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Wound Healing in Patients who Skin-bleach: Observations by Healthcare Professionals in Ghana

Observations by Healthcare Professionals about Wound Healing in Ghanaian Patients who Skin-bleach

Short Title: Wound healing observations in skin-bleaching patients

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ABSTRACT

Skin-bleaching is a common practice globally and is associated with many cutaneous and systemic health risks. Anecdotally, skin-bleaching is linked to impairments in wound healing, but there is little data to support the claim. This cross-sectional survey of healthcare professionals serving the Greater Accra Region, Ghana region investigates their observations of wound healing in patients who skin-bleach and their methods for screening skin-bleach use in patients. A 25-item self-administered questionnaire using 5-point Likert-scales was distributed with convenient sampling to physicians and nurses employed at Ghanaian hospitals. 57 electronic and 78 paper responses were collected (total = 135). Most respondents agreed that wounds in skin-bleaching patients heal more slowly (4.22), are more prone to infection (4.11), hemorrhage (3.89), wound dehiscence (3.9), and are more difficult to manage (4.13). No respondent reported universal screening of all patients for skin-bleaching, but most ask about skin-bleaching if there is suspicion for it (42.2%).

Our findings support the anecdotes about observable wound healing impairments in patients who skin-bleach. There is also wide variation in skin-bleaching screening practices, suggesting a need for guidelines to properly identify these patients and facilitate early risk prevention.

KEYWORDS

Skin bleaching, skin lightening, wound healing, wound infection, mass screening

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KEY MESSAGES

- Skin-bleaching is associated with various cutaneous and systemic health risks, including wound healing complications.
- This cross-sectional survey was developed to assess skin-bleaching screening practices and observations of wound healing in bleached skin by Ghanaian nurses and physicians.
- Ghanaian health professionals are more likely to ask about skin-bleaching if they suspect it in a patient.
- Ghanaian health professionals report observed delays in wound healing, increased risk of wound infection and dehiscence, and challenging wound care management in bleached skin.

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INTRODUCTION

Skin-bleaching, also known as skin-whitening, skin-lightening, and skin-toning, is a common yet controversial practice among the African, Asian, and Caribbean Diasporas. Topical skin-bleaching products, like soaps and creams, are applied to the skin to achieve a fairer complexion for cosmetic reasons and to attain a higher social status—a notion often perpetuated through media and marketing.

In 2019, the World Health Organization (WHO) reported that 77% of Nigerian women, 61% of Indian women, and 59% of Togolese women use skin-bleaching products. A 2004 survey estimated that 40% of people in China, Malaysia, the Philippines, and South Korea use skin-bleaching products [1].In Ghana, our country of interest, 40.4% of individuals surveyed in Kumasi [2]and 50.3% of individuals surveyed from Accra[3] report current or past use of skin-bleaching products. As of 2022, the global skin lightening market is projected to reach an estimated 11.8 billion USD by 2026 [4].

Skin-bleaching products commonly contain potent corticosteroids, mercury, and hydroquinone as active melanin-suppressing agents. Chronic use of these products come with the risk of cutaneous complications, such as skin discoloration, exogenous ochronosis, thinning or thickening of skin, and inflammatory disorders, and skin malignancies, including squamous cell carcinoma [3,5,6]. Chronic use is also associated with systemic health risks, including symptoms of mercury poisoning, nephrotic syndrome, adrenal insufficiency, Cushing's syndrome, and diabetes mellitus [7,8]. Cases of steroid-based skin lighteners use have also been linked to osteonecrosis of femoral head and life-threatening post-operative adrenal crisis [9, 10]

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Thus, skin-bleaching has been declared a public health concern by the WHO, requiring public awareness and regulatory government action [1]. Many countries have banned the sale and import of products containing hydroquinone, a tyrosinase inhibitor. Ghana became one of the first West African countries to do so in 2016 [11]. However, skin-bleaching products are currently available for off-market purchase and have become increasingly available online.

Anecdotally, wound healing has been noted as another complication of prolonged skin-bleaching use. Chronically bleached skin is said to lose its strength and elasticity, which presents suturing challenges and delayed wound healing [10]. Poor surgical wound healing may lead to infection, sepsis, postoperative hemorrhage, and pain, as well as longer hospitalizations and increased medical costs [5]. To our knowledge, however, no literature exists which further explores the interaction between skin-bleaching and wound healing.

This study investigates whether skin-bleaching noticeably impairs wound healing in both surgical and non-surgical patients through the perspective of Ghanaian nurses and physicians. Our objective was to quantify and analyze their observations of wound healing in Ghanaian patients who routinely use skin-bleaching products. We also sought to obtain greater insight into their skin-bleaching patient screening methods and challenges that arise with wound care management. We hypothesized that health professionals will associate skin-bleach use with wound healing impairments and general wound care challenges. Identification of these challenges is necessary to target interventions for risk prevention in wound healing complications and adverse health effects.

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MATERIALS AND METHODS

We obtained ethical clearance from Quinnipiac University Institutional Review Board and Ghana Health Services ethical review committee, prior to distribution of this survey.

Study Design

This study is a cross-sectional survey with a convenient sampling using both paper and electronic questionnaires of healthcare professionals serving the Greater Accra Region of Ghana.

Survey Method

The survey was a 25-item self-administered web and paper questionnaire. Questions, statements, and free response prompt were designed to obtain information about participant demographics, how providers inquire about skin-bleaching, how they identify patients who skin-bleach, and their observations made about wound healing in patients who skin-bleach. Descriptors of skin-bleaching characteristics were guided by Lartey et al [3] and Olumide et al [10] papers. Observations were measured using a 5-point Likert Scales. Frequency of observed physical traits of skin-bleaching patients were scored as "Never", "Rarely", "I don't know", "Sometimes/Often", and "Always". Skin healing observations and opinions were scored as "Strongly disagree", "Disagree", "I don't know/Neither agree nor disagree", "Agree", and "Strongly Agree". The full questionnaire is provided in the appendix. The final survey was reviewed by two surgical colleagues at Tema General Hospital (TGH) to ensure appropriateness and relevance for a Ghanaian participation sample.

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Survey Distribution

We conducted a survey of physicians and nurses with clinical experience in Ghanaian healthcare setting. We implemented convenience and snowball sampling methods by distributing surveys to willing participating hospitals and asking participants to share the web link with their healthcare colleagues. Participating hospitals were TGH , Korle Bu Teaching Hospital, and New Crystal Hospital – Ashaiman, all serving the Greater Accra region. Paper copies of the survey were only distributed to participants at TGH, as the local research supervisor worked at this location and was able to supervise the distribution and collection of the survey. Participants were instructed to not complete the web version if they received a paper copy, to avoid duplicate responses. The electronic version was hosted using *Qualtrics* (Provo, UT) survey platform. Informed consent was obtained at the beginning of the survey. Upon completion of the survey, participants were invited to voluntarily enter a raffle for a gift card valued at 300 GHS (approximately 50USD). Entries were coded numerically and winner was chosen using a random number generator.

Statistical analysis

Data was compiled into a Microsoft *Excel* spreadsheet and qualitatively analyzed using IBM *SPSS* (Armonk, NY). Open-ended survey responses were compiled into an Excel spreadsheet, and coded into shared categories. Frequency distributions for categorical variables were assessed to identify trends in demographic and screening practice responses. Likert-score means were calculated for observations. Physician and nurse comparisons of Likert-scores were analyzed using independent sample T-tests. If a participant did not respond to an item, the response was not included in the analysis so that percentages represented a portion of a full set.

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RESULTS

Demographics

135 total responses were collected between September and November 2020. Paper questionnaires were distributed to 85 people, and 78 responses were received, representing a 91.7% response rate. The remaining 57 responses were collected electronically. Response rate for the electronic questionnaires could not be determined due to snowball sampling. (Table 1) Most respondents were nurses (n= 70, 51.9%). Majority of physicians were general practitioners (n=25, 18.5%), followed by 24 physicians with operative experience as either surgeons or OBGYN (n=23, 17.0%). Majority of respondents have 1-5 years of clinical experience in Ghana (n=54; 40.0%) and report seeing 3 or more patients per month whom they suspect skin-bleach (n=106; 78.5%).

Skin-bleaching Screening

Figure 1 represents differences in skin-bleaching screening practices among respondents. Majority of respondents report they screen for skin-bleaching during patient interview only if they suspect skin-bleaching. However, no one reported that they screen all. When screening, most respondents asked about frequency of use (77.1%), followed by duration of use (63.9%), then specific products used (59%) (Figure 2).

Observations

Table 2 compiles the mean calculated scores of all surveyed observations of skin-bleaching patients. Skin-tone, presence of fair skin with dark lips, joints, and fingernails, and large patches of uneven skin tone rated the highest on the Likert-scales as identifiable traits of skin-bleaching in patients. When asked about wound healing, most respondents agreed that they routinely assess

wounds. Mean Likert-scores were highest for observing a difference in surgical and non-surgical wound healing, slower wound healing in skin-bleach patients, increased rate of infection in skin-bleach patients, and increased rate of wound hemorrhage and dehiscence in skin-bleach patients.

Comparing Nurse and Physician Responses

Overall, there was minimal difference in responses between nurses and physicians (Figures 3 and 4). Nurses and physicians tended to report the same observation in identifiable skin-bleaching traits. However, there was a difference in noticing differences in wound healing rates. Compared to physicians (3.97), nurses were more likely to agree that wounds heal more slowly in patients who skin-bleach (4.46), and that there is a difference in both non-surgical (Physician=3.77; Nurse=4.29) and surgical wound healing (Physician=3.98; Nurse=4.32) between skin-bleach patients and non-skin-bleach patients

Open-end Responses

A total of 21 participants offered free responses. (Table 3) Out of these free responses a total of 33 individual comments were identified, categorized into 6 themes: healing rate, infection rate, other complications, wound size, counseling, and cost/management. The majority of free responses were concerned with delayed healing rate (30%) and the wound complications or characteristics (30%).

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DISCUSSION

Our overall findings support the anecdotes about wound healing impairments and complications in patients who skin-bleach. Patients who use skin-bleaching agents are reported to have slower healing wounds, greater likelihoods of wound infections, dehiscence, and hemorrhage, and generally require more wound care management. These observations are consistent with studies of wound healing complicated by topical steroid use, revealing slowed healing rates due to epidermal and dermal atrophy, delayed re-epithelialization, reduced vascular connective tissue support and impaired formation of granulation tissue due to poor angiogenesis [12]. Beyond the skin, another operative challenge with chronic topical steroid application is the risk for adrenal crisis due to the stress of surgery [13, 14]. This highlights the significance of obtaining a thorough patient history of skin-bleaching with proper identification of the type of skin-bleaching agent used.

Our study also finds that Ghanaian healthcare professionals regularly encounter patients in the hospital settings whom they believe are skin-bleaching. Figure 5 is an artistic impression using *ProCreate* (Hobart, Australia) created by the first author depicting identifiable traits commonly associated with skin-bleaching based on our findings. However, our findings also reveal inconsistent screening practices concerning the identification of these skin-bleaching patients. The wide variation in interviewing practices suggests a need to standardize the screening of skin-bleaching in patients, as skin-bleaching appears to be prevalent in the reported clinical populations. Although there are inconsistencies in screening practices, the majority of respondents ask for frequency of use, duration of use, and type of product used. These factors

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may be important in predicting the likelihood and severity of post-operative wound healing complications in skin-bleaching patients.

Nurses were more likely to agree to observing slower wound healing in skin-bleaching patients. This is not surprising, as nurses are generally responsible for routine wound care. Most of the physician respondents were general practitioners as well, and may have less experience treating and monitoring wounds compared to physicians from surgical specialties. However, physicians and nurses both expressed uncertainty in how to manage chronic and surgical wound care in these patients. This carries significant implications for skin-bleaching patients, because they may not be receiving optimal care to address their specific wound care challenges. There is potential for the expansion of medical and nursing education to increase awareness and training for skin-bleaching wound care.

The open-end responses provide some insight into topics that were not addressed by this study. Intraoperative risks, hospital cost management challenges, and patient education should also be investigated in our efforts to understand the ways skin-bleaching impacts global health.

The study does have limitations. The sample was small in size, utilized convenience and snowball sampling methods, and only reflected observations from Ghanaian providers primarily in the Greater Accra region, which limits the generalizability of our findings. Many questionnaires were returned with incomplete responses as well. It is possible that the smaller sample size is due to the preoccupation with COVID-related stressors during the time of survey. Additional studies could use larger and broader samples, targeting healthcare professionals in

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other African, Asian, and Caribbean countries. We were also unable to reliably calculate the electronic response rate and assess the difference in response rate between the electronic and manual questionnaires. Future studies could track survey weblink clicks or webpage visitors to measure survey distribution for the electronic responses rate calculation.

Respondent age and gender were not obtained at the time, as it was not believed to be relevant, but obtaining this demographic data could have revealed possible age or gender trends in screening and observation practices amongst healthcare professionals. Our study also did not address healthcare provider attitudes toward the practice of skin-bleaching, patients who skin-bleach, or their opinions on increasing awareness of skin-bleaching complications. Furthermore, the study is limited by its self-reported data, which is susceptible to recall and response biases. Our findings partially rely on our respondents' abilities to recall subjective wound healing observations of up to thousands of patients, which may be inaccurate. There is risk of acquiescence bias, in which respondents may have felt more inclined to agree with responses that endorse the wound healing impairments described in the questionnaire. There may also have been social desirability bias to over-report "good" practices, such as consistent, thorough skin-bleaching patient screenings. Prospective surveys could overcome these pitfalls by using more objective measurements, such as data extraction from medical records or direct observation of wound healing rates and complications.

Another limitation is that skin-bleaching products are poorly regulated, so little is known about the strength of their active ingredients and potential contaminants. Thus, it is challenging to truly

ascertain which particular skin-bleaching products are more likely to cause wound healing impairments.

There is also question as to whether wounds on non-bleached areas of an individual's body heal differently to wounds on bleached areas of the body. For instance, would a person who only bleaches their face and neck experience poor healing to a wound on their leg? Chronic use of these products is suspected to cause systemic effects, which may suggest that any form of regular exposure may affect wound healing processes in non-bleached parts of the body. At the time of this study, there is a lack of hard evidence to support this theory. Future studies might compare wound healing in non-bleached and bleached areas of skin on individual patients or by using an animal model.

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CONCLUSION

In this study we report that this sample of Ghanaian healthcare professionals generally agree that skin-bleaching leads to impairments in wound healing. There appears to be a notable prevalence of skin-bleaching among the patient population. However, there do not appear to be screening guidelines for skin-bleaching patients or wound care protocols focused on skin-bleaching patients. Greater attention on skin-bleaching practices in patients could allow for better counseling of patients who skin-bleach, while reducing the morbidity of wound healing complications.

Beyond the topic of wound healing, skin-bleaching is associated with other systemic health complications, which further necessitates screening and counseling guidelines against skin-bleaching practices.

In the future, this survey could be distributed to healthcare professionals in other regions of Ghana, as well as other countries where skin-bleaching is endemic. Further studies may also objectively measure wound healing rates and complications in skin-bleaching patients, comparing to matched control patients to validate or negate these observations.

Ultimately, we intend for these findings to serve as a contribution to the growing discussion surrounding the skin-bleaching epidemic, offering patients and providers a greater understanding of the effects this practice may have on one's health. Work must be done to reduce the use of skin-bleaching products all together—but interventions should be concurrently developed for chronic users of skin-bleaching products.

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FIGURE LEGEND

Figure 1: Skin-bleaching screening frequencies

Figure 2: Methods for skin-bleaching screening

Figure 3: Comparing Nurse and Physician Physical Characteristic Observations

Figure 4: Comparing Nurse and Physician Wound Healing Observations

Figure 5: Original illustration of commonly observed skin bleaching characteristics[1]

[1] Original illustration created by first author

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TABLES

Table 1: Demographics

Respondent Demographics		
Occupation N=135	**N**	**%**
Nurse	70	51.9
Physician – General Practitioner	25	18.5
Physician – Surgeon	13	9.6
Physician – Other (House Officer)	11	8.1
Physician – OBGYN	10	7.4
Physician Assistant	5	3.7
Physician – Emergency	1	0.7
Total Years of Clinical Experience; N=135	**N**	**%**
Less than 1 year	6	4.4
1-5 years	51	37.8
5-10 years	33	24.4
10+ years	45	33.3
Total Years of Clinical Experience in Ghana; N=134	**N**	**%**
Less than 1 year	6	4.4
1-5 years	54	40
5-10 years	30	22.2
10+ years	44	32.6

Estimated frequency of skin bleach patient encounters per month;

N=134	**N**	**%**
0 Patients per month, Never	4	3
1-2 patients per month, Rarely	24	17.8
3-5 patients per month, Sometimes	51	37.8
5-10 patients per month, Often	32	23.7
10+ patients per month, Very often/Regularly	23	17

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Table 2: Observations of Skin-bleaching patients

Evaluation Statements	Mean Score	SD
Physical Characteristics		
Fair, yellow or red toned skin	4.17	0.682
Large patches of uneven skin tone (dark, light, or red patches)	4.08	0.603
Fair skin with dark lips, fingernails, elbows, knuckles, or palms of hands	4.16	0.77
Heavily scarred or blemished skin	3.76	0.84
Thinner skin (Their hair follicles and veins are often visible)	4.18	0.901
Abnormal hair growth or hair loss	3.05	1.095
Chronic wounds and sores on their skin	3.45	0.919
Wound Healing Observations		
I routinely assess wounds and provide wound care.	4.12	0.935
Differences in wound healing between skin-bleaching and non-skin-bleaching surgical patients	4.16	0.91
Differences in wound healing between skin-bleaching and non-skin-bleaching non-surgical patients	4.12	0.827
Slow wound healing in patients who skin-bleach	4.22	0.925
Quick wound healing in patients who skin-bleach	2.02	0.88
Wounds are more prone to infection in patients who skin-bleach	4.11	1.021

Wounds are more prone to hemorrhage/ excess bleeding in patients who skin-bleach	3.89	1.071
Increased surgical wound dehiscence in patients who skin-bleach	3.9	1.07
Increased wound care and management of skin-bleach surgical wounds	4.13	0.776
Confidence monitoring wound healing in patients who skin-bleach	2.98	1.08

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Table 3: Open-End Responses

Variable	N	%	Representative Response
Delayed Healing Rate	10	30	*"most patients I have nursed who bleach had wound heal slowly"*
Infection Rate	5	15	*" more prone to wound infection"*
Other Complications	10	30	*"serious lacerations and abrasions on fall or trauma" "skin that have been bleached turn to peel off even if it has not been incised with a sharp object." "suturing becomes difficult" "wound has a peculiar scent"*
Wound Size	2	6	*"patients with bleached skin develops blister around their wounds increasing the size of the wound"*
Cost and Management	2	6	*"prolong hospitalization, poor wound healing, and excessive cost"*

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Counseling	4	12	*"I inform them that the product is bleaching their skin, explain the effects long term and encourage them to stop and change their product."*

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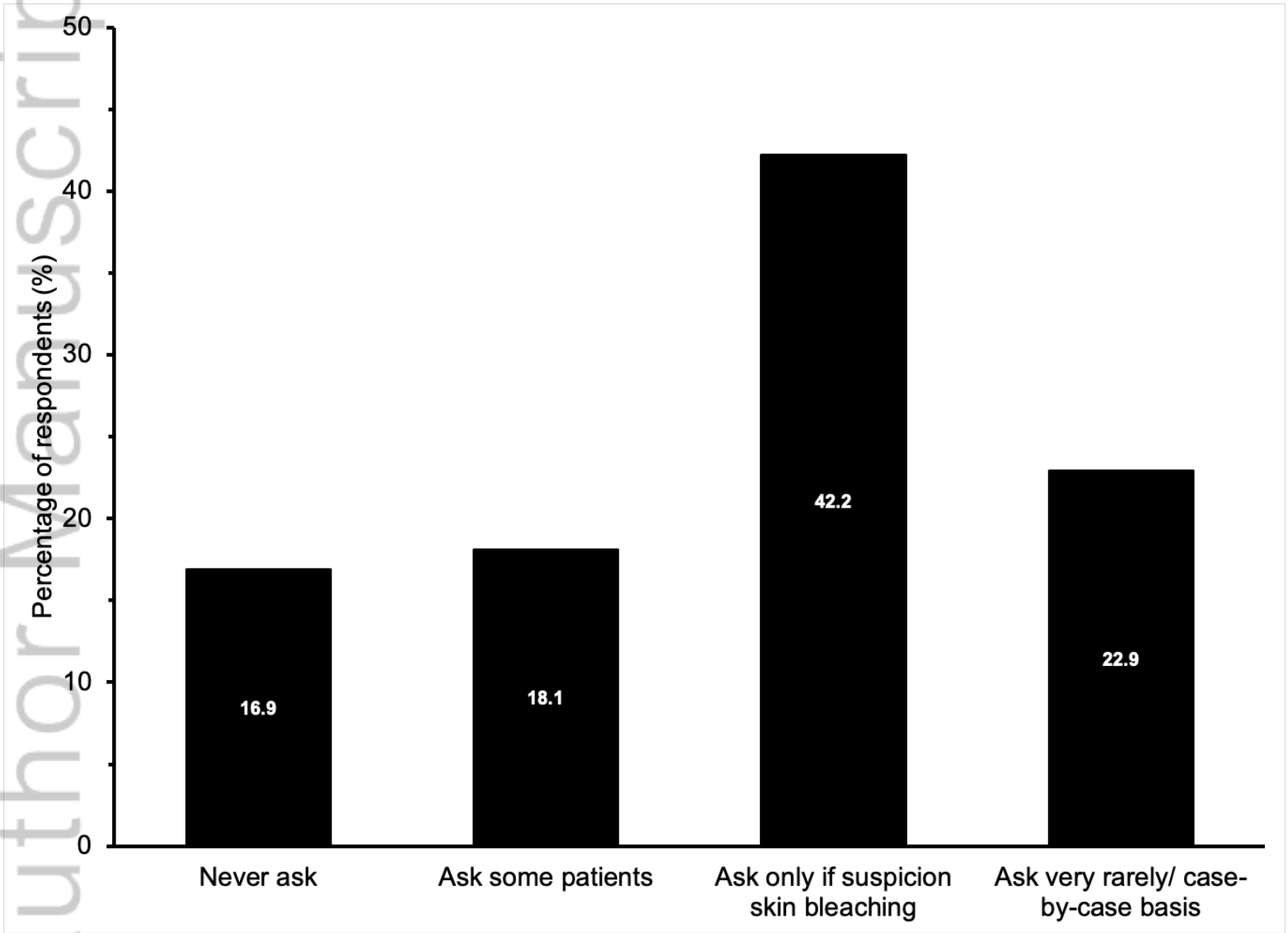

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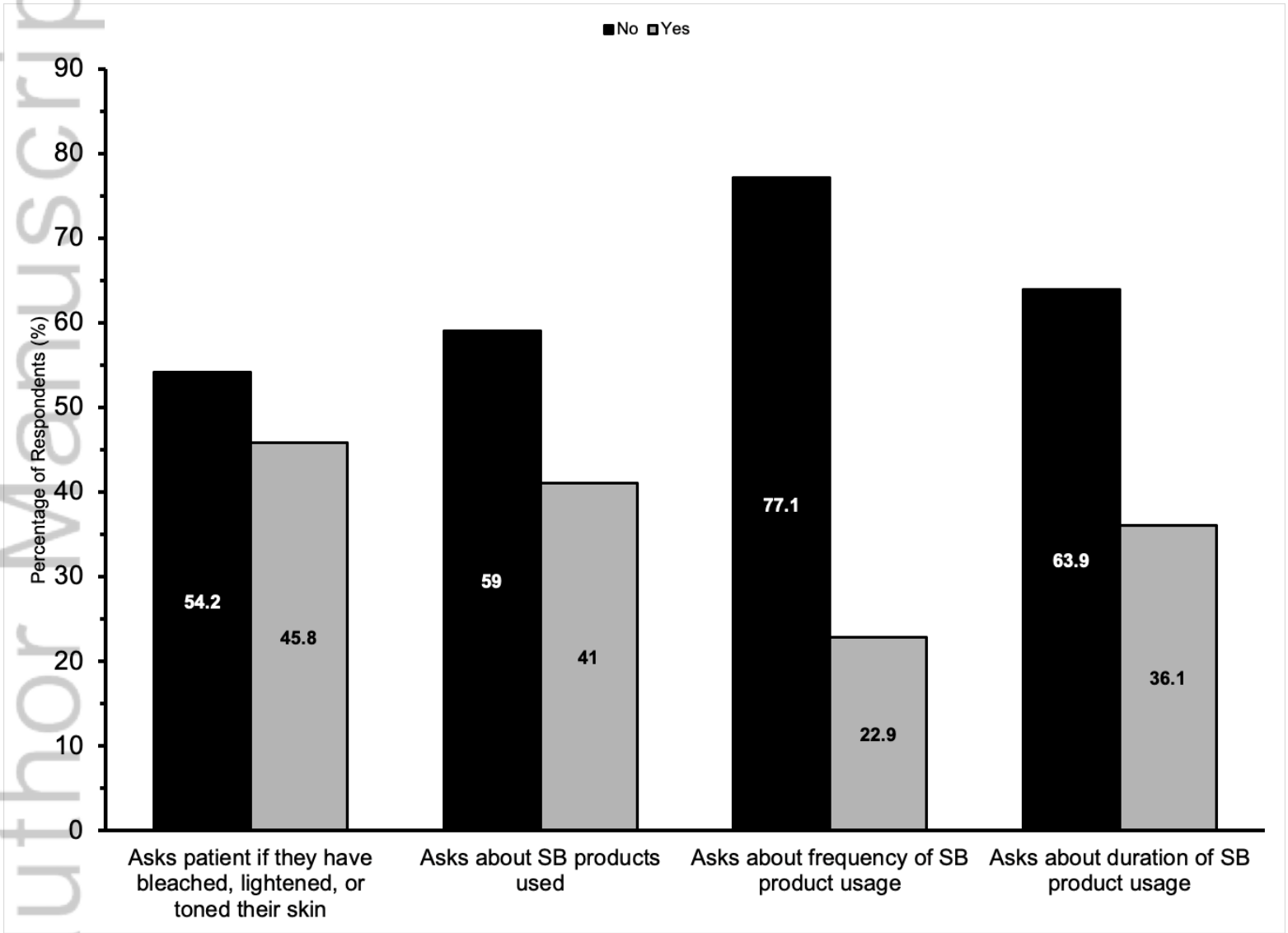

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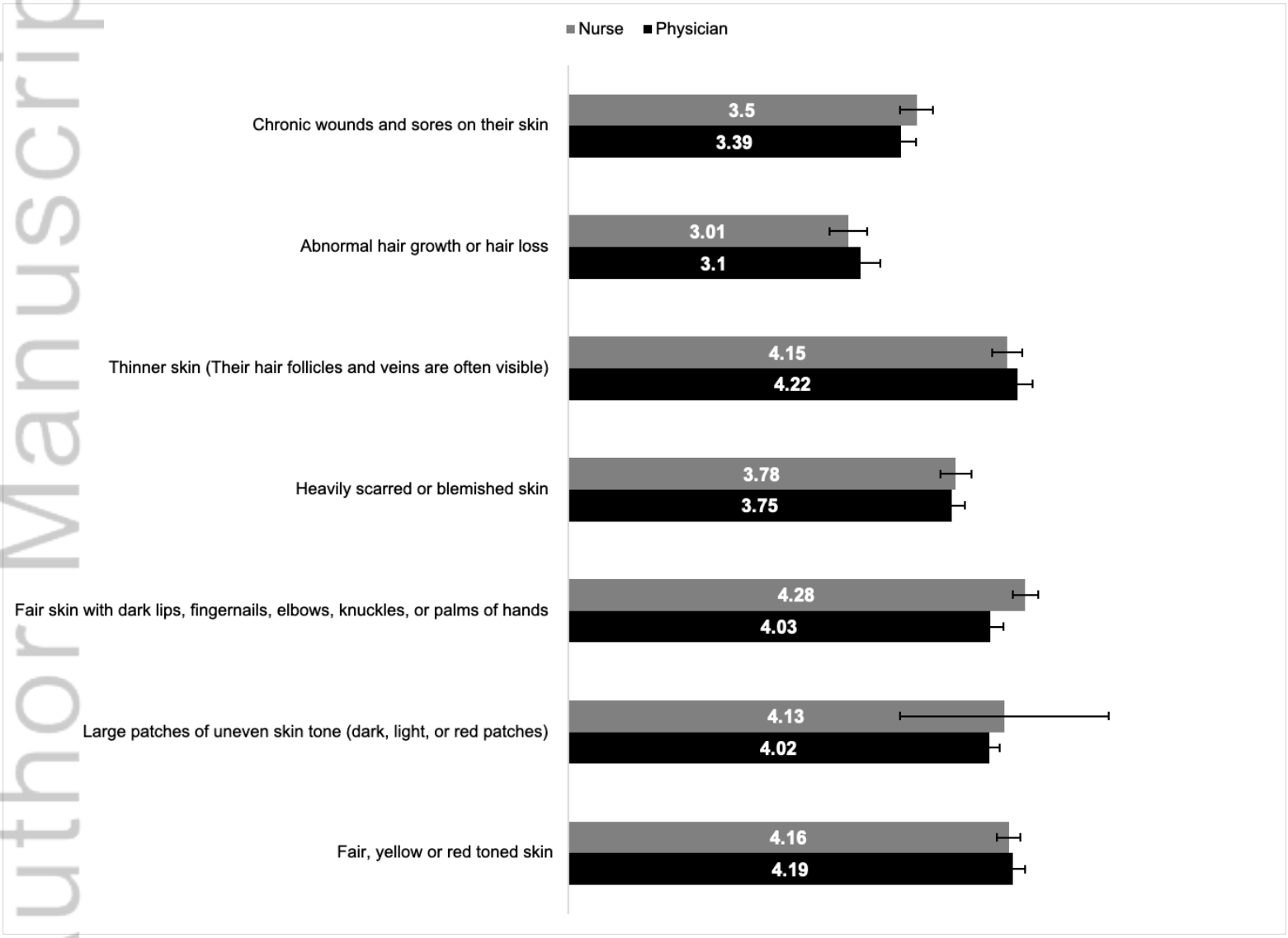

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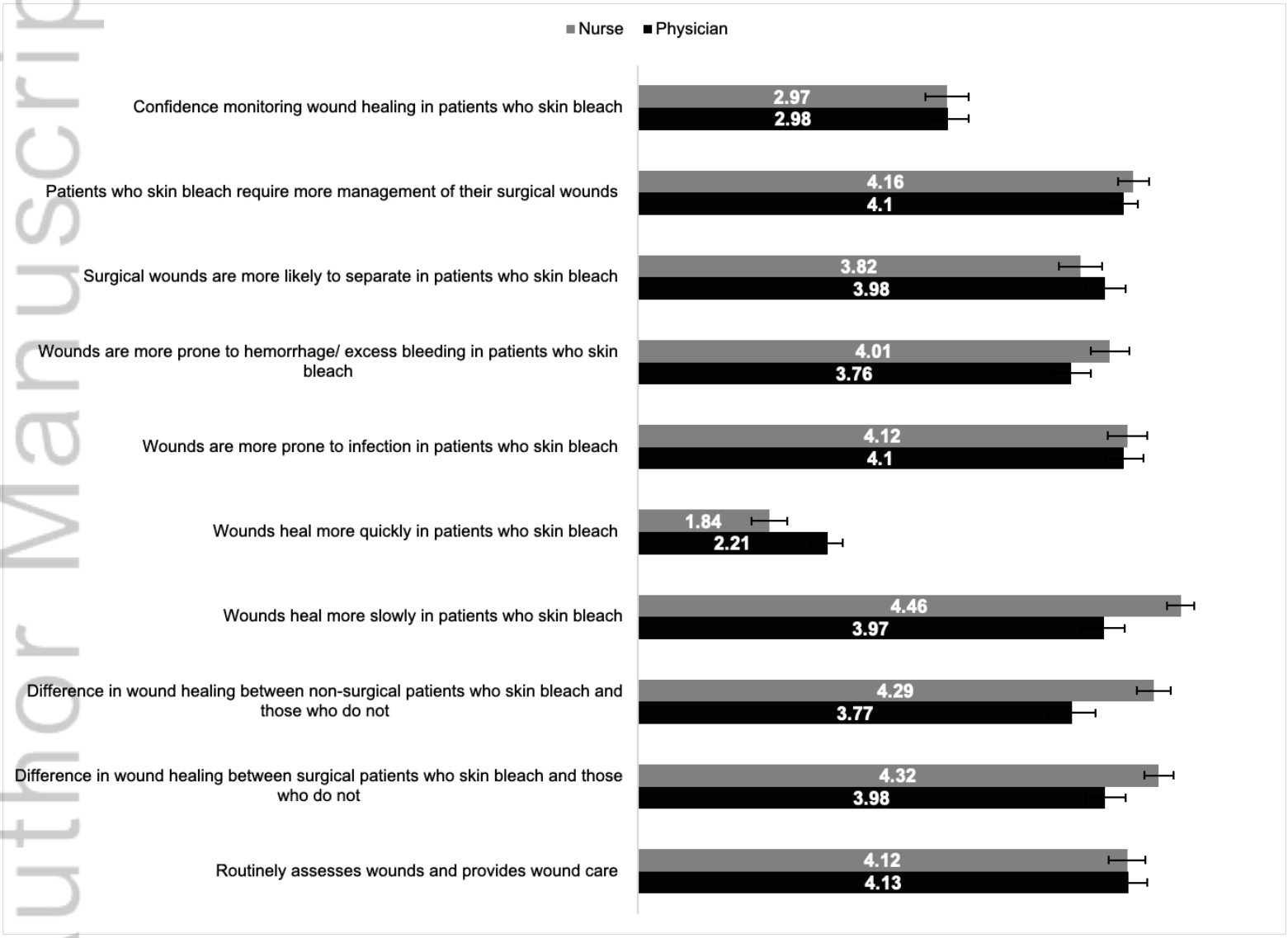

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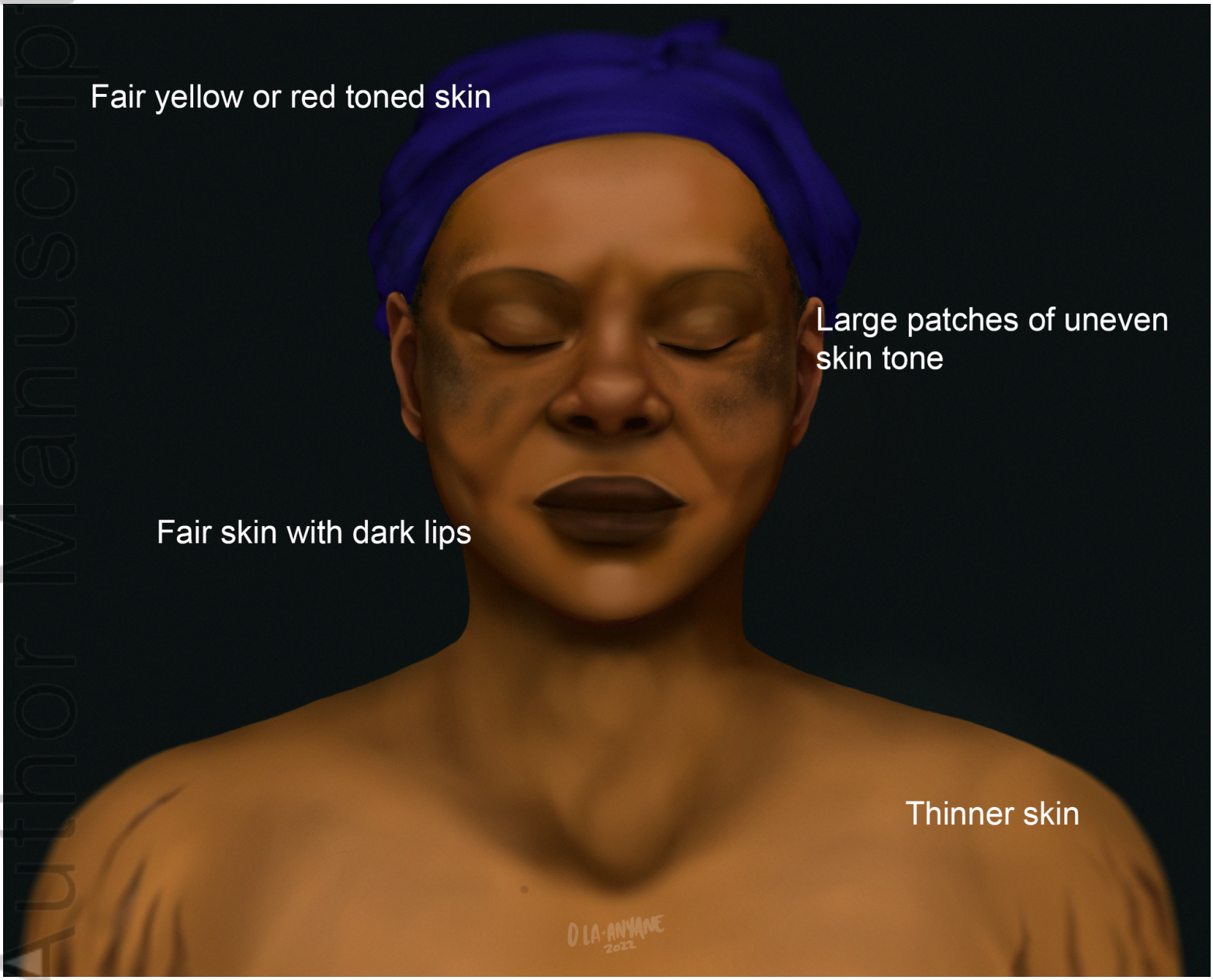

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