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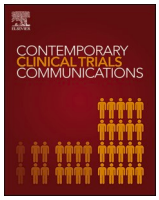

Challenges and lessons learned in recruiting participants for school-based disease prevention programs during COVID-19

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ABSTRACT

Schools provide an ideal setting for delivery of disease prevention programs due to the ability to deliver health education and counseling, including health behavior interventions, to large numbers of students. However, the remote and hybrid learning models that arose during the coronavirus (COVID-19) pandemic created obstacles to these efforts. In this article, we provide insights on collaborating with schools to deliver disease prevention programming during the height of the COVID-19 pandemic, and in subsequent years. We illustrate these strategies by drawing upon our firsthand research experiences engaging high schools in a school-based cancer prevention trial focused on sun safety. Delivery of a cluster-randomized trial of a school-based skin cancer prevention program was initiated in the spring of 2020 at the onset of the COVID-19 pandemic in the U.S. We present multilevel evaluation data on strategies used to reach schools remotely and share lessons learned that may inform similar approaches moving forward during times of crises. Although the COVID-19 pandemic interrupted school-based recruitment for this trial, enrollment improved one year later and did not appear to differ between rural and urban schools. Recruitment strategies and trial-related procedures were modified to address new challenges brought about by the pandemic. Despite the COVID-19 crisis altering US classrooms, disease prevention programming can continue to be offered within schools, given close community partnerships and new adaptations to the ways in which such programming and research are conducted.

1. Introduction

The COVID-19 pandemic created far-reaching impacts across all domains of life globally: children's well-being has been particularly affected. There are ongoing tensions between how to balance public health measures to prevent COVID-19 spread with the emotional and physical health and academic progress of students. At the height of school closures in April 2020, it was estimated that over 57 million children in kindergarten through 12th grade in the U.S. and almost 1.6 billion students worldwide were impacted [1]. The effect of school closures reaches well beyond academics as schools are an essential source of food, healthcare, social interaction, and physical activity, particularly in poor and underserved areas of the country and among families of children with disabilities [1–3]. The initial impacts of these disruptions and closures on children include substantial loss of learning, increased social isolation, food insecurity, higher exposure to

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[interpersonal] violence, worsening mental health, and decreased fitness [1–6], with children from low-income families and children with disabilities being disproportionately burdened. One study found that students from households with lower parent education levels had a 60 % greater learning-loss due to COVID-19-related school closures compared to their peers [7]. This is very concerning, as students from disadvantaged backgrounds were significantly more likely to be exposed to longer periods of remote learning during the pandemic [8]. If these impacts are not reversed, they will only serve to worsen existing disparities in educational achievement and health outcomes among communities of color and marginalized groups.

Disease prevention programs targeting children are often delivered within the school setting, enabling the delivery of health education and counseling to large numbers of students [9,10]. However, the remote and hybrid learning models that arose during the COVID-19 pandemic[1] created obstacles to these efforts. In this commentary, we provide insights on collaborating with schools to deliver disease prevention programming during the height of the COVID-19 pandemic, and in the intervening time since it began. We illustrate these strategies by drawing upon our firsthand research experiences engaging high schools in a school-based cancer prevention trial focused on sun safety. We present multilevel evaluation data (district, school, participant-levels) related to strategies used during the COVID-19 pandemic to reach schools remotely, and share lessons learned that may inform similar approaches moving forward during times of crises.

2. Study description

Our school-based skin cancer prevention programming, called SHINE (Sun-safe Habits Intervention and Education), consists of education on skin cancer and its prevention behaviors, provision of students' personalized ultraviolet (UV) photographs revealing existing facial skin damage not visible to the naked eye, and support to students on completing their own action plans for skin cancer prevention strategies. SHINE was designed to be delivered in-person to maximize student engagement and due to use of specialized UV photography equipment that is not currently available virtually. SHINE is registered on ClinicalTrials.gov (NCT04341064).

In order to evaluate program efficacy, we initiated a cluster-randomized trial in the spring of 2020, coinciding with the onset of the COVID-19 pandemic in the U.S. Preparation for the delivery of this sun safety program had been initiated 3 months previously, with resources obligated in that budget year to deliver and evaluate the program. The impetus for delivering the program was based on an extensive community needs assessment, and delivery of a pilot intervention program [11–15].

Skin cancer prevention is particularly relevant in the communities of focus in our project (in Utah) as they have the highest incidence and mortality rates in the U.S. for melanoma, the deadliest form of skin cancer [16,17]. Rural and mountainous areas, such as those in Utah, are also disproportionately affected by skin cancers including melanoma [18–20]. We identified high schools located in urban and rural communities in Utah to participate in the SHINE skin cancer prevention program and efficacy trial. Our school-level recruitment process involved first obtaining district-level permission (if required) to conduct the research study within the school system, and then contacting high school principals to approve the study and disseminate the information to science and health teachers within their school. Usually, principals ask our staff to contact teachers on their behalf once they approve the study. After principals give permission for the study to take place in their school, it is ultimately up to the individual teacher to decide whether or not they want their classes to participate in SHINE. We provide information to teachers and on how our program content and activities fulfill key learning objectives contained in state education guidelines to help inform their decision. The overall recruitment goal for the SHINE study is 30 schools over 3 years of enrollment.

In March 2020, we were in the midst of recruiting schools for the Fall of 2020. Once the COVID-19 pandemic started, schools in our catchment area transitioned to online instruction for the remainder of the school year (through June 2020). Based on conversations with our school partners, we made the decision to only enroll one school that had been recruited prior to the start of the pandemic and to curtail recruitment efforts until the following school year due to the significant COVID-19-related disruptions and stress. Most schools in Utah restarted in-person instruction in Fall 2020. However, Utah school districts continued to face a number of challenges related to the pandemic–including the need to adapt to new hybrid learning models (e.g., some students learning remotely, while others were in-person, alternating days of in-person versus online instruction), managing new procedures to prevent the spread of COVID-19 in school and during school-related activities (e.g., masking), and concerns about having individuals external to the school community such as researchers conduct in-person activities. In light of these challenges, the one school enrolled in the Fall of 2020 dropped-out of the study after the students completed their baseline assessment.

We re-started recruitment efforts in spring of 2021 (see Table 1 for summary). We initially contacted 37 schools. Nine schools declined to participate upon initial outreach with 6 being schools in rural areas and 3 schools in urban areas. Primary reasons for schools not enrolling in the trial included COVID-19 restrictions and school staffing limitations. Ten schools expressed initial interest in participating in the study but were not recruited: eight did not respond to logistics phone calls; one school tentatively agreed due to COVID-19 restrictions but later chose not to participate, and one school said they would reach out to the health teacher and never responded to follow up. Four schools did not respond to contact attempts. We successfully recruited 14 new schools, 8 (57 %) of which were located in rural areas and 6 (43 %) in urban areas. This was consistent with our implementation framework to enroll schools from both urban and rural geographic settings and our study design. Recruited schools tended to have a higher total student population (median = 1672 vs. 488) but were similar to schools not participating with respect to percentage of minority students (median = 21 % vs. 25 %) and proportion of students who were economically disadvantaged (as indexed by the proportion of students receiving free or reduced-priced lunches; median = 34 % vs. 33 %). Of the 14 recruited schools, 4 ultimately did not participate due to becoming unresponsive or staffing changes. Individual (student)-level outcomes were collected in the Fall of 2021 among 463 students from 10 schools.

3. Lessons learned

Our experience working with secondary schools on cancer prevention programming at the beginning of the pandemic and the challenges we encountered and perceived ultimately revealed several lessons. First, maintenance of community ties even during times of crisis can lay the foundation for continued collaboration when the crisis subsides. At the beginning of the pandemic, we were able to maintain contact with community partners and schools to be able to learn their challenges and

Table 1
Summary of recruitment of schools to SHINE study in 2021.

	Urban	Rural
Contacted	**16**	**21**
No response	3	1
Declined	3	6
Initial interest (not recruited)	4	6
Lost after recruited	2	2
Enrolled, completed baseline	**4**	**6**

[1] Abbreviations: COVID-19 = Coronavirus Disease 2019, UV = Ultraviolet, SHINE = Sun-safe Habits Intervention and Education.

current practices. Our community partners included state-level education administrators and health education personnel and school administration and district level staff with whom we had prior working relationships. Early communication with these partners led our research team to collaborate with Utah schools on a COVID-19 testing project in schools [21], which met their more immediate priorities and needs and allowed us to successfully re-enter with the skin cancer prevention trial priority once COVID-19 was more easily managed within schools and in-person instruction returned.

Second, adaptation of school-based programming and research procedures to optimally meet a school's needs is essential. Through early (in the pandemic) conversations with our community and school partners about the constraints that schools faced and their needs, we adapted our cancer prevention trial procedures. School administrators expressed concern with potential COVID-19 exposures with researchers coming to the school in person, so we minimized our in-person presence at schools by providing options for remote assessments and delivering some parts of the intervention remotely. We also worked to minimize the time burden on teachers by instituting an online consent system that could be sent out to students and their parents/guardians. Our partners cautioned that it may be difficult to recruit teachers and their students given the many competing demands they had related to the challenges of teaching during the pandemic. As a result, we augmented our trial recruitment strategies by working closely with our community and university partners to support these recruitment efforts. For instance, our state-level school health education partner made announcements about our trial during the virtual meetings and encouraged teachers to enroll their classes in the trial through her newsletter and email communications. Our research team also provided educational presentations on cancer prevention and opportunities to enroll in the SHINE trial to statewide school health education professionals during regional conferences, such as through the Society of Health and Physical Educators. Additionally, we built on existing partnerships with the state health department to provide information on the trial to school nurses statewide and partnerships between colleagues at our academic institution and private and charter schools to recruit them into subsequent cohorts.

Third, tailoring recruitment and retention strategies can lead to higher enrollment. Prior to the pandemic, our recruitment efforts relied on administration to share information about our skin cancer prevention trial with teachers in their schools and contacted us on their own accord. After the COVID-19 pandemic started, we found that it was more effective, after receiving permission from the principal, to contact teachers directly about the trial. We also scheduled brief phone conversations with teachers during their planning times to answer any questions they had about the trial and to discuss any accommodations and address any barriers before they were enrolled into the trial. The bulk of our recruitment efforts were focused on health teachers. However, we also discovered that science teachers were interested in the content we were offering, so we expanded recruitment to include science (e.g., biology) teachers.

Furthermore, we augmented our trial recruitment strategies by working closely with our community and university partners to support these recruitment efforts. For instance, our state-level school health education partner made announcements about our trial during the virtual meetings and encouraged teachers to enroll their classes in the trial through her newsletter and email communications. Our research team also provided educational presentations on cancer prevention and opportunities to enroll in the SHINE trial to statewide school health education professionals during regional conferences, such as through the Society of Health and Physical Educators. Additionally, we built on existing partnerships with the state health department to provide information on the trial to school nurses statewide and partnerships between colleagues at our academic institution and private and charter schools to recruit them into subsequent cohorts. Once schools re-started in-person and public health measures were put into place to prevent the spread COVID-19, we found that more teachers were eager to have outside presenters return to their classrooms and to add new content to their existing curriculum.

4. Conclusion

Network-building was essential to recruitment and retention efforts, especially during the pandemic. Although the COVID-19 pandemic interrupted school-based recruitment for this trial, enrollment improved one year later and did not appear to differ between rural and urban schools. Our initial data suggest that adolescents rarely use recommended sun protection strategies and over-engage in skin cancer risk behaviors, particularly outdoor tanning. These behaviors, and time spent outdoors, did not appear to be differentially impacted by the pandemic. Therefore, our data suggest that despite the COVID-19 crisis altering US classrooms, cancer prevention scientists must remain vigilant in their efforts to curb both intentional and unintentional sun exposures and intervene upon modifying adolescents' risk behaviors where and whenever possible, and by adaptable means.

Our experience also highlighted the benefits of maintaining contacts with community partners during times of health crises and identifying ways to support these partners in their immediate priorities. However, a limitation of the present study is that the lessons learned are based on qualitative experience rather than statistical analyses. In conclusion, the COVID-19 pandemic brought about a multitude of challenges to children, their families, and the many settings that provide services to these children and families. However, it also provided an opportunity to reimagine the ways in which we provide and study disease prevention programming in school-based settings and rural communities overall.

CRediT authorship contribution statement

Yelena P. Wu: Writing – review & editing, Writing – original draft, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Elise K. Brunsgaard:** Writing – review & editing, Investigation. **Nic Siniscalchi:** Project administration, Investigation, Data curation. **Tammy Stump:** Writing – review & editing, Writing – original draft, Supervision, Data curation. **Heather Smith:** Writing – review & editing, Data curation. **Douglas Grossman:** Writing – review & editing, Conceptualization. **Jakob Jensen:** Writing – review & editing, Methodology. **David B. Buller:** Writing – review & editing, Methodology, Conceptualization. **Jennifer L. Hay:** Writing – review & editing, Methodology. **Jincheng Shen:** Methodology, Formal analysis. **Benjamin A. Haaland:** Methodology, Formal analysis. **Kenneth P. Tercyak:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Ethics approval

The study protocol was approved by the University of Utah's IRB on 11/15/2019, reference number IRB_00118620.

Consent for publication

Not applicable.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The datasets generated and/or analyzed during the current study are not publicly available due to recruitment for this study being ongoing, but are available from the corresponding author on reasonable request.

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