Implicit Bias Among Dental Professionals: A Scoping Review

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Background and Research Objectives

- Implicit bias is a form of unintentional and automatic bias that carries an impact on judgment, decisions, and behaviors.[1]
- In the health care setting, implicit bias drives discriminatory practices and policies, negatively impacting patient care.[2]
- Racial and ethnic minorities are shown to receive lower quality health care in comparison to white individuals, even in the case of comparable insurance status, income, age, and severity of conditions.[3]
- This scoping review aims to evaluate the existence of implicit bias among oral health professionals, and how this may impact patient outcomes.

Methods

- This review adheres to the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).[4]
- Peer-reviewed studies deemed eligible for inclusion if: addressed the implicit bias of oral health professionals and how such bias can impact patient oral health outcomes.
- Studies were excluded if they did not focus on implicit bias specifically in the oral health profession, or only examined explicit bias.
- We searched all literature on PubMed meeting inclusion criteria and published through October 2023..
- A total of 11 studies were included in our final review per the inclusion criteria (Figure 1).

Key Findings

- Study findings suggest overall moderate levels of color-blind racial attitudes among dental students and professionals.[5–10]
- Findings indicate a greater likelihood of recommending extractions for Black patients in comparison to white patients, illustrating the role of race in clinical decision-making.[11]
- Study results suggest implicit racial preferences for European Americans over African Americans; non-white participants show more positive implicit preferences toward African Americans compared to white participants.[12]
- Significant racial disparities exist in the recommendation for oral and oropharyngeal cancer, particularly among minority groups and individuals in rural areas.[13]

Figure 1. PRISMA-ScR Flowchart
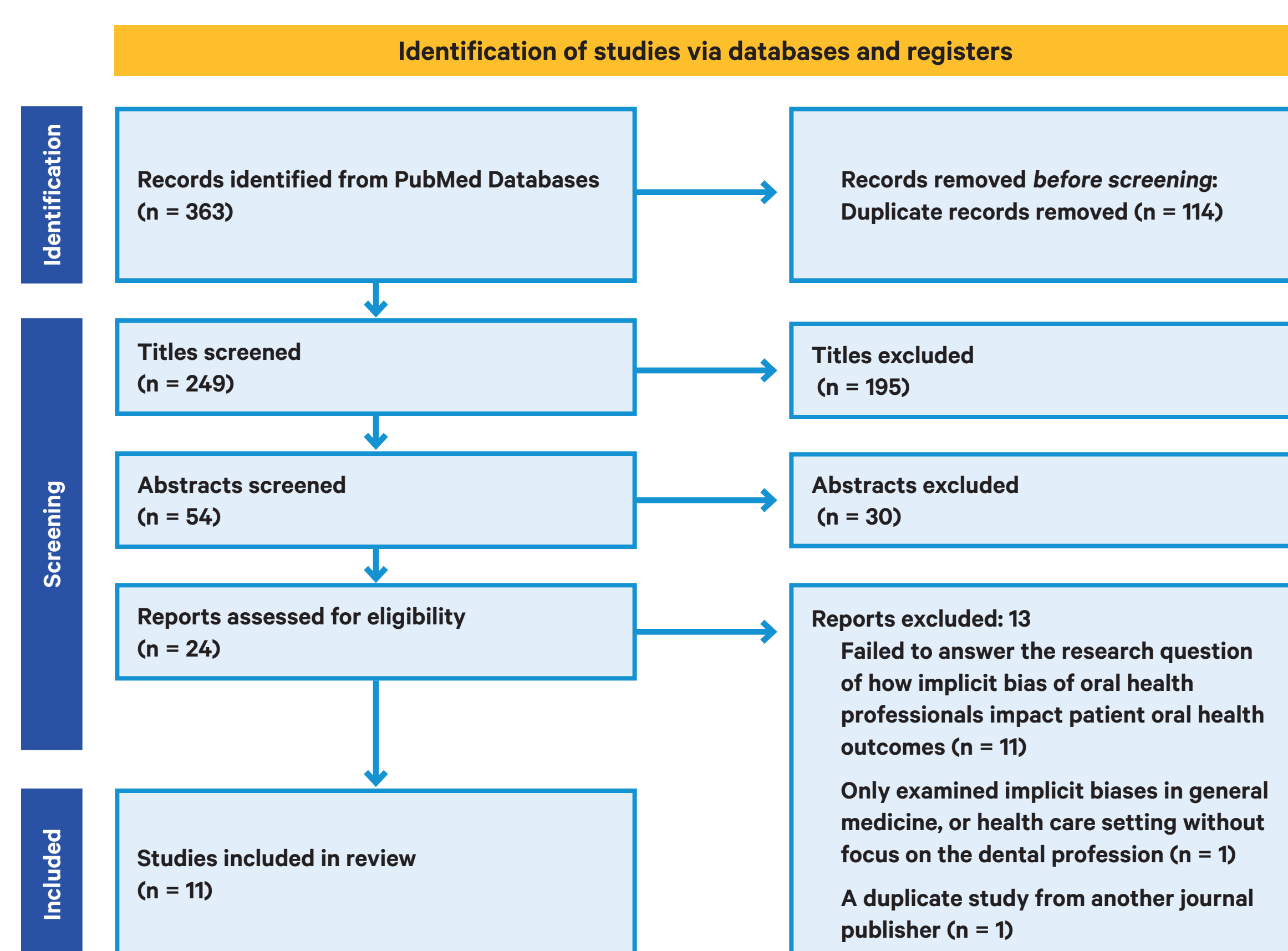

Color-Blind Racial Attitudes Scale (CoBRAS)

- The Color-Blind Racial Attitudes Scale (CoBRAS) is a 20-item measurement tool used to quantify the awareness of contemporary racist ideals by measuring individuals' lack of awareness or denial of racism.[5]
- Overall CoBRAS scores suggest moderate levels of color-blind racial attitudes on average among a sample of first-year and second-year dental hygiene students, a sample of clinical dental hygienists, a sample of dental hygiene faculty from eight US hygiene programs, and a sample of faculty and students at one US dental school.[5–10]
- Second-year dental hygiene students and four-year bachelor program enrollees had lower overall CoBRAS scores than first-year students and those in a two-year associate's degree program.[6]
- Findings indicate younger hygienists identifying as African American have significantly lower CoBRAS scores than older hygienists identifying as "Other".[8]
- Female and underrepresented minority (URM) students demonstrate greater sensitivity to racism in comparison to male and majority students.[9]

Brief Implicit Association Test (BIAT)

- The Implicit Association Test (IAT) provides measures of association strengths — often corresponding to attitudes, identities, and stereotypes.[14]
- The Brief Implicit Association Test (BIAT) consists of two blocks of trials with the same four categories and stimulus-response mappings as utilized in the IAT, however with only one-third the number of trials.[15]
- High race preference and race dental cooperativeness BIAT scores (91.23% and 78.85%) demonstrate a pro-white bias among study participants.[11]
- Approximately 90% of study participants responded they would "definitely" or "probably" not recommend extraction for the white patient compared to 50% for the Black patient.[11]
- Over two-thirds (67.8%) of study participants show a preference for European Americans over African Americans.[12]
- Study results show IAT d-scores to increase with increasing age, suggesting greater levels of implicit bias in older populations.[12]

Figure 2. Differing Treatment Recommendations by Patient Race

- A study by Patel et al. presented a clinical case to 57 dentists; 28 respondents were presented with a fictional Black patient; 29 were presented with a fictional white patient.[11]
- All other clinical details were identical.
- Study participants were significantly more likely to recommend root canal treatment to white patients (t=2.46, p=0.017).
- Study participants were significantly more likely to recommend extraction for Black patients (t=3.03, p=0.003), despite a near-equal diagnosis of irreversible pulpitis between both patients (Figure 2).
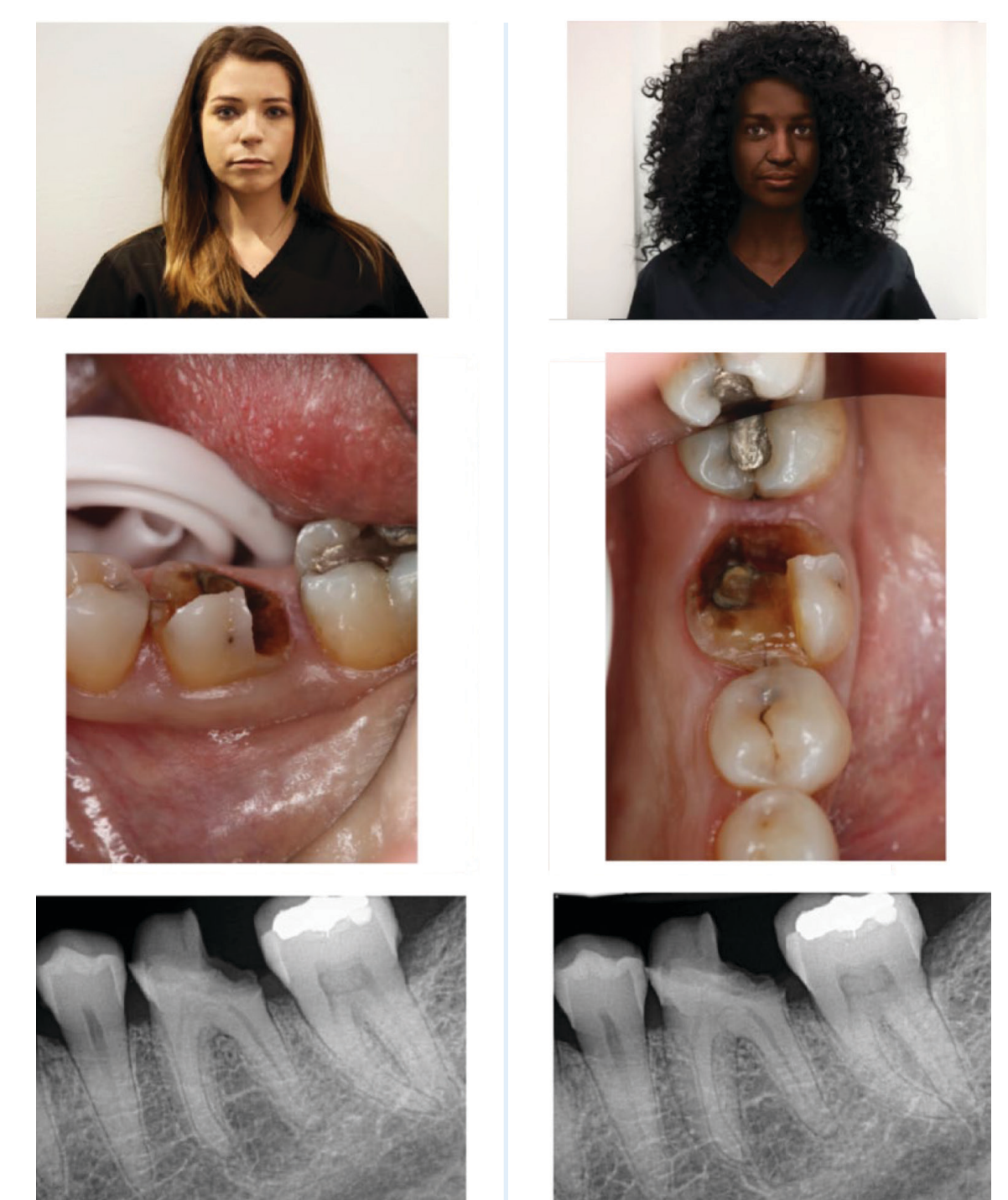
Additional Study Findings

- Findings show the odds of not being recommended surgery after having been diagnosed with oral oropharyngeal cancer are two times as high for Black patients in comparison with white patients.[13]
- Racial disparities in recommendation for surgery were most evident among patients from rural areas with lip and buccal cancer; there was a fourfold increase in the odds of not recommending surgery among Black patients.[13]
- Datasets lack representation of racial minorities and historically disadvantaged groups, thus impacting the operationalization and representation of racial/ethnic variables in orthodontic literature.[16]
- Artificial Intelligence/Machine Learning (AI/ML) models use these data at risk of perpetuating selection bias when predicting clinical outcomes due to lack of representation in original data sets.[16]

Conclusions

- Overall CoBRAS scores suggest moderate levels of color-blind racial attitudes on average across all studies included in this review.
- Evidence reveals implicit racial bias can impact the clinical decision-making of dental professionals.
- Results suggest that dentists recommend extractions, and fewer root canal treatments, for Black patients.
- Findings show significant racial disparities in surgery recommendation for oral and oropharyngeal cancer to exist.
- Current AI/ML models are prone to perpetuate racial biases.

Implications For Policy and Practice

- There is a need for further research to determine the extent implicit bias contributes to oral health disparities.
- It is critical to integrate professional development and implicit bias training within dental and dental hygiene school curricula to promote early awareness and active prevention.
- Efforts are needed to attract and retain oral health professionals from marginalized racial and ethnic backgrounds to increase workforce diversity.
- Important to ensure future AI/ML algorithms are developed, tested, and implemented in an equitable and fair manner.

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