doi:10.36849/JDD.7499e

Implicit Bias and Clinical Decision Making in Psoriasis Management Among Dermatology Residents: A Feasibility Study

Onjona B. Hossain BS,[a] Rithu Srikantha MD,[b] Nkanyezi Ferguson MD,[c] Ilir Agalliu MD ScD,[d] Cristina M. Gonzalez MD MEd[e]

[a]Department of Medicine, Albert Einstein College of Medicine, Bronx, NY
[b]Department of Dermatology, Feinberg School of Medicine/Northwestern Medicine, Chicago, IL
[c]Department of Dermatology, University of Missouri School of Medicine, Columbia, MO
[d]Department of Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, NY
[e]Institute for Excellence in Health Equity, New York University Grossman School of Medicine, New York, NY

Black and White individuals may not receive equal healthcare even when insurance status, income level, and access to health care are taken into account.[1] Despite psoriasis having an established standard of care, the black race is associated with a lower likelihood of receiving biologics among Medicare beneficiaries.[2] Implicit bias, which refers to subconscious beliefs that individuals have about other identity groups,[3] may perpetuate disparities by influencing physicians' clinical decision-making.[4] This IRB approved feasibility study assesses the association between implicit race bias, race-compliance stereotyping, and psoriasis patient management in dermatology residents.

A confidential online survey with a single, randomized vignette describing either a black or white 33-year-old male patient with severe plaque psoriasis was distributed to current US dermatology residents via the Association of Professors of Dermatology (APD) listserv from October 2021 to January 2022. Residents selected the best patient management option, rated their attitudes toward implicit bias using a Likert scale, and completed two Implicit Association Tests (IAT): Race and Race-Compliance.[5]

Data were analyzed using either Student t-tests or one-way ANOVA for normally distributed continuous variables when comparing two or more groups, and chi-square/Fisher exact tests for categorical variables, respectively; all tests were two-sided. The IAT d-scores range from -2 to +2, with positive d-score indicating implicit preference for white race relative to black race; a negative d-score indicates the converse.

Overall, 30 residents completed the survey (Table 1). Four dropped out before completing the Race IAT (n=26), and nine more dropped out before completing the Race-Compliance IAT (n=17). Residents assigned to either the white or black patient vignette were similar demographically (Table 1) and in their race and compliance IAT d-scores (Table 2).

Residents selected systemic, topical, and phototherapy at similar rates for both patient vignettes (P=0.99; Table 1). Though not statistically significant, biologics were chosen more often for the black patient (n=8, 50%) compared to the white patient (n=4, 28.6%, P=0.23; Table 1). Furthermore, Race IAT d-scores of residents assigned to the black patient show greater pro-white bias in residents who chose biologics (mean 0.32±0.25) compared to non-biologics (0.03±0.60, P=0.22) (Table 3). This difference is more pronounced when comparing the Race-Compliance IAT d-score between residents who chose biologics (0.23±0.31) versus non-biologics (-0.21±0.30) in the same group (P=0.06; Table 3).

Majority of residents agree that implicit bias may affect their management decisions (n=19, 63.3%), knowledge of their implicit biases may improve their clinical management (n=26, 86.7%), and formal training on implicit bias should be included in the residency curriculum (n=26, 86.7%; Table 1).

Our study demonstrated no statistically significant difference in dermatology residents' management of severe psoriasis between two different skin types. Additionally, residents were open to implicit bias education during residency training. Interestingly, biologics were chosen more often for the black patient compared to the white patient. This could be due to increased awareness of implicit bias and hypercorrection, perceived differences in disease severity from patient photos despite identical provided history, or study limitations: small sample size, risk of response and social desirability bias, and inability to determine response rate. Given the unexpected direction of implicit bias and associated clinical decision-making, as well as the limitations of vignette studies, future research in actual or simulated clinical settings could better advance our understanding of the role of implicit bias in clinical decision-making within dermatology.

doi:10.36849/JDD.7499e

TABLE 1.

Comparing Residents' Demographics and Clinical Decisions by Assigned Vignette, and Perceptions of Implicit Bias Education and Impact

		Total N=30	White Vignette N=14	Black Vignette N=16	P*
Year in Training, n (%)	PGY2	11 (36.7)	5 (35.7)	6 (37.5)	0.70
	PGY3	13 (43.3)	7 (50.0)	6 (37.5)	
	PGY4	6 (20.0)	2 (14.3)	4 (25.0)	
Residency Region, n (%)	Northeast	10 (33.3)	5 (35.7)	5 (31.3)	0.78
	South	1 (3.3)	0	1 (6.2)	
	Central	14 (46.7)	7 (50.0)	7 (43.8)	
	West	5 (16.7)	2 (14.3)	3 (18.7)	
Gender, n (%)	Female	14 (46.7)	5 (35.7)	9 (56.3)	0.26
	Male	16 (53.3)	9 (64.3)	7 (43.7)	
Latino/a/x, n (%)	No	26 (86.7)	13 (92.9)	13 (81.3)	0.55
	Yes	3 (10.0)	1 (7.1)	2 (12.5)	
	Unknown	1 (3.3)	0	1 (6.2)	
Race, n (%)	Non-Hispanic White	19 (63.4)	9 (64.3)	10 (62.5)	0.63
	Person of Color[a]	10 (33.3)	5 (35.7)	5 (31.3)	
	Unknown	1 (3.3)	0	1 (6.2)	
Therapeutic Route, n (%)	Systemic[b]	19 (63.3)	9 (64.3)	10 (62.5)	0.99
	Topical[c]	2 (6.7)	1 (7.1)	1 (6.2)	
	Phototherapy[d]	9 (30.0)	4 (28.6)	5 (31.3)	
Biologic Therapy, n (%)	Non-Biologic[e]	18 (60.0)	10 (71.4)	8 (50.0)	0.23
	Biologic[f]	12 (40.0)	4 (28.6)	8 (50.0)	
Q1: Management Decisions[g]	Disagree	8 (26.7)	--	--	--
	Neither Agree nor Disagree	3 (10.0)	--	--	
	Agree	19 (63.3)	--	--	
Q2: Knowledge[h]	Disagree	1 (3.3)	--	--	--
	Neither Agree nor Disagree	3 (10.0)	--	--	
	Agree	26 (86.7)	--	--	
Q3: Previous Training[i]	Disagree	3 (10.0)	--	--	--
	Neither Agree nor Disagree	2 (6.7)	--	--	
	Agree	25 (83.3)	--	--	
Q4: Residency Curriculum[j]	Disagree	0 (0)	--	--	--
	Neither Agree nor Disagree	4 (13.3)	--	--	
	Agree	26 (86.7)	--	--	

Footnote: **P*-values were generated using either one-way ANOVA or Student T-test by comparing scores across different groups.
[a]Person of Color consists of Asian (n=5), Multiracial (n=3), and Other (n=2)
[b]Systemic: methotrexate, acitretin, adalimumab, apremilast
[c]Topical: combination therapy with clobetasol and a topical vitamin D analogue
[d]Phototherapy: Narrowband UVB phototherapy
[e]Non-Biologic: combination therapy with clobetasol and a topical vitamin D analogue, Narrowband UVB phototherapy, methotrexate, acitretin, and apremilast
[f]Biologic: adalimumab
[g]Q1: Implicit (subconscious) bias about patients based on their race/ethnicity may affect the way I make management decisions.
[h]Q2: Knowledge of my implicit (subconscious) biases may help me improve my clinical management of patients.
[i]Q3: I previously had formal training on implicit (subconscious) bias in residency.
[j]Q4: Formal training on implicit (subconscious) bias should be included in the residency training curriculum.

doi:10.36849/JDD.7499e

TABLE 2.

Comparing Race and Compliance IAT D-Scores Within Groups

		Race IAT			Compliant IAT		
		N (%)	D-Score mean (SD)	*P**	N (%)	D-Score mean (SD)	*P**
	Total	26 (100.0)	0.24 (0.45)		17 (100.0)	0.07 (0.29)	
Vignettes	White	10 (38.5)	0.33 (0.41)	0.38	7 (41.2)	0.08 (0.16)	0.81
	Black	16 (61.5)	0.17 (0.47)		10 (58.8)	0.05 (0.37)	
Year in Training	PGY2	10 (38.5)	0.22 (0.61)		5 (29.4)	0.25 (0.31)	
	PGY3	10 (38.5)	0.24 (0.39)	0.98	7 (41.2)	0.08 (0.25)	0.11
	PGY4	6 (23.0)	0.26 (0.24)		5 (29.4)	-0.14 (0.24)	
Residency Region	Northeast	10 (38.5)	0.39 (0.28)		6 (35.3)	0.15 (0.33)	
	South	1 (3.8)	0.23 (0)	0.53	0	--	0.6
	Central	10 (38.5)	0.08 (0.63)		6 (35.3)	-0.03 (0.37)	
	West	5 (19.2)	0.23 (0.23)		5 (29.4)	0.08 (0.10)	
Gender	Female	12 (46.2)	0.32 (0.23)	0.35	8 (47.1)	-0.03 (0.38)	0.25
	Male	14 (53.8)	0.16 (0.57)		9 (52.9)	0.15 (0.16)	
Race[a]	Non-Hispanic White	16 (64.0)	0.17 (0.51)	0.4	11 (64.7)	0.043 (0.35)	0.68
	Person of Color[b]	9 (36.0)	0.32 (0.34)		6 (35.3)	0.11 (0.15)	
Therapeutic Route	Systemic[c]	17 (65.4)	0.31 (0.26)		13 (76.5)	0.14 (0.25)	
	Topical[d]	2 (7.7)	0.51 (0.39)	0.16	0	--	0.07
	Phototherapy[e]	7 (26.9)	-0.031 (0.71)		4 (23.5)	-0.16 (0.33)	
Biologic Therapy	Non-Biologic[f]	15 (57.7)	0.16 (0.14)	0.32	9 (52.9)	-0.056 (0.25)	0.07
	Biologic[g]	11 (42.3)	0.34 (0.09)		8 (47.1)	0.20 (0.10)	

Footnote: **P*-values were generated using either one-way ANOVA or Student T-test by comparing scores across different groups.
[a]1 resident selected unknown race and was removed from this single analysis (N=25 instead of 26).
[b]Person of Color consists of Asian, Multiracial, and Other
[c]Systemic: methotrexate, acitretin, adalimumab, apremilast
[d]Topical: combination therapy with clobetasol and a topical vitamin D analogue
[e]Phototherapy: Narrowband UVB phototherapy
[f]Non-Biologic: combination therapy with clobetasol and a topical vitamin D analogue, Narrowband UVB phototherapy, methotrexate, acitretin, and apremilast
[g]Biologic: adalimumab

TABLE 3.

Comparing Race and Compliance IAT D-Scores for Different Therapies Stratified by Vignette

	Race IAT				Compliant IAT			
Type of Treatment	**White Vignette**		**Black Vignette**		**White Vignette**		**Black Vignette**	
Therapeutic Route	N (%)	D-Score mean (SD)	N (%)	D-Score mean (SD)	N (%)	D-Score mean (SD)	N (%)	D-Score mean (SD)
Systemic[a]	7 (70)	0.34 (0.30)	10 (62.5)	0.29 (0.24)	6 (85.7)	0.09 (0.18)	7 (70)	0.18 (0.31)
Topical[b]	1 (10)	0.78 (0)	1 (6.2)	0.23 (0.0)	0	--	0	--
Phototherapy[c]	2 (20)	0.09 (0.82)	5 (31.3)	-0.08 (0.76)	1 (14.3)	0.06 (0.0)	3 (30)	-0.24 (0.36)
*P**	--	0.44	--	0.38	--	0.9	--	0.17
Biologic Therapy	**N (%)**	**D-Score mean (SD)**	**N (%)**	**D-Score mean (SD)**	**N (%)**	**D-Score mean (SD)**	**N (%)**	**D-Score mean (SD)**
Non-Biologic[d]	7 (70)	0.31 (0.42)	8 (50.0)	0.03 (0.60)	5 (71.4)	0.07 (0.13)	4 (40.0)	-0.21 (0.30)
Biologic[e]	3 (30)	0.39 (0.48)	8 (50.0)	0.32 (0.25)	2 (28.6)	0.12 (0.29)	6 (60.0)	0.23 (0.31)
*P**	--	0.81	--	0.22	--	0.72	--	0.06

Footnote: **P*-values were generated using either one-way ANOVA or Student T-test by comparing scores across different groups.
[a]Systemic: methotrexate, acitretin, adalimumab, apremilast
[b]Topical: combination therapy with clobetasol and a topical vitamin D analogue
[c]Phototherapy: Narrowband UVB phototherapy
[d]Non-Biologic: combination therapy with clobetasol and a topical vitamin D analogue, Narrowband UVB phototherapy, methotrexate, acitretin, and apremilast
[e]Biologic: adalimumab

doi:10.36849/JDD.7499e

DISCLOSURES

The authors have no conflicts of interest to declare.

IRB approval status: Reviewed and approved by Einstein IRB; IRB# 2020-12583.

REFERENCES

1. Smedley BD, Stith AY, Nelson AR. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. The National Academies Press; 2003.
2. Takesita J, Gelfand JM. Li P, et al. Psoriasis in the US Medicare population: prevalence, treatment, and factors associated with biologic use. *Journal Invest Dermatol*. 2015;135(12):2955-63.
3. Wilson BN, Murase JE, Sliwka D, et al. Bridging racial differences in the clinical encounter: How implicit bias and stereotype threat contribute to health care disparities in the dermatology clinic. *Int J Womens Dermatol*. 2021 Jan 9;7(2):139-144. doi: 10.1016/j.ijwd.2020.12.013.
4. Green AR, Carney DR, Pallin DJ, et al. Implicit bias among physicians and its prediction of thrombolysis decisions for Black and White patients. *Journal of General Internal Medicine*. 2007;22(9):1231-1238. doi:10.1007/s11606-007-0258-5.
5. Lane KA, Nosek MR, Greenwald BA. Understanding and using the Implicit Association Test: IV. What we know (so far). In: Wittenbrink N BS, ed. *Implicit Measures of Attitudes: Procedures and Controversies*. Guildford Press; 2007:59-102.

AUTHOR CORRESPONDENCE

Rithu Srikantha MD

E-mail:..... rithu.srikantha@nm.org