CHEST

Decídetexto: Mobile Cessation Support for Latino Adults Who Smoke

A Randomized Clinical Trial

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BACKGROUND: Latino adults experience multiple barriers to health care access and treatment that result in tobacco-related disparities. Mobile interventions have the potential to deliver smoking cessation treatment among Latino adults, who show the highest use rates of mobile technologies.

RESEARCH QUESTION: Is *Decídetexto*, a culturally accommodated mobile health intervention, more effective for smoking cessation compared with standard care among Latinx adults who smoke?

STUDY DESIGN AND METHODS: A two-arm parallel group randomized clinical trial was conducted in Kansas, New Jersey, and New York between October 2018 and September 2021. Eligible Latino adults who smoke (n = 457) were randomly assigned to *Decídetexto* or a standard care group. The primary outcome was biochemically verified 7-day smoking abstinence at week 24. Secondary outcomes included self-reported 7-day smoking abstinence at weeks 12 and 24 and uptake and adherence of nicotine replacement therapy (NRT).

RESULTS: Participants' mean age was 48.7 (SD, 11.1) years, 45.2% were female, and 50.3% smoked ≥ 10 cigarettes per day. Two hundred twenty-nine participants were assigned to *Decídetexto* and 228 to standard care. Treating those lost to follow-up as participants who continued smoking, 14.4% of participants in the *Decídetexto* group were biochemically verified abstinent at week 24 compared with 9.2% in the standard care group (OR, 1.66; 95% CI, 0.93-2.97; $P = .09$). Treating those lost to follow-up as participants who continued smoking, 34.1% of the participants in the *Decídetexto* group self-reported smoking abstinence at week 24 compared with 20.6% of participants in the standard care group (OR, 1.99; 95% CI, 1.31-3.03; $P < .001$). Analyzing only participants who completed the assessment at week 24, 90.6% (174/192) of participants in the *Decídetexto* group self-reported using NRT for at least 1 day compared with 70.2% (139/198) of participants in standard care (OR, 4.10; 95% CI, 2.31-7.28; $P < .01$).

INTERPRETATION: Among Latino adults who smoke, the *Decídetexto* intervention was not associated with a statistically significant increase in biochemically verified abstinence at week 24. However, the *Decídetexto* intervention was associated with a statistically significant increase in self-reported 7-day smoking abstinence at weeks 12 and 24 and uptake of NRT. This randomized clinical trial provides encouragement for the use of *Decídetexto* for smoking cessation among Latino adults.

CLINICAL TRIAL REGISTRATION: ClinicalTrials.gov identifier: NCT03586596.

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KEY WORDS: Latino adults; mHealth; nicotine replacement therapy; smoking; smoking cessation; tobacco; tobacco cessation

Take-home Points

Study Question: Is *Decídetexto*, a culturally accommodated mobile health intervention, more effective for smoking cessation compared with standard care among Latino adults who smoke?

Results: Treating those lost to follow-up as participants who continued smoking, 14.4% of participants in the *Decídetexto* group were biochemically verified abstinent at week 24 compared with 9.2% in the standard care group (OR, 1.66; 95% CI, 0.93-2.97; $P = .09$). Treating those lost to follow-up as participants who continued smoking, 34.1% of the participants in the *Decídetexto* group self-reported smoking abstinence at week 24 compared with 20.6% of participants in the standard care group (OR, 1.99; 95% CI, 1.31-3.03; $P < .001$). Analyzing only participants who completed the assessment at week 24, 90.6% (174/192) of participants in the *Decídetexto* group self-reported using nicotine replacement therapy for at least 1 day compared with 70.2% (139/198) of participants in standard care (OR, 4.10; 95% CI, 2.31-7.28; $P < .01$).

Interpretation: Among Latino adults who smoke, the *Decídetexto* intervention was not associated with a statistically significant increase in biochemically verified abstinence at week 24. However, the *Decídetexto* intervention was associated with a statistically significant increase in self-reported 7-day smoking abstinence at weeks 12 and 24, and uptake of nicotine replacement therapy. This trial provides encouragement for the use of *Decídetexto* for smoking cessation among Latino adults.

Tobacco use is the leading preventable cause of morbidity and mortality among Latino adults,[1,2] the largest racial and ethnic minority group in the United States.[3] Of the 63 million Latino adults residing in the United States,[3] approximately 5 million (7.7%) currently smoke cigarettes.[4] Overall, Latino adults experience multiple barriers to health care access and treatment that result in tobacco-related disparities. Compared with Black and White adults, Latino adults are less likely to receive advice to quit smoking and to access smoking cessation resources, including behavioral counseling and pharmacotherapy.[5-9] Barriers to accessing treatment include scarcity of resources in Spanish, lack of cultural sensitivity, mistrust of the health care system, and limited knowledge of available resources.[10,11] Despite numerous barriers, many Latino adults are interested in using behavioral counseling and pharmacotherapy to support quit attempts.[12-18]

Recent changes in health care delivery in the United States (eg, widespread adoption of technology, focus on population health management)[19-21] have created an opportune time for providing smoking cessation behavioral counseling and pharmacotherapy through mobile health (mHealth) interventions. Studies demonstrate the effectiveness of mHealth interventions for smoking cessation, allowing for flexible delivery of information, with algorithms used to tailor content to individual motivational and behavioral needs for smoking cessation.[22,23] The potential for mHealth interventions to deliver smoking cessation treatment may be even greater among hard-to-reach, socioeconomically disadvantaged, and uninsured populations.[23]

Although existing mHealth interventions for smoking cessation have been translated into Spanish, most were developed primarily by and for non-Latino, English-speaking individuals. Moreover, the uptake of these interventions among Latino adults remains minimal even though they are show the highest use rates of mobile technologies.[24] Thus, in partnership with a

ABBREVIATIONS: mHealth = mobile health; NRT = nicotine replacement therapy; RCT = randomized clinical trial

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community advisory board and guided by the Cultural Accommodation Model of Substance Abuse Treatment,[25] we developed *Decídetexto*, a culturally accommodated mHealth intervention for smoking cessation.[26] The current smoking cessation randomized clinical trial (RCT) evaluated the efficacy of *Decídetexto* compared with standard care among Latino adults who smoke. The primary outcome was biochemically verified 7-day smoking abstinence at week 24. Secondary outcomes included self-reported 7-day smoking abstinence at weeks 12 and 24, and uptake and adherence of nicotine replacement therapy (NRT).

Study Design and Methods

Trial Design and Participants

This study was a two-arm parallel group RCT to evaluate the efficacy of *Decídetexto*, a culturally accommodated mHealth intervention for smoking cessation, compared with standard care among Latino adults who smoke.[26] The community advisory board actively participated in developing the *Decídetexto* intervention and the printed educational material, assessments, recruitment, and study implementation. The Human Subject Protection committees approved study procedures at Hackensack University Medical Center (#Pro2017-0528), the University of Rochester Medical Center (IRB #STUDY00005080), and the University of Kansas Medical Center (IRB #STUDY00004475), ClinicalTrials.gov identifier: NCT03586596.[27]

Recruitment was conducted by bilingual (English and Spanish) community health workers using clinic- (eg, referrals from clinics, patient registry calls) and community-based (eg, in-person community outreach events, radio and television interviews) approaches.[17,18] Recruitment was conducted in Kansas, New Jersey, and New York between October 2018 and February 2021; recruitment was suspended from March 2020 through July 2020 because of the COVID-19 pandemic. Final follow-up assessment was completed in September 2021.

Eligible individuals self-identified as Hispanic or Latino, knew how to read and speak English or Spanish, were at least 21 years of age, smoked cigarettes 3 or more days per week for at least 6 months, reported interest in quitting smoking in the next 30 days, had an active cellphone with unlimited text messaging capability, knew how to send and read text messages, and were willing to complete two study visits and assessments. Exclusion criteria included use of other tobacco products more than once per week; current participation in any other smoking cessation program or use of any medication to quit smoking; living with a current study participant; being pregnant, breastfeeding, or planning to become pregnant in the next year; or planning to move in the next 6 months. Research staff conducted eligibility screening in person or by phone. Individuals eligible to participate in the study were scheduled for an in-person appointment for enrollment and baseline assessment.

Randomization and Intervention

After reviewing and signing the consent form, participants were randomly assigned to the *Decídetexto* intervention or a standard care (control) group in a 1:1 ratio via computer-generated individual random assignment. A block size of four was used to generate the randomization schema. Study staff provided each participant with the appropriate intervention after randomization. Neither the participants nor the research staff knew the group assignment in advance.

The study intervention is described in detail elsewhere.[26] Participants in both treatment conditions received printed educational material and had access to NRT at no cost via a toll-free study number. Participants randomized to the *Decídetexto* intervention also received a culturally accommodated mHealth intervention for smoking cessation.

Educational Material: The educational material consisted of a culturally accommodated printed 12-page booklet, available in English and Spanish, that described the health risks of smoking, the health benefits of stopping smoking, and behavioral strategies for quitting. The educational material described the benefits of using NRT, how to access NRT at no cost via a toll-free study number, and how to access behavioral counseling at no cost via their state quitline.

***Decídetexto* Intervention:** *Decídetexto* is a culturally accommodated mHealth intervention for smoking cessation that included (1) a tablet-based program that collected smoking-related information to guide the development of an individualized smoking cessation quit plan followed by a text messaging program; (2) a 24-week text messaging counseling program with interactive capabilities along with prompts for accessing and using pharmacotherapy; and (3) pharmacotherapy support (ie, NRT).[26] Participants

interacted with the tablet-based program for 10 to 15 minutes to review their reasons for quitting, learn about correct use of NRT, and hear a testimony from someone who quit smoking using the text messaging program. The tablet-based program also collected information for each participant on the number of cigarettes smoked per day, reasons for quitting, their top two smoking triggers, and their preferred strategies to manage each trigger. Subsequently, the tablet-based program prompted the selection of NRT (gum or patch) and a quit date within the next 30 days. Participants were then enrolled in the 24-week text messaging counseling program, which included prescheduled messages with content based on phases of the quitting process (pre-quit phase [up to four messages per day], quit date [four messages], post-quit intensive [up to three messages per day], and post-quit maintenance [up to three messages per week]). The library consisted of 712 scheduled messages, including 10 themes: education, logistics (how to use the text messaging program), intratreatment social support, coping with triggers, extratreatment social support, stimulus control, vicarious experience, relapse prevention, social norms, and reward. *Decídetexto* included Latino values of *familismo* (strong loyalty and closeness with the family), *personalismo* (warm conversations that convey care and understanding), *simpatía* (not criticizing), and *confianza* (establishing trust).[28-30] Readability scores of the text messages averaged a 3.9 (4th-grade level) in English, and 77.4 (easy/very easy) in Spanish, using the Flesch-Kincaid and Fernandez-Huerta tests, respectively.[31-33] Participants were instructed to use a keyword (stress, crave, family, patch, gum) to receive unlimited, immediate automated text responses with information about the chosen topic. Participants also had the option to text concerns or questions to the program to receive individual feedback from study tobacco treatment specialists. In addition, participants received a text message every 2 weeks after their quit date to reassess their smoking status. If participants indicated that they were smoking, automated messages encouraged them to select a new quit date.

Nicotine Replacement Therapy: Nicotine patches and gum were offered to participants at no cost. If participants requested NRT, an initial 4-week supply of their preferred NRT was mailed to their address. If participants requested a refill, a second 6-, 4-, or 2-week supply (depending on their number of cigarettes smoked per day) of their NRT of preference was mailed to their address. NRT dosage and duration (6-10 weeks) followed the Clinical Practice Guidelines for Treatment of Tobacco Use.[34]

Measures and Outcomes

The baseline assessment included participants' age, sex, education, annual income,[35] primary language, acculturation level (measured by the Brief Acculturation Scale for Hispanics),[36] country of origin, number of cigarettes per day, attempted smoking cessation in the past year, smoking dependence (measured by the severity of dependence scale),[37] and smoking cessation medication use. Assessments at baseline, week 12, and week 24 included tobacco use (7-day timeline follow-back),[38] the smoking self-efficacy questionnaire,[39,40] and uptake (ie, using NRT for at least 1 day) and adherence (using NRT for more than 4 weeks) to NRT.

Retention was measured by the proportion of participants who completed the follow-up assessments at weeks 12 and 24 after enrollment. Follow-up study visits were conducted in person or by phone. No additional cessation counseling was provided during these follow-up visits. Participants received telephone, text, and postcard reminders before each study visit. Monetary incentives were based on the completion of the assessments and was independent of smoking status, with $30 at baseline, $20 at week 12, and $50 at week 24.

Self-reported 7-day smoking abstinence (no cigarette smoking in the past 7 days) was assessed at weeks 12 and 24. Saliva was collected from participants who self-reported 7-day smoking abstinence at week 24. Before the onset of the COVID-19 pandemic (March 1, 2020), saliva samples were collected in person. After its onset, participants who self-reported cessation were requested to provide the salivary sample via mail. The primary outcome was biochemically verified 7-day smoking abstinence at week 24, confirmed by salivary cotinine less than or equal to 15 ng/mL.[41] Secondary outcomes included self-reported 7-day smoking abstinence at weeks 12 and 24 and uptake and adherence of NRT.

Sample Size and Statistical Methods

Based on previous studies,[15,16] postulated outcomes at week 24 were 20% biochemically verified smoking abstinence among participants in the *Decídetexto* group and 10% in the standard care group, treating those lost to follow-up as participants who continued smoking per the Russell standard.[42] With 309 participants in each group, 618 participants in total, the study was estimated

to provide 85% power to detect these expected differences with a type I error rate of 5%. Because of the COVID-19 pandemic, the study stopped recruitment before achieving the target sample size. Community health workers recruited 457 Latino adults who smoke into the study (73.9% of the target sample size).

Descriptive statistics for each study arm included frequencies and percentages for categorical variables and means and SDs for continuous variables. We used the Russell standard, treating those lost to follow-up as participants who continued smoking. χ^2 tests compared treatment groups at weeks 12 and 24. All outcomes were conducted with two-sided tests at a type I error rate of 5%. A Bonferroni adjustment was made to account for our four secondary outcomes, resulting in a threshold for significance of .0125 (= .05/4). SAS, version 9.4 (SAS Institute), was used for all statistical analyses.

Results

Figure 1 depicts screening, enrollment, and retention of trial participants. Of 1,072 screened Latino adults who smoked, 895 (83.5%) were eligible, and 459 (42.8%) attended an in-person visit, were consented, completed enrollment, and were randomized. Two individuals were removed from the study because of protocol violations (immediately after enrollment one reported that they were breastfeeding and the other that they were not currently smoking). A total of 229 individuals in the *Decídetexto* intervention group and 228 individuals in the control group were included in the final analyses.

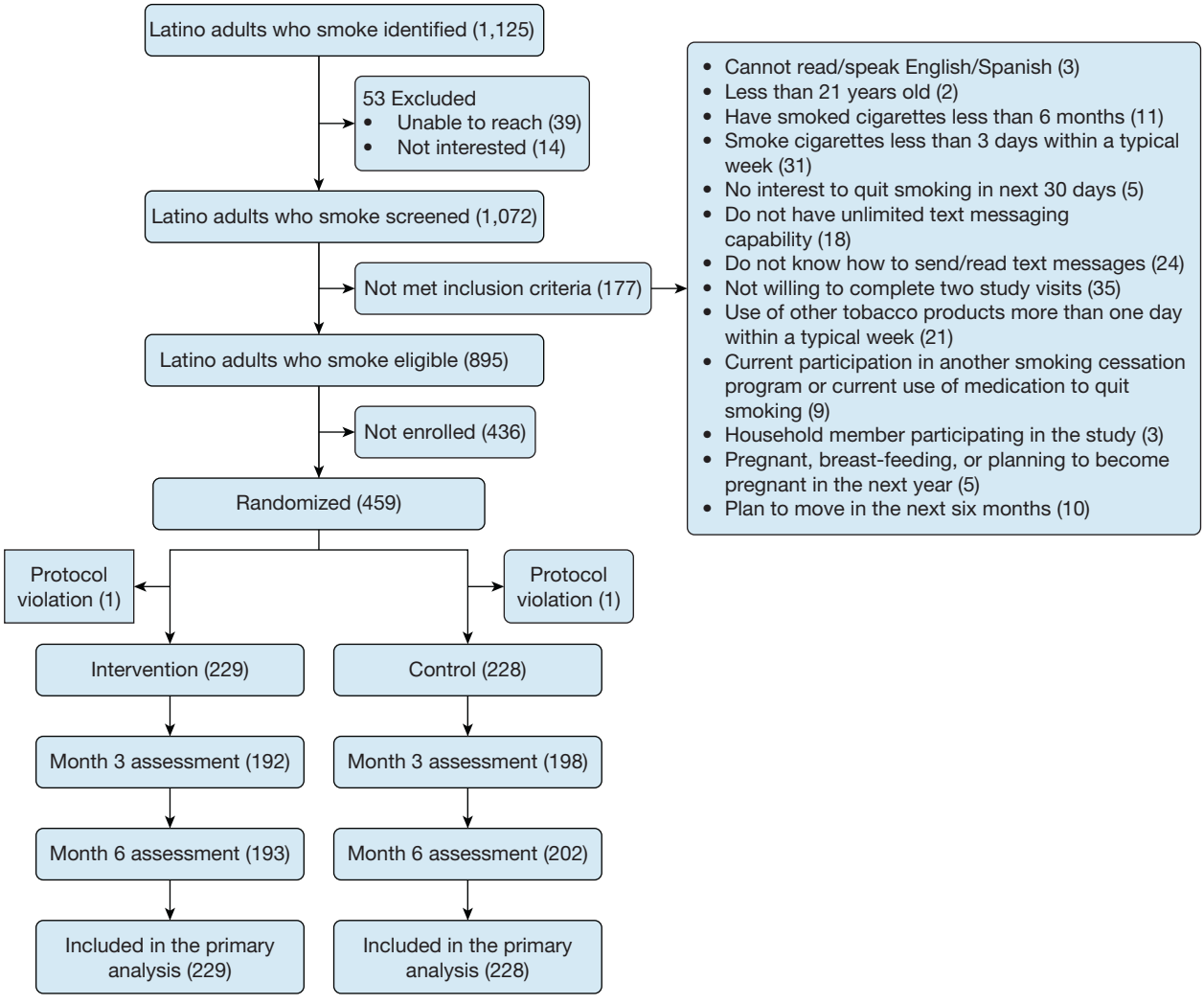

Figure 1 – *Study flowchart.*

The two groups were similar at baseline (Table 1). Most participants (71.2%, 163/229) used the *Decídetexto* intervention in Spanish. The overall retention rate at week 24 was 86.4% (395/457). Retention was comparable between groups, with 84.3% (193/229) and 88.6% (202/228) of the intervention and control groups completing assessments at week 24, respectively.

Biochemically Verified 7-Day Smoking Abstinence Rates

Treating those lost to follow-up as participants who continued smoking, 14.4% of participants in the *Decídetexto* group were biochemically verified abstinent at week 24 compared with 9.2% in the standard care group (OR, 1.66; 95% CI, 0.93-2.97; $P = .09$; Table 2). In a secondary analysis with completers only (n = 395), 17.1% of participants in the *Decídetexto* group were biochemically verified abstinent at week 24 compared with 10.4% in the standard care group (OR, 1.78; 95% CI, 0.99-3.20; $P = .05$).

Of 125 participants who self-reported smoking abstinence at week 24, the study team collected saliva from 96 participants (76.8%) to assess cotinine levels. Before the onset of the COVID-19 pandemic, the study team collected saliva samples from 88.8% (56/63) of the participants who self-reported smoking abstinence. After the onset of COVID-19, the study team collected saliva samples from 64.5% (40/62) of the participants who self-reported smoking abstinence. Of the 96 saliva

TABLE 1] Baseline Characteristics by Treatment

Characteristics	Participants, No. (%)	
	Decídetexto (n = 229)	Standard Care (n = 228)
Age, mean (SD), y	48.57 (10.87)	48.83 (11.41)
Female	101 (44.1%)	106 (46.5%)
Male	128 (55.9%)	122 (53.5%)
Education ≥ high school	163 (71.2%)	167 (73.2%)
Below poverty[a]	58 (25.3%)	63 (27.6%)
Spanish as primary language	163 (71.2%)	159 (69.7%)
High Hispanic acculturation[b]	70 (30.6%)	68 (29.8%)
Country/region of birth		
Caribbean[c]	63 (27.5%)	77 (33.8%)
Central America and Mexico[d]	51 (22.3%)	46 (20.2%)
South America[e]	63 (27.5%)	50 (21.9%)
United States	51 (22.3%)	54 (23.7%)
Other[f]	1 (0.4%)	1 (0.4%)
Heavy smoking[g]	109 (47.6%)	121 (53.1%)
Attempted smoking cessation in the previous year	135 (59.0%)	127 (55.7%)
Severity of dependence scale, mean (SD)	9.08 (2.76)	9.12 (2.75)
Previous use of medications for smoking cessation[h]	117 (51.1%)	118 (51.8%)
Previous use of nicotine replacement therapies[i]	103 (45.0%)	109 (47.8%)
Self-efficacy for smoking cessation, mean (SD)[j]	24.62 (9.48)	22.70 (8.57)

SD = standard deviation.
[a]Poverty was based on the 2020 US Census poverty thresholds by size of family and number of children. A total of 11 participants in the *Decídetexto* group and eight participants in the standard care group did not provide income data.
[b]High acculturation was defined as an average score of 3 or higher in the Brief Acculturation Scale for Hispanics (average scores ranged from 1 to 5). Three participants in the *Decídetexto* group did not provide acculturation data.
[c]Participants who were born in Cuba, Dominican Republic, and Puerto Rico were categorized as "Caribbean."
[d]Participants who were born in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama were categorized as "Central America."
[e]Participants who were born in Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Uruguay, and Venezuela were categorized as "South America."
[f]Participants who were born in Spain and Portugal were categorized as "Other."
[g]Heavy smoking was defined as ≥ 10 cigarettes per day.
[h]Medications for smoking cessation included nicotine patch, nicotine gum, nicotine lozenge, nicotine nasal spray, nicotine inhaler, varenicline, and bupropion.
[i]Nicotine replacement therapies included nicotine patch, nicotine gum, nicotine lozenge, nicotine nasal spray, and nicotine inhaler.
[j]Self-efficacy was measured by the Self-Efficacy Questionnaire-12.

TABLE 2] Biochemically Verified and Self-Reported 7-Day Smoking Abstinence Rates by Treatment

Outcome	Approach	Treatment	Week 12 (Rate)	*P*	OR (95% CI)	Difference Between Rates (95% CI)	Week 24 (Rate)	*P*	OR (95% CI)	Difference Between Rates (95% CI)
Biochemically verified 7-day smoking abstinence rates	Treating those lost to follow-up as participants who continued smoking	*Decídetexto*	NA	NA	NA	NA	14.4% (33/229)	.09	1.66 (0.93, 2.97)	5.2% (−0.70, 11.1)
		Standard care	NA	NA	NA	NA	9.2% (21/228)	NA	NA	NA
	Completers only	*Decídetexto*	NA	NA	NA	NA	17.1% (33/193)	.05	1.78 (0.99, 3.20)	6.7% (-0.075, 13.5)
		Standard care	NA	NA	NA	NA	10.4% (21/202)	NA	NA	NA
Self-reported 7-day smoking abstinence rates	Treating those lost to follow-up as participants who continued smoking	*Decídetexto*	37.1% (85/229)	**< .01**	2.77 (1.80, 4.28)	19.6% (11.6, 27.5)	34.1% (78/229)	**< .01**	1.99 (1.31, 3.03)	13.4% (5.4, 21.5)
		Standard care	17.5% (40/228)	NA	NA	NA	20.6% (47/228)	NA	NA	NA
	Completers only	*Decídetexto*	38.9% (75/193)	**< .01**	2.66 (1.69, 4.19)	19.6% (10.8, 28.3)	40.4% (78/193)	**.01**	2.77 (1.80, 4.28)	17.1% (8.1, 26.2)
		Standard care	19.3 (39/202)	NA	NA	NA	23.2% (47/202)	NA	NA	NA

Saliva was collected from participants who self-reported 7-day smoking abstinence (no cigarette smoking in the past 7 days) at week 24. A bolded *P* value indicates statistical significance. NA = not applicable.

samples obtained, 54 were biochemically verified as abstinent (biochemical validation of 56.3%). Biochemical validation was comparable between groups with 56.9% (33/58) and 55.3% (21/38) validated in the intervention and control groups, respectively.

Self-Reported 7-Day Smoking Abstinence Rates

Participants in the *Decídetexto* group were significantly more likely to self-report smoking abstinence at weeks 12 and 24 compared with those who received standard care. Treating those lost to follow-up as participants who continued smoking, 34.1% of the participants in the *Decídetexto* group self-reported smoking abstinence at week 24 compared with 20.6% of participants in the standard care group (OR, 1.99; 95% CI, 1.31-3.03; $P < .01$). A secondary analysis with completers only (n = 395) also showed a significant treatment effect for the *Decídetexto* intervention at week 24 (40.4% vs 23.2%; OR, 2.77; 95% CI, 1.80-4.28; $P = .01$).

Uptake and Adherence of NRT

Using an analysis with completers only, 90.6% (174/192) of participants in the *Decídetexto* group self-reported using NRT for at least 1 day compared with 70.2% (139/198) of participants in standard care (OR, 4.10; 95% CI, 2.31-7.28; $P < .01$). Using an analysis with participants who self-reported using NRT for at least 1 day, 64.4% (112/174) of participants in the *Decídetexto* group self-reported using NRT for more than 4 weeks compared with 59.0% (82/139) of participants in standard care (OR, 1.26; 95% CI, 0.79-1.99; $P = .33$). Using an analysis with participants who self-reported using NRT for at least 1 day, on average, participants in the *Decídetexto* group self-reported using NRT for 34.8 days (SD, 21.4; range, 1-70) compared with 32.4 days (SD, 21.3; range, 1-70) among participants in standard care ($P = .31$).

Safety

Among all 457 participants, two participants (0.4%) in the *Decídetexto* group died. These deaths were determined to be related to an opioid overdose and diabetes complications, not related to the study. There were no other reports of death, life-threatening events, hospitalization, persistent or significant disability, or incapacity.

Discussion

In this study with Latino adults who smoke, biochemically verified cessation rate at week 24 was 5% higher in the *Decídetexto* group compared with standard care, although this difference was not statistically significant. This finding is partly explained by not achieving the targeted sample size for recruitment and the different rates of saliva sample collection to biochemically verify smoking abstinence before and after the onset of the COVID-19 pandemic. Nevertheless, *Decídetexto* produced statistically significantly greater self-reported 7-day smoking abstinence at weeks 12 and 24 compared with standard care. These secondary outcomes yielded $P < .01$, which are significant when compared with a Bonferroni-corrected significance level. Still, these secondary statistical analyses should be interpreted as exploratory.

Decídetexto was also associated with improvements in uptake of NRT. This result is particularly relevant given that negative beliefs toward smoking cessation medications have been reported among Latino adults (eg, concerns about side effects, fears of becoming dependent on medications, cultural inclinations toward quitting without chemical aid).[8,9,43] Current findings suggest that, when treated with a culturally accommodated mHealth intervention for smoking cessation, Latino adults request and make use of NRT.

Despite the high burden of tobacco-related morbidity and mortality experienced by Latino adults,[1,2] there have been few smoking cessation trials purposely focused on Latino adults.[44] To our knowledge, this study is one of two adequately powered smoking cessation RCTs focused on Latino adults conducted in the past decade. Simmons et al[44] conducted an RCT among Spanish-speaking Latino adults showing the efficacy of culturally relevant booklets and pamphlets on self-reported 7-day point prevalence smoking abstinence at month 24.[45] Secondary data analyses of smoking cessation RCTs have been conducted to explore the efficacy of different interventions among Latino adults.[46,47] For example, Santiago-Torres et al[45] analyzed the data from 210 Latino adults enrolled in an RCT (8.7% of the total sample size) assessing the efficacy of acceptance and commitment therapy delivered via a smartphone app compared with the US Clinical Practice app.[46] Results showed acceptance and commitment therapy delivered via a smartphone app may be efficacious for smoking cessation among Latino adults.[46] Our current trial extends these findings by supporting the clinical utility of mHealth interventions for smoking cessation to increase smoking abstinence among Latino adults.

Because of its scalability, *Decídetexto* has the potential for widespread adoption by health care clinics and community-based organizations to advance smoking cessation among Latino adults.

Limitations

Limitations to this study include a reduced sample size caused by halting recruitment during the COVID-19 pandemic. However, the *Decídetexto* intervention still demonstrated an increase in biochemically verified smoking abstinence by 5% compared with standard care, a clinically meaningful improvement given that cessation rates tend to be low. Second, the COVID-19 pandemic negatively affected the study's ability to obtain saliva samples to biochemically verify smoking abstinence. Self-reported smoking abstinence has been judged to be appropriate for minimal-contact interventions that do not involve face-to-face clinical contact.[37] In this study, biochemical validation was comparable between groups, giving greater credence to accepting self-reported smoking abstinence as a meaningful outcome. Third, findings should be generalized cautiously to populations that differ from the characteristics of those included in this study. For example, participants smoked cigarettes 3 or more days per week and did not use other tobacco products. Future studies should address these patterns of tobacco use. Finally, the assessment at week 24 did not include past 7-day use of NRT. There is a possibility that some participants who self-reported 7-day smoking abstinence at week 24 were still using NRT, which precluded biochemical verification of self-reported abstinence. However, this concern is mitigated because the study only provided up to 10 weeks of NRT at baseline, and the average duration of NRT use was 34.8 days.

Interpretation

Among Latino adults who smoke, the *Decídetexto* intervention produced a 5.2% greater biochemically verified smoking abstinence at week 24 compared with standard care, although this difference was not statistically significant. However, the *Decídetexto* intervention was associated with statistically significantly greater self-reported 7-day smoking abstinence at weeks 12 and 24 compared with standard care. Moreover, the *Decídetexto* intervention was associated with increased uptake of NRT compared with standard care. Overall, findings provide encouragement for the use of *Decídetexto* for smoking cessation among Latino adults.

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References

1. Miller KD, Goding Sauer A, Ortiz AP, et al. Cancer statistics for Hispanics/Latinos, 2018. *CA Cancer J Clin*. 2018;68(6):425-445.
2. Centers for Disease Control and Prevention (CDC). Quitting smoking among adults—United States, 2001-2010. *MMWR Morb Mortal Wkly Rep*. 2011;60(44):1513-1519.
3. U.S. Census Bureau. Quick Facts. U.S. Census Bureau website. Accessed December 28, 2023. https://www.census.gov/quickfacts/fact/table/US/RHI725222
4. Cornelius ME, Loretan CG, Jamal A, et al. Tobacco product use among adults—United States, 2021. *MMWR Morb Mortal Wkly Rep*. 2023;72(18):475-483.
5. Wetter DW, Mazas C, Daza P, et al. Reaching and treating Spanish-speaking smokers through the National Cancer Institute's Cancer Information Service: a randomized controlled trial. *Cancer*. 2007;109(2 Suppl):406-413.
6. Hooper MW, Payne M, Parkinson KA. Tobacco cessation pharmacotherapy use among racial/ethnic minorities in the United States: considerations for primary care. *Fam Med Commun Health*. 2017;5(3):193-203.
7. Soto Mas FG, Papenfuss RL, Jacobson HE, Hsu CE, Urrutia-Rojas X, Kane W. Hispanic physicians' tobacco intervention practices: a cross-sectional survey study. *BMC Public Health*. 2005;5:120.
8. Levinson AH, Borrayo EA, Espinoza P, Flores ET, Pérez-Stable EJ. An exploration of Latino smokers and the use of pharmaceutical aids. *Am J Prev Med*. 2006;31(2):167-171.
9. Levinson AH, Pérez-Stable EJ, Espinoza P, Flores ET, Byers TE. Latinos report less use of pharmaceutical aids when trying to quit smoking. *Am J Prev Med*. 2004;26(2):105-111.
10. Foraker RE, Patten CA, Lopez KN, Croghan IT, Thomas JL. Beliefs and attitudes regarding smoking among young adult Latinos: a pilot study. *Prev Med*. 2005;41(1):126-133.
11. Bock BC, Niaura RS, Neighbors CJ, Carmona-Barros R, Azam M. Differences between Latino and non-Latino white smokers in cognitive and behavioral characteristics relevant to smoking cessation. *Addict Behav*. 2005;30(4):711-724.
12. Cox LS, Cupertino AP, Tercyak KP. Interest in participating in smoking cessation treatment among Latino primary care patients. *J Clin Psychol Med Settings*. 2011;18(4):392-399.
13. Cupertino AP, Cox LS, Garrett S, et al. Tobacco use and interest in smoking cessation among Latinos attending community health fairs. *J Immigr Minor Health*. 2011;13(4):719-724.
14. Cartujano-Barrera F, Perales J, Arana E, et al. Increasing access to smoking cessation treatment among Latino smokers using case management. *J Smok Cessat*. 2019;14(3):168-175.
15. Cartujano-Barrera F, Arana-Chicas E, Ramírez-Mantilla M, et al. "Every day I think about your messages": Assessing text messaging engagement among Latino smokers in a mobile cessation program. *Patient Prefer Adherence*. 2019;13:1213-1219.
16. Cartujano-Barrera F, Sanderson Cox L, Arana-Chicas E, et al. Feasibility and acceptability of a culturally- and linguistically-adapted smoking cessation text messaging intervention for Latino smokers. *Front Public Health*. 2020;8:269.
17. Arana-Chicas E, Cartujano-Barrera F, Rieth KK, et al. Effectiveness of recruitment strategies of Latino smokers: secondary analysis of a mobile health smoking cessation randomized clinical trial. *J Med Internet Res*. 2022;24(6):e34863.
18. Arana-Chicas E, Cartujano-Barrera F, Ogedegbe C, et al. Feasibility and effectiveness of recruiting Latinos in Decídetexto-A smoking cessation clinical trial from an emergency department patient registry. *Int J Environ Res Public Health*. 2021;18(20):10859.
19. Mohanty N, Salgado C, Rapoport A, Sarma Baxi R, Panzer J, Simon J. The people, process, and technology for population management in community health. *Fam Syst Health*. 2021;39(1):112-120.
20. Sheikh A, Anderson M, Albala S, et al. Health information technology and digital innovation for national learning health and care systems. *Lancet Digit Health*. 2021;3(6):e383-e396.
21. Nittas V, Zecca C, Kamm CP, Kuhle J, Chan A, von Wyl V. Digital health for chronic disease management: an exploratory method to investigating technology adoption potential. *PLoS One*. 2023;18(4):e0284477.
22. Whittaker R, McRobbie H, Bullen C, Rodgers A, Gu Y, Dobson R. Mobile phone text messaging and app-based interventions for smoking cessation. *Cochrane Database Syst Rev*. 2019;10(10):CD006611.
23. Kong G, Ells DM, Camenga DR, Krishnan-Sarin S. Text messaging-based smoking cessation intervention: a narrative review. *Addict Behav*. 2014;39(5):907-917.
24. Anderson M. Technology device ownership: 2015. Pew Research Center website. 2015. Accessed December 28, 2023. http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015
25. Burrow-Sanchez JJ, Martinez CR, Hops H, Wrona M. Cultural accommodation of substance abuse treatment for Latino adolescents. *J Ethnic Substance Abuse*. 2011;10:202-225.
26. Cartujano-Barrera F, Arana-Chicas E, Catley D, et al. Decídetexto: mobile cessation support for Latino smokers—study protocol for a randomized clinical trial. *Contemp Clin Trials*. 2020;99:106188.
27. National Institutes of Health Clinical Center. Mobile Cessation Support for Latino Smokers. NCT03586596. ClinicalTrials.gov. National Institutes of Health; 2018. Updated September 8, 2021. https://clinicaltrials.gov/study/NCT03586596
28. Smith-Morris C, Morales-Campos D, Castañeda Alvarez EA, Turner M. An anthropology of familismo: On narratives and description of Mexican/immigrants. *Hisp J Behav Sci*. 2013;35(1):35-60.
29. Flores G. Culture and the patient-physician relationship: achieving cultural competency in health care. *J Pediatr*. 2000;136(1):14-23.
30. Juckett G. Caring for Latino patients. *Am Fam Physician*. 2013;87(1):48-54.
31. Flesch R. A new readability yardstick. *J Appl Psychol*. 1948;32(3):221-233.
32. Kincaid JP, Fishburne RP, Rogers RL, Chissom BS. Derivation of new readability formulas (Automated Readability Index, Fog Count, and Flesch Reading Ease Formula) for navy enlisted personnel. Memphis, TN: Naval Air Station; 1975.
33. Fernández Huerta J. Medidas sencillas de lecturabilidad. *Consigna*. 1959;214:29-32.
34. Fiore MC, Jaen CR, Baker TB, et al. Treating tobacco use and dependence: 2008 update. Clinical Practice Guideline. U.S. Department of Health and Human Services. Rockville, MD: Public Health Service; 2008.

35. U.S. Census Bureau. Poverty thresholds U. S. Census Bureau. Accessed December 28, 2023. https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html

36. Mills SD, Malcarne VL, Fox RS, Sadler GR. Psychometric evaluation of the brief acculturation scale for Hispanics. *Hisp J Behav Sci*. 2014;36(2):164-174.

37. Mercincavage M, Smyth JM, Branstetter SA, Catley D. Exploring the Severity of Dependence Scale (SDS) as a possible measure of nicotine dependence. *Subst Abus*. 2016;37(2):323-329.

38. Brown RA, Burgess ES, Sales SD, Whiteley JA, Evans DM, Miller IW. Reliability and validity of a smoking timeline follow-back interview. *Psychol Addict Behav*. 1998;12(2):101.

39. Etter J, Bergman M, Humair J, Perneger T. Development and validation of a scale measuring self-efficacy of current and former smokers. *Addiction*. 2000;95(6):901-913.

40. Cartujano-Barrera F, McIntosh S, Cox LS, et al. Translation and examination of the reliability and validity of the Spanish version of the smoking self-efficacy questionnaire among Latino smokers. *Tob Use Insights*. 2021;14. 1179173X211035366.

41. Benowitz NL, Bernert JT, Foulds J, et al. Biochemical verification of tobacco use and abstinence: 2019 update. *Nicotine Tob Res*. 2020;22(7):1086-1097.

42. West R, Hajek P, Stead L, Stapleton J. Outcome criteria in smoking cessation trials: Proposal for a common standard. *Addiction*. 2005;100(3):299-303.

43. Fu SS, Kodl MM, Joseph AM, et al. Racial/ethnic disparities in the use of nicotine replacement therapy and quit ratios in lifetime smokers ages 25 to 44 years. *Cancer Epidemiol Biomarkers Prev*. 2008;17(7):1640-1647.

44. Webb MS, Rodríguez-Esquivel D, Baker EA. Smoking cessation interventions among Hispanics in the United States: a systematic review and mini meta-analysis. *Am J Health Promot*. 2010;25(2):109-118.

45. Simmons VN, Sutton SK, Medina-Ramirez P, et al. Self-help smoking cessation intervention for Spanish-speaking Hispanics/Latinxs in the United States: a randomized controlled trial. *Cancer*. 2022;128(5):984-994.

46. Santiago-Torres M, Mull KE, Sullivan BM, Zvolensky MJ, Bricker JB. Can a smartphone application help Hispanic/Latinx adults quit smoking? A randomized trial secondary analysis. *J Contextual Behav Sci*. 2022;26:261-270.

47. Kwon DM, Santiago-Torres M, Mull KE, Sullivan BM, Zvolensky MJ, Bricker JB. Web-delivered Acceptance and Commitment Therapy (ACT) for smoking cessation: is it engaging and efficacious for US Hispanic/Latinx adult smokers? *Prev Med Rep*. 2022;29:101952.