UC Agriculture & Natural Resources
California Agriculture

Title
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Permalink
https://escholarship.org/uc/item/3xq572hz

Journal
California Agriculture, 77(3-4)

ISSN
0008-0845

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Publication Date
2023

DOI
10.3733/ca.2023a0015

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RESEARCH ARTICLE

Exploring the challenges and benefits of online youth-led nutrition programs

When youth-led participatory action research programming went online, it became easier to schedule meetings, but participants' engagement was weakened.

by Yu Meng, Marisa Neelon, Nancy LePage, Brandon Louie and Nancy Erbstein

Online: https://doi.org/10.3733/ca.2023a0015

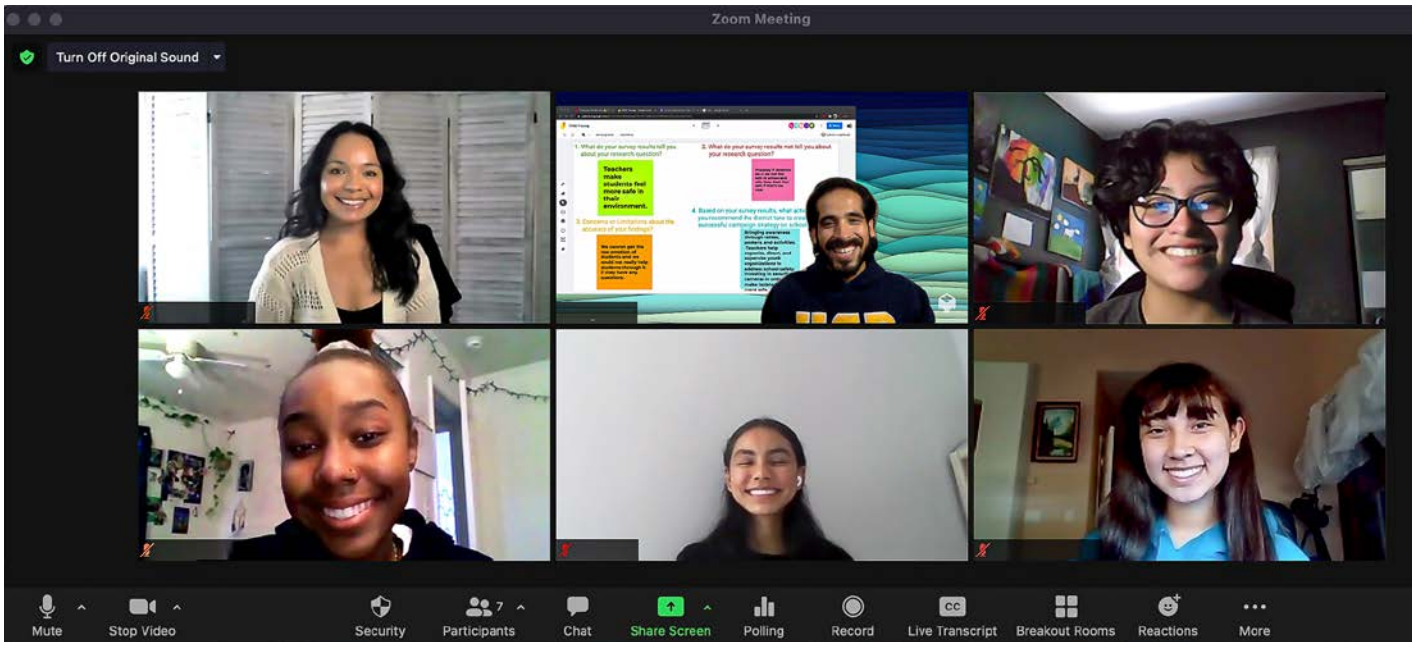
Abstract

Nutrition educators at the University of California Cooperative Extension (UCCE) have been engaging low-income youth in youth-led participatory action research (YPAR) for several years. During COVID-19, these educators transitioned from in-person to online YPAR programming. Delivering the YPAR program online presented challenges but also fostered new strategies and provided benefits. This study assesses the challenges, strategies and benefits of online YPAR programming, and it examines future program implications from the perspectives of both nutrition educators and youth. Qualitative interviews were conducted via Zoom with eight nutrition educators who attempted to implement YPAR programming during the 2020–2021 school year. We used a retrospective Qualtrics survey to gain information from 54 youth participants. We found that online facilitation encouraged the innovative use of technology, which was especially important because it allowed teams to connect with each other during tumultuous times. This online format made meetings easier in terms of planning, documentation and logistics. However, the online format presented particular challenges, such as coping with internet and technology difficulties and trying to sustain authentic engagement among participants without in-person interactions. Consequently, 50% of nutrition educators and 45% of youth respondents said they preferred a mix of in-person and online meetings for future YPAR programming.

One in five adolescents in the United States is obese (Fryar et al. 2020). Behavioral patterns established at this transitional period can determine both current and adult health status (Lawrence et al. 2017). As young people grow, they are increasingly influenced by their peers, cultural norms, environment, institutional policies, and social cues, such as media (Ohri-Vachaspati et al. 2014). Unfortunately, young people's environments do not always encourage and enable them to make healthy choices. This is especially true for youth in marginalized, under-resourced communities. National cross-sectional studies confirm disparities in food security, nutritious food access, and health status (Bailey et al. 2017; McCullough et al. 2022; Odoms-Young and Bruce 2018). Youth from low-income families eat fewer fruits and vegetables (Svastisalee et al. 2012) and participate in fewer physical activities compared to youth with higher socioeconomic status, due to inequities in access, resources and infrastructure (Abraczinskas and Zarrett 2020). Furthermore, the current global pandemic imposed additional burdens on youth and amplified inequities in the food system (Kyerematen et al. 2022). To help youth adopt healthy behaviors, and to encourage them to advocate for just policies, systems and environmental



Moving youth-led participatory action research (YPAR) programming from in-person to virtual presented challenges but also fostered new strategies and provided benefits. *Photo:* maroke, iStock.



YPAR encourages a high level of youth engagement, which includes collaborative interactions and relationship building between the youth and adult allies. *Photo*: Eli Figueroa.

changes that address local needs, it is critical to support youth development through an effective, equity-oriented, multi-level approach.

From instruction to engagement

CalFresh Healthy Living, University of California (CFHL, UC) is a state implementing agency of Supplemental Nutrition Assistance Program Education (SNAP-Ed). This program serves low-income families through nutrition education that aims to reflect a social-ecological model of healthy nutrition and physical activity (Bronfenbrenner 1977). In 2016, CFHL, UC began providing greater support for youth engagement within its programming in order to enhance learning (Louie et al. 2018) and support policy, systems and environmental changes that can affect their socio-ecological contexts. Through collaboration among the CFHL, UC State Office, UC Davis Center for Regional Change (CRC), UC Davis School of Education, and select UC Cooperative Extension counties, nutrition education staff began piloting youth-led participatory action research (YPAR) methodologies. These methodologies followed U.S. Department of Agriculture SNAP-Ed guidance in supporting policies, systems and environmental changes to promote healthy nutrition and physical activity as well as youth development principles. Unlike traditional direct nutrition education, YPAR encourages a high level of youth engagement, which includes collaborative interactions and relationship building between the youth and adult allies and taps into the unique insights and networks of youth to inform health promotion and health equity efforts. Youth pursue a scaffolded inquiry process through which they identify challenges relevant to their own lives; conduct research to understand the problems, local assets and strengths; develop recommendations; and then advocate for changes based on their research evidence (Cammarota and Fine 2008; London et al. 2003; Ozer 2017).

Adapting to online format

The initial lockdown from the COVID-19 pandemic began in March 2020, resulting in the closure of most schools and youth-serving organizations and cancellation of nearly all in-person programs in California. Nutrition educators rapidly adapted their programs and delivered them remotely. Historically, YPAR efforts have primarily relied on ongoing, in-person interactions between youth and their adult allies as they develop relationships, research topics, research skills, data collection methods, datasets and actions based on the data (Wallerstein and Duran 2006). Given this precedent of in-person YPAR, resources for remote YPAR project facilitation were limited.

In an effort to support nutrition educators, the CRC and UC Davis School of Education published a document in May 2020 with tips on how to adapt in-person activities to be conducted online. These tips were based on the authors' prior experiences with in-person YPAR programs, early experimentation with YPAR online during the pandemic, and prior experiences supporting transnational collaborative youth projects online (Louie and Erbstein 2020). They drew on the Community Futures, Community Lore Stepping Stones toolkit for YPAR, which was designed by the CRC and UC Davis School of Education. The toolkit, in turn, was based on hundreds of YPAR projects conducted in person over the past several decades by the Intercultural Oral History Project, Community LORE, Youth In Focus, and the CRC's Putting Youth on the Map program.

During the 2020–2021 academic year, seven out of eight nutrition educators facilitated YPAR utilizing the Community Futures, Community Lore Stepping Stones YPAR toolkit. One intended to do so but did not successfully implement a YPAR project due to the pandemic. Recognizing the knowledge gap in online YPAR delivery and the valuable lessons that could be learned from both challenges and strategies, we decided to conduct a mixed methods study of nutrition educators and youth participants' experiences.

Exploring experiences

Utilizing a convergent mixed methods approach, our team captured and compared nutrition educator and youth perspectives on the challenges, adaptations, innovations and benefits of online YPAR programming. We conducted semi-structured interviews over Zoom with all eight UC Cooperative Extension county nutrition educators. Interview questions explored the challenges and barriers that nutrition educators encountered while facilitating YPAR entirely online, how they navigated those challenges and barriers, and what benefits (if any) resulted from the online format. Interviews lasted between 30 minutes and two hours. Interview questions included, "Given your experiences this past year, which format would you prefer?" and "If virtual delivery continues, what support would help you be more successful?"

To document the experiences of youth participants in these YPAR projects, we utilized a retrospective survey. Our research team worked with the CFHL, UC State Office's evaluation team to revise the existing assessment survey for the 2020–2021 academic year to investigate youths' experiences and preferences based on their participation in fully online YPAR projects. Questions added to the survey instrument included, "Thinking about this year, what did you like most about the online format of this YPAR program?" and "If given a choice, how would you like to participate in a YPAR program again?" The survey, which included both quantitative and qualitative questions, was administered to all the YPAR project participants across three counties. Of the approximately 243 youth who participated, 54 responded to the survey (22%). Respondents included sixth-, eleventh- and twelfth-grade students.

After quantitative data and qualitative data were collected and analyzed separately, additional analysis was pursued to look across the findings from both datasets. Two researchers performed a thematic analysis using a priori coding (Braun and Clark 2006) of the nutrition educator interview transcripts and youth responses to the open-ended survey questions. Descriptive statistics in the form of frequencies and percentages were also calculated to understand the youth and nutrition educators' predominant preferences for future programming.

After the qualitative and quantitative data were analyzed, findings were compared. This allowed for data triangulation to both validate emerging points in each dataset and identify any similarities and differences in nutrition educator and youth participant experiences.

Challenges of online delivery

Pursuing YPAR online presented expected challenges. The top three challenges youth experienced were closely aligned with those identified by nutrition educators.

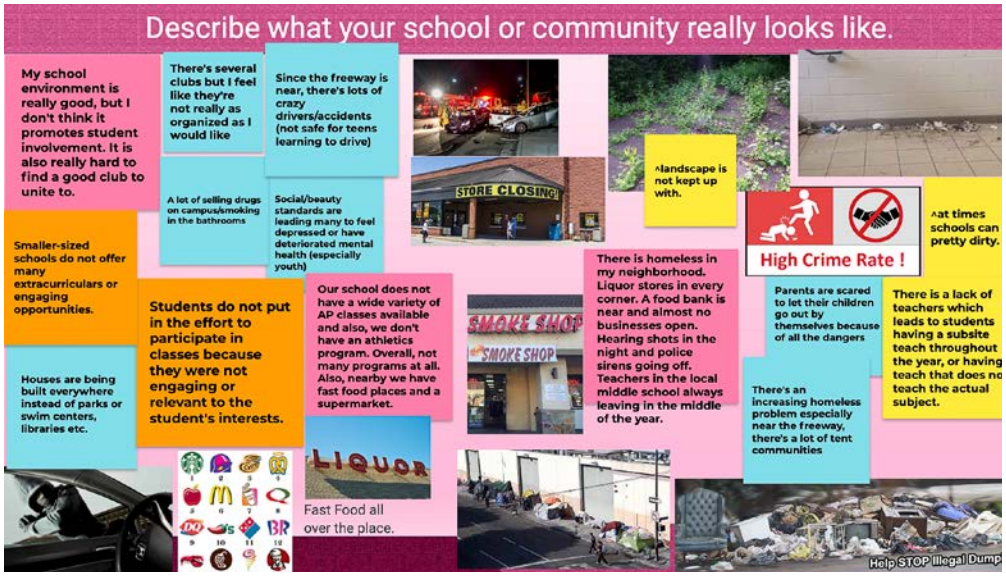
Nineteen percent of youth mentioned that they missed in-person communication and connection. When young people were asked about which aspects of the online format did not work well for them, they described several communication issues. These included limited visual and verbal interactions between individuals and groups; having trouble "getting the word out" about the YPAR project; and, ultimately, feeling disconnected from their team members. Similarly, six nutrition educators emphasized the difficulties in building team relationships between the youth themselves and with staff at the schools. For example, one nutrition educator responded, "I think doing it in-person would have been nicer in the sense that I would have gotten a feel for the school, maybe the space where we would meet, maybe meet the folks, connect with any other important adult allies that are going to be key to the YPAR process."

> Unlike traditional direct nutrition education, YPAR encourages a high level of youth engagement, which includes collaborative interactions and relationship building between the youth and adult allies and taps into the unique insights and networks of youth to inform health promotion and health equity efforts.

The internet and technology were the second most frequently mentioned challenges. Youth (17%) emphasized internet problems, including unstable, slow or nonexistent internet connections; video and audio lag time; and difficulties with their computers and Zoom. These challenges were not only experienced by the youth but also by the educators, resulting in a loss of valuable time and momentum.

In addition, nutrition educators found that they had to adjust their online activities to make them as accessible as possible given students' technology. For example, one nutrition educator noted, "They have access to school Chromebooks, but the Chromebooks are not that great from what I understand. And some of the students would be in class on their phones, and it's difficult for them to go to a poll or go to another website or to close the Zoom window . . . ." According to the educators, making these adjustments and providing technology-related assistance to youth was





Youth Google Jamboard responses to YPAR Stepping Stones Toolkit activity prompts. *Photo*: Eli Figueroa.

time-consuming, especially in the context of learning how to implement online programming.

Youth also experienced difficulties in focusing and staying engaged. Although this was the third most frequently mentioned challenge (9% of youth), it directly affects both learning outcomes and project success. They mentioned being easily distracted, feeling bored while listening, and disengagement during the online meetings. Similarly, educators found it difficult to understand how the youth were doing. According to the educators, their meeting facilitation was constrained due to the online format and not being able to see the youth (when their cameras were turned off), making it hard to interpret their pausing or silence in response to direct questions.

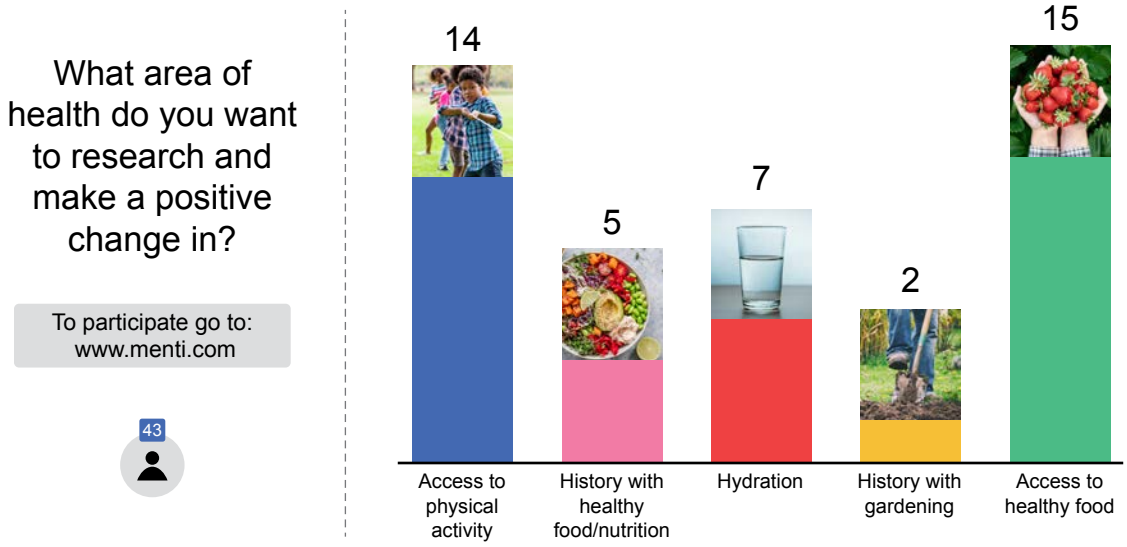
Adaptations and innovations

The online format also presented opportunities for nutrition educators to adapt existing strategies, like encouraging ongoing engagement and modifying the Stepping Stones toolkit, to address the challenges of remote meetings. In addition to those two strategies, the third most mentioned strategy was avoiding and resolving technology-related issues.

Six nutrition educators mentioned incorporating a variety of activities into their meetings in an effort to foster engagement, with varying levels of success. For example, four nutrition educators said they nudged youth to engage by calling on them, asking questions and inviting them to use the Zoom chat feature. Additionally, four nutrition educators mentioned incorporating physical activities like "stretching sessions" and "movement breaks." Other approaches included check-in questions, brief polls, and online games. Despite their efforts, one nutrition educator emphasized the challenges of Zoom fatigue: "We definitely make the meetings fun, in the sense of trying to do like an ice-breaker, a break here, a game . . . to just give it a different feel but, at the end of the day, the students are on a screen."

Additionally, five nutrition educators mentioned adapting and augmenting the Stepping Stones toolkit. Three nutrition educators shared how applications such as Google Jamboard and Google Forms allowed youth to simultaneously work on Stepping Stones activities that would normally require them to use paper, posters and markers in person. Four mentioned incorporating new activities, related online content, and discussions to help youth understand the focus of their specific YPAR projects. Developing a meeting structure was also key for educators, whether this entailed creating a slide deck as a visual aid, "having a clear agenda . . . to stay on track", or "creating a routine" so that the youth would know what to expect.

Lastly, five nutrition educators mentioned attempting to avoid or overcome technology-related issues. This included increasing their own proficiency in online facilitation. Practice taught them strategies such as muting nearly all participants in a hybrid-simultaneous format, playing videos using the host with the best internet connection, and effectively using multiple screens and windows. Navigating the technology also included intentionally using online applications that youth already understood. For example, one nutrition educator used Google Classroom since it was already being used by their collaborating teacher, while another



Activities and tools used to foster engagement in online YPAR meetings, such as interactive polls, could also enhance in-person sessions. *Photo*: Daisy Valdez.

stopped using PDFs because the youth found them difficult to use. They learned that these strategies were ideally implemented at the outset: ". . . one of my first things was to learn 'Where are they? What are they using? What programs are they using?' And then I have to adapt to the needs of my students."

Benefits of online delivery

There were several benefits to supporting YPAR online, including convenience; the discovery of enjoyable, interactive, technology-assisted activities; and the discovery of effective, efficient ways to share and document information. Twenty-two percent of youth respondents and nutrition educators emphasized the convenience inherent in the online format. For example, youth shared that they enjoyed "the ability to meet with others in a flexible way" and "easily [talking] to people through the computer." No matter where they were, youth could attend without facing transportation challenges. Similarly, six nutrition educators mentioned how online meetings eliminated their commute and the need to secure physical meeting spaces and allowed two nutrition educators to support a YPAR project across long distances.

As an additional benefit, youth (22%) and nutrition educators also noted the discovery and use of engaging online activities. Youth mentioned enjoying activities like Google Jamboards, check-in questions, discussions, videos and movement breaks. According to one participant, "Although it was online, the activities in the club were still engaging and allowed for communication and an interchanging of ideas between all the members." Similarly, four nutrition educators talked about their plans to use online applications and engaging activities in the future, even when delivering YPAR in person again. They expected the tools and techniques that they learned would "enhance the in-person lesson," whether these new activities and tools were only used "every once in a while" or "infused into the daily activities."

Four nutrition educators also mentioned that the online format made it easier for them to distribute and document information related to YPAR meetings. According to two nutrition educators, distributing information was easier because they could deliver information directly to the youth using a safe messaging app or a group email. In addition, youth input was easier to capture, store and reference because it was automatically recorded on Google Jamboard and other online platforms where activities took place.

Hybrid format preferred

Based on results from the retrospective survey, 45% of youth respondents preferred a hybrid format for future YPAR programming, 25% preferred in-person only and 7.5% preferred online only. Additionally, 22.5% of youth respondents selected "no preference." Youths' preference for the in-person format, either in hybrid form or fully in-person, was based on their desire for "hands-on activities," "easier" communication and more "in-depth discussions."

Similarly, four nutrition educators preferred a hybrid format, specifically a format where the majority of meetings would be conducted in-person with occasional online meetings. The other four nutrition educators preferred a fully in-person format because this made it easier for them to develop relationships, promote group socializing, and engage the youth. According to the nutrition educators, the in-person format also allowed the youth to deliver more powerful presentations and more fully celebrate their successes at the end of the school year. Notably, none of the nutrition educators preferred a fully online format.

Future program direction

When the COVID-19 pandemic caused school closures, in-person education pivoted to remote delivery. Our study contributes to the current literature aimed at understanding the challenges, strategies and benefits of



The authors' findings revealed some of the limitations of technology, including variable access to reliable internet connections and appropriate devices for youth to fully engage online. *Photo*: rfranca, iStock.

remote YPAR programming based on the perspectives of both nutrition educators and youth.

Technology — including the internet, digital equipment, and software — has been incorporated into education for some time and more recently to scale up YPAR projects (Gibbs et al. 2020). Prior exposure to educational technology benefited educators and students when the pandemic paused in-person education. Previous literature has shown the positive impact that technology can have on teaching and learning, including the ability to overcome geographical limitations (Raja and Nagasubramani 2018). Similarly, our study found that technology allowed for enhanced convenience, flexibility and creativity for both the YPAR facilitators and youth participants. At the same time, however, our findings revealed some of the limitations of technology, including variable access to reliable internet connections and appropriate devices for youth to fully engage online. These findings are consistent with data highlighting inequities in access to online learning. According to a study from the Pew Research Center, 15% of households in the United States lack high-speed internet access (Anderson and Perrin 2018). This rate jumps to 35% for households that have an annual income of less than $30,000 and school-age children, demonstrating the disproportionate impact on youth from low-income households. Additionally, 35% of teens have to use a cellphone to complete their homework at least some of the time, with the rate increasing to 45% for teens in low-income households. Since all the youth participants in these CFHL, UC YPAR projects were students at SNAP-Ed eligible schools, these issues were expected.

Our findings also align with studies highlighting that students have felt socially disconnected and have missed in-person interactions with their peers at school due to social distancing and isolation (Elmer et al. 2020; Evans et al. 2021; Zheng et al. 2021). Based on a survey of 149 pre-college students, 43% cared less about educational goals than previously and 50% felt disconnected after the transition to fully online classes during the pandemic (Lemay et al. 2021). This may explain why only a few of our youth participants and none of the nutrition educators wanted to continue online-only programming.

Considering the challenges and benefits of online education and program delivery, youth and nutrition educators who participated in this study predominantly prefer a hybrid format for future YPAR program delivery. Facilitating a YPAR project through a mix of in-person and online engagement could leverage the benefits of both approaches while also limiting their respective drawbacks. For example, in-person sessions could emphasize connection, communication, relationship-building and engagement around key project stages and tasks, while online meetings could enhance flexibility and convenience — particularly once a collective sense of the team's identity has been established or when in-person meetings are not possible. Online education tools such as Google Jamboard, Kahoot and Mentimeter as well as virtual team-building activities were promising additions to YPAR programming. These tools could continue to be used in both in-person and online sessions to support enhanced engagement, creativity and project documentation.

Strengths and limitations

This study provides timely findings that will improve understanding of online YPAR programming and help with ideas about how to modify curricula, delivery methods, and staff professional development. Overall, there were several strengths and limitations of this study. One major strength is that it is the first qualitative study to our knowledge to examine a highly engaging youth program from a SNAP-Ed nutrition educators' perspective which also integrates youth feedback in order to fully understand the implementation and reception of online YPAR programming. Secondly, data from this study were collected from racially and ethnically diverse low-income youth.

Because staff interviews were conducted over Zoom, one study limitation was the potential for the online video interview format to stymie the development of solidarity and trust between researchers and interviewees (Salerno Valdez and Gubrium 2020). Furthermore, where the interviewee shared space with others, online video interviews may have hindered their openness to sharing. Other possible limitations include the educators' varying levels of experience in conducting YPAR programs and facilitating online projects and the lack of urban sites in our population. In order to protect participants' privacy, we intentionally did not attempt to link the interview and survey data with specific respondents, settings and locations. This limited our ability to assess the implications of variation across settings and community types.

Ideas for engaging youth online

Given our findings, we offer these practical recommendations to organizations and individuals implementing YPAR projects:

1. Provide training and resources to YPAR facilitators for continued online/hybrid programming, including lessons and activities adapted to online learning with presentation slide decks; access to online educational tools such as age-appropriate mapping tools and videos; and hardware such as microphones and cameras to support online facilitation.
2. Enhance professional development support, including shadowing and mentoring opportunities with other YPAR facilitators.
3. Address youth internet access and/or equipment needs to enhance opportunities for full participation.
4. Conduct additional research to understand any differences in outcomes for youth, organizations and communities between those participating in fully online formats versus hybrid and in-person YPAR programming.

This study revealed challenges that nutrition educators faced when programs changed quickly from fully in-person to fully online due to COVID-19. Most of the nutrition educators were able to continue programming and identified several benefits and adaptive strategies associated with online delivery. Despite the isolation induced by the pandemic, many youth participants still indicated that they felt connected in meaningful ways and were in fact able to work together to improve their communities through YPAR projects. Given the ongoing uncertainty of the COVID-19 pandemic's trajectory and the realities of our increasingly connected world, this study can further guide development of resources, training approaches, and strategies to support YPAR facilitators. CA

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References

Abraczinskas M, Zarrett N. 2020. Youth participatory action research for health equity: Increasing youth empowerment and decreasing physical activity access inequities in under-resourced programs and schools. Am J Commun Psychol 66(3–4):232–43. https://doi.org/10.1002/ajcp.12433

Anderson M, Perrin A. 2018. Nearly one-in-five teens can't always finish their homework because of the digital divide. Washington, D.C.: Pew Research Center. www.pewresearch.org/fact-tank/2018/10/26/nearly-one-in-five-teens-cant-always-finish-their-homework-because-of-the-digital-divide

Bailey ZD, Krieger N, Agénor M, et al. 2017. Structural racism and health inequities in the USA: Evidence and interventions. Lancet 389(10077):1453–63. https://doi.org/10.1016/S0140-6736(17)30569-X

Braun V, Clarke V. 2006. Using thematic analysis in psychology. Qual Res Psychol 3(2):77–101. https://doi.org/10.1191/1478088706qp063oa

Bronfenbrenner U. 1977. Toward an experimental ecology of human development. Am Psychol 32(7):513–31. https://doi.org/10.1037/0003-066X.32.7.513

Cammarota J, Fine M. 2008. Youth participatory action research: A pedagogy for transformational resistance. In *Revolutionizing Education: Youth Participatory Action Research in Motion*. Cammarota J, Fine M (eds.). New York, NY: Taylor and Francis. p 1–9.

Elmer T, Mepham K, Stadtfeld C. 2020. Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. PLoS ONE 15(7):e0236337. https://doi.org/10.1371/journal.pone.0236337

Evans C, Moore R, Seitz S, et al. 2021. Youth perspectives on virtual after-school programming during the COVID-19 pandemic. J Youth Development 16(5):251–68. https://doi.org/10.5195/jyd.2021.1063

Fryar CD, Carroll M, Afful J. 2020. Prevalence of overweight, obesity and severe obesity among children and adolescents aged 2–19 years: United States, 1963–1965 through 2017–2018. Washington, D.C.: U.S. Department of Health & Human Services. www.cdc.gov/nchs/data/hestat/obesity-child-17-18/obesity-child.htm

Gibbs L, Kornbluh M, Marinkovic K, et al. 2020. Using technology to scale up youth-led participatory action research: A systematic review. J Adolescent Health 67(2S):S14–S23. https://doi.org/10.1016/j.jadohealth.2019.10.019

Kyerematen R, Oguda L, Asemota O. 2022. COVID-19 pandemic: Health inequities in children and youth. Arch Dis Child 107:297–9. http://doi.org/10.1136/archdischild-2020-320170

Lawrence EM, Mollborn S, Hummeret RA. 2017. Health lifestyles across the transition to adulthood: Implications for health. Soc Sci Med 193:23–32. https://doi.org/10.1016/j.socscimed.2017.09.041

Lemay DJ, Bazelais P, Doleck T. 2021. Transition to online learning during the COVID-19 pandemic. Comput Hum Behav Rep 4:100130. https://doi.org/10.1016/j.chbr.2021.100130

London JK, Zimmerman K, Erbstein N. 2003. Youth-led research and evaluation: Tools for youth, organizational, and community development. New Dir Eval (98):33–45. https://doi.org/10.1002/ev.83

Louie B, Xiong N, Erbstein N, et al. 2018. Building together: Developing key partnerships to support youth-led participatory action research in CalFresh Healthy Living, University of California programming, UC Davis Center for Regional Change. https://regionalchange.ucdavis.edu/report/building-together

Louie B, Erbstein N. 2020. Tips for facilitating youth participatory action research (YPAR) remotely. UC Davis Center for Regional Change. https://regionalchange.ucdavis.edu/sites/g/files/dgvnsk986/files/inline-files/CFCL%20Remote%20YPAR%20Tips.pdf

McCullough ML, Chantaprasopsuk S, Islami F, et al. 2022. Association of socioeconomic and geographic factors with diet quality in US adults. JAMA Netw Open 5(6):e2216406. https://doi:10.1001/jamanetworkopen.2022.16406

Odoms-Young A, Bruce, MA. 2018. Examining the impact of structural racism on food insecurity. Fam Community Health 41:S3–S6. https://doi.org/10.1097/FCH.0000000000000183

Ohri-Vachaspati P, DeLia D, DeWeese RS, et al. 2014. The relative contribution of layers of the Social Ecological Model to childhood obesity. Public Health Nutr 18(11):2055–66. https://doi.org/10.1017/S1368980014002365

Ozer EJ. 2017. Youth-led participatory action research: Overview and potential for enhancing adolescent development. Child Dev Perspect 11(3):173–7. https://doi.org/10.1111/cdep.12228

Raja R, Nagasubramani PC. 2018. Impact of modern technology in education. J Appl Advanced Res 3:33–5. https://doi.org/10.21839/jaar.2018.v3iS1.165

Salerno Valdez E, Gubrium A. 2020. Shifting to virtual CBPR protocols in the time of Corona Virus/COVID-19. Int J Qual Meth 19. https://doi.org/10.1177/1609406920977315

Svastisalee CM, Holstein BE, Due P. 2012. Fruit and vegetable intake in adolescents: Association with socioeconomic status and exposure to supermarkets and fast food outlets. J Nutr Metab. Article ID 185484. https://doi.org/10.1155/2012/185484

Wallerstein NB, Duran B. 2006. Using community-based participatory research to address health disparities. Health Promot Pract 7(3):312–23. https://doi.org/10.1177/1524839906289376

Zheng W, Yu F, Wu YJ. 2021. Social media on blended learning: The effect of rapport and motivation. Behav Inform Technol 41(9):1941–51. https://doi.org/10.1080/0144929X.2021.1909140