

Evaluate the Effect of Inadequate Representation on Dermatology Education and its Impact on the Quality of Care for Patients of Color

Alexa Rowe*[†]

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Abstract

The concepts of diversity and representation are important in all career fields, but it is especially important in medical fields. In medical fields, treatment is dependent on the patient population and what and to whom the physicians are exposed to. Some medical fields suffer more than others as a result from a lack of diversity and representation. For instance, the field of dermatology is severely lacking in diversity, and it significantly affects their outcomes. There are various disparities that come with this lack of representation such as reduced patient outcomes and decreased quality of care. Education is a large part of solving and eliminating these disparities and increasing patient outcomes and the quality of care. This research analysis gathered data from various research papers to identify dermatological disparities within education. Once these disparities were identified, the papers were further evaluated to propose solutions for improving patient of color outcomes and their quality of care. This research examines how the treatment of patients of color is impacted by the lack of diversity in dermatology education. To achieve this, it assessed the quantity of dermatology-related physicians, text materials, clinical trial participants, and the degree of diversity inclusion. It also identified and proposed solutions to diversify dermatology by means of education. Based on the data and analysis conducted it is feasible to draw the conclusion that there is a general lack of diversity in dermatology education, which negatively affects patient outcomes and care quality.

1 Introduction

In 2018, the U.S Census Bureau provided statistics that show its population will become ‘minority white’ in 21 years. In 2045, white people will comprise 49.7 percent of the population whereas Hispanic people will make up 24.6 percent,

*Student at Randolph High School

[†]Advised by: Dr. ChiChi Mpamaugo from Columbia University

Black people 13.1 percent, Asian people 7.9 percent, and multiracial people 3.8 percent [Fre18]. Since the demographics of the U.S are changing dramatically, its workforce should be reflective of that. Professions in medicine show mass underrepresentation of various racial and ethnic groups despite these changing demographics. African Americans, for example, currently make up 13 percent of the U.S population, but in medicine, 4 percent of them are physicians [DZF⁺17]. This statistic remains similar across various racial/ethnic groups and across multiple fields of study in medicine. The field this paper is going to be discussing specifically is dermatology.

Dermatology is the second least diverse field in medicine. Within the specialty, less than 5 percent of Black and Latinx people make up the field (3 percent of dermatologists are Black and 4.2 percent are Latinx) [DKG⁺21]. This has been a continued trend in dermatology for over 30 years and there needs to be a change. The dermatology field needs to match the projected patient population in terms of diversity to provide satisfactory patient outcomes. There needs to be more diversity in general medicine, but more specifically dermatology. Increased diversity is needed because it enhances and widens the scope in which people think. Healthcare providers will receive perspectives from multiple groups of people which positively impacts their education. Diversity leads to a more inclusive society benefiting all people, which is especially important in medicine as physicians need to successfully treat all people. Diversity improves the quality of care for all patients, especially patients of color because physicians are more adept to treat them. When referring to quality of care, it consists of the diagnosis, treatment plan, and management of patient complications. Patients who receive poor care also receive improper follow-up and treatment; therefore, as diversity in the field increases, so do patient outcomes and their quality of care. Education also needs to be taught in ways that reduce implicit bias, automatic and unintentional bias, in order to deliver patients of color the care they deserve.

The disparities found within dermatology include the lack of diversity of physicians, text materials, and clinical trial participants. These three main disparities affect a patient's overall quality of care when being treated by a dermatologist. This research analysis will evaluate how inadequate representation within dermatology education impacts quality of care for patients of color.

2 Methods

This paper is a systematic literature review. The search engines Google Scholar and PubMed were used to find all the cited references. The papers were primarily found from searching various key words. Key words included: dermatology, people of color, educational disparities, quality of care, diagnosis, frequency of complications, research and trials, physicians of color, text material. The references were also filtered through their abstracts. They were excluded if they did not mention health disparities. A total of 23 references met the criteria and were included in the analysis.

3 Results

3.1 Number of Dermatology Physicians

The number of physicians of color in the U.S is extremely limited. This flawed proportion can result in mistrust from patients of color leading to their lowered quality of care. A way to fix this proportion and increase the quality of care for patients of color would be by increasing diversity of the workforce and cultural competence among dermatologists which would enhance patient adherence, satisfaction, and outcomes of treatments [BCH23]. Increasing the education of physicians to be culturally sensitive is necessary for patients of color to feel comfortable to erase the history of prejudice deeply rooted in the healthcare system.

3.1.1 Physicians of Color in Mental Health Professions

The need to educate physicians on how to be culturally sensitive extends beyond the field of dermatology, like mental health professionals. It is especially important to educate physicians on how to be culturally sensitive and treat patients of color. The proportion of white physicians to non-white physicians remains the same across multiple fields. Table I from the research paper, “Progress in Improving Mental Health Services for Racial-Ethnic Minority Groups: A Ten-Year Perspective,” shows various mental health fields and the percentages of mental health physicians of color from each field. White physicians act as the majority in each field over the ten years shown in this paper. No racial group exceeds 15 percent alone and white people continuously carry the majority of at least 65 percent [SM14]. There are so many medical fields whose patients struggle as a result of these disproportionate percentages.

3.1.2 Physicians of Color in Dermatology

Physicians of color being able to share their firsthand experiences in the medical field, specifically within the field of dermatology, is vital to the education of residents. Table II from the research paper, “Skin of color education in dermatology residency programs: Does residency training reflect the changing demographics of the United States?,” presents results from an online survey. The survey asked program directors and chief residents of dermatology residencies questions regarding how well a job their residency program does of educating residents about skin of color. Questions 1 and 2 ask about there being an expert on skin of color in their residencies. The majority of people answered “no” with 84.1 percent and 85.4 percent for Question 1 and 73 percent and 80.5 percent for Question 2 [NJWL08]. This is a significant problem because without proper education about treating skin of color, future dermatologists will not be equipped to diagnose people of color which can lead to increased complications and worsened overall quality of care. This is a big concern that is explicitly addressed in Question 8 which asks if the residents get experience with treating skin of color. The

Table 1

Proportion of clinically trained mental health professionals from racial-ethnic minority groups compared with U.S. population, in percentages

Group	Racial-ethnic minority representation											
	Psychiatry				Psychology				Social work			
	1999 clinicians ^a	1999 U.S. population	2006 clinicians ^b	2006 U.S. population	1999 clinicians ^c	1999 U.S. population	2006 clinicians ^d	2006 U.S. population	1996 clinicians ^e	1996 U.S. population	2004 clinicians ^f	2004 U.S. population
American Indian or Alaska Native	.1	.7	.4	.9	.6	.7	.4	.9	.6	.7	.5	.7
Asian American or Pacific Islander	10.4	3.7	13.1	5.0	1.5	3.7	2.0	5.0	1.7	3.5	1.6	4.6
Latino	4.4	11.5	4.7	14.8	2.4	11.5	2.9	14.8	2.8	10.6	4.5	13.1
Black or African American	2.7	12.1	3.2	13.4	2.1	12.1	2.5	13.4	3.1	12.0	6.3	12.1
White	81.5	71.9	78.6	65.3	93.4	71.9	92.2	65.3	91.8	73.2	87.1	68.8

^a The 1999 American Psychiatric Association membership residing in the United States, excluding medical students, psychiatry residents, corresponding psychiatrists, and inactive members. Race-ethnicity was not specified for 6.2%.

^b The 2006 American Psychiatric Association membership residing in the United States, excluding medical students, psychiatric residents, international members and fellows, inactive members, associates, fellows, and honorary fellows. One race-ethnicity was not specified for 7.9% (data were missing or respondents reported multiethnicity).

^c American Psychological Association data. Race-ethnicity was not specified for 5.5%.

^d American Psychological Association Member Directory 2006. Compiled by APA Center for Workforces Studies. One race-ethnicity was not specified for 20.5% (data were missing or respondents reported multiethnicity).

^e Association for Social Work Board estimates. Race-ethnicity not specified for .8%.

^f The Association for Social Work Board estimates the number of licensed social workers to be 310,000. This number excludes bachelor level, doctorate level, and nondegree licensed social workers. An estimated 79% of this number, or 244,900, have M.S.W. degrees and are thus eligible to hold clinical licenses. The proportion with an M.S.W. degree and a clinical license is unknown. Hence, for purposes of this table, the total number of clinically trained social workers was considered to be 244,900.

Figure 1: Santiago, C. D., and Miranda, J. (2014). Progress in improving mental health services for racial-ethnic minority groups: A ten-year perspective. *Psychiatric Services*, 65(2), 180-185.

majority, again, was “no” with 69.8 percent and 87.8 percent [NJWL08]. Increased number of physicians of color are needed to educate other residents and dermatologists and provide their experiences/accounts to teach other physicians how to care for patients of color without showing them prejudice and implicit bias.

3.1.3 Patient-physician Congruence

As a result of the ongoing prejudice in the healthcare system, patients would rather have physicians that look like them or better represent them. This theory is known as patient-physician congruence. Patient-physician congruence is often preferred by patients of color, and it results in them receiving overall better outcomes and treatment adherence. Patient-physician congruence is the similarity or link a patient has with his or her physician based on ethnicity, age, or gender [JMGD05]. These similarities increase the patient’s comfort level, adherence to taking experimental treatments, and correctly taking prescribed medications. Studies have shown communication issues with physicians and patients often results in the failure of them taking the correct medications [JMGD05].

This phenomenon is in part because patients of color, in particular Black patients, have historical mistrust in the medical system. This mistrust resulted from decades of systemic racism and historical trauma where they were not

Table I. Survey results

Survey question:	Chief residents (n = 63), %				Program directors (n = 41), %			
	Yes	No	IDK	P value	Yes	No	IDK	P value
1. Does your residency program have an acknowledged expert who conducts a clinic specializing in skin of color?	14.3	84.1	1.6	<.001	14.6	85.4	0.0	<.001
2. Does your residency program have an acknowledged expert who offers lectures focusing on skin of color?	25.4	73.0	1.6	<.001	19.5	80.5	0.0	<.001
3. Does your residency program include faculty who are members of the Skin of Color Society?	12.7	24.5	61.9	.096	9.8	68.3	22.0	<.001
4. Does your residency program have didactic sessions or lectures focusing on diseases in skin of color?	52.4	47.6	0.0	.70	65.9	31.7	2.4	.02
5. Do your residents have experience in treating patients with keloids?	100.0	0.0	0.0	<.001	100.0	0.0	0.0	<.001
6. Do your residents have experience in treating patients with CCCA?	84.1	12.7	3.2	<.001	90.2	7.3	2.4	<.001
7. Do your residents have experience in treating patients with melasma?	100.0	0.0	0.0	<.001	100.0	0.0	0.0	<.001
8. Does your residency program have a dedicated rotation in which residents gain experience treating patients with skin of color?	30.2	69.8	0.0	<.001	12.2	87.8	0.0	<.001

CCCA, Centrifugal cicatricial alopecia; IDK, I don't know.

Figure 2: Nijhawan, R. I., Jacob, S. E., and Woolery-Lloyd, H. (2008). Skin of color education in dermatology residency programs: does residency training reflect the changing demographics of the United States? *Journal of the American Academy of Dermatology*, 59(4), 615-618.

treated fairly. Systemic racism is discrimination of a racial or ethnic group by a system or institution. For years, the American healthcare system built its institutions on systemic racism through illicit trials, experiments, and behaviors. More physicians of color are needed to help provide comfort for patients of color especially Black patients who have severe mistrust in the medical industry [KIC22]. Patient-physician congruence is important here because the patient and physician can both understand one another's point of view regarding the medical industry, and not be biased or judgmental. Patients of color also have continued mistrust in the modern day because "contributing factors occur within the general health care system as well as through provider bias/racism, impaired communication with patients, and lack of trust in the health care system among vulnerable patient populations" [KSFF⁺21]. Therefore, many patients of color favor having patient-physician congruence as it creates a safe space for them with a physician that they are more likely to trust. This ultimately leads to better adherence and outcomes because patients are far more likely to listen to a physician who they can relate to and connect with on a deeper level.

3.1.4 Patient-physician Congruence in Obstetrics and Gynecology

Obstetrics and Gynecology (OB-GYN), similar to dermatology, is a field in medicine where patient-physician congruence has been shown to be beneficial. OB-GYN focuses on women's health, and a large part of that is childbirth and

finding solutions to maternal mortality. Maternal mortality refers to a woman's death that resulted from a childbirth or a complication one year after childbirth. Maternal mortality is an even larger issue for women of color because of the health disparities that exist within institutions. For example, white women have a maternal mortality rate of 13.4 percent, African American women 41.7 percent, and American Indian and Alaska Native 28.3 percent [Nat21]. While these stats are so significant, studies show that patient-physician congruence does improve outcomes for patients of color. These mortality outcomes are due to the implicit bias shown from white physicians based on the assumptions made about women of color. These assumptions are not based on fact or education, and they can negatively impact the quality-of-care patients are receiving and it explains the high mortality rate in women of color.

3.1.5 Patient-physician Congruence in Dermatology

Patient-physician congruence is an established theory and practice in various medical fields, but it is rarely implemented in Dermatology, or if it is, it is done incorrectly. Because less than 5 percent of Black and Latinx people make up the Dermatology field, the proportion of physicians and patients of color are so unbalanced that racial congruence cannot take place [DKG⁺21]. In the field, white physicians tend to treat white patients. This causes white physicians to be insufficient in treating patients of color which overall lowers their quality of care. Not only are patients of color not receiving patient-physician congruence, but white providers are also not being trained to treat patients of color. Because Dermatology is the 2nd least diverse medical field in America [DKG⁺21], there are limited opportunities for patient-physician congruence. It is more important in dermatology because of the severe lack of physicians of color. More physicians of color need to be recruited so patient physician congruence can be adequately established. Once this patient-physician congruence is prevalent, quality of care for dermatology's patients of color will be significantly raised and their outcomes will be better. However, patient-physician congruence is not the only factor that can improve patient outcomes. It also starts within the education and training in the residences to help physicians become aware and culturally competent to treat patients of color.

3.1.6 The Association of Professors of Dermatology and their Proposed Solutions

The Association of Professors of Dermatology (APD) is defined as "the organization representing leaders of dermatology training in the United States" [GCS17]. The APD strongly believes in increased diversity and diverse recruitment in the dermatology field and believes that can start from residency programs. To do that, they must seek applications from historically Black colleges or universities with medical schools that have a diverse range of students. Increasing diversity in medical schools is also important due to the lack of applications from people underrepresented in medicine. Ways to increase the number of students from

underrepresented groups could be done through systems like affirmative action and increased financial aid. Inclusive recruitment overall is an especially important part of raising the numbers of physicians of color. The APD encourages the education of implicit biases and how that impacts recruitment, education, and career development of trainees and professors [GCS17]. This initiative will educate professors on how to eliminate implicit bias in recruitment, therefore allowing for more dermatology residents of color and physicians of color in the near future. Also, there needs to be diversity in primary care givers as well as dermatologists and residents [KSFF⁺21]. Primary care givers frequently treat and examine patients of color for these diseases. Racial congruence and increased education are vital here because often there could be incorrect diagnosis. Ultimately, these initiatives promote racial congruence in the workforce by increasing the diversity of future dermatologists allowing for better quality of care for patients of color.

3.2 Dermatological Text Materials

In numerous dermatology residencies across the United States, education about patients of color among residents is subpar, and the materials professors use to educate them are not reflective of the diverse patient population. Deficient medical student and resident education in diseases presentation in people of color and underrepresentation of minorities in dermatology contribute to the disparities in the field [KSFF⁺21]. From the images in textbooks, to the interactive learning approaches; residents are not learning about how to properly treat people of color due to the lack of representation in these learning methods. Increased representation in dermatology education is needed to train residents and dermatologists to provide better outcomes for people of color resulting in an overall better quality of care.

3.2.1 Dermatological Images in Textbooks

It has been well studied that educational materials in dermatology do not portray images of darker skinned patients. In the research paper “Disparities in Dermatology Educational Resources,” Table III quantifies the number of light and dark skin images in dermatology textbooks. It categorized and created shade ranges for both categories and used “Indeterminate” for images that did not meet the criteria for inclusion. Out of the 7 textbooks, each had less than 20 percent dark skinned images, making light skinned images the consistent majority [EP06]. The mean percentage of dark-skinned images from all 7 textbooks was approximately 11.4 percent. This percentage, although formulated from 17 years ago, has remained the same from then into the present. In 2006, the white population had made up 66 percent of the population, and that number increased 6.7 percent since 2021 showing white people still hold the majority [USA23]. The percentage of white people in the population continues to remain disproportionate both then and now. These images in textbooks should recognize all skin colors so dermatologists can easily treat skin conditions on

Table I. Images of different skin phototypes in dermatology textbooks

Textbook	Dark	Light	Indeterminate	Total	Dark skin images
Bologna	254	1011	61	1326	19%
Freedberg	240	1339	67	1646	15%
Rook	178	1255	79	1522	12%
Fitzpatrick 5th	97	721	39	857	11%
Fitzpatrick 4th	73	602	26	701	10%
Sauer's	57	550	8	615	9%
Habif	36	944	32	1012	4%

Dark, Skin phototype V-VI; *light*, skin phototype I-IV.

Figure 3: Ebede, T., and Papier, A. (2006). Disparities in dermatology educational resources. *Journal of the American Academy of Dermatology*, 55(4), 687-690.

everyone. If these textbooks continue to show a lack of diversity and representation, patients of color will receive delayed diagnosis and treatment from the lack of knowledge.

3.2.2 Melanoma in Textbooks

Skin cancer, Melanoma, is significantly underrepresented in patients of color, specifically, the disease is not shown on darker skin tones in dermatology textbooks and educational materials. Images of melanoma on skin of color is rare, and this rarity causes delay of treatment, diagnosis, increased cancer risk, and mortality [RKS⁺22]. Dermatologists are not properly educated on this disease and how it pertains to patients of color. They are not capable of treating melanoma on skin of color because they have not seen it before. When it comes to self-diagnosing, when a patient can successfully identify a medical condition themselves, there is also a significant lack of knowledge. There is a gap in the medical literature regarding melanoma on skin of color, so neither dermatologists nor patients can identify the disease. In attempts to rectify this, there should be more published, comprehensible literature out on this topic to improve health literacy of patients of color and physicians [RKS⁺22]. Also, because there is a lack of physicians able to help them, patients of color are going to unreliable internet sources which provides inaccurate information on melanoma.

The lack of dermatology images in textbooks can also have many ethical

consequences. The main consequence is that it lowers the diversity of the dermatology field even more. It is already the 2nd least diverse medical field, so by not embracing diversity in its education, the field could become the least diverse medical field. The lack of visual representation in textbooks can also lead residents to have conflicting morale. Representation is especially important here because it affects the medical students. Because most medical students do not know what specialty they want to go into yet, representation would make them feel like they belonged and were included. A not diverse field does not provide that sense of comfort. A resident of color would not want to work in one of the least diverse fields of medicine and not have any images in the textbooks they are reading represent them [LTC19].

3.2.3 Lectures in Dermatology Residencies

Residencies provide the opportunity for trainees to gain exposure to different patients in dermatology. Looking back at Table II from the research paper, “Skin of color education in dermatology residency programs: Does residency training reflect the changing demographics of the United States?,” the survey results also provide information relating to educational and lecture materials available at dermatology residencies. Respectfully, questions 2 and 4 in the survey asked whether there are people that specialize in lectures about patients of color and if there are lectures on diseases specific to patients of color. For question 2, 73 percent and 80.5 percent answered “no” although for question 4, 47.6 percent and 31.7 percent of people answered “no” [NJWL08]. Question 2 has a statistically significant p value of .001 for both chief residents and program directors and Question 4 has a statistically p value of 0.02 only for program directors, the p value of chief residents is not statistically significant [NJWL08]. The statistical significance of these responses show that residents are not getting exposed to knowledge of patients of color.

3.2.4 Clinical Exposure in Dermatology Residencies

In dermatology, there are many diseases that affect patients of color that residents cannot treat because they have no clinical exposure. Table IV from [NJWL08], shows survey results from chief residents and program directors of dermatology residencies asking about if their residents had treated certain diseases. All 3 diseases listed were diseases common in patients of color and the treatment methods were common as well. 2/3 diseases had the majority of answers being “yes” indicating their residents do treat this. However, Central Centrifugal Cicatricial Alopecia (CCCA), was the disease that only 39.7 percent chief residents and 31.7 percent program directors admitted to treating [NJWL08]. CCCA is a disease common in Black women that often goes undiagnosed. The cause for this is the lack of exposure dermatologists and residents get from treating this disease. Since they do not have the knowledge or experience, Black women receive poorer outcomes and misdiagnosis.

Clinical exposure to patients of color is vital for dermatology residents to

Table II. Representation of common dermatologic diseases in dark skin

Diagnosis	Bologna	Freedberg	Rook	Fitzpatrick 5th	Fitzpatrick 4th	Sauer's	Habif
Common dermatologic diseases							
Acne vulgaris	0/13	0/13	4/36	1/5	1/5	0/7	0/27
Alopecia	1/6	3/10	3/17	0/10	0/8	1/9	0/9
Atopic dermatitis	7/15	2/10	1/8	3/9	1/4	0/16	0/20
Pityriasis rosea	1/4	0/4	0/3	0/1	0/1	1/11	0/8
Psoriasis	2/24	2/46	0/34	1/17	1/12	0/21	0/34
Syphilis, secondary	6/10	9/16	3/13	2/7	1/2	9/16	3/5
Tinea infection	4/20	4/15	1/13	4/20	4/17	1/24	3/39
General medical diseases with racial or ethnic predisposition							
Sarcoidosis	3/6	1/6	4/12	2/4	1/3	0/3	0/0
Erythema dyschromicum perstans (ashy dermatosis)	3/3	1/1	0/0	0/0	0/0	0/0	0/0
Cutaneous amyloidosis	1/7	0/4	4/11	1/4	0/2	0/0	0/0

Numbers = dark skin pictures/total number of pictures for each disease.

Figure 4: Nijhawan, R. I., Jacob, S. E., and Woolery-Lloyd, H. (2008). Skin of color education in dermatology residency programs: does residency training reflect the changing demographics of the United States? *Journal of the American Academy of Dermatology*, 59(4), 615-618.

advance their own learning and understanding of more diseases and treatments. Textbook and lecture material is a particularly crucial step in doing this, but they cannot replace clinical work and real experiences with patients of color. These clinical exposures result in an increased quality of care for the patients of color in the future. Dermatologists that have received this experience will be more successful in treating them in the future and providing adequate diagnosis and treatment with limited side effects and flawed outcomes [CWK⁺20].

3.2.5 How Lack of Diversity in Residency Curriculums Affects Quality of Care

As mentioned earlier in the paper, the lack of representation affects the relationships between patients and physicians. Since, many patients of color, especially Black patients, already have a deep mistrust in the medical system, not having diverse images of color and learning about certain diseases can cause many physicians to be less confident with diagnosis and treatment of patients of color. This hesitation with diagnosis may cause bias and stereotypes to prevail and a deeper mistrust to be built in these communities. From the lack of education, there is an erasure of the diseases affecting patients of color because if they are not shown in educational settings, it's like the disease never existed [AOL20]. If physicians are not exposed to people of color in a clinical or educational setting, it negatively affects the quality of care they provide.

3.3 Clinical Trial Participants

Throughout many industries, diversity and inclusion in clinical trials have made minimal improvements. In the medical industry specifically, clinical trial diversity has been under scrutiny for years and it has been a target area for improvement across multiple industries. For instance, the National Institute of Health (NIH) Revitalization Act of 1993 mandated ethnic diversity in clinical trials and research [CHB⁺23], but substantial progress has yet to be made as clinical trials are still largely not diversified. To ensure adequate scientific information can assess new treatments' safety and efficacy, people of colors' participation in clinical trials is crucial to reducing the societal burden of disease [HGSB96].

3.3.1 Mistrust in Dermatological Clinical Trials

Since dermatology is already one of the least diverse medical fields, they do not have proper inclusion in clinical trials of drugs that could heavily affect the skin of patients of color. Many patients of color have a long-standing mistrust in the medical system, so they refuse to participate in research and clinical trials due to how they were treated in history. There have been many historical examples in where Black people were abused and used in clinical trials and research without proper consent. For example, during the 1950s and 1960s, experiments were conducted at Holmesburg Prison in Philadelphia by dermatologist Albert Kligman. Most of the participants in Kligman's trials were incarcerated Black males that did not provide their consent. Moreover, government agencies and pharmaceutical companies funded these experiments. While tretinoin, a renowned acne drug commonly prescribed for teenagers, was one of the most important drugs to come out of these experiments, the way the experiment was conducted was rightfully called into question [KIC22]. In the following sections, we will explore in detail how systemic racism has impacted the participation of people of color in clinical research.

3.3.2 Black Americans and Their Opinions on Clinical Trials

It is also important not to blame people of color for their mistrust in the medical system, but to blame the system that failed them. In the research paper, "Why African Americans May Not be Participating in Clinical Trials," a questionnaire was filled out by solely African Americans to give their thoughts on clinical trial participation. Most responses showed an overall fear of clinical trials. Like the Holmesburg Prison Experiments, they did not want to be treated like "guinea pigs" and shared an overall mistrust in the medical system. Finally, they felt that enrollment tactics used by many companies and physicians were not done in a respectful or appropriate manner [HGSB96]. African American and Caucasian parents of pediatric dermatology patients were polled about their willingness to take part in research, their level of interest, and reasons for that level of interest in the study "Perceptions of pediatric clinical research among African American and Caucasian parents." There was a general unwillingness to participate, but

parents of African Americans were more likely to express mistrust in the field of medical research [SMCSG09].

3.3.3 Proposed Solutions from “Meeting the Challenge” Summit

In 2022, the Skin of Color Society hosted a “Meeting the Challenge” summit and there were important proceedings and takeaways. The summit included main presentations from the family of Henrietta Lacks. She was an African American woman whose cells were donated to science and used in research and clinical trials without her consent. Her cells created immense breakthroughs in science and her contributions will be valued forever. The key points of the summit included identifying and understanding the current state of clinical trials, creating solutions for the lack of diversity, and breaking down the barriers to achieve those solutions [CHB⁺23].

The summit also provided information pertaining specifically to Black people and obstacles for clinical trial recruitment. Two significant obstacles were negative attitudes because of mistrust and logistical barriers (transportation, childcare needs, working conditions). Black people and people of color in general are not properly being sought out and recruited for these clinical trials. These obstacles also function as socially determinant factors that physicians analyze while treating Black patients, so it should also be taken into consideration with clinical trial recruitment [CHB⁺23].

In Table V from the summit overview “The Skin of Color Society’s Meeting the Challenge Summit, 2022 Diversity in Dermatology Clinical Trials Proceedings”, it presents a chart that meticulously organizes all the factors that can contribute to the suboptimal care these people are receiving. The chart shows that it is not just on the physicians or educators, but on everyone involved in the field to make a difference and promote clinical trial diversity [CHB⁺23].

3.3.4 How Lack of Diversity in Clinical Trial Research Affects Quality of Care

Dermatology as a field must do better to promote diversity and inclusion in clinical trials because if they do not, side effects and complications will arise. Some common side effects that can result from the lack of studies done on people of color include dark spots, discoloration, and hyperpigmentation. Because of these side effects and flawed outcomes of the dermatology drugs being prescribed, more research and clinical trials need to be directed at skin of color. The overall lack of research and clinical trials is leading to less advances in the field and significantly less knowledge to pass on to dermatology residents and trainees. If nothing is being tested in clinical trials on people of color, dermatologists become less and less informed of how drugs and diseases affect all types of people. This vicious cycle will keep leading to a reduced quality of care for patients because their trainees are not receiving the proper education and information through research and clinical trials.

Physician-related barriers	Investigator-related barriers	Industry-related barriers	Patient-related barriers	Site- and staff-related barriers
<ul style="list-style-type: none"> • Lack of awareness of clinical trial availability • Minimal time required to discuss clinical trials with patients • Fear of interference with clinical workflow • Concerns that trial may interfere with patient-physician relationship • Language or cultural barriers • Practical considerations about reimbursement and clinical resources • Paucity of incentives to refer patients • Insufficient infrastructure (staffing and study supplies/equipment) 	<ul style="list-style-type: none"> • Misunderstanding of benefits of recruiting • Need for cultural humility • Inability to retain enrolled patients • Lack of diversity among research team • Ineffective, clear communication • Lack of understanding of the necessity of recruiting a representative population • Administrative burdens • Scarcity of protected, funded time for research 	<ul style="list-style-type: none"> • Study design barriers include in-person vs virtual visits, number of required study visits, number and frequency of trial-related testing, narrow inclusion criteria, and complex trial design that may be difficult for patients to understand • Stringent timelines • Regulatory rules and guidance slow to change • Trained mindsets hard to change • Difficulty locating qualified investigators • Lengthy process for improvement and removal of ineffective methods • Limited number of accessible sites 	<ul style="list-style-type: none"> • Perceived risk of participating • Mistrust of medical and research professionals and system • Poor relationship with health care professional • Presence of comorbid diseases • Inadequate access to health care • Poor health and research literacy • Lack of clinical trial awareness and information • Lack of financial resources • Inability to take time off to attend study visits • Lack of transportation • Long travel distance to trial site • Lack of childcare coverage • Limited English proficiency 	<ul style="list-style-type: none"> • Lack of community engagement • Lack of diversity among research team • Insufficient funding • Inadequate funding to support clinical research infrastructure • Different electronic medical records across sites • Inadequate knowledge of clinical research • Complex regulatory requirements • Rigid and lengthy institutional review board requirements • Lengthy consent process

Figure 5: Cobb, C. B., Heath, C. R., Byrd, A. S., McKinley-Grant, L. J., Callender, V., Adamson, A. S., ... and Harvey, V. M. (2023). The Skin of Color Society’s Meeting the Challenge Summit, 2022: Diversity in Dermatology Clinical Trials Proceedings. JAMA dermatology.

4 Discussion

By 2045, white people will make up 49.7 percent of the population in the United States, turning the country into a "minority white" nation. The second least diverse medical specialty, dermatology, has a significant underrepresentation of different racial and ethnic groups. The dermatology field needs to be more diverse to provide satisfactory patient outcomes. The diversity of the field must match that of the anticipated patient population to broaden the field’s perspective and raise the standard of care provided to patients of color. For diversity to be achieved and patient outcomes to be improved, health disparities must be addressed and solved with education.

Many may be curious as to why diversity is so important and why it matters. For a more inclusive society, increased diversity in general medicine, especially dermatology, is essential. It broadens the mind’s perspective and enhances the education of others’ lived experience. Additionally, because doctors of color are more skilled at treating patients of color, diversity enhances the quality of care for all patients. This is crucial in medicine because all patients must be successfully treated for everyone’s benefit and the overall financial benefit of the country. In the U.S, there have been countless strides to improve dermatology in every aspect of life and job field. The medical field needs to be able to treat all people of all ethnicities and races. This is why diversifying the field matters, so physicians can become adept at treating patients of color and a way to improve

that is through education.

To improve patient outcomes, there needs to be an increase of culturally sensitive educational opportunities for dermatologists and dermatology residents. The dermatology workforce needs adequate education regarding people of color, specifically their unique needs and conditions. Currently this is extremely limited due to the lack of knowledge and studies on managing and treating patients of color [DKG⁺21]. Education of dermatologists allows patients of color to receive better results, less complications, and proper diagnosis. Currently, there are many health disparities in dermatology that prevent patients of color from getting the care they deserve. Changes in education play a big part in diversifying the field of dermatology with the goal to address and resolve these health disparities.

For increasing diversity in the field, the APD had some solutions through education. APD promotes increased recruitment and diversity in the dermatology field, beginning with residency programs. The APD is looking for applicants from historically Black colleges and universities with diverse medical schools to accomplish this. Increasing the number of doctors of color requires inclusive recruitment. The APD supports racial parity in the workforce, racial education, and enhancing the standard of care for patients of color.

Increased diversity in education materials at dermatology residencies is vital to improve quality of care as well. Patients of color, especially Black patients, have a strong mistrust of the medical system, which negatively affects patient-physician relationships. Due to the lack of diverse disease images and knowledge, doctors may be less skilled at diagnosing patients of color, which can result in prejudice and stereotypes. Additionally, the lack of knowledge about diseases experienced by patients of color can erase them, which has a detrimental effect on the standard of care.

In clinical trials, there has been a lack of diversity that further disrupts the education of dermatologists to treat patients. Dermatology must promote diversity and inclusion in clinical trials to avoid side effects and complications. Studies on people of color, such as dark spots, discoloration, and hyperpigmentation, can lead to flawed outcomes. This lack of research and clinical trials results in fewer advances and less knowledge for dermatology residents and trainees. This cycle leads to reduced patient care quality and inadequate education for trainees.

Over the course of this research paper many solutions and results have been discussed to increase the quality of care in patients of color through means of education. In Table VI we provided an overview of the solutions to the areas of disparities in dermatology.

5 Conclusion

This research paper assessed how the lack of diversity in dermatology education affects the quality of care for patients of color. To do that, it evaluated the number of physicians, text materials, and clinical trial participants in dermatol-

Solutions for Addressing Disparities		
Physicians in Dermatology	Dermatology Text Materials	Dermatology Clinical Trials
❖ Residency programs can seek applications from historically Black colleges or universities with medical schools that have a diverse range of students	❖ Add images that include an equal distribution of skin colors	❖ Patients of color need to be ethically recruited for clinical trials
❖ Affirmative action and increased financial aid	❖ Residencies and medical schools should have lectures focused on patients of color	❖ Federal mandates on diversity in clinical trials should be stricter
❖ Educate professors on how to eliminate implicit bias in recruitment	❖ Have residency clinics dedicated to treating people of color	❖ Participation should include transportation and childcare

ogy and the extent to which diversity was included. From that data analysis, a conclusion could be made that there is an overall lack of diversity in dermatology's education and as a result, patients are receiving poorer outcomes and quality of care. This paper provides various solutions for this issue.

There are a few limitations in this research paper. To start, there is limited literature specific to dermatology, or this topic. Some references found in this paper may be outdated as there remains few new studies around the topic of diversity in dermatology. Medical training and education in dermatology is also a very understudied field with limited research and retrospective studies. To decrease the limitations found in my paper, the overall solution would be to increase studies in the dermatology field. In residencies, medical schools, and educational institutions, there is an opportunity to implement some of these proposed solutions around increasing diversity in the workforce, education, and research.

Additional important follow up research could explore focusing on not only patients of color, but their skin shades. The study would showcase the difference of quality of care in dermatology based on skin shade. Skin color is not the same thing as race, so there would be other aspects to analyze [LSDJ]. Colorism would be a large factor in these results, not just racism and bias. In closing, the absence of equal representation in dermatology education prevents people of color to receive adequate care and to lessen this disparity, prioritizing diversity in the field is necessary.

6 Tables and Charts Discussed in Research Paper

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