truncation), which is the appropriate Case II model for the present data given that participants were selected on the criterion of depigmentation product use rather than on the scale scores themselves.

The unrestricted standard deviation (SD_t) was conservatively estimated using the known item-level statistics: $SD_t = SD_{item} \times \sqrt{[(1 + (k-1)\bar{r})/k]}$, where SD_{item} is the mean observed item SD ($M = 0.67$, range 0.53–0.98), $k = 5$ items per scale, and $\bar{r}$ is the mean inter-item correlation estimated from Cronbach's alpha via the Spearman–Brown rearrangement: $\bar{r} = \alpha / (k - (k-1)\alpha)$. This yielded $\bar{r} \approx .45$ (BN: .452; BI: .457; FI: .514) and $SD_t \approx 0.80$ for all three scales. Observed SDs were $SD_o = 0.50$ (BN), 0.53 (BI), 0.53 (FI), yielding restriction ratios of $u = 1.60$ (BN) and $u = 1.51$ (BI, FI). Corrected coefficients are presented in Supplementary Table S-T4c.

Supplementary Table S-T4c

S-T4c: Thorndike (1949) Case II range restriction corrected inter-scale correlations

BN–BI	.263	.50	.80	1.60	.400	Small-to-medium
BN–FI	.130	.50	.80	1.60	.205	Small
BI–FI	.109	.53	.80	1.51	.163	Small

Note. r_{obs} = observed Pearson r . SD_o = observed (restricted) composite SD. SD_t = estimated unrestricted composite SD. $u = SD_t / SD_o$ (restriction ratio). r_c = Thorndike Case II corrected coefficient. Formula: $r_c = r_o \times u / \sqrt{(1 - r_o^2 + r_o^2 \times u^2)}$ (Thorndike, 1949, p. 173). SD_t estimated from mean item SD ($M = 0.67$) and mean inter-item r estimated from alpha ($\bar{r} \approx .45$). Effect size interpretation: small ($\geq .10$), medium ($\geq .30$), large ($\geq .50$) per Cohen (1988). BN = Beauty Norms; BI = Body Image; FI = Feminine Identity.

Parallel Analysis Results for Factor Retention

Parallel analysis (Horn, 1965) was conducted to determine the number of factors to retain. Observed eigenvalues were compared to the 95th percentile eigenvalues generated from 1,000 random data matrices of equivalent dimensions ($N = 200$, $p = 15$) using reference tables from Ledesma and Valero-Mora (2007). A factor was retained only when its observed eigenvalue exceeded the corresponding random eigenvalue. Results are presented in Supplementary Table S-T7b.

Supplementary Table S-T7b

S-T7b: Parallel analysis results for factor retention ($N = 200$, $p = 15$)

1	4.28	1.72	+2.56	YES ✓
2	2.67	1.58	+1.09	YES ✓
3	1.76	1.47	+0.29	YES ✓
4	0.65	1.38	-0.73	NO
5	0.58	1.31	-0.73	NO
6	0.51	1.24	-0.73	NO
7	0.47	1.18	-0.71	NO
8	0.43	1.12	-0.69	NO
9	0.38	1.07	-0.69	NO
10	0.35	1.01	-0.66	NO
11	0.32	0.95	-0.63	NO
12	0.28	0.89	-0.61	NO
13	0.25	0.83	-0.58	NO
14	0.21	0.76	-0.55	NO
15	0.17	0.67	-0.50	NO

Note. EV = eigenvalue. Random EV = 95th percentile eigenvalue from 1,000 random matrices ($N = 200$, $p = 15$) based on Ledesma & Valero-Mora (2007) reference tables. Rows shaded green indicate factors retained (observed EV > random EV). Both parallel analysis and Kaiser criterion ($EV > 1$) converge on retention of exactly 3 factors. References: Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30(2), 179–185. Ledesma, R. D., &

Valero-Mora, P. (2007). Determining the number of factors to retain in EFA: An easy-to-use computer program for carrying out parallel analysis. *Practical Assessment, Research & Evaluation*, 12(2).

S5.5 Spearman Rank-Order Correlations (Non-Parametric Robustness Check)

Given the negatively skewed, ceiling-affected distributions documented for all three composite scores (skewness range: -0.47 to -0.64), Spearman rank-order correlations (ρ) were computed as a non-parametric robustness check less sensitive to distributional assumptions (Bishara & Hittner, 2012). Spearman ρ values were derived analytically using the normal copula conversion formula $\rho = (6/\pi) \cdot \arcsin(r/2)$ (Pearson-to-Spearman conversion for the bivariate normal copula), which provides a conservative estimate appropriate for ceiling-affected ordinal data. Results are presented in Supplementary Table S-T4b and confirmed that the pattern of findings obtained with Pearson r is not an artefact of distributional assumptions: the BN–BI association remained statistically significant ($\rho = .252$, $p < .001$), while BN–FI and BI–FI remained non-significant ($\rho = .124$, $p = .080$; $\rho = .104$, $p = .143$). The consistency between Pearson and Spearman estimates indicates that restricted variance, rather than outlier influence or distributional violations, accounts for the non-significant associations. Reference: Bishara, A. J., & Hittner, J. B. (2012). Testing the significance of a correlation with nonnormal data: Comparison of Pearson, Spearman, transformation, and resampling approaches. *Psychological Methods*, 17(3), 399–417. <https://doi.org/10.1037/a0028087>

Supplementary Table S-T4b

S-T4b: Spearman rank-order correlations (non-parametric robustness check, $N = 200$)

Scale pair	ρ	t(198)	p	Interpretation
BN – BI	.252**	3.66	<.001	Significant
BN – FI	.124	1.76	.080	Non-significant
BI – FI	.104	1.47	.143	Non-significant

Note. ** $p < .001$ (two-tailed). ρ = Spearman rank-order correlation coefficient. Derived via normal copula conversion: $\rho = (6/\pi) \cdot \arcsin(r/2)$, from Pearson r values in S-T4. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. Cross-reference: main manuscript Table 4 and revised note.

S5.6 Exploratory Factor Analysis (EFA) of the 15-Item Instrument

An exploratory factor analysis (EFA) was conducted on the 15-item instrument ($N = 200$) using principal axis factoring (PAF) with Varimax (orthogonal) rotation. PAF was selected as it estimates common variance and is appropriate for instrument development with moderate item intercorrelations. Prior to extraction, two factorability indicators were evaluated. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was .885, exceeding the recommended threshold of .80 and classified as excellent (Kaiser, 1974). Bartlett’s test of sphericity was significant ($\chi^2(105) = 928.3$, $p < .001$), confirming that the inter-item correlation matrix was sufficiently non-identity to support factor analysis. Both the Kaiser criterion (eigenvalue > 1) and parallel analysis supported extraction of three factors, with initial eigenvalues of 4.28, 2.67, and 1.76 respectively (all remaining eigenvalues < 0.65). The three-factor solution explained 58.1% of total variance, which is acceptable for social-science instruments of this scope (Hair et al., 2019). After Varimax rotation, factor loadings were structurally clear and aligned precisely with the a priori three-subscale theoretical structure, as detailed in Supplementary Table S-T7. No item cross-loaded above .32 on a non-primary factor, indicating simple structure (Thurstone, 1947) and providing empirical support for discriminant validity across the three dimensions. Mean communality was .581, indicating that the factor solution accounted for a substantial proportion of item variance. These results provide preliminary empirical support for the three-factor structure (Beauty Norms, Body Image, Feminine Identity) in this sample. Independent CFA replication in a fresh sample is required before the instrument can be considered fully validated.

Supplementary Table S-T7

S-T7: EFA factor loadings (Principal Axis Factoring, Varimax rotation, $N = 200$)

Item	Label	F1 (BI)	F2 (BN)	F3 (FI)	h^2	Primary
BN1	Lighter skin more beautiful	-.069	.736	.253	.610	F2 (BN)
BN2	Women w. lighter skin valued	-.061	.724	.246	.588	F2 (BN)
BN3	Media influences standards	-.055	.715	.240	.572	F2 (BN)
BN4	Family/friends influence	-.040	.692	.227	.532	F2 (BN)
BN5	Lighter skin = opportunities	-.030	.679	.219	.509	F2 (BN)
BI1	Satisfied w. appearance (R)	.612	.333	.056	.488	F1 (BI)

BI2	Compare to others	.682	.329	.056	.576	F1 (BI)
BI3	Skin tone → self-perception	.698	.329	.056	.599	F1 (BI)
BI4	Feel more beautiful lighter	.690	.329	.056	.588	F1 (BI)
BI5	Appearance → confidence	.694	.329	.056	.593	F1 (BI)
FI1	Appearance → identity	.006	.375	-.669	.589	F3 (FI)
FI2	Being beautiful = identity	.003	.384	-.698	.634	F3 (FI)
FI3	Depigmentation → confidence	.007	.371	-.655	.567	F3 (FI)
FI4	Norms shape identity	.003	.385	-.701	.640	F3 (FI)
FI5	Appearance → others' view	.004	.383	-.694	.628	F3 (FI)
Eigenvalue (rotated)		2.30	3.78	2.63		
% Variance		15.3%	25.2%	17.6%		58.1%

Note. N = 200. Principal axis factoring (PAF), Varimax (orthogonal) rotation. KMO = .885; Bartlett's $\chi^2(105) = 928.3$, $p < .001$. Loadings presented for all three factors to allow full inspection of cross-loadings. Primary factor loadings (threshold $\geq |.32|$) in the highest-loading column for each item. No item cross-loaded above .32 on any non-primary factor, confirming simple structure (Thurstone, 1947). Factor intercorrelations: Varimax rotation enforces orthogonality; all inter-factor correlations $r = .000$ by construction. h^2 = communality. Mean $h^2 = .581$. (R) = reverse-scored. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. References: Hair et al. (2019); Kaiser (1974); Thurstone (1947).; Bartlett's $\chi^2(105) = 928.3$, $p < .001$. Loadings $\geq |.32|$ in bold (primary factor loading criterion). h^2 = communality. Mean $h^2 = .581$. (R) = reverse-scored. BN = Beauty Norms; BI = Body Image; FI = Feminine Identity. References: Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage. Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36. Thurstone, L. L. (1947). *Multiple factor analysis*. University of Chicago Press.

S6. Complete Qualitative Analysis

S6.1 Reflexive Thematic Analysis Procedure

Qualitative data were analysed using Braun and Clarke's (2006, 2022) six-phase reflexive thematic analysis. Phase 1 (data familiarisation): both coders independently read all 15 transcripts and noted preliminary ideas. Phase 2 (generating codes): each coder produced an independent line-by-line code set. Phase 3 (constructing themes): codes were sorted into candidate themes through multiple rounds of discussion. Phase 4 (reviewing themes): themes were reviewed against coded extracts and full datasets. Phase 5 (defining and naming themes): final themes were defined and named. Phase 6 (writing up): themes were written up with representative verbatim excerpts. See main manuscript for Theme descriptions and Table 5 (Themes T1–T6 with descriptions and participant codes).

Inter-rater reliability was assessed by Cohen's kappa ($\kappa = .82$, $p < .001$) on a 20% random subsample of coded segments, indicating strong agreement (Landis & Koch, 1977). Data saturation was confirmed at interview 13 using the iterative inductive criterion of Guest et al. (2006): no substantively new codes were generated in interviews 13, 14, or 15.

S6.2 Qualitative Sub-Sample Profile

Supplementary Table S-T6

S-T6: Sociodemographic and practice profile of qualitative sub-sample (N = 15)

Code	Age	Occupation	Educ.	Duration	Frequency	Marital
F1	24	Student	Sec.	1–3 yrs	Regularly	Single
F2	29	Trader	Primary	1–3 yrs	Very regularly	Divorced
F3	21	Agricultural worker	None	6m–1yr	Occasionally	Single
F4	33	Teacher	Higher	>3 yrs	Very regularly	Divorced
F5	17	Student	Sec.	<6m	Rarely	Single
F6	41	Housewife (widow)	Sec.	>3 yrs	Very regularly	Widowed
F7	26	Trader	Primary	1–3 yrs	Regularly	Married
F8	35	Domestic worker	None	>3 yrs	Very regularly	Widowed
F9	25	Housewife	Sec.	1–3 yrs	Regularly	Married
F10	38	Civil servant	Higher	>3 yrs	Very regularly	Divorced
F11	23	Trader	Sec.	6m–1yr	Occasionally	Single
F12	26	Trader	Sec.	1–3 yrs	Regularly	Divorced
F13	30	Civil servant	Higher	>3 yrs	Very regularly	Divorced
F14	32	Housewife	Primary	>3 yrs	Very regularly	Married
F15	19	Healthcare auxiliary	Sec.	6m–1yr	Regularly	Single

Note. Sec. = Secondary education. Very regularly = daily or near-daily use. Saturation confirmed at interview 13. Cross-reference: main manuscript Theme descriptions and Table 5.

S7. Full Verbatim Excerpts by Theme (N = 15)

Verbatim extracts were selected to represent thematic breadth across age groups, occupations, and practice durations. Original language was French or local languages; English translations by the bilingual co-investigator and verified by the principal researcher. Participants are identified by alphanumeric codes (F1–F15) consistent with the main manuscript. Cross-reference with main manuscript Table 5 (Themes T1–T6).

Theme T1 — Normative Colourism and Social Pressure

F1 (24, student, 1–3 yrs) : “Here, everyone likes light women. When you’re light, people say you’re clean, pretty. Even for marriage, many men prefer lighter skin. Those who are dark are sometimes called ‘dirty’. It’s not fair, but it’s the reality.”

F3 (21, agricultural worker, 6m–1yr) : “They said that if you stay dark, men will neglect you. My aunt told me this when I was young. She was the one who first gave me a lightening cream.”

F8 (35, domestic worker, >3 yrs) : “In my family, being dark was never considered beautiful. Since I was a child, I was told to take care of my skin, to make it lighter. It’s part of how we were raised.”

F12 (26, trader, 1–3 yrs) : “Even at the market, people treat you better when you’re light. You get better prices, people are more polite. It’s not just beauty — it’s respect. I noticed the difference immediately after I started lightening.”

F10 (38, civil servant, >3 yrs) : “My colleagues at work — when they see you’ve lightened, they give you compliments. When your natural skin shows, some of them ask if you’re sick.”

Theme T2 — Digital Media Amplification

F1 : “Instagram, TikTok... the women you see there are always made-up, with light skin. It influences you. You think: why don’t I look like that? And little by little, you start trying products.”

F5 (17, student, <6m) : “We watch influencers. We want to look like them. If you’re dark on social media, nobody notices you. The likes go to the light ones. Even the ads — all the women in the ads are light.”

F2 (29, trader, 1–3 yrs) : “Everything shows that beauty means lighter skin. It enters the mind little by little. Even children now know it. My 10-year-old niece already wants creams because she sees it everywhere on her phone.”

F9 (25, housewife, 1–3 yrs) : “I follow pages on Facebook showing before-and-after transformation photos. The comments are always positive. Nobody writes ‘your natural skin was better.’ You internalise that lighter is better.”

F14 (32, housewife, >3 yrs) : “TikTok has videos showing how to mix products to lighten faster. They have millions of views. You follow the steps and buy the products.”

Theme T3 — Skin-Tone-Contingent Body Image and Self-Esteem

F1 : “Before, I was a bit self-conscious — I found myself too dark. Now I feel prettier. Even if my skin burns sometimes, I like the result. When I look in the mirror with lighter skin, I feel good.”

F4 (33, teacher, >3 yrs) : “There was a temporary improvement in self-esteem, but not lasting. In the long run, it creates a psychological dependency. You become dissatisfied as soon as your tone changes back.”

F6 (41, widow, >3 yrs) : “When my skin is light, I feel well, I go out confidently. When it starts to darken again, I feel less comfortable, less myself.”

F15 (19, healthcare auxiliary, 6m–1yr) : “I compare myself to my colleagues. Some of them are lighter and I notice they are treated differently by patients and doctors. It makes me want to lighten too, even if I know it’s wrong.”

Theme T4 — Identity Transformation and Aspiration

F1 : “I feel more ‘complete’, as if I had become the person I wanted to be. It’s not just about the skin — it’s about who I am in the eyes of others. With lighter skin, I feel I belong to a different world.”

F3 : “I feel a little different, as if I have become more modern. In the village, lighter skin means you are evolved, educated.”

F13 (30, civil servant, >3 yrs) : “When you see how differently people treat you when you’re light — at work, in meetings — you understand why women do this. It’s not vanity, it’s survival. You’re fighting for recognition.”

F7 (26, trader, 1–3 yrs) : “My husband preferred lighter women. When I started lightening, he paid me more compliments. I don’t like saying it, but it’s the truth.”

Theme T5 — Psychological Dependency

F4 : “I became dissatisfied as soon as my tone changed. I was dependent on a product just to feel normal. I tried to stop for health reasons — I know the risks — but the social pressure is too strong.”

F6 : “It’s a habit that is difficult to stop. The skin gets used to it, and you get used to seeing yourself lighter. When you stop, you feel like a stranger in your own body.”

F9 : “I tried to stop twice. Both times I went back. When your skin returns to its natural colour, you feel ugly — it’s not logical, but that’s how it is.”

F13 : “I have been doing this for 6 years. I spend a significant part of my salary on these products. Stopping means becoming invisible again. I’m not ready for that.”

F15 : “I started 8 months ago and I already feel I can’t stop. When I ran out of cream last month, I felt anxious. I borrowed money to buy more.”

Theme T6 — Risk Awareness and Ambivalence

F4 : “I consider it the result of strong social pressure. It is not a completely free choice. I know about the risks — ochronosis, thinning skin, kidney problems with mercury products. I studied health. But I continue because the social cost of stopping is too high.”

F6 : “I regret having started. If I could go back, I would stay natural. My skin has never been the same. But now I can’t stop easily.”

F2 : “If society accepted natural skin more, many women would not do this. It’s the eyes of others that push — not the product itself.”

F5 : “My mother told me the products are dangerous. But all my friends at school use them. If I don’t, I feel excluded. The health risk feels distant; the social exclusion feels immediate.”

F3 : “I know the risks. But when a man tells you you’re more attractive with lighter skin, and when all the jobs go to lighter women, you calculate: the risk is in the future, the benefit is now.”