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Development and Pilot Evaluation of a Bilingual Oral Health and Mental Health Literacy Toolkit for Hispanic/Latino Youth in the United States

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Abstract

Background

Oral health and mental health are closely interconnected, yet health education initiatives frequently address these conditions separately. Evidence suggests that poor oral health, including oral pain, impaired oral function, tooth loss, and dental disease, is associated with depressive symptoms and that the relationship between oral and mental health may be bidirectional. Hispanic/Latino youth may experience additional barriers related to language, health literacy, healthcare navigation, and access to culturally appropriate health information. In the United States, Hispanic/Latino adolescents continue to experience substantial mental health concerns, while language barriers remain an important challenge for individuals with limited English proficiency.

Objective

The primary objective of this study is to develop and pilot-test a culturally and linguistically appropriate bilingual oral health and mental health literacy toolkit for Hispanic/Latino youth. The study will evaluate the feasibility, acceptability, and preliminary effectiveness of the toolkit in improving participants' knowledge, self-efficacy, and intended oral health behaviors.

Methods

This study will use a mixed-methods, pretest-posttest pilot design. The project will consist of four phases: (1) needs assessment and evidence synthesis; (2) bilingual toolkit development; (3) stakeholder and youth review; and (4) pilot implementation and evaluation. The toolkit will be developed in English and Spanish using plain-language, culturally responsive content and visual educational materials. Participants will complete a baseline survey before receiving the intervention and a post-intervention survey immediately following exposure to the toolkit, with an optional follow-up assessment to evaluate short-term retention and self-reported behavior change. Quantitative outcomes will include changes in oral health knowledge, mental–oral health knowledge, self-efficacy, perceived barriers, and intended preventive behaviors. Qualitative feedback will assess acceptability, cultural relevance, clarity, usefulness, and recommendations for improvement.

Expected Significance

This pilot study will generate preliminary evidence regarding the feasibility and potential effectiveness of a bilingual oral and mental health literacy intervention for Hispanic/Latino youth. Findings will inform refinement of the toolkit and provide preliminary data for larger community-based studies and future intervention trials.

Keywords

Oral health literacy; Mental health literacy; Hispanic latino youth; Bilingual intervention; Health disparities; Health equity; Health education; Language barriers; Dental public health.

Introduction

Background

The intersection of oral and mental health is a critical yet underexplored area in public health. Research suggests that individuals with mental health conditions face significant barriers to oral healthcare, leading to poor oral health outcomes. This project aims to develop a culturally responsive and linguistically accessible toolkit in two languages, English and Spanish, to improve oral health literacy among individuals affected by mental health conditions. As we know, the state is such a multicultural country, and the language barrier is real. In 2024, the prevalence of mental illness in the United States was 23.08% for adults or about 60 million people. This includes 5.86% of adults who experienced a severe mental illness. [1] According to the Substance Abuse and Mental Health Services Administration (SAMHSA), 21.4% of Hispanic or Latino adults in the United States had a mental health condition in the past year. (2) out of which 14.6% of Hispanic or Latino adults received mental health treatment in the past year [2]. 42% of Hispanic youth in the US reported feeling persistently sad or hopeless in 2024 [3]. A significant language barrier exists within the Latino community in the USA, where many individuals primarily speak Spanish, leading to difficulties accessing essential services, information, and communication in English-dominant settings, highlighting the critical need for Spanish language toolkits to bridge this gap and ensure equitable access for all; these toolkits can include translated documents, educational materials, and culturally sensitive information presented in Spanish to serve the Latino community better [4]. Three in four (77%) Hispanic immigrants have been in the U.S. for ten years or longer, and two-thirds (67%) are employed, yet a majority live in lower-income households (less than \$40,000 per year). Two-thirds of Hispanic immigrants have limited English proficiency (LEP), and a similar share have a high school education or less

[5]. Oral health and mental health are important components of overall health and well-being, yet they are frequently addressed independently within healthcare and public health systems. Emerging evidence demonstrates a meaningful relationship between oral health and mental health, particularly depression. A systematic review of studies published through 2024 found that tooth loss, oral pain, and impaired oral function were consistently associated with increased depressive symptoms, supporting a potentially bidirectional relationship between oral and mental health.

Poor mental health may also interfere with preventive health behaviors, healthcare utilization, treatment adherence, and the ability to maintain oral hygiene. Conversely, oral pain, dental disease, impaired chewing, and concerns regarding appearance may negatively affect psychological well-being and quality of life.

Despite this relationship, educational resources frequently separate oral health from mental health. This separation may limit patients' understanding of how the two domains interact and may represent a missed opportunity for prevention and early intervention.

Hispanic/Latino Youth and Health Disparities

Hispanic/Latino communities represent a large and diverse population in the United States and may experience multiple social and structural barriers to healthcare access. Language is one important factor. Approximately 26 million people in the United States have limited English proficiency, and Spanish is the most common language among individuals with limited English proficiency. Hispanic individuals account for nearly two-thirds of the U.S. limited-English-proficient population.

Language barriers can affect understanding of healthcare information, communication with providers, healthcare navigation, and access to preventive services. Among Hispanic adults, Spanish-language respondents have reported greater difficulty understanding healthcare coverage and navigating aspects of the healthcare system compared with English-speaking respondents.

Youth mental health is also an important public health concern. CDC data from the 2023 Youth Risk Behavior Survey showed that approximately 42% of Hispanic students reported persistent feelings of sadness or hopelessness.

These findings highlight the need for health education resources that are understandable, culturally appropriate, linguistically accessible, and designed specifically for younger populations.

Health Literacy as a Public Health Intervention Target

Healthy People 2030 defines personal health literacy as the ability to find, understand, and use information and services to inform health-related decisions and actions. Importantly, health literacy is not solely an individual responsibility; healthcare organizations and systems also have a responsibility to make health information accessible and understandable.

A bilingual educational intervention therefore represents more than simple translation. The proposed toolkit will incorporate plain language, culturally appropriate examples, visual communication, healthcare-navigation information, and actionable recommendations.

Research gap

Although bilingual health education materials are available for individual oral health or mental health topics, there is a need for an integrated resource that addresses the relationship between oral health and mental health while also supporting health literacy and healthcare navigation among Hispanic/Latino youth.

Study Aim

The overall aim of this study is to develop and pilot-test a culturally responsive bilingual oral health and mental health literacy toolkit for Hispanic/Latino youth in the United States.

Specific Objectives

Objective 1

To identify priority oral health, mental health, health-literacy, and healthcare-navigation topics relevant to Hispanic/Latino youth through a literature review and stakeholder needs assessment.

Objective 2

To develop an evidence-based bilingual toolkit in English and Spanish incorporating plain-language educational content, visual aids, culturally responsive messaging, and practical healthcare-navigation resources.

Objective 3

To assess the toolkit's content validity, clarity, cultural relevance, and usability through review by subject-matter experts, community stakeholders, and members of the target population.

Objective 4

To pilot-test the toolkit and evaluate its preliminary effectiveness in improving:

- oral health knowledge;
- knowledge regarding the relationship between oral and mental health;
- perceived ability to access and understand health information;
- self-efficacy regarding oral health behaviors;
- perceived barriers to oral healthcare; and
- intention to engage in preventive oral health behaviors.

Objective 5

To assess the feasibility and acceptability of the intervention and generate preliminary data for a larger longitudinal study.

Research Questions

1. Does exposure to a bilingual oral and mental health literacy toolkit improve oral health knowledge among Hispanic/Latino youth?
2. Does the toolkit improve participants' understanding of the relationship between oral health and mental health?
3. Does exposure to the toolkit improve oral health self-efficacy and confidence in navigating healthcare resources?
4. Does the toolkit influence participants' intentions to engage in preventive oral health behaviors?
5. Is the toolkit perceived as understandable, culturally appropriate, relevant, and acceptable by the target population?
6. What components of the toolkit are perceived as most useful, and what modifications are recommended by participants and stakeholders?

Hypotheses

Primary hypothesis

Participants will demonstrate a statistically significant improvement in oral health and mental–oral health knowledge following exposure to the bilingual toolkit.

Secondary Hypotheses

Following exposure to the intervention, participants will demonstrate:

1. Increased oral health self-efficacy;
2. Improved understanding of the relationship between oral and mental health;
3. Increased confidence in navigating oral healthcare resources;
4. Increased intention to engage in preventive oral health behaviors; and
5. Reduced perceived barriers to obtaining oral healthcare information and services

Study Design

A mixed-methods, prospective pretest-posttest pilot study will be conducted. The study will consist of four sequential phases:

Phase I: Needs assessment and evidence synthesis

A targeted literature review will identify evidence-based topics related to:

- oral health literacy;
- mental health literacy;
- oral health and depression/psychological well-being;
- preventive oral health behaviors;
- healthcare navigation;
- language barriers;

- culturally responsive health communication; and
- oral health disparities among Hispanic/Latino populations.

Key stakeholders will also be consulted to identify educational priorities

Phase II: Toolkit development

An English-Spanish toolkit will be developed based on findings from Phase I.

Potential content areas will include:

- oral hygiene;
- dental caries prevention;
- periodontal health;
- oral pain and when to seek care;
- nutrition and oral health;
- tobacco/vaping and oral health;
- stress and oral health;
- depression and oral health;
- medication and oral health considerations;
- the relationship between oral and mental health;
- when and where to seek dental care;
- preventive dental visits;
- understanding basic healthcare terminology;
- navigating dental insurance and community resources; and
- mental health and crisis/support resources.

Phase III: Content validation and user testing

The preliminary toolkit will be reviewed by:

- dental public health professionals;
- dental clinicians;
- mental health professionals;
- health communication/health-literacy experts;
- community organizations; and
- members of the target youth population.

Reviewers will evaluate:

- accuracy;
- readability;
- cultural appropriateness;
- linguistic clarity;
- visual appeal;
- relevance;
- actionability; and

- usability.

The Spanish version should undergo forward translation and independent review/back-translation, rather than relying solely on direct word-for-word translation.

Phase IV: Pilot intervention

Eligible participants will complete a baseline survey before receiving the toolkit. Participants will then review the educational materials through a standardized delivery format. A post-intervention survey will be administered immediately following the intervention. If resources permit, a follow-up survey will be administered approximately 4–8 weeks after the intervention to assess short-term retention and self-reported behavioral changes.

Study population

The target population will be Hispanic/Latino youth residing in the United States.

Proposed inclusion criteria

Participants must:

- identify as Hispanic/Latino or have a Hispanic/Latino cultural background;
- fall within the predefined study age range;
- be able to understand English or Spanish;
- provide informed assent/consent as applicable; and
- have access to the toolkit and survey platform.
- The final age range should be explicitly defined in the IRB protocol.

Exclusion criteria

Participants may be excluded if they:

- are outside the predefined age range;
- are unable to complete the survey in English or Spanish;
- previously participated in development testing of the final toolkit; or
- are unable to provide required consent/assent.

Recruitment

Participants will be recruited through community and youth-serving organizations, schools, community health centers, dental clinics, and participating community organizations.

Potential community partners may include organizations serving Hispanic/Latino populations and organizations providing dental, mental health, or social services. Recruitment materials will be available in both English and Spanish.

Intervention

Bilingual oral health and mental health literacy toolkit

The intervention will consist of a bilingual educational toolkit developed specifically for Hispanic/Latino youth.

The toolkit will use:

- plain-language communication;
- culturally relevant examples;
- illustrations and infographics;
- short educational sections;
- actionable recommendations;
- bilingual terminology;
- healthcare-navigation resources; and
- links/QR codes to reputable healthcare resources.

The intervention will emphasize that oral and mental health are interconnected components of overall health rather than treating either condition in isolation.

Outcome Measures

Primary outcome

Change in Oral and Mental–Oral Health Knowledge

Knowledge will be assessed using a structured questionnaire administered before and after intervention exposure.

Possible domains include:

- recommended oral hygiene practices;
- dental caries prevention;
- periodontal disease prevention;
- importance of preventive dental visits;
- effects of diet on oral health;
- relationship between stress/mental health and oral health;
- relationship between depression and oral health;
- appropriate reasons for seeking dental care; and
- healthcare-navigation knowledge.

A total knowledge score will be calculated.

Primary endpoint: mean change in knowledge score from baseline to post-intervention.

Secondary Outcomes

1. Self-efficacy

Participants will rate their confidence in performing recommended oral health behaviors and obtaining appropriate oral healthcare.

2. Mental–oral health literacy

Participants will assess their understanding of how mental health and oral health can influence one another.

3. Healthcare navigation

Participants will report their confidence in:

- identifying where to obtain dental care;
- knowing when dental care is necessary;
- understanding basic healthcare terminology; and
- identifying available community resources.

4. Behavioral Intentions

Participants will report their likelihood of:

- brushing twice daily;
- flossing/interdental cleaning;
- attending preventive dental visits;
- seeking care for oral symptoms;
- discussing mental health concerns when appropriate; and
- using reliable health information sources.

5. Acceptability and Usability

Participants will rate:

- readability;
- usefulness;
- visual appeal;
- cultural relevance;
- language clarity;
- perceived relevance;
- ease of understanding; and
- likelihood of recommending the toolkit.

Qualitative component

Open-ended questions will be included in the post-intervention survey.

Participants will be asked:

1. What did you find most useful about the toolkit?
2. Was any information difficult to understand?
3. Did the toolkit address concerns that are important to you?
4. Did the English/Spanish format make the information easier to understand?
5. What information should be added?
6. What information should be removed or changed?
7. What would make this toolkit more useful to other Hispanic/Latino youth?

If feasible, a small number of participants and stakeholders may participate in semi-structured interviews or focus groups.

Qualitative responses will be analyzed using thematic analysis to identify recurring themes related to usability, cultural relevance, language accessibility, and intervention acceptability.

Data collection

Data will be collected at three potential time points:

Time point	Assessment
T0 – Baseline	Demographics, oral health knowledge, mental–oral health knowledge, self-efficacy, perceived barriers
T1 – Immediately post-intervention	Knowledge, self-efficacy, healthcare navigation, behavioral intentions, acceptability
T2 – 4–8-week follow-up	Knowledge retention, self-reported behaviors, continued use of toolkit

The T2 assessment is recommended because it substantially strengthens the manuscript by allowing assessment beyond immediate recall.

Statistical analysis

Descriptive statistics will be used to characterize the study population.

Continuous variables will be summarized using means and standard deviations or medians and interquartile ranges, as appropriate. Categorical variables will be summarized using frequencies and percentages.

Primary analysis

Change in the primary knowledge score between baseline and post-intervention will be evaluated using:

- paired t-test for normally distributed continuous outcomes; or
- Wilcoxon signed-rank test for non-normally distributed outcomes.

Secondary analysis

Changes in self-efficacy, mental–oral health literacy, healthcare-navigation confidence, and behavioral intentions will be evaluated using appropriate paired statistical tests.

If a follow-up assessment is implemented, repeated-measures analysis or a linear mixed-effects model may be used to evaluate changes across T0, T1, and T2. Effect sizes and 95% confidence intervals should be reported in addition to p-values. Because this is a pilot study, emphasis will be placed on effect estimates, confidence intervals, feasibility, and acceptability, rather than statistical significance alone.

Sample size

As a pilot study, the initial sample size should primarily be justified based on feasibility and estimation of preliminary effect sizes rather than definitive hypothesis testing.

A target sample of approximately 50–100 participants would provide preliminary estimates of intervention effects, variability, recruitment feasibility, and participant acceptability. The final sample size should be determined using an a priori power calculation once the primary outcome measure and anticipated effect size have been established.

Data quality and instrument development

Before full implementation, survey questions will undergo pilot testing to assess:

- comprehension;
- reading level;
- response burden;
- ambiguous wording;
- translation accuracy; and
- cultural appropriateness.

Where possible, previously validated health-literacy or self-efficacy measures should be incorporated rather than creating an entirely new instrument.

Any newly developed knowledge items should undergo expert review and pilot testing before being used as the primary outcome.

Ethical considerations

Institutional Review Board approval will be obtained before participant recruitment and data collection. Because the study involves youth, parental permission and participant assent will be obtained when required based on participant age and institutional policies.

Participation will be voluntary. No participant will be required to disclose a mental health diagnosis. Because the intervention discusses mental health, the study materials will include appropriate crisis and support resources. The toolkit will clearly distinguish educational information from individualized medical or mental health advice.

Participant identifiers will be minimized, and research data will be stored securely in accordance with institutional requirements.

Feasibility outcomes

In addition to effectiveness outcomes, the pilot study will assess feasibility using:

- recruitment rate;
- enrollment rate;
- survey completion rate;
- intervention completion rate;
- follow-up retention rate;
- average time required to complete the intervention;
- proportion of participants requiring assistance;
- toolkit usability ratings; and

- participant willingness to recommend the toolkit.

Expected results

We anticipate that exposure to the bilingual toolkit will be associated with:

1. Improved oral health knowledge;
2. Improved understanding of the relationship between oral and mental health;
3. Increased confidence in performing preventive oral health behaviors;
4. Improved confidence navigating dental and health resources;
5. Increased intention to obtain preventive dental care;
6. High perceived acceptability and cultural relevance; and
7. Identification of areas requiring refinement before larger-scale implementation.

Because this is a pilot study, the investigators will avoid assuming effectiveness before the data are collected.

Significance

This study addresses three interconnected public health priorities: oral health disparities, mental health literacy, and language-related barriers to healthcare information. Health literacy is increasingly recognized as a foundational component of health equity, with responsibility shared by individuals and healthcare organizations. The proposed intervention addresses these issues by combining oral health and mental health education into a single bilingual resource designed specifically for Hispanic/Latino youth. If the pilot demonstrates feasibility and promising preliminary outcomes, the toolkit could subsequently be evaluated in a larger community-based controlled study.

Findings will be disseminated through:

- Peer-reviewed publication;
- Dental public health conferences;
- Community presentations;
- Academic presentations;
- Participating community organizations; and
- Future grant applications.

The toolkit itself may be made available digitally to participating organizations following completion of the study and appropriate review of copyright, licensing, and institutional requirements.

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