Development and Beta Test of a Faith-Based Facebook Intervention for Smoking Cessation in Rural Communities (FAITH-CORE)

Pravesh Sharma, Brianna Tranby, Celia Kamath, Tabetha Brockman, Ned Lenhart, Brian Quade, Nate Abuan, Martin Halom, Jamie Staples, Colleen Young, LaPrincess Brewer, Christi Patten

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Abstract

Background: Rural communities experience significant health inequities regarding tobacco use and access to cessation treatment due to geographic barriers and infrastructure limitations. Social media and other digital platforms offer promising avenues to improve access and overcome engagement challenges in tobacco cessation efforts for rural populations.

Objective: This study aimed to develop and beta-test a social media intervention prototype (FaithCore) delivered through a Facebook group specifically designed for rural smokers seeking evidence-based smoking cessation resources.

Methods: We developed a culturally and faith-aligned Facebook group intervention (FaithCore) tailored to promote the use of smoking cessation resources among rural smokers. The principles of community-based participatory research (CBPR) informed the intervention content and engagement strategies. A beta test was conducted with a sample of rural smokers to assess the intervention's usability, acceptability, and preliminary efficacy.

Results: The beta-test results indicated that the FaithCore intervention was perceived as helpful, easy to understand, and effective in achieving its intended goals. Notably, 90% of participants reported attempting to quit smoking, and 90% reported utilizing or seeking the cessation resources discussed within the group.

Conclusions: This study suggests that social media group interventions, incorporating culturally and faith-aligned content and engagement strategies delivered by trained moderators, hold promise for promoting smoking cessation in rural communities. Future research will involve a large pilot trial to evaluate the intervention's effectiveness on smoking cessation outcomes.

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Original Paper

Development and Beta Test of a Faith-Based Facebook Intervention for Smoking Cessation in Rural Communities (FAITH-CORE)

Abstract

Background: Individuals living in rural communities experience substantial geographic and infrastructure barriers to attaining health equity in accessing tobacco use cessation treatment. Social media and other digital platforms offer promising avenues to improve access and overcome engagement challenges in tobacco cessation efforts. Research has also shown a positive correlation between faith-based involvement and a lower likelihood of smoking, which can used to engage rural communities in these interventions.

Objective: This study aimed to develop and beta-test a social intervention prototype using a Facebook group specifically designed for rural smokers seeking evidenced-based smoking-cessation resources.

Methods: We designed a culturally and faith-aligned Facebook group intervention, FaithCore, tailored to engage rural people who smoke in smoking-cessation resources. Both intervention content and engagement strategies were guided by CBPR principles. Given the intervention's focus on end users—rural people who smoked—we conducted a beta test to assess any technical or usability issues of this intervention before any future trials for large-scale implementation.

Results: No critical beta-test technical and usability issues were appreciated. Besides, the FaithCore intervention was helpful, easy to understand, and achieved its intended goals. Notably, 90% of participants reported tried quitting smoking, while 90% reported using or seeking cessation resources discussed within the group.

Conclusions: This study provides preliminary evidence that social media group interventions embedding culturally and faith-aligned content and engagement strategies delivered by trained moderator(s) are promising for smoking cessation in rural communities. Our future step is a large pilot trial to evaluate the intervention's effectiveness on smoking cessation outcomes.

Keywords: social media; Facebook; rural; smoking; cessation; Quitline; CBPR, FaithCore

Introduction

Background

People living in rural communities experience significant disparities related to tobacco use cessation treatments due to geographical and infrastructure difficulties [1,2]. Rural areas have a higher prevalence of tobacco cigarette smoking compared to urban areas. This trend is observed in both men (29% vs. 19%) and women (25% vs. 13%) living in rural areas [3]. Due to these inequalities, people living in rural communities experience a higher prevalence of

chronic conditions, including cardiovascular disease and cancer [4,5]. In addition, rural populations have lower access to in-person (face-to-face) cessation services due to greater distance from clinics, which adds to the travel costs to assess these services [6,7].

Social media and other digital platforms can potentially increase access and overcome geographical and location-based barriers to engagement in tobacco cessation efforts, particularly in underserved populations such as rural communities [8]. Facebook is the most popular social networking platform, with 68% of United States (US) adults using it. This is more than double the proportion of people on other social media sites, such as X (21%), Instagram (28%), Pinterest (26%), and LinkedIn (25%) [9]. Moreover, 75% of Facebook users engage with the platform daily, indicating high engagement [9]. Facebook is available 24/7 and has interactive tools that can engage users and foster peer support (sharing personal experiences, offering hope, and increasing feelings of empowerment), crucial in substance use disorder (SUD) treatment [10]. This can lead to greater intervention adoption and sustainability [11,12]. Therefore, developing an intervention that can be delivered through Facebook could encourage collaborative efforts to promote smoking cessation interventions and could resonate with rural populations.

Numerous studies observed the impact of spirituality and religious beliefs on positive health behaviors. Specifically, research has shown a positive correlation between this belief and a lower likelihood of cigarette smoking [13-15]. However, the definitions of religiosity and spirituality change across cultures and can even intersect; therefore, it has been challenging to define these terminologies, and there hasn't been any consensus on their definitions [16]. Though distinct concepts, religiosity and spirituality often share a core focus on the transcendent. Both involve believing in the supernatural, the sacred, or an "ultimate reality" beyond the physical world [16,17]. More specifically, religiosity refers to a codified and affirming relationship with institutionalized religions. Typically, religions have codified the set of doctrinal beliefs and prescriptive behaviors shared within a community of its adherents. On the other hand, spirituality emphasizes the individual's search for or attachment to the holy or ultimate reality. This may be outside of the domain of any religion; spiritual fulfillment within persons is achieved by bearing practices such as meditation, associating with nature, and building a personal relationship with a higher power [18-21]. Simultaneously, "Faith" is often described as a philosophical concept. Studies show that faith is a non-static concept and often means a belief pattern that provides meaning to them. Through faith, individuals try to gain an appreciation of their world and circumstances [22]. A religious scholar, Raza Aslan [23], defines and differentiates faith from religion by stating, "Faith is personal and mysterious and individualistic and inexpressible and indefinable. Religion is merely the language that you can use to express what is fundamentally inexpressible, to define what is undefinable [24]." Our study used "faith-based" terminology to separate from religion and spirituality, and align with the Centers for Disease Control and Prevention's "faith-based initiative" for smoking cessation [25,26].

As a participatory approach and for the above reasons, collaborating with faith-based leaders can be highly effective in designing and testing interventions targeting health behaviors [27]. Community-Based Participatory Research (CBPR) is an approach that involves collaboration with community stakeholders and partners at every step of the research. This approach allows community members to participate in all aspects of the research process and contribute their expertise with shared ownership and responsibility. Through this process, knowledge is exchanged, and action is integrated to improve the health and well-being of the community

[28]. A review of clinical trials conducted in rural populations revealed that higher levels of engagement with communities toward CBPR approaches were associated with higher recruitment and participation rates [29]. Culturally relevant messaging for smoking cessation derived through CBPR enhances treatment acceptability [30,31], study recruitment, evidence-based smoking cessation treatment (EBCT) resources acceptance, and cessation rates [11,12,32]. This method is especially crucial for rural populations that are inaccessible and marginalized. This process empowers people to act and become agents of sustainable change in their communities, making a meaningful and lasting difference. This study operationalized intervention development through informed CBPR strategic steps to enhance sustainability and generate a more lasting impact within the rural community. The design process integrated inclusion of key stakeholders such as faith leaders, academic researchers, and rural end-users.

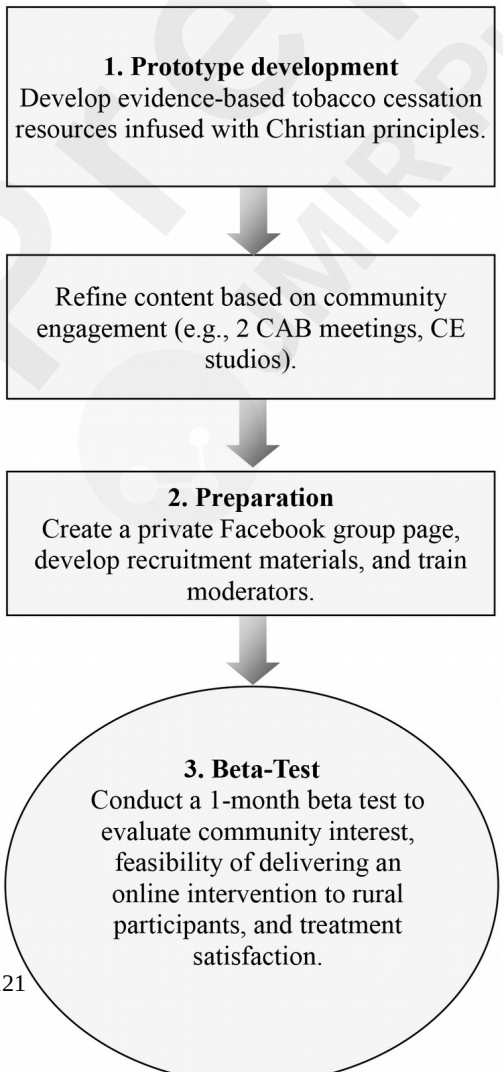
Objectives

The Faith-Core study aims to develop and beta-test an innovative faith-based Facebook intervention prototype for rural individuals who smoked [2]. The current paper describes the development and beta-test of the Facebook intervention prototype. We also share critical lessons learned that could be applied by others interested in similar health behavior interventions.

Methods

Figure 1 provides an overview of the current study to develop and beta-test the Facebook intervention prototype. The process for developing the intervention materials with community input was deemed exempt from institutional review board (IRB) approval by the Mayo Clinic IRB in February 2023. The Mayo Clinic IRB approved the beta-test phase in October 2023.

Figure 1. Overview of the development of the Faith-Core intervention prototype and its beta-test.



1. Prototype Development

The formative work for the prototype development included (1) creation of intervention materials, (2) community feedback on the intervention design and materials, and (3) intervention moderator training. The work of Pagoto and colleagues [33] informed the development of the components of our prototype.

Community Engagement

We invited community members to join a Community Advisory Board (CAB) and to participate in community engagement (CE) studios. Before engaging with the community, the research team introduced CAB members with guidelines to establish and maintain a supportive, inclusive, and respectful community participation and sharing of opinions. These guidelines were built on our team's prior work on this topic and Mayo Clinic's Center for Health Equity and Community Engagement Research (CHCR). The CAB comprised 10 members (60% women), including local pastors from Wisconsin, New Hampshire, and Tennessee, and people who smoked currently or in the past. The CHCR staff assisted in recruiting five CE studio members (40% women), consisting of community members representing potential end users (adult individuals who currently smoke) of the intervention. CAB members received an honorarium of $150 per meeting. CE studio members received honorariums from CHCR.

First CAB Meeting

In May 2023, the study team and CAB held their first online meeting, which lasted for 90 minutes. The project lead, PS, provided a brief overview of the project and discussed respectful engagement guidelines to support CAB members when sharing feedback. Before meeting with CAB, the research team developed a preliminary content library that included rural health, substance use, and health disparities researchers, pastors from local churches, and rural patient advocates from the Mayo Clinic enterprise. The posts were categorized by topic, such as connecting with others, practicing patience, prayer, resisting temptation, and so on. Each topic had at least three posts that included an image or video, a relevant Bible verse, text, and a discussion post related to the topic. During the meeting, CAB members provided feedback on the preliminary content library on (1) Bible verses that were most suitable for the topic of each post, (2) images and videos that best reflected the content of each post and Bible verse, and (3) that the text of each post was culturally appropriate and not stigmatizing. The CAB feedback was incorporated, and posts were revised accordingly.

CE Studio

The study team, CHCR staff, and CE Studio community experts held an online 90-minute CE Studio. Overall, the CE Studio community experts appreciated the intervention content and agreed they would be interested in joining a community faith-based Facebook group. They also agreed that Facebook would be a good platform to receive this information, particularly since many rural people use it. However, some community experts mentioned that Facebook is not very appealing to a younger age group and that other social media platforms might be more effective in engaging young people who smoke. One participant noted, "For a younger age group, Facebook isn't that appealing. I do not know anyone of my age (young adult) who uses Facebook anymore." The CE Studio community experts emphasized the importance of incorporating Christian faith-based messages in smoking cessation-related posts. One of the participants stated, "This can help people of the Christian faith better understand their position when it comes to smoking and their faith. The content is motivating and good." The CE Studio suggestions were discussed with the CAB during the second meeting.

Second CAB Meeting

In August 2023, the study team held the second CAB meeting to review the feedback received from CE Studios community experts. In addition, we discussed a potential study logo designed by a local artist and beta-test participant conduct guidelines for expected group behavior. The CAB members shared their thoughts on the feedback received and how to adapt the intervention materials. The changes made to the study materials before opening a beta test of the intervention are listed in **Table 1**. **Table 2** provides an overview of refinements made to specific posts based on CAB and CE Studio.

Table 1: Summary of second CAB meeting feedback and resultant changes in the content library.

Study component	CAB feedback	Changes reflected in the content library
Study name	Original name: "Church-based social media intervention among rural people who smoke (CHURCH): Intervention prototype development." - CAB noted that not all Christians call their place of worship a church, and not all individuals are members of a church. - Liked "faith-based" and "community" to align with study goals.	New name: "Faith-Core: A Christian Faith-Based Facebook Intervention for Smoking Cessation in Rural Communities"
Study logo	Local artist designed logo options. CAB requested design edits.	 New design was approved by CAB and used in study handouts and posts.
Facebook intervention weekly topics	Original weekly topics proposed: Prayer, Connection to Others, Grace, Temptation, Faith, and Patience/Forgiveness. - CAB suggested that posts in this group should start with support. - Recommended different topics for the weeks on NRTs/medications ("grace") and exercise ("faith").	Weekly topics were narrowed to 4 weeks for the beta-test: Connection to Others, Patience, Prayer, and Temptation. NRT/medication posts were moved to the "patience" weekly topic.
Facebook intervention posts	Liked having simple posts and inclusion of Bible verses and recommended adding a verse to each post/topic.	Weekly posts started with a separate "topic" post to make actual content posts simpler, and verses were added in each post.
	CAB members and pastors noted that	Evidence-based research supports the

	mindfulness and meditation can be viewed negatively by some Christians.	efficacy of mindfulness in smoking cessation. Added a post from a well-known Christian organization describing how Christians can use mindfulness in a biblical way.
	Suggested photos of praying hands and people being mindful.	Selected new stock photos or video link thumbnails based on the recommendation.
	Recommended adding encouragement for introverts to call the Quitline.	Added text: *"Some people are more introverted and don't want to talk to a stranger. That's ok! However, research shows that when you call a Quitline, you are 6 times more likely to quit than going cold turkey."*
	Suggested incorporating confession.	Added verse to Quitline post: *"Confess to one another and pray for each other so that you may be healed." James 5:16*
CE studio feedback	The CAB did not agree with the CE Studio comment that "prayer was overused" and did not think stock photos would "make or break" the posts.	Some stock photos were replaced with other images or video link thumbnails.
	CAB agreed with the recommendation to add a post about shame.	A post featuring a video from Dr. Brene Brown was added to Week 4 on reframing feelings of shame when struggling with cravings and relapse.

2. Preparation

Moderator Training

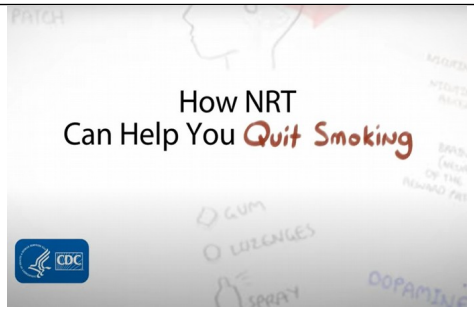
The study staff selected as moderators for this study completed the moderator training with author CY, Mayo Clinic Social Network Director, in two parts, which spanned over two days. This comprehensive training provided a valuable introduction to the unique qualities of online groups and coached moderators on the principles of building an online community with purpose. Moderators were trained to foster conversations between online members and how to engage members (participants in this case) on the topic/intervention and with one another. The strategies covered in the training were tailored to the program's specific goals and tactics to achieve them. The training also included social media technical set-up, welcoming members to the program, managing an active group, self-care for moderators, and how to handle difficult situations. The training provided a pre-designed reference guide to the moderators for their future reference. CY remained available for trained moderators to contact anytime for support.

Facebook Page Development

The study team responsible for conducting the beta test created a dedicated Facebook page. During the setup process, CY reviewed and approved various aspects of the page, including its design, study description, and welcome materials.

Table 2. Examples of revisions made to specific Facebook posts before and after CAB feedback.

Before CAB feedback:	After CAB feedback
Topic: Prayer	
 Mindfulness is when we focus on the "right now" without judging ourselves or what we are sensing and feeling. We can practice mindfulness anytime, anywhere, while doing anything. Prayer itself is a mindful activity! Choose an activity you do every day – like washing dishes or brushing your teeth – and try doing it in a mindful, or prayerful, way. Video: Quit smoking through mindfulness Video: Mayo Clinic Mindful Living Discussion question: How do you think mindfulness can increase your awareness to stop and think before acting?	 *"Pray at all times in the Spirit." Ephesians 6:18* Mindfulness means focusing on the "right now" without judging what we are sensing and feeling. We can practice mindfulness anytime, anywhere, while doing anything. Prayer itself can be a mindful activity! The article above discusses how Christians can use mindfulness from a biblical perspective: https://www.focusonthefamily.com/family-qa/mindfulness-a-christian-approach/ Mindfulness is also effective in helping people quit smoking. This smokefree.gov webpage shares tips on using mindfulness to cope with cravings and stress: https://smokefree.gov/challenges-when-quitting/stress/practice-mindfulness Discussion question: How can you use mindfulness to be more aware, and pause before doing something out of habit or boredom?
Topic: Patience	



You don't have to quit cold turkey! In fact, more than 95% of smokers who quit cold turkey do not actually stay quit. There are many kinds of quit smoking medicines, and they each work in different ways. If you've tried one before and it didn't work, we encourage you to check out this week's posts and links to learn more about other types.

There are 5 types of quit-smoking medications approved by the FDA:

- Nicotine gum, patches, and lozenges (all available over the counter without a prescription)
- Bupropion (decreases cravings and other withdrawal symptoms; prescription needed)
- Varenicline (reduces urge to smoke and reduces the pleasure from cigarettes if you do smoke; prescription needed)

Video: How NRTs can help you quit

Discussion question: How do you feel about relying on NRTs (patches, gum, medicines, etc.) to support you on your quitting journey?

"Therefore I will boast all the more gladly about my weaknesses, so that Christ's power may rest on me…. For when I am weak, then I am strong."
II Corinthians 12:9-10

Our focus this week is on patience. Quitting smoking is hard! "Slipping," having a cigarette, or even returning to smoking are a normal part of the quitting process. In fact, experts believe it takes most people at least 5-7 quit attempts before they finally stay quit. Go easy on yourself – you are not failing!

Nicotine Replacement Therapies (NRT) can help you manage withdrawal while your body becomes healthy again. This video explains how nicotine affects the brain and body, and how NRTs like the patch, gum, and medications work: https://www.youtube.com/watch?v=g3Ar4v5K880

This link has more information on NRTs and other quit methods to combine with medication: https://smokefree.gov/tools-tips/how-to-quit/using-nicotine-replacement-therapy

Discussion question: In the past, have NRTs been successful in helping you manage withdrawal symptoms? If you're new to NRTs, how can you plan ahead to use them?
(Anonymous poll – Which NRTs have you tried [list]?)

3. Beta-Test of the Intervention

A beta test is a small-scale field test comprising a preliminary feasibility study and a novel behavioral health intervention uptake. This field test allows for further refinement of the study protocol and the intervention itself before evaluating its efficacy. Beta testing's primary objectives are to identify and address issues about intervention usability. By involving a group of target users ("end-users") as beta testers, researchers can gather valuable feedback regarding the quality and user experience of the intervention. This feedback is then used to make improvements before the large-scale evaluation such as RCT. The purpose of this phase was to provide participants with 30 days of exposure to the Faith-Core group and obtain their feedback to (1) ensure the system worked as intended, (2) identify technical issues, and (3) facilitate program refinements in preparation for the pilot testing.

Study Recruitment and Methods

Participants were recruited using paid (sponsored) ads on Facebook and Instagram, organic posts on Mayo Clinic social media platform pages, and printed flyers sent to pastors on the CAB to post in church buildings. Interested participants were directed to an online eligibility screening survey hosted by Qualtrics. Respondents screened but determined to be ineligible were given cessation resources and contact information for additional support. All participants provided written informed consent. At the end of the beta test, participants were asked to provide open-ended feedback on improving moderator posts and the Facebook group.

Study inclusion criteria were: (1) Age ≥18 years, (2) lived in a rural area (based on Rural-Urban Commuting Area (RUCA) code 4-10 [34] derived from zip code) within the MCHS catchment area, (3) self-reported smoking at least one tobacco cigarette per day over the past seven days, (4) were willing to make or consider attempting to quit smoking, (5) had reliable access to the internet on a computer, tablet, or smartphone (or were willing to use a loaner iPad for the duration of the study), (6) had or were willing to create a Facebook account, (7) were willing to complete a baseline survey before starting the intervention, and (8) were comfortable viewing study posts that contain Christian faith-based content including Bible verses, and were willing to respect the confidentiality and faith perspectives of other group members. Participants were ineligible if they did not meet the above criteria. Our investigation recruited participants who were comfortable viewing and engaging with Christianity-based content, including Bible verses, but did not limit recruitment to any specific religious affiliation. Neither self-report as "spiritual" was a part of the study eligibility criteria.

Faith-Core Group Initiation

Building on our study team's experience using online social media platforms to deliver behavioral interventions, we created a private Facebook group to share content posts with information on EBCT for smoking and connect group members for interpersonal support. Facebook, which is owned by Meta, allows us to host private groups that cannot be found in public searches and are only open to members by invitation from the group administrator. Posts in the group do not appear in members' main News Feed section or on their personal profile pages. To see and engage with group content, participants were instructed to access the group page at least three times per week during the one-month intervention period.

Participants were informed during the consent that the group would start after 10 people had consented to the study [35]. They were asked to review participant guidelines and complete the baseline survey while waiting for others to join. One week before the intervention started, all the consented participants were sent an invite and detailed instructions to join the private Facebook group. Upon entering the group, members were greeted with a Welcome Post and

encouraged to introduce themselves to build connections with other members.

In December 2023, the intervention beta test was conducted over four weeks. The Facebook group was led by a moderator from the study team who had received training in facilitating online support groups (BT). The moderator shared EBCT content posts three times per week for 12 posts on Mondays, Wednesdays, and Fridays. The weekly topics were Connection to Others, Patience, Prayer, and Temptation. Because Christmas Day, a holy day in Christianity, fell on a Monday, the content post for that day was delayed until Tuesday, and a Christmas greeting post was shared on Monday.

Posts included an image at the top, a stock photo or a link thumbnail, a Bible verse, EBCT information related to that week's topic, and additional links for more details. A discussion question was also posted as a comment to encourage conversations among group members. Participants could engage with posts by reacting (i.e., like, love, care, laugh, surprised, sad, angry), commenting and replying to others' comments, and making their posts to the private group. The moderator also utilized engagement features like anonymous polls, videos, and external links.

Measures

Before joining the Facebook group, consented participants were asked to complete a baseline survey assessing demographics including religious affiliation and tobacco cessation treatment in the past 30 days, the readiness to quit Contemplation Ladder [36], an adapted Fagerström Test for Nicotine Dependence [37], and a modified (for this study) BREF version of the World Health Organization's Quality of Life Measurement Instrument Spirituality, Religiousness, and Personal Beliefs facets [38].

At the end of the intervention, participants who had joined the Facebook group were asked to complete a survey assessing whether they had attempted to quit smoking during the program and any resources they used, the number of cigarettes in the past week, the 30-item Usefulness and Ease of Use (USE) Questionnaire [39] which was rated on a 7-point Likert scale, and open-ended questions on suggestions for improvement and overall satisfaction. Both the baseline and follow-up surveys were completed online, and participants received a $25 cash card for completing each survey.

Beta-test feasibility was measured by the number of consented participants who could join the Facebook group and by the number of members who actively engaged with the intervention (e.g., view posts, react, comment, make independent posts, etc.). At the end of the beta test, participants were also asked to provide open-ended feedback on improving moderator posts and the Facebook group.

Data Analysis

Survey responses were collected in Research Electronic Data Capture (REDCap) [40], which is a secure, HIPAA-compliant data management platform. Descriptive engagement statistics were pulled from the Insights Summary available to group administrators, and additional details were compiled by the moderator (BT). We analyzed the responses to open-ended questions using content analysis [41].

Ethical Consideration

The Mayo Clinic Institutional Review Board (23-000837) deemed the study exempt. The CAB

members received a US $150 honorarium, and CE studio community experts received US $50. The participants received US $25 for completing the baseline assessment and US $25 for the postintervention assessment. For the beta test phase, study data was deidentified.

Results

Baseline: Recruitment was completed from November 14-20, 2023. A total of 31 interested participants were screened and 17 were eligible. The most common reason for ineligibility was not living in a rural area. Twelve participants provided written consent and were enrolled, and all 12 completed the baseline survey (92% women, 92% white, 67% employed part- or full-time, average age 48.5 [range = 24-66] years). **Table 3** provides participant baseline characteristics.

Table 3. Baseline characteristics of participants in beta-test. The participants were self-reported adult individuals who smoked and lived in rural areas.

Baseline characteristics	n = 12
Age (mean, range)	48.55 (24-66) years[a]
Gender, Women	11 (92%)
Ethnicity/race	
White	11 (92%)
African American	1 (8%)
Marital status	
Single, divorced, separated	7 (58%)
Married or long term relationship	5 (42%)
Employment	
Part-time or full	8 (67%)
Homemaker	2 (17%)
Retired	1 (8%)
Other[b]	1 (8%)
Education	
High school or GED	1 (8%)
Some college	1 (8%)
Associate's degree	5 (42%)
Bachelor's degree	4 (33%)
Graduate degree	1 (8%)
Current member of an organized religious group	
Yes	7 (58%)
No	5 (42%)
Frequency of attending organized religious events	
Once a week or more	2 (17%)
About 2-3 times a month	1 (8%)
About once a month	1 (8%)
A few times a year	2 (17%)
Almost never	1 (8%)
Faith tradition (options also included Buddhist, Muslim, Jewish, other, etc.)	
Catholic	3 (25%)
Evangelical	2 (17%)

Lutheran or Protestant	7 (58%)
Used cessation treatment or medication to quit in last 30 days	2 (17%)[c]
Quit attempt in last 30 days	9 (58%)
Intended timeframe to quit	
Within the next month	7 (58%)
Within the next 6 months	4 (33%)
Someday, but not next 6 months	-
Not sure	1 (8%)
Contemplation ladder score (1=not ready, 10=ready now)	Mean = 7 (range=5-10)
Confidence in ability to quit (1=not at all, 10=completely)	Mean = 6 (range=3-8)
Minutes to first cigarette of the day within 5 minutes	4 (33%)
How many cigarettes per day do you smoke?	
10 or fewer	5 (42%)
11-20	5 (42%)
21-30	3 (25%)
31 or more	-

[a]Data were missing for one participant.
[b]Work 3-4 hours per week.
[c]One had used nicotine replacement therapy, and one had used non-nicotine medication.

Spirituality and religion: **Figure 2** shows the importance of spirituality and religion in participants' lives. All participants responded that spirituality has at least "a little" importance in their lives. Each participant noted the importance of religion in their overall identity. No participant responded that spirituality and religion are not important to them."

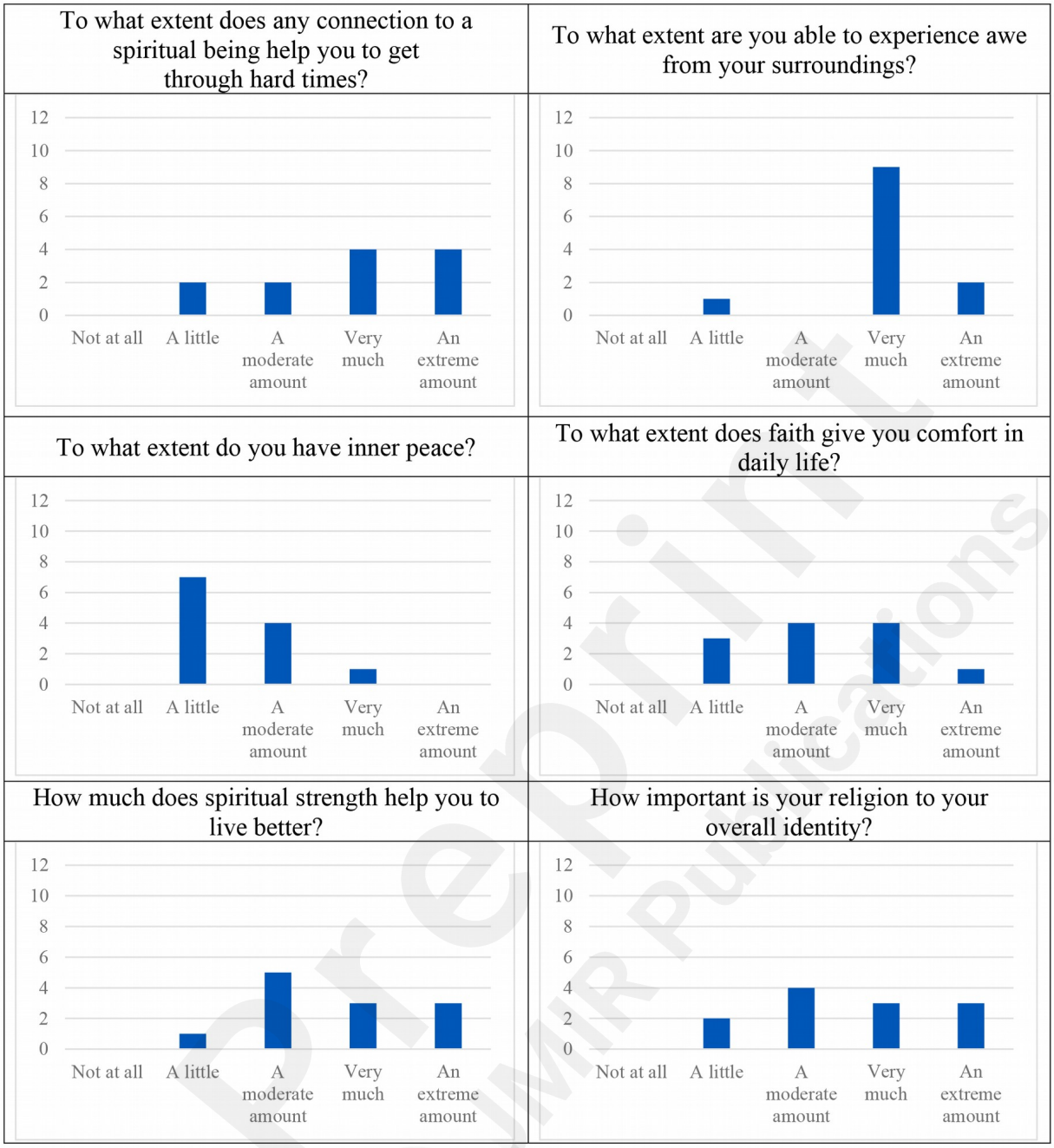


Figure 2. Represents a figural representation of the importance of spirituality and religion in participants' lives.

Facebook Group Activity: Two participants could not join the Facebook group and reported technical difficulties with the internet or their Facebook app and were withdrawn from the study. Ten participants joined the private Facebook group and participated actively throughout the beta test. All participants viewed the posts, made comments, and reacted to posts at least three times. Eight participants posted comments on multiple posts and engaged with each other to share personal experiences using nicotine replacement therapies, non-nicotine medications, and different coping strategies, as well as to celebrate their success in cutting back or quitting using the new information shared through the intervention. As anticipated, engagement slowed somewhat over the week between Christmas and New Year's, but all participants continued to enter the group and view posts. No participants reported problems

or technical difficulties accessing or participating in the group.

End of intervention survey: At the end of the beta test, 90% of participants self-reported they had tried to quit smoking tobacco cigarettes since joining the Faith-Core group. And 90% of participants reported using or seeking EBCT resources. Of those who sought treatment, 60% reported using NRTs, 20% called a Quitline, 20% texted a Quitline, 40% used counseling services, and 40% used group support services.

Responses on the USE Questionnaire showed that participants found the Facebook group easy to use and were satisfied with it. On the 1-7 Likert scale, mean scores in the following categories were: usefulness 5.52 (SD 1.18; range 2-7); ease of use 6.01 (SD 1.17; range 2-7); ease of learning 6.47 (SD 0.89; range 4-7); and satisfaction 5.86 (SD 1.16; range 3-7).

Participant Feedback on Group

Participants provided open-ended feedback on improving moderator posts and the Facebook group **(Table 4)**. Four areas of response emerged: (1) increasing the number of participants [> 10 before the group starts], (2) encouraging participants to share additional information about themselves, (3) making posts more interactive, and (4) encouraging group members to post more frequently. Moderators expressed no concerns with social media engagement and moderating the group.

Table 4. Quotes from Faith-Core beta-test participants at the end-of-study survey

Suggestions for improving the post content (text, images, verses, links)	“More posts in general, more scripture more pictures” “Run program longer with a larger group of people” “I think the group members could've been more active”
Suggestions for improving discussion questions or interactions with group members	“Maybe a group chat where we got to know each other better” “Use polls more” “Make the questions shorter and more interactive”
Suggestions for overall improvement	“More posts in general, then I would see it more and interact more” “Great idea! More people would benefit from this. More conversations daily would be fabulous” “More members” “More specific activities to try”
Positive aspects of the program	“Positive and friendly” “Good content, nice to talk to others” “I liked that it was always there, so easy to use” “Enjoyed the support” “I found extra techniques to add to my quitting arsenal’ “They were kind. Everyone was willing to help and listen to each other” “It was a wholesome community and we all struck to the plot of the group, everyone encouraged each other” “They inspired me to continue” “Interesting articles and resources”

Negative aspects of the program	"I think it was a bit boring. Probably because we had few members" "Didn't love having my name and business out there" "Would have liked more interaction; seemed to focus on meds"

Discussion, Conclusions, and Overall Recommendations

This paper describes a CBPR process to create and beta-test a social media intervention prototype aimed at helping people quit smoking. The prototype was designed to provide evidence-based resources, peer support, and culturally tailored content. The paper discusses various strategies that were used to engage users, train moderators, and create content, aiming to prepare moderators and develop a prototype for a pilot testing trial.

The intervention prototype was developed using the CBPR approach, and it met all the set goals and timelines. The project was completed smoothly, with no concerns raised by the CAB and CE studio members. Regular updates to community members and stakeholders on the study's progress played a vital role in the project's success. Similar to our earlier work with social media platforms for addiction treatment [12], the Faith-Core beta test was feasible. In the beta-test phase, we used validated Social Media Usability Measures, and participants scored high in every category (usefulness, ease of use, ease of learning, and satisfaction) with an average mean score of greater than 5. This indicates that the intervention was useful, easy to learn, and satisfies its intended purpose.

Additionally, there was a potential effectiveness signal, with 90% of participants attempting to quit smoking tobacco cigarettes, and 90% of them reported using or seeking the cessation resources discussed in the group to help them quit smoking. The qualitative feedback during the beta test will facilitate specific improvements to the prototype and intervention before larger pilot trials. During the beta-test study, two participants dropped out due to technical problems. Since digital disparities are prevalent among the rural residents, strategies should be planned on assist participants as needed for digital access and digital literacy challenges. [42]. For the future pilot phase, we plan to have a digital navigator on board for unforeseen digital connectivity problems that participants may experience.

The primary feedback from the beta-test participants was to increase interaction and engagement among the group participants. Participant engagement in the group is critical to exchanging experiences and supporting one another actively. As we prepare for the pilot phase, we will discuss strategies to augment participant engagement with social media experts and the moderator in our study. One way to increase engagement could be incentivizing the participants to comment on the post. For example, Lyu and colleagues, in a social media study, incentivized participants to comment on Facebook posts to increase group engagement [43]. "In this study, the constructs of spirituality and religiosity were not the primary focus. As illustrated in Figure 2, participants in our study demonstrated a spectrum of these constructs. It is postulated that these constructs evolve with personal life experiences, which often influence their future course. For example, individuals may maintain their Christian affiliation while altering their level of participation in religious activities. Similarly, bereavement, illness, or major life transitions can lead to a reevaluation of spiritual beliefs and practices [18-21]. Furthermore, there is often a delicate balancing act between religious beliefs and spirituality, which may positively impact one's health behaviors, such as engaging in smoking cessation. Our future pilot study will periodically administer validated instruments to assess spirituality and religiosity. This will be used to examine the modifying influence of these constructs on our main results regarding smoking reduction behaviors and cessation outcomes."

Limitation

Given that the beta-test participants were restricted to the Midwest population, the acceptability of this intervention may limit its generalizability to other rural populations. However, this phase was focused on prototype development and testing the overall function of the prototype. Future pilot study steps will pave the way toward larger and more generalizable evaluations. In addition, the beta test recruited individuals with access to the internet and smart devices to access Facebook, which may lead to selection bias. For future larger testing, we will consider providing a loaner digital device to participants with no digital access to eliminate this selection bias [42].

Our project has many strengths. We adopted a CBPR approach to develop our prototype, and we proactively engaged health communication and social media experts to train moderators to achieve high-level engagement during beta testing. Throughout each step, we gather multiple levels of feedback from the community and end-users to improve the content library and conduct the project. While most of the feedback has already been incorporated, the beta-test feedback will be used to further improve the process and content library before future pilot studies. Our community stakeholders expressed interest in being trained as moderators and maintaining the proposed Facebook group, ensuring self-sustainability post-study.

Conclusion

In conclusion, this study suggests that social media group interventions co-created through a CBPR approach, incorporating culturally and faith-aligned content and engagement strategies, hold promise for promoting positive outcomes in rural populations when facilitated by trained moderators. The intervention prototype met all the set goals and timelines. During the beta phase, we did not identify any critical technology and user interface-related issues. However, better digital support is needed for future trials targeting rural populations to prevent participant attrition rates. Further research and a large pilot trial are being planned to evaluate the effectiveness of this intervention prototype.

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Conflicts of Interest

None declared.

Abbreviations

CAB: community advisory board
CBPR: community-based participatory research
CE: community engagement
CHCR: Center for Health Equity and Community Engagement Research
EBCT: evidence-based cessation treatment

NRT: nicotine replacement therapies

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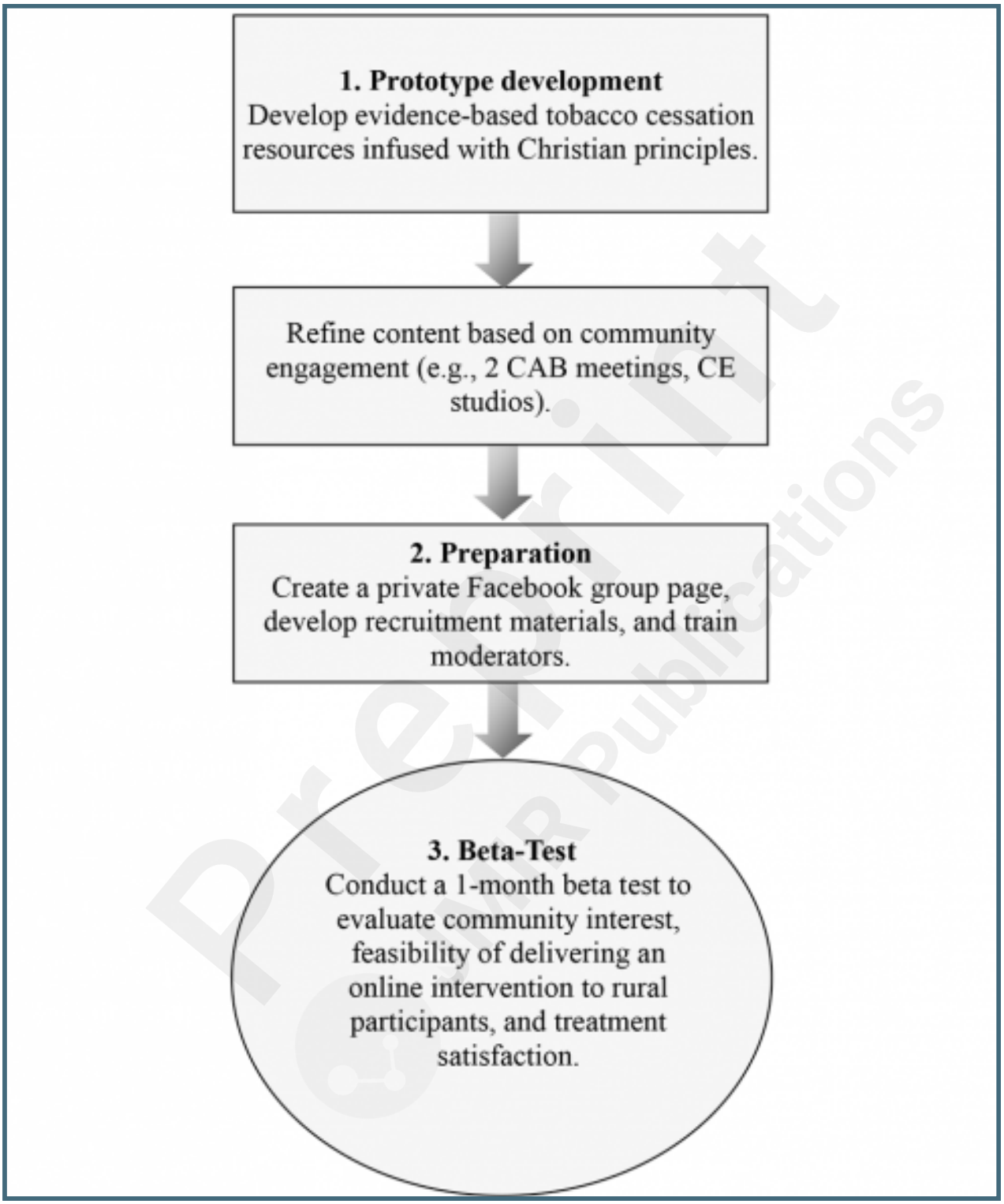
Supplementary Files

Figures

Overview of the development of the Faith-Core intervention prototype and its beta-test.



Represents a figural representation of the importance of spirituality and religion in participants' lives.