

COMMENTARY

Redefining the “crown”: Approaching chemotherapy-induced alopecia among Black patients with breast cancer

Versha A. Pleasant MD, MPH¹  | Ava S. Purkiss PhD^{1,2} | Sofia D. Merjaver MD, PhD³

¹Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan, USA

²Department of Women's and Gender Studies, Department of American Culture, University of Michigan, Ann Arbor, Michigan, USA

³Department of Internal Medicine, University of Michigan, Rogel Cancer Center, Ann Arbor, Michigan, USA

Correspondence

Versha A. Pleasant, University of Michigan, 1500 East Medical Center Dr, Ann Arbor, MI 48109, USA.

Email: vershap@med.umich.edu

KEYWORDS

alopecia, breast cancer, breast neoplasm, chemotherapy, race

For centuries, hair has been critical to how human beings understand racial categories, gender designations, class status, and personal worth. For Black women in particular, hair has been and continues to be deeply tied to ethnic identity. Its history is complex, ranging from the 1960–1970s “Black is Beautiful” movement that popularized the Afro and other non-Eurocentric styles as symbols of self-determination and political protest,¹ to Black hair being denigrated in schools and workplaces.^{2–5} Black hair has even necessitated legislation to protect its expression.⁶ In light of this contentious history, Black communities have informally adopted the word “crown” when referring to Black hair in an effort to redefine Black beauty and create a positive cultural consciousness.

Hair loss, therefore, can be a devastating experience, perhaps even more so when associated with a breast cancer diagnosis. Research demonstrates that chemotherapy-induced alopecia (CIA) is associated with low body esteem, low self-efficacy, and negative coping behaviors related to cancer diagnosis among women,^{7–9} with some declining cancer treatment altogether to avoid hair loss.^{10,11} Although most of the data on CIA include predominantly White cohorts, there is a paucity of research regarding the specific impact of CIA among Black women, who are disproportionately affected by more aggressive disease in which chemotherapy (particularly neoadjuvant chemotherapy) is more likely to be administered.^{12–17} One literature review only showed four studies specifically characterizing CIA outcomes among African American women, with data suggesting

that this group may be at higher risk of diffuse, permanent alopecia and may achieve poor results in hair preservation interventions.¹⁸ A qualitative study of 38 Black survivors of breast cancer revealed disturbing implications of CIA, such as hair loss being perceived by participants as more traumatic than the loss of breast tissue and experiencing physiological side effects of illness stemming from the loss of patients' hair,¹¹ sentiments also echoed by patients in other CIA studies.^{9,19,20} Perhaps distinctive to Black women were the concerns about the inability to wear wigs that were not designed for Black hair color or textures, with the author highlighting the need for practitioners to better understand such unique psychological effects of CIA on Black women.¹¹ Given the racial and gendered context of CIA, the aim of this commentary is to illuminate the cultural relevance of Black hair to the breast oncology community and explore how therapeutic options for CIA may uniquely impact Black breast cancer survivors.

The extent of CIA can vary by patient based on factors such as drug dose, administration, age, medical comorbidities, nutritional status, and preexisting alopecia.²¹ CIA tends to be most profound for patients receiving anthracyclines (such as doxorubicin), taxanes (such as paclitaxel and docetaxel), cyclophosphamide, or etoposide.^{22,23} Although hair regrowth can restart up to 6 months after chemotherapy, the texture and appearance of hair may undergo permanent changes and, rarely, some patients may experience permanent alopecia.²¹ Some of these predisposing factors may be more present in

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2023 The Authors. Cancer published by Wiley Periodicals LLC on behalf of American Cancer Society.

the Black community. Black women already suffer from higher rates of alopecia at baseline,²⁴⁻²⁶ although there have been no studies closely examining how this trend intersects with CIA. In a 10-year retrospective study examining women experiencing CIA after breast cancer treatment, 13 total had been identified as having permanent alopecia, with 10 of those patients identifying as African American and three identifying as White. African American women in this cohort also experienced more diffuse hair loss.²⁷ Another study demonstrated that many Black survivors of breast cancer were conflicted about their new hair growth and texture after CIA, partly because of historically racialized perceptions of Eurocentric beauty.¹¹

Research regarding effective prechemotherapy interventions and medications to address CIA has been modest. Scalp compression with tourniquets and medicinal Chinese herbs have been studied, but none have demonstrated consistent or significantly improved hair loss outcomes.²⁸ Scalp dermoscopy (trichoscopy) and bloodwork have been suggested to determine preexisting risk of hair loss and improve chemotherapy treatment management.²¹ Topical vasoconstrictors have also been proposed, but formulations such as topical epinephrine and norepinephrine have only proven effective on animal models.²⁹ Stimulators of hair regrowth after chemotherapy such as minoxidil have demonstrated some efficacy^{21,22,28,30} but neither minoxidil nor any of the other previously mentioned treatments have been extensively studied in Black women with CIA.

Scalp cooling, however, is the only intervention for CIA prevention that has been approved by the U.S. Food and Drug Administration³¹ and demonstrates positive response rates from 50% to 80%.^{22,32-36} The "Paxman" or "DigniCap" cooling systems, also referred to as "cold caps" or "cold capping," work by reducing the temperature of the scalp from 34.4°C to 18.3°C before, during, and immediately after chemotherapy. Scalp cooling can reduce blood flow to hair follicles through vasoconstriction and decrease intrafollicular metabolic rate, with the aim of decreasing chemotherapy uptake and susceptibility to toxicity at the follicle.^{23,36}

One particular multicenter prospective cohort study examined outcomes of patients undergoing scalp cooling with stage I or II breast cancer receiving adjuvant or neoadjuvant chemotherapy regimens (excluding anthracyclines). Hair loss of 50% or less (the definition of treatment success in this study) was seen in 66.3% of participants undergoing scalp cooling along with improvement in quality-of-life measures. Regarding self-perception, 27.3% of patients who underwent scalp cooling felt less physically attractive compared with 56.3% of control group patients. Overall, scalp cooling was associated with less hair loss 4 weeks after chemotherapy compared with control group outcomes. Of the total cohort (101 in the scalp cooling group and 16 in the control group), 9.0% were Black (compared with 77.0% White).³⁵ However, efficacy across racial groups was not examined in this particular study.

Although cold caps have demonstrated some benefit in White populations, who constitute the majority of research participants, there is limited data on its efficacy among Black patients. One particular phase 2 trial examined the effects of cold capping on 15 Black patients receiving at least four cycles of both nonanthracycline

and anthracycline regimens. The modified Dean scale and the Chemotherapy Alopecia Distress Scale were used to measure the extent of alopecia and patient distress, respectively. However, this trial was terminated early because of lack of efficacy. Both scores increased, with most patients experiencing grade 3 alopecia with >50% hair loss ($p < .001$ and $p = .4$ for modified Dean scale and Chemotherapy Alopecia Distress Scale, respectively) and only one patient demonstrating successful hair retention.³⁷

This trial calls attention to the need for further research on how the mechanism behind cold capping can be modified to increase effectiveness for all users. Hair texture, particularly hair thickness, has been shown in computer models to have an inverse relationship with the ability of the cap to effectively cool the scalp because the cap must make direct contact with the scalp.^{38,39} This requirement can create challenges when certain textures of Black hair become curlier (and therefore thicker) when wet.⁴⁰ These factors should be taken into consideration in the design of cold capping to better accommodate Black patients' hair needs.

It is critical for oncologists to be knowledgeable about other options that may be available to Black women at risk for CIA. Cranial prostheses can serve as acceptable alternatives in the setting of CIA. However, as previously illuminated in a prior qualitative study of Black breast cancer survivors,¹¹ most cranial prostheses targeted to breast cancer patients may not mimic the natural hair texture of Black patients, making the patient's medical condition even more apparent. Many Black CIA sufferers may turn to their local beauty supply store for a more "natural"-looking wig. From this demand, there have emerged several companies focused on creating wigs tailored to Black breast cancer survivors. *Coils to Locks* is a budding organization established by a Black breast cancer survivor whose goal was to create more ethnically appropriate ("coily" and curly) wigs that are covered by health insurance.⁴¹ Similarly, the founder of *Shades of Melanin* was inspired by their loved one with breast cancer and created an online store providing ethnic hair care options for those experiencing hair loss.⁴²

For those Black breast cancer patients who prefer not to undergo scalp cooling or wear a cranial prosthesis, decisions regarding scalp care and hair styling are important. Gaining a deeper understanding of alternative hairstyles for Black women may be valuable for oncologists. Although seemingly out of the realm of expertise, oncologists may consider discussing hair styling with Black patients. New hair growth may be fragile and may not initially support hairstyles that create significant tension in the scalp (such as cornrows or braided extensions)^{43,44} or chemical treatment of the hair (such as relaxers and hair dye).^{45,46} Despite the increased levels of melanin in many Black individuals, utilizing sunscreen with SPF and covering the scalp can provide protection against sunburn and skin cancer.⁴⁷

Given their significant influence and presence in the Black community, hair stylists represent a group that has the potential to play a more prominent role in conversations regarding the impact of CIA. Hair stylists have historically been involved in interventions regarding breast cancer education among Black people,⁴⁸ with Black hairdressers even being considered ideal "lay health advisors" to their

Key Points

- Black hair has significant historical, social, political, and cultural implications for Black patients.
- Chemotherapy-induced alopecia (CIA) can be a devastating side effect of breast cancer treatment for all racial groups, but may have unique implications for Black patients.
- Oncologists should gain a deeper understanding of the impact of CIA among Black patients.

FIGURE 1 Key points provides a summary of the significance of CIA among Blacks. CIA indicates chemotherapy-induced alopecia.

clients.^{49–52} This powerful role of cosmetologists could potentially extrapolate to CIA because Black clients have indicated they are more likely to accept hairdresser-issued health advice about chronic diseases if that advice is directly linked to hair issues.⁵³ Indeed, several studies have shown that Black hair stylists foster high levels of trust, relatability, and credibility with their clients.^{48,52,53} The safe cultural space fostered between Black women and their hairdressers could be leveraged by oncologists to explore CIA concerns and options with their patients. An unconventional but possibly beneficial approach could involve including hairdressers in conversations about hair regrowth through peer education, with the patient's enthusiastic consent, as part of their holistic care.

It is imperative to acknowledge the unique and highly variable texture of Black hair, for which the effectiveness of a single intervention may not be entirely feasible. With the heterogeneity of Black hair textures comes the diversity of perspectives within the Black community regarding hair loss in the setting of breast cancer treatment. Therefore, although we explore general cultural implications in this commentary, each individual's view of their hair and their emotional experience as they navigate breast cancer may vary within the Black community.

Ultimately, Black patients undergoing breast cancer treatment may experience CIA, which could affect their self-perceptions of beauty, femininity, and personal worth. Their hair loss may produce especially profound psychological side effects given the unique sociocultural weight of hair in Black communities.¹¹ Oncologists should engage their Black patients in discussions exploring how CIA may affect them and their breast cancer care, eliciting any specific needs, concerns, fears, or barriers (Figure 1). The breast oncology community would greatly benefit from more studies that examine the psychosocial impact of CIA on Black women and its effect on breast cancer care. This research could take the form of both quantitative and qualitative data collection among Black breast cancer survivors

Considerations for CIA Among Black Patients

- Oncologists should engage their Black patients in discussions exploring how CIA may affect them and their breast cancer care.
- There is a need for more quantitative and qualitative studies among Black breast cancer survivors that illuminate the impact of CIA on psychological and clinical outcomes.
- Tools that have proven efficacious in White populations (such as cold capping) should be tailored to the diversity of Black hair textures to increase efficacy.
- Breast oncologists should advocate for a diverse cranial prosthesis selection at their respective institutions to provide more aesthetic options to Black patients.
- Culturally relevant approaches to Black hair that decrease the impact of CIA should be prioritized, such as those that engage Black hair stylists in discussions of healthy hair care.

FIGURE 2 Considerations for CIA among Black patients provides a summary of key points for oncologists to consider regarding CIA among Blacks. CIA indicates chemotherapy-induced alopecia.

that offer more insight into how CIA could affect psychological and clinical outcomes (Figure 2).

Tools that have proven efficacious in White populations (such as cold capping) should be tailored to the diversity of Black hair textures to increase efficacy. We hope breast oncologists will be inspired to advocate for a more diverse cranial prosthesis selection at their respective institutions to provide more aesthetic options to Black patients. Culturally relevant approaches to Black hair that decrease the impact of CIA should be prioritized, such as those that engage Black hair stylists in discussions of healthy hair care. Oncologists should be knowledgeable about how hair may affect the care and treatment of breast cancer among Black patients to empower them with options that allow them to redefine their crown.

ACKNOWLEDGMENTS

There are no funding sources for this article.

CONFLICTS OF INTEREST STATEMENT

Sofia D. Merjaver reports being founder, share holder, and chief scientific officer for Inheret, a software company that makes clinical risk assessment tools. The other authors declare no conflicts of interest.

ORCID

Versha A. Pleasant  <https://orcid.org/0000-0003-2752-9636>

REFERENCES

1. Craig ML. *Ain't I a beauty queen? Black women, beauty, and the politics of race*. Oxford Academic; 2002.
2. Mobile Catastrophic Insurance Claims Company Sued by EEOC for Race Discrimination over Hair Policy. US Equal Employment Opportunity Commission; 2013. Accessed February 6, 2023. <https://www.eeoc.gov/newsroom/mobile-catastrophic-insurance-claims-company-sued-eeoc-race-discrimination-over-hair>
3. Stubbs R. *A wrestler was forced to cut his dreadlocks before a match. His town is still looking for answers*. The Washington Post; 2019. Accessed

- February 6, 2023. <https://www.washingtonpost.com/sports/2019/04/17/wrestler-was-forced-cut-his-dreadlocks-before-match-his-to-wn-is-still-looking-answers/>
4. American Screening Sued by EEOC for Race Discrimination. US Equal Employment Opportunity Commission; 2021. Accessed February 6, 2023. <https://www.eeoc.gov/newsroom/american-screening-sued-eeoc-race-discrimination>.
 5. Cox C. Texas teen banned by high school from attending graduation after refusing to cut dreadlocks. USA Today; 2020. Accessed February 6, 2023. <https://www.usatoday.com/story/news/nation/2020/01/24/black-texas-teen-barred-high-school-after-graduation-not-cutting-dreadlocks/4562210002/>
 6. Lee MS, Nambudiri VE. The CROWN act and dermatology: taking a stand against race-based hair discrimination. *J Am Acad Dermatol*. 2021;84(4):1181-1182. doi:10.1016/j.jaad.2020.11.065
 7. Versluis A, van Alphen K, Dercksen W, de Haas H, Kaptein AA, van den Hurk C. Looking bad: female patients drawing their representation of chemotherapy-induced alopecia. *J Health Psychol*. 2022; 27(13):3013-3027. doi:10.1177/13591053221075503
 8. Lemieux J, Maunsell E, Provencher L. Chemotherapy-induced alopecia and effects on quality of life among women with breast cancer: a literature review. *Psycho Oncol*. 2008;17(4):317-28. doi:10.1002/pon.1245
 9. Boland V, Brady A-M, Drury A. The physical, psychological and social experiences of alopecia among women receiving chemotherapy: an integrative literature review. *Eur J Oncol Nurs*. 2020;49:101840. doi:10.1016/j.ejon.2020.101840
 10. McGarvey EL, Baum LD, Pinkerton RC, Rogers LM. Psychological sequelae and alopecia among women with cancer. *Cancer Pract*. 2001;9(6):283-9. doi:10.1111/j.1523-5394.2001.96007.pp.x
 11. Wilson KB. And it'll come back real baby fine: Black women's experiences with hair loss and regrowth after chemotherapy for breast cancer treatment. *Qual Health Res*. 2022;32(7):1071-1085. doi:10.1177/10497323221091929
 12. Newman LA, Kaljee LM. Health disparities and triple-negative breast cancer in African American women: a review. *JAMA Surg*. 2017;152(5):485-93. doi:10.1001/jamasurg.2017.0005
 13. Hester RH, Hortobagyi GN, Lim B. Inflammatory breast cancer: early recognition and diagnosis is critical. *Am J Obstet Gynecol*. 2021;225(4):392-6. doi:10.1016/j.ajog.2021.04.217
 14. Stringer-Reasor EM, Elkhanany A, Khoury K, Simon MA, Newman LA. Disparities in breast cancer associated with African American identity. *Am Soc Clin Oncol Educ Book*. 2021(41):e29-46. doi:10.1200/edbk_319929
 15. Abraham HG, Xia Y, Mukherjee B, Merajver SD. Incidence and survival of inflammatory breast cancer between 1973 and 2015 in the SEER database. *Breast Cancer Res Treat*. 2021;185(1):229-38. doi:10.1007/s10549-020-05938-2
 16. Killelea BK, Yang VQ, Wang S-Y, et al. Racial differences in the use and outcome of neoadjuvant chemotherapy for breast cancer: results from the National Cancer Data Base. *J Clin Oncol*. 2015;33(36):4267-76. doi:10.1200/jco.2015.63.7801
 17. Pastoriza JM, Karagiannis GS, Lin J, et al. Black race and distant recurrence after neoadjuvant or adjuvant chemotherapy in breast cancer. *Clin Exp Metastasis*. 2018;35(7):613-23. doi:10.1007/s10585-018-9932-8
 18. Hrin ML, McMichael AJ. Chemotherapy-induced alopecia in African American women: a literature review demonstrates a knowledge gap. *J Am Acad Dermatol*. 2022;86(6):1434-5. doi:10.1016/j.jaad.2021.06.858
 19. Browall M, Gaston-Johansson F, Danielson E. Postmenopausal women with breast cancer: their experiences of the chemotherapy treatment period. *Cancer Nurs*. 2006;29(1):34-42. doi:10.1097/00002820-200601000-00006
 20. Freedman TG. Social and cultural dimensions of hair loss in women treated for breast cancer. *Cancer Nurs*. 1994;17(4):334-41. doi:10.1097/00002820-199408000-00006
 21. Rossi A, Fortuna MC, Caro G, et al. Chemotherapy-induced alopecia management: clinical experience and practical advice. *J Cosmet Dermatol*. 2017;16(4):537-41. doi:10.1111/jocd.12308
 22. Rubio-Gonzalez B, Juhász M, Fortman J, Mesinkovska NA. Pathogenesis and treatment options for chemotherapy-induced alopecia: a systematic review. *Int J Dermatol*. 2018;57(12):1417-24. doi:10.1111/ijd.13906
 23. Massey CS. A multicentre study to determine the efficacy and patient acceptability of the Paxman Scalp Cooler to prevent hair loss in patients receiving chemotherapy. *Eur J Oncol Nurs*. 2004;8(2):121-30. doi:10.1016/j.ejon.2003.10.006
 24. Thompson JM, Park MK, Qureshi AA, Cho E. Race and alopecia areata amongst US women. *J Investig Dermatol Symp Proc*. 2018;19(1):S47-50. doi:10.1016/j.jisp.2017.10.007
 25. Gathers RC, Lim HW. Central centrifugal cicatricial alopecia: past, present, and future. *J Am Acad Dermatol*. 2009;60(4):660-8. doi:10.1016/j.jaad.2008.09.066
 26. Billero V, Miteva M. Traction alopecia: the root of the problem. *Clin Cosmet Investig Dermatol*. 2018;11:149-59. doi:10.2147/ccid.s137296
 27. Masidonski P, Mahon SM. Permanent alopecia in women being treated for breast cancer. *Clin J Oncol Nurs*. 2009;13:13-4.
 28. Zhou T, Han S, Zhu Z, Hu Y, Xing W. Interventions for preventing chemotherapy-induced alopecia: a systematic review and network meta-analysis of randomized controlled trials. *Cancer Nurs*. 2021;44:E567-77.
 29. Soref CM, Fahl WE. A new strategy to prevent chemotherapy and radiotherapy-induced alopecia using topically applied vasoconstrictor. *Int J Cancer*. 2015;136(1):195-203. doi:10.1002/ijc.28961
 30. Duvic M, Lemak NA, Valero V, et al. A randomized trial of minoxidil in chemotherapy-induced alopecia. *J Am Acad Dermatol*. 1996;35(1):74-8. doi:10.1016/s0190-9622(96)90500-9
 31. Rossi A, Caro G, Fortuna MC, Pigiaccioli F, D'Arino A, Carlesimo M. Prevention and treatment of chemotherapy-induced alopecia. *Dermatol Pract Concept*. 2020;10:e2020074. doi:10.5826/dpc.1003a74
 32. Breed WPM, van den Hurk CJG, Peerbooms M. Presentation, impact and prevention of chemotherapy-induced hair loss: scalp cooling potentials and limitations. *Expert Rev Dermatol*. 2011;6(1):109-25. doi:10.1586/edm.10.76
 33. Macduff C, Mackenzie T, Hutcheon A, Melville L, Archibald H. The effectiveness of scalp cooling in preventing alopecia for patients receiving epirubicin and docetaxel. *Eur J Cancer Care*. 2003;12(2):154-61. doi:10.1046/j.1365-2354.2003.00382.x
 34. Shin H, Jo SJ, Kim DH, Kwon O, Myung S-K. Efficacy of interventions for prevention of chemotherapy-induced alopecia: a systematic review and meta-analysis. *Int J Cancer*. 2015;136(5):E442-54. doi:10.1002/ijc.29115
 35. Rugo HS, Klein P, Melin SA, et al. Association between use of a scalp cooling device and alopecia after chemotherapy for breast cancer. *JAMA*. 2017;317(6):606-14. doi:10.1001/jama.2016.21038
 36. Nangia J, Wang T, Osborne C, et al. Effect of a scalp cooling device on alopecia in women undergoing chemotherapy for breast cancer: the SCALP Randomized Clinical Trial. *JAMA*. 2017;317(6):596-605. doi:10.1001/jama.2016.20939
 37. Dilawari A, Gallagher C, Alintah P, et al. Does scalp cooling have the same efficacy in Black patients receiving chemotherapy for breast cancer? *Oncology*. 2021;26(4):292-e548. doi:10.1002/onco.13690
 38. Janssen FEM, Van Leeuwen GMJ, Van Steenhoven AA. Modelling of temperature and perfusion during scalp cooling. *Phys Med Biol*. 2005;50(17):4065-73. doi:10.1088/0031-9155/50/17/010
 39. Komen MMC, Smorenburg CH, van den Hurk CJG, Nortier JWR. Factors influencing the effectiveness of scalp cooling in the

- prevention of chemotherapy-induced alopecia. *Oncology*. 2013;18(7):885-91. doi:10.1634/theoncologist.2012-0332
40. Araoye EF, Stearns V, Aguh C. Considerations for the use of scalp cooling devices in Black patients. *J Clin Oncol*. 2020;38(30):3575-6. doi:10.1200/jco.20.02130
41. Coils to Locks. Accessed June 1, 2022. <https://coilstolocks.com/>
42. Shades of Melanin. Accessed June 1, 2022. <https://shadesofmelaninhair.com/>
43. Molamodi K, Fajuyigbe D, Sewraj P, et al. Quantifying the impact of braiding and combing on the integrity of natural African hair. *Int J Cosmet Sci*. 2021;43(3):321-31. doi:10.1111/ics.12699
44. Haskin A, Aguh C. All hairstyles are not created equal: what the dermatologist needs to know about Black hairstyling practices and the risk of traction alopecia (TA). *J Am Acad Dermatol*. 2016;75(3):606-11. doi:10.1016/j.jaad.2016.02.1162
45. Sishi VNB, Van Wyk JC, Khumalo NP. The pH of lye and no-lye hair relaxers, including those advertised for children, is at levels that are corrosive to the skin. *S Afr Med J*. 2019;109(12):941-6. doi:10.7196/samj.2019.v109i12.14010
46. Mayo TT, Callender VD. The art of prevention: it's too tight-loosen up and let your hair down. *Int J Womens Dermatol*. 2021;7(2):174-9. doi:10.1016/j.ijwd.2021.01.019
47. Muth CC. Chemotherapy and hair loss. *JAMA*. 2017;317(6):656. doi:10.1001/jama.2016.21266
48. Wilson TE, Fraser-White M, Feldman J, et al. Hair salon stylists as breast cancer prevention lay health advisors for African American and Afro-Caribbean women. *J Health Care Poor Underserved*. 2008;19(1):216-26. doi:10.1353/hpu.2008.0017
49. Linnan LA, Ferguson YO. Beauty salons: a promising health promotion setting for reaching and promoting health among African American women. *Health Educ Behav*. 2007;34(3):517-30. doi:10.1177/1090198106295531
50. Resnicow K, Andrews AM, Beach DK, et al. Randomized trial using hair stylists as lay health advisors to increase donation in African Americans. *Ethn Dis*. 2010;20:276-81.
51. Palmer KNB, Rivers PS, Melton FL, et al. Health promotion interventions for African Americans delivered in U.S. barbershops and hair salons-a systematic review. *BMC Publ Health*. 2021;21(1):1553. doi:10.1186/s12889-021-11584-0
52. Sadler GR, Ko CM, Wu P, Alisangco J, Castañeda SF, Kelly C. A cluster randomized controlled trial to increase breast cancer screening among African American women: the Black cosmetologists promoting health program. *J Natl Med Assoc*. 2011;103(8):735-45. doi:10.1016/s0027-9684(15)30413-2
53. Palmer KNB, Okechukwu A, Mantina NM, et al. Hair stylists as lay health workers: perspectives of Black women on salon-based health promotion. *Inquiry*. 2022;59:469580221093183. doi:10.1177/00469580221093183