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Associations between self-efficacy, social support, racial discrimination, and adolescents oral health

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Abstract

Objective This study aimed to develop a conceptual model exploring the relationships between perceived social support (PSS), self-efficacy, racial discrimination, and oral health (OH) in adolescents.

Methods A cross-sectional study of adolescents aged 12–18 was conducted at a university dental clinic. Participants completed a questionnaire on demographics, OH, PSS, general self-efficacy, and task-specific self-efficacy (TSSE). Structural Equation Modeling (SEM) was used for analysis.

Results A total of 252 adolescents participated in the study, with an average age of 14 years; 60% were female, 81% were born in Canada, 56% identified as White, and 20% perceived discrimination. PSS was positively associated with general self-efficacy ($p=0.002$), TSSE for dental visits ($p=0.004$), dietary habits ($p=0.004$), and tooth-brushing ($p=0.002$), while also elevating sugar consumption ($p=0.002$). PSS ($p=0.048$) and discrimination ($p=0.01$) reduced tooth-brushing frequency. Self-efficacy for dietary habits ($p=0.005$) and tooth-brushing ($p=0.002$) positively correlated with increased tooth-brushing, while self-efficacy for dietary habits decreased sugar consumption ($p=0.001$). Self-efficacy for tooth-brushing was linked to reduced dental visits ($p=0.02$). PSS indirectly increased brushing frequency ($p=0.02$) and reduced dental-care utilization ($p=0.004$). Discrimination indirectly reduced self-efficacy for dental visits ($p=0.003$) but increased self-efficacies for tooth-brushing ($p=0.01$) and dietary habits ($p=0.03$).

Conclusion PSS was directly related to increased self-efficacy, while discrimination indirectly affected OH. Oral health was associated with self-efficacy for dietary habits and tooth-brushing, but not dental visits alone.

Implications for health equity The findings underscore the critical need to address systemic inequities in oral health care access. By exploring the interplay between social support, discrimination, and self-efficacy, this study highlights actionable pathways to reduce disparities and improve oral health outcomes among adolescents.

Keywords Self-efficacy, Social Support, Racial Discrimination, Adolescents Oral Health

Introduction

Adolescents' quality of life is significantly influenced by their oral health [1]. The World Health Organization (WHO) defines oral health as the absence of cavities, clean teeth, absence of pain, normal gum colour and no bleeding [2]. Previous research has suggested a potential link between poor oral health in adolescents and the development of both acute and chronic conditions such as obesity, diabetes, cardiovascular disease, osteoporosis,

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and respiratory infections [3, 4]. Poor oral health can also lead to significant pain and negatively affects school performance [5].This highlights the importance of maintaining and establishing positive oral health habits in adolescents, as they are crucial for both their oral health and overall well-being in adulthood. Yet, oral health is the most prevalent unmet health need among adolescents [1].

Globally, the incidents rate of dental caries in permanent teeth among children aged 5 to 14 years increased by 15.25% over the last decade and has since remained consistently high [6]. Similarly, between 2015–2020, there has been a minimal overall reduction in prevalence of caries among U.S. adolescents, while the disease being most prevalent among ethnic minorities, lower income families, and those with over and underweight BMI [7]. In Canada, 58.8% of adolescents have at least one decayed tooth and the prevalence of caries remains a significant burden among indigenous population, those without dental insurance, and new immigrants and refugees [2] highlighting the persistent inequities in oral health.

Adolescents face a wide range of factors that can contribute to deterioration of their oral health. These factors include poor dietary choices, the presence of eating disorders, inadequate oral hygiene practices, and engaging in risky behaviors such as tobacco and alcohol use [1]. Consequently, their oral health suffers significant negative impacts. According to social cognitive theory, developed by Albert Bandura, an individual's behaviour is influenced by core determinates such as personal factors, environmental influences, and behavioural factors [8]. Personal determinants encompass cognitive processes, emotional states, and biological events, while environmental factors include social norms, access to resources, and physical surroundings. This interplay highlights how personal beliefs and social contexts shape behavior and underscores the importance of considering both individual and environmental aspects in health promotion strategies [9].

Self-efficacy, which is a component of personal determinants, refers to individuals' belief in their ability to take necessary actions to improve their health outcomes [8]. High self-efficacy is associated with greater efforts and persistence in achieving a desired outcome despite facing obstacles [10]. In the context of oral health, higher self-efficacy has been associated with improve timing, method, and duration of tooth brushing as well as reduced gingival bleeding and plaque among adolescents [10, 11]. Research has also shown that adolescents with higher self-efficacy brush their teeth more frequently, attend dental visits and have better dietary habits, which are strong predictors of positive oral health outcomes [10].

Elements such as social support and racial discrimination fall under environmental factors within social cognitive theory. Social support is defined as "an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient" [12]. Several studies have shown a relationship between low social support and increased coronary artery disease, psychological problems such as depression, and cancer [13, 14]. Similar findings have been reported in the oral health domain. For example, Dahlan et al. found that parental social support is linked with lower rates of dental caries and decrease sugar consumption among children [15]. Another study conducted by Dahlan et al., found that dental care utilization among immigrants and ethnic minorities children increased significantly once social support was provided by parents [16]. Furthermore, strong social support has been associated with a higher frequency of tooth brushing among adolescents [17].

Discrimination, another critical environment factor, negatively affects health outcomes, including oral health. In health care settings, racial discrimination can shape clinicians' opinions, beliefs, behaviours, and attitudes, contributing to significant disparities in quality of care provided to the racially minoritized populations [18]. It contributes to negative physical health outcomes, including cardiovascular disease, diabetes, obesity, and detrimental health behaviours [19]. Research has shown that racial discrimination can hinder the establishment of trust between patients and health care providers, as a result, leads to increased fear and avoidance of health care services, non-adherence to treatments, and poorer overall health status [18]. In oral health domain, racial discrimination can create barriers to accessing dental care, leading to poorer oral health outcomes. Furthermore, adolescents with perceived discrimination tend to consume more sugary foods and have less frequent toothbrushing compared to those who do not perceive such discrimination [20].

Self-efficacy, social support, and racial discrimination are key determinants of oral health and has a profound impact on adolescents oral health behaviors. While existing literature has examined the influence of each of these variables individually, there is limited understanding of their combined impact. Guided by Bandura's Social Cognitive Theory, this study adopts an explicative framework to explore how environmental and psychosocial factors interact to influence oral health behaviors among adolescents. Specifically, the framework proposes that perceived social support and racial discrimination affect adolescents' oral health behaviors both directly and indirectly through their impact on self-efficacy. We hypothesized that (1) perceived social support is positively

associated with self-efficacy and oral health behaviors; (2) perceived racial discrimination would negatively affect self-efficacy and oral health behaviors; and (3) discrimination can mediate the effect of perceived social support on adolescents' oral health behaviors. This study aimed to address this gap by examining how self-efficacy, social support, and racial discrimination interact to affect adolescents' oral health. By investigating these relationships, the study seeks to provide a more comprehensive understanding of the factors influencing oral health and inform strategies to improve oral health outcomes among adolescents.

Methods

Study settings and participants

In this cross-sectional study, a convenience sample of participants were recruited from the University of Alberta dental clinic in 2021. The inclusion criteria were adolescents aged 12–18 who were proficient in English and did not have significant mental and health disabilities. A research assistant explained the purpose of the study to patients and their parents while they awaited their appointment. Signed informed consent and assent forms were obtained from parents and patients prior to data collection. Participants were identified using anonymous code numbers, with access to these codes restricted to the researchers. The study protocol was approved by the ethics board of the University of Alberta (#Pro00077682).

Data collection and procedure

Adolescents completed a questionnaire consisting of four sections. The first section gathered demographic data for both the adolescents and their families, including date of birth, place of birth (Canada or elsewhere), gender, ethnicity, parent's educational level (categorized as less than high school, high school, college/university, I don't know), household income (categorized as less than $1,999, between $2000-$3,999, greater than $4000), and dental coverage (Yes/No). The second section collected data on frequency of consuming sugary food or drink, frequency of toothbrushing, time of last dental visit and reason (categorized as regular check-up, non-urgent or urgent dental problems), and self-rated oral health status (categorized as very good, good, fair, and poor). In addition, perceived racial discrimination was measured with the question: Have you ever been treated unfairly or discriminated against based on your race? (Yes/No) The first two sections of the questionnaire were used in previous studies [9, 16, 19].

In section three, general and task-specific self-efficacy were assessed using validated measurement tools [21, 22]. General self-efficacy (GSE) reflects adolescents'overall belief in their ability to manage challenges and exert control over their oral health behaviors (Schwarzer & Jerusalem, 1995). It was assessed using General Self-Efficacy Scale (GSES), a widely used scale originally developed in German and later adapted into 28 languages, including English [21, 22]. This 10-item questionnaire, rated on a 5-point Likert scale, yielding a total score ranging from 10 to 50 [21, 22]. In samples from 23 nations, Cronbach's alphas ranged from 0.76 to 0.90, with most values in the high 0.80 s [21, 22]. Its criterion-related validity has been supported by several correlational studies, reporting positive associations with factors such as positive emotions, dispositional optimism, and job satisfaction [21, 22].

Task-specific self-efficacy, which refers to individual's confidence in performing particular oral health behaviors such as brushing, dietary habits, and dental visits [23], was assessed using the Self-Efficacy for Self-Care Scale (SESS) [21, 22, 24]. This validated 15-item scale consists of three subscales that measure self-efficacy for toothbrushing, dietary habits, and dental visits, using a 5-point Likert scale, similar to the GSE scale [21, 22, 24]. The SESS demonstrated strong internal consistency (Cronbach's alpha $=0.86$) [24] and showed significant correlation with the GSE scale (GSES) scores, supporting its concurrent validity [24]. Each subscale captures a distinct aspect of self-efficacy: self-efficacy for toothbrushing refers to an adolescent's confidence in their ability to maintain consistent and effective brushing habits; dietary self-efficacy reflects their perceived ability to control and make healthier dietary choices, such as limiting sugar intake and self-efficacy for dental visits pertains to the confidence in scheduling and attending regular dental check-ups despite potential barriers, such as fear or logistical challenges.

The last section collected data on participant's perceived social support (PSS) using the Personal Resource Questionnaire (PRQ85) [25]. This scale contains 15 questions rated on a 5-point Likert scale. Over the years the alpha reliability of PRQ has been shown over multiple years as approximately 0.90. Construct validity was performed in the study by Joachim (2002), with findings ranging between 0.53 and 0.58, indicating that the two PRQ-85 subscales measured the same construct [26]. These results indicate the PRQ is a reliable and valid tool to measure perceived social support [26]. The PRQ85 score was calculated by adding all the items, with items 4, 7, 10, 16, 24 being reversed ($5=1$, $4=2$, $3=3$, $2=4$, $1=5$). A higher score reflects greater levels of perceived social support [25].

Data analysis

The descriptive statistics of the sample included discrete variables that were reported in percentages. Continuous

variables were presented as mean ± SD, median, and range, using the Statistical Package for Social Sciences (SPSS; Version 28.0; IBM, Armonk, NY). The second stage of the analysis aimed to test the direct and indirect effects among perceived social support, racial discrimination, self-efficacy, and adolescents' oral health behaviors using Structural Equation Modeling (SEM) with AMOS 28.0 (IBM, Armonk, NY, USA). Prior to model estimation, key assumptions required for SEM were evaluated. These included multivariate normality of the data, absence of multicollinearity among predictor variables, and adequacy of sample size. A sample size of 252 participants was deemed sufficient for the complexity of the model, considering commonly used recommendations for SEM [27].

All predictive variables of racial discrimination, social support, and self-efficacy were examined in relation to the adolescents' oral health behaviors. Maximum likelihood estimation was used to determine the model parameters [28]. Additionally, bootstrapping, where multiple samples were randomly drawn from the original sample, was estimated to obtain less-biased standard errors and 95% CI bootstrap percentiles. As recommended by previous studies, the following indices were used to report model goodness of fit: A $\chi 2/df$ ratio of < 3.0, root mean square error of approximation (RMSEA) values < 0.06, comparative fit index (CFI) and Tucker-Lewis Index (TLI) ≥ 0.9 and a standardized root mean square residual (SRMR) < 0.08 and goodness-of-fit index (GFI) ≥ 0.90 indicate an acceptable model fit [29].

Results

Among the 252 participants, the mean (SD) age was 14 (1.8) years, 60% were female, 81% were born in Canada, 56% self-identified as White, and 20% reported experiencing discrimination (Table 1).

PSS had a direct positive association with increased general self-efficacy ($\beta = 0.28$, $p = 0.002$) and task specific self efficacy for dental visits ($\beta = 0.01$, $p = 0.004$), dietary habits ($\beta = 0.09$, $p = 0.004$), and tooth-brushing ($\beta = 0.14$, $p = 0.002$). PSS was also linked to elevated sugar consumption ($\beta = 0.011$, $p = 0.002$). Both PSS ($\beta = -0.003$, $p = 0.048$) and discrimination ($\beta = -0.06$, $p = 0.01$) were associated with reduced tooth-brushing frequency.

SEM allowed us to estimate the total effects, which is the sum of direct effects (e.g., perceived social support → discrimination) and indirect effects (e.g., perceived social support → self efficacy through discrimination). The mediation effect of PSS on adolescents' oral health behaviors through discrimination was assessed by analyzing the statistical significance of the indirect effects and the confidence interval of bias-corrected bootstrap (Fig. 1).

Table 1 Participant characteristics ($N = 252$)

Characteristics	N (%)
Child gender	
Female	152 (60)
Childbirth place	
Born in Canada	203 (81)
Ethnicity	
Whites	142 (56)%
Others	110 (44)
No of children in family	
1	18 (7)
2	100 (40)
≥ 3	134 (53)
Mother's level of education	
High school or lower	63 (25)
College/University	165 (65)
Monthly income level	
Less than $1,999	7 (3)
$2,000—$3,999	38 (15)
More than $4,000	85 (34)
Child age (mean, SD, range)	14 (1.8) (12–18)
Living with	
Single parent	60 (24)
Both parents	192 (76)
Child dental insurance	
No insurance	56 (22)
Has insurance	154 (61)

Additionally, bootstrapping, where multiple samples were randomly drawn from the original sample, was estimated to obtain less-biased standard errors and 95% CI bootstrap percentiles.

SEM showed that 30% of the variance of adolescents' oral health behavior scores was explained by perceived social support (PSS), experiences of racial discrimination, GSE, and TSSE related to toothbrushing, dietary habits, and dental visits.

In this study, SEM model examined multiple direct effects, which include the effect of parental PSS on discrimination, TSSE for dental visits, dietary habits, and toothbrushing, and GSE. (Table 2.) The direct effect of PSS was significantly associated with increased GSE ($\beta = 0.28$, P-value $= 0.002$) and self-efficacies for dental visits ($\beta = 0.01$, P-value $= 0.004$), for dietary habits ($\beta = 0.09$, P-value $= 0.004$), and for toothbrushing ($\beta = 0.14$, P-value $= 0.002$). With regards to adolescents' oral health behaviors, PSS was significantly linked with increased sugar consumption ($\beta = 0.011$, P-value $= 0.002$). Both PSS ($\beta = -0.003$, P-value $= 0.048$) and perceived.

racial discrimination ($\beta = -0.06$, P-value $= 0.01$) were associated with decreased toothbrushing.

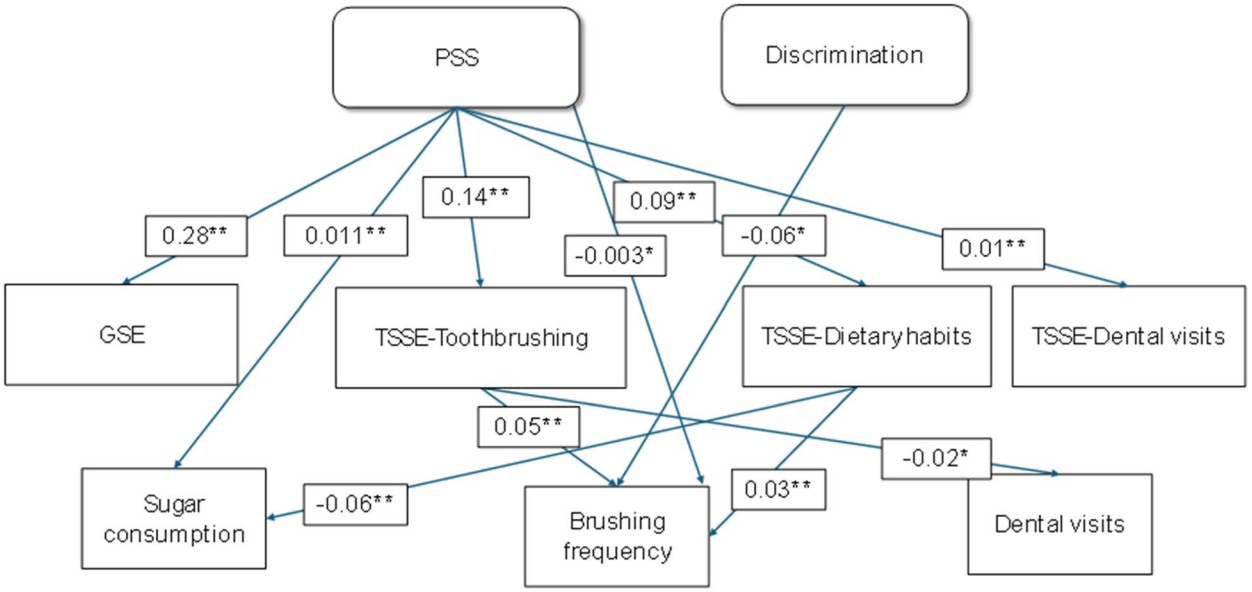

Fig. 1 Significant bootstrapped standardized direct effect estimates illustrated with solid arrows. For ease of interpretation, only significant paths are shown. **P*-value <.05, ***P*-value <.01

Table 2 Bootstrapped direct and indirect effects

			B **Estimates**	***P*-Value**
Direct effects				
Parental PSS		**Discrimination**	**−0.004**	**0.21**
Parental PSS	→	Self efficacy for dental visits	0.01	0.004*
Parental PSS	→	Self efficacy for dietary habits	0.09	0.004*
Parental PSS	→	Self efficacy for tooth brushing	0.14	0.002*
Parental PSS	→	General Self efficacy	0.28	0.002*
Parental PSS	→	Sugar consumption	0.011	0.002*
Parental PSS	→	Brushing frequency	−0.003	0.048*
Parental PSS	→	Last dental visit	0.002	0.43
Discrimination	→	Sugar consumption	0.07	0.44
Discrimination	→	Brushing frequency	−0.06	0.01*
Discrimination	→	Last dental visit	0.02	0.10
Discrimination		General Self efficacy	0.11	0.80
Self efficacy for dental visits	→	Sugar consumption	0.03	0.16
Self efficacy for dental visits	→	Brushing frequency	0.01	0.49
Self efficacy for dental visits	→	Last dental visit	−0.01	0.21
Self efficacy for dietary habits	→	Sugar consumption	−0.06	0.001*
Self efficacy for dietary habits	→	Brushing frequency	0.03	0.005*
Self efficacy for dietary habits	→	Last dental visit	−0.001	0.80
Self efficacy for tooth brushing		Sugar consumption	−0.4	0.06
Self efficacy for tooth brushing		Brushing frequency	0.05	0.002*
Self efficacy for tooth brushing	→	Last dental visit	−0.02	0.02*
General Self efficacy		Sugar consumption	0.002	0.33
General Self efficacy		Brushing frequency	−0.002	0.78
General Self efficacy	→	Last dental visit	0.001	0.85

* Statistically significant

frequency (Table 2), (Fig. 1).

The task-specific self-efficacies showed notable direct effects on oral health behaviours. Self-efficacy for dietary habits (β = 0.03, P-value = 0.005) and toothbrushing (β = 0.05, *P*-value = 0.002) were associated with an increase in toothbrushing frequency. In addition, higher diet self-efficacy was linked to reduced sugar consumption (β = −0.06, *P*-value = 0.001), while higher toothbrushing self-efficacy was associated with a decrease in the rate of dental visits (β = −0.02, *P*-value = 0.02) (Table 2), (Fig. 1).

SEM also examined the indirect effects of Parental PSS on TSSE and adolescents' oral health behaviors, and the indirect effect of Discrimination on TSSE and GSE. (Table 3).

The indirect effect of adolescents' PSS showed an increase in toothbrushing frequency (β = 0.01, *P*-value = 0.02) and a reduction in dental visits (β = −0.004, *P*-value = 0.004). Furthermore, perceived racial discrimination was indirectly associated with adolescents' task-specific self-efficacies; leading to decreased self-efficacy for dental visits (β = −0.06, *P*-value = 0.003) and increased self-efficacies for tooth brushing (β = 0.04, *P*-value = 0.01) and dietary habits (β = 0.25, *P*-value = 0.03) (Table 3). The SEM model showed a moderate model fit based on the indices referenced in the literature (CMIN/DF = 10.14, RMSEA = 0.19, CFI = 0.70).

Table 3 Bootstrapped direct and indirect effects

Indirect Effects			B **Estimates**	***P*-Value**
Parental PSS		**Self efficacy for dental visits**	**0.001**	**0.30**
Parental PSS	→	Self efficacy for dietary habits	0.004	0.12
Parental PSS	→	Self efficacy for tooth brushing	0.002	0.15
Parental PSS	→	Sugar consumption	−0.008	0.60
Parental PSS	→	Brushing frequency	0.010	0.02*
Parental PSS	→	Last dental visit	−0.004	0.004*
Discrimination	→	Self efficacy for dental visits	−0.06	0.003*
Discrimination	→	Self efficacy for dietary habits	0.25	0.03*
Discrimination	→	Self efficacy for tooth brushing	0.04	0.01*
Discrimination	→	General Self efficacy	0.12	0.12

* Statistically significant

Discussion

The findings of this study underscore the complex interplay between social factors and self-efficacy in shaping adolescents' oral health behaviors. While many studies have examined the impact of each factor on general health, there limited understanding of their combined effect on oral health and, particularly in adolescent age group. In addition, researchers often examined these factors in isolation concerning oral health [10, 17, 20]. Therefore, the primary aim of this study was to explore their combined effects on adolescents' oral health. The study found that perceived social support (PSS), discrimination, general self-efficacy (GSE), and task-specific self-efficacy for toothbrushing, dietary habits, and dental visits significantly influenced adolescents' oral health behaviors. PSS was positively associated with general and task-specific self-efficacies and linked to increased sugar consumption and decreased toothbrushing frequency. Perceived racial discrimination was negatively associated with toothbrushing frequency. Self-efficacy for dietary habits and toothbrushing increased toothbrushing frequency but had mixed effects on sugar consumption and dental visits. Additionally, PSS indirectly increased toothbrushing frequency and reduced dental visits, while discrimination influenced task-specific self-efficacies in various ways.

The direct positive relationship between PSS and GSE aligns with Bandura's social cognitive theory, which posits that social environments significantly influence personal efficacy beliefs [8]. This increase in self-efficacy across various domains, including dental visits, diet, and toothbrushing frequency, suggests that adolescents who perceive higher support are more confident in managing their oral health. This phenomenon is supported by findings which report that social support is a key prerequisite for patients' self-efficacy or self-care behaviours [30].

Previous studies reported a mixed findings regarding the association between PSS and sugar consumption. While some studies showed that higher level of PSS was significantly associated with lowers sugar consumption [15, 16], others were not able to find a significant association [17, 31].

The findings of this study showed that adolescents with higher levels of PSS had a higher sugar consumption. The association between PSS and increased sugar consumption introduces a paradox where social support, while boosting self-efficacy, may also encourage behaviors detrimental to oral health. This could be explained by social conformity to peer dietary habits, which often include higher sugar intake [31]. In addition, increased sugar consumption among adolescents can be influenced by various factors, such as the characteristics of their neighborhoods [32]. Living in areas with lower socioeconomic

status often exposes adolescents to unhealthy food and drink choices, leading them to adopt less healthy dietary practices [32]. These neighborhoods may lack access to fresh and nutritious foods, instead offering more fast and convenience foods high in sugar [32] The availability of these unhealthy options in local convenience stores and schools further contributes to poor dietary habits. Additionally, the challenges that families face, such as financial constraints, can overshadow concerns about their children's oral health, making it less of a priority [32].

The indirect effect of racial discrimination on self-efficacy, specifically reducing self-efficacy for dental visits while increasing it for toothbrushing and dietary habits, underscores the detailed ways in which negative social experiences can shape health behaviors. This dual impact suggests that while discrimination can diminish trust in healthcare systems, leading to decreased dental visits, it may simultaneously trigger compensatory behaviors like increased toothbrushing as a form of self-reliance [18]. Despite widespread improvements in healthcare delivery over the last decade, social discrimination remains a significant contributor to the persistent negative health outcomes experienced by racial/ethnic minority populations [18].

Although many studies have established a connection between self-efficacy and both general and oral health in adults, this relationship has not been thoroughly investigated in adolescents [33, 34]. Our study revealed that task-specific self-efficacy scores are related to their respective positive oral health behaviors in adolescents. The direct effects of task-specific self-efficacy on increasing toothbrushing frequency and reducing sugar consumption are particularly noteworthy. They emphasize the crucial role that confidence in specific health-related actions plays in maintaining good health, supporting previous research that associates higher self-efficacy with improved oral hygiene practices [20]. Adolescents with higher self-efficacy for toothbrushing tend to brush their teeth more frequently. This finding aligns with previous findings, that self-efficacy in brushing and flossing was significantly associated with the frequency of these behaviors, as measured both retrospectively and prospectively [10, 20]. Additionally, another study found that interventions aimed at increasing participants' self-efficacy resulted in improvements in the timing, method, and duration of toothbrushing [10, 11]. The observed decrease in dental visits associated with higher self-efficacy for tooth brushing might indicate an overconfidence effect, where individuals believe routine toothbrushing is sufficient to maintain oral health, potentially overlooking the need for professional care. This unexpected result warrants further investigation into how adolescents interpret their self-efficacy and its implications for comprehensive oral health.

This study exhibits several limitations that need to be acknowledged. Participants were recruited from the University clinic, limiting the ability to extrapolate findings to the general population, as they might have higher motivation or better access to oral health resources. The cross-sectional design limits causal inference, and the reliance on self-reported data introduces potential biases. Convenience sampling may limit representativeness, and focusing on English-speaking adolescents might exclude non-English-speaking individuals, potentially overlooking important perspectives. Future research should address these limitations to validate and expand upon these insights. Although the sample size of 252 participants allowed for meaningful analysis, it may limit the generalizability of findings, particularly given the number of variables assessed. Future research with a larger sample size is recommended to further validate these associations and enhance statistical power.

However, there are notable strengths, including its comprehensive analysis of the interplay between perceived social support (PSS), discrimination, general and task-specific self-efficacy on adolescents' oral health behaviors, which provides a detailed understanding of these factors' collective influence. The use of Structural Equation Modeling (SEM) ensures a robust analysis by capturing complex relationships. Additionally, the use of validated measurement tools increases the reliability and validity of the results, and the focus on adolescents fills a crucial gap in the literature.

Conclusion

This study highlights the intricate balance between social support, discrimination, and self-efficacy in shaping adolescent oral health behaviors. The findings revealed that perceived social support directly enhanced both general and task-specific self-efficacy, which in turn positively influenced oral health behaviors. Conversely, racial discrimination indirectly affected task-specific self-efficacy, indicating that negative social experiences can undermine adolescents' confidence in managing their oral health. Notably, while self-efficacy for dietary habits and toothbrushing are critical determinants of oral health behaviors, self-efficacy for dental visits alone does not show a significant connection. These findings underscore the multifaceted nature of barriers to oral health care, including social influences like social support and discrimination, which impact adolescents'oral health behaviors. Addressing these barriers through targeted, equitable strategies is essential to reduce disparities and improve oral health outcomes for underserved populations.

Implications for health equity

The findings of this study emphasize the intertwined roles of social support, racial discrimination, and self-efficacy in shaping adolescents'oral health behaviors. Theoretically, the study supports frameworks that highlight the influence of psychosocial and structural determinants on health behavior, reinforcing the need to understand oral health within broader social contexts. Practically, the results call for targeted strategies that go beyond improving access to care by addressing the social conditions in which adolescents live. Culturally informed programs that reduce bias, promote positive social networks, and enhance task-specific self-efficacy are essential. Interventions should be embedded within public health initiatives and focus on strengthening family and community-based support systems. From a policy standpoint, ensuring equitable access to preventive and restorative dental services remains a priority, particularly for marginalized and underserved populations. These findings contribute to the development of a multi-level framework for promoting adolescent oral health and reducing health disparities through both individual and systemic change.

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Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by R.D, M.A and B.B. The first draft of the manuscript was written by R.D and S.B. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki (https://www.wma.net/policies-post/wma-declaration-of-helsinki/). The study protocol was approved by the ethics board of the University of Alberta (Ethics approval number: pro00077682). Signed informed consent forms were obtained from parents and patients prior to data collection. This study was performed in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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