

# Using the Tools of Today to Advance the Life Course Interventions of Tomorrow

Shari Barkin, MD, MSHS,<sup>a</sup> Sarah Verbiest, DrPH, MSW, MPH,<sup>b</sup> Jerica Berge, PhD, MPH<sup>c</sup>

Life course research recognizes that health and disease can be facilitated or exacerbated by social, physical, and biologic contexts over time. Obesity, with its long-term complications including cardiovascular disease, type 2 diabetes, and some forms of cancer, begins in childhood and, if not averted, is a major predictor of adult poor health outcomes and shortened lifespan.<sup>1</sup> Life course interventions to prevent and treat obesity address multiple contexts, from biologic to sociologic, with consideration for childhood developmental timing. The timing of these interventions varies, starting as early as pregnancy and spanning infancy, toddlerhood, preschool, school-age, and adolescence. These interventions also are implemented in a variety of settings, including

clinic, school, community, and home settings. Yet, these obesity life course interventions produce variable outcomes, from no effect to modest effect.<sup>2</sup>

## THE QUESTION IS WHY

It is clear that a one-size-fits-all approach does not work when it comes to obesity life course interventions. For example, behavioral interventions designed to improve nutrition and physical activity, 2 major behavioral drivers of obesity, work for some children but not others.<sup>3</sup>

Specifically, effective interventions tend to work better in higher socioeconomic status populations, provide a higher “dose” of the intervention over a longer period of

time,<sup>4</sup> and include a family-based approach involving at least 1 family member, as well as the child. Paul et al<sup>4</sup> reported on a responsive infant parenting intervention that improved early growth trajectories and reduced later childhood obesity. A critical element of success was the ability to go into the home setting and tailor the approach to achieve improved outcomes.

Another example of a successful life course intervention is the Maternal, Infant, and Early Childhood Home Visiting program. These programs reach populations that have been marginalized by physically going into the participant’s home during pregnancy and early childhood, with some addressing social determinants of health. Over decades, this and other home visiting programs have



<sup>a</sup>Department of Pediatrics, Division of General Pediatrics, Vanderbilt University Medical Center, Nashville, Tennessee; <sup>b</sup>Jordan Institute for Families and Collaborative for Maternal and Infant Health, University of North Carolina School of Social Work, Chapel Hill, North Carolina; and <sup>c</sup>Department of Research, Healthy Eating and Activity Across the Life Course, University of Minnesota, Minneapolis, Minnesota

Dr Barkin developed the concept, drafted the initial manuscript, and reviewed and revised it; Drs Berge and Verbiest reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

The information, content and/or conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by, the Health Resources and Services Administration, the US Department of Health and Human Services, or the US government.

**DOI:** <https://doi.org/10.1542/peds.2021-053509N>

Accepted for publication Oct 27, 2021

Address correspondence to Shari Barkin, MD, Department of Pediatrics, Vanderbilt University Medical Center, 2200 Children’s Way, Suite 2404, Nashville, TN 37232. E-mail: shari.barkin@vumc.org

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2022 by the American Academy of Pediatrics

**FUNDING:** Dr Barkin received award #3U54MD010722-05S1 (Access Equity: An Opportunity to Build Telemedicine to Reach Diverse Populations Effectively) from the National Institute on Minority Health and Health Disparities. Dr Berge received grant R61/33 (HL151978; The Family Matters Intervention), funded by the National Institutes of Health/National Heart, Lung, and Blood Institute. This project is also supported by the Health Resources and Services Administration of the US Department of Health and Human Services under award #UA6MC32492 and the Life Course Intervention Research Network. Funded by the National Institutes of Health (NIH).

**CONFLICT OF INTEREST DISCLAIMER:** The authors have indicated that they have no potential conflicts of interest to disclose.

provided home-based services for pregnant women and families with children from underresourced communities from birth through kindergarten age, striving to ensure that all children receive nurturing care from their family to promote child health. These evidence-based models result in improved pregnancy outcomes and other reflections of maternal health and well-being, including improved indicators of education and employment, reduced stress and depression, and improved financial security. Children experience reduced rates of child abuse/neglect, fewer behavioral/developmental problems, improved school performance, and improved health care use.<sup>5</sup> However, although effective, these interventions are costly and therefore tend to only reach a small percentage of the population who need them.

#### **ENTER VIRTUAL CARE DELIVERY**

Identifying and using the technologic tools of today that could mirror effective home-based approaches could be a cost-effective way to expand reach. The coronavirus disease 2019 (COVID-19) pandemic introduced novel approaches to reach families where they live.

Through direct-to-family video telehealth approaches, providers were brought directly into a family's context, able to see their living space. In a video telehealth equity study conducted at Vanderbilt University Medical Center, 80% of patients from diverse populations accessed telehealth using their mobile phones. Both parent and child introduced the provider to the other family members and showed the research team "around" their home. This provided a new perspective and deeper understanding of their home context. Some even took the visit outside of their home to show

where they play or why they do not go outside to play. They provided information on what food was available in their pantry and refrigerator and what kitchen equipment they could use for cooking. Whereas, for the typical in-person visit, patients have difficulty recalling medication names, in the case of video telehealth, they showed us their medications (including over-the-counter medications). All this information, typically not shared as part of an in-person visit in another setting such as the clinic, school, or community center, allowed the provider team to tailor recommendations to the patients' unique context.

In another example, the Family Matters intervention, a National Institutes of Health-funded study, needed to pivot to provide "in-home" visits virtually because of the COVID-19 pandemic restrictions. This intervention includes community health workers conducting in-home visits and using mobile health technologies to intervene on familial stress in multigenerational households of children aged 5 to 9 to increase healthy home food environments. A critical component of this life course intervention is exposing the entire family system to the intervention, increasing the likelihood of success and sustainability. Moving to a virtual in-home visiting platform allowed for convenience in family scheduling of in-home virtual visits, resulting in more family members being available to participate in the intervention and for more visits to be successfully completed.

Another project that used telehealth approaches, The Maternal Health Access Project, increased access to perinatal support services. This project included training community health workers, lactation specialists, doulas, and maternal support group leaders about how to serve women

and families of color via these virtual platforms. Families also received needed supplies to support their ability to connect (internet access, devices, training about how to engage virtually). Whether remote blood pressure monitoring or baby cafes (providing lactation support), once community workers had the tools they needed, they were able to successfully care for families in new and more accessible ways. Although full remote care is now optional, the capacity to provide more flexible, person-centered support opens a new world of opportunity for expanded services over time.

#### **IN SHORT, THESE VIRTUAL LIFE COURSE INTERVENTIONS CAN BE A GAME CHANGER**

Video telehealth is not new. Before the COVID-19 pandemic, telehealth typically occurred by bringing a patient into the clinic, where someone would assess them, set up the computer, and initiate contact to a specialist in another clinic. This remote clinician had the ability to direct a nurse to assess the patient, allowing the specialist to "examine" the patient from a distance. However, the pandemic spurred major telehealth policy changes that allowed direct-to-patient video telehealth with patients using their own digital devices from their homes. It is this direct-to-patient approach that allows us to have a new tool in our life course intervention toolkit.

Specifically, including video telehealth allows for a contextual home-setting assessment that provides essential tailoring information to maximize intervention effectiveness. This capacity is especially important when working with disadvantaged populations for whom it is more difficult to obtain equivalent outcomes from life course

interventions than for more affluent populations. One important difference may be the presence of barriers that affect the intensity or frequency of interventions, including such things as lack of transportation or child care. Many barriers can be addressed using a video telehealth approach that obviates the need to travel. Video telehealth alone can facilitate more regular participation by removing this common barrier. Alternatively, it could be paired with in-person approaches, providing an assessment of patients' home environments in a way that merely asking about that environment could not. As with any intervention modality, researchers also need to consider unintended risks. In the case of "seeing" the home environment virtually, concerns could arise and might need to be elevated if children are at risk for abuse or neglect. However, this is not different from current in-person home visits. In both cases, families need to be informed of potential risks before participating in either a virtual or in-person home visit.

Telehealth has obvious value as it changes the typical medical encounter. It also can contribute to new ways of carrying out research. Telehealth has potential major implications for how, where, and by whom health research can be conducted. Traditionally, research has taken place in hospitals, clinics, and community settings such as schools or community centers, but

the locus of research could now be a virtual platform removing a physical place as the meeting point. This means subjects can be recruited remotely and their home circumstances documented remotely. Interventions could be conducted in real-time and real-life settings and data could be collected through apps and new technologies and devices that are proliferating daily. In the Family Matters study, data collection of weight, height, waist circumference shifted to telehealth platforms with a data collector coaching via video to ensure high-quality data collection. In this study, offering a virtual platform approach resulted in higher involvement of the entire family and more complete data on all family members.

Direct-to-patient video telehealth interventions can be cost-effective, individually tailored, and reach diverse populations. Its use can remove barriers and increase the ability to deliver more of the intervention "dose," while including the family in the process. At the same time, a concerted effort is needed to achieve and maintain equity to equipment and bandwidth that supports telehealth interventions. Furthermore, although telehealth visits hold high promise, it is also important to address other patient barriers, such as imaging or blood draw appointments that require in-person visits. Properly implemented, adding

this tool could enhance these interventions that set the stage for lifelong behavior changes to improve lifelong health.

The idea is simple, the potential outcome profound.

#### ABBREVIATION

COVID-19: coronavirus disease 2019

#### REFERENCES

1. Eriksson JG, Kajantie E, Lampl M, Osmond C. Trajectories of body mass index amongst children who develop type 2 diabetes as adults. *J Intern Med*. 2015; 278(2):219–226
2. Waters E, de Silva-Sanigorski A, Hall BJ, et al. Interventions for preventing obesity in children. *Cochrane Database Syst Rev*. 2011;(12):CD001871
3. Barkin SL, Heerman WJ, Sommer EC, et al. Effect of a behavioral intervention for underserved preschool-age children on change in body mass index: a randomized clinical trial. *JAMA*. 2018; 320(5):450–460
4. Paul IM, Savage JS, Anzman-Frasca S, et al. Effect of a responsive parenting educational intervention on childhood weight outcomes at 3 years of age: the INSIGHT randomized clinical Trial. *JAMA*. 2018;320(5):461–468
5. Home Visiting Evidence of Effectiveness. Publications. U.S. Department of Health & Human Services. Available at: <https://homvee.acf.hhs.gov/publications/articles>. Accessed July 1, 2021