



## Short communication

# Adapting the National Diabetes Prevention Program: Learning from Lifestyle Coach strategies and adjustments during the COVID-19 pandemic in the United States

Madelyn Whitaker<sup>a,\*</sup>, Megha Shah<sup>b</sup>, Manuel Gutierrez Chavez<sup>a</sup>, Anu Asnaani<sup>a</sup>,  
Cassidy A. Gutner<sup>c</sup>, Natalie D. Ritchie<sup>d</sup>, Katherine J.W. Baucom<sup>a</sup>

<sup>a</sup> Department of Psychology, University of Utah, 380 1530 E, Salt Lake City, UT 84112, USA

<sup>b</sup> Department of Family and Preventive Medicine, Emory University School of Medicine, 100 Woodruff Circle, Atlanta, GA 30322, USA

<sup>c</sup> Department of Psychiatry, Boston University School of Medicine, 720 Harrison Avenue, Room 906, Boston, MA 02118, USA

<sup>d</sup> Kaiser Permanente Center for Health Research, 3800 N. Interstate Avenue, Portland, OR 97227, USA

## ARTICLE INFO

## Keywords:

Diabetes prevention program  
Lifestyle intervention  
COVID-19  
Adaptations  
Remote delivery  
Distance learning  
Qualitative analysis

## ABSTRACT

**Background:** The National Diabetes Prevention Program (National DPP) is an evidence-based lifestyle intervention successfully disseminated across the United States. Some adaptations have been made to address real-world needs, including during the COVID-19 pandemic. This study aims to qualitatively describe adaptations Lifestyle Coaches made in response to the pandemic.

**Methods:** Between May and June 2021, Lifestyle Coaches ( $n = 300$ ) from organizations across the United States answered open-ended survey questions about adjustments implemented during the pandemic. Survey responses were descriptively coded and codes were grouped into categories.

**Results:** Nearly all coaches transitioned the format of their class from in-person to remote delivery (93.0 %;  $n = 279$ ). Other commonly-reported strategies included adjusting contact with participants (48.0 %;  $n = 144$ ), increasing support for participants (36.7 %;  $n = 110$ ), and tailoring materials (28.3 %;  $n = 85$ ).

**Conclusions:** Maintaining these adaptations may address barriers to engagement in the National DPP and improve access to the program. Increased support for emotional symptoms and ensuring a patient-centered approach to care are particularly promising strategies.

## 1. Introduction

Diabetes affects 34.2 million Americans and is associated with high morbidity and mortality (Centers for Disease Control and Prevention, 2022). The COVID-19 pandemic further exacerbated the public health burden of diabetes, with a bidirectional relationship in which diabetes is linked to more severe COVID-19 infection (Smith et al., 2021), and infection may contribute to new-onset diabetes (Khunti et al., 2023). Therefore, effective diabetes prevention strategies are needed more than ever, especially as the COVID-19 virus becomes endemic to society. The Centers for Disease Control and Prevention's (CDC) National Diabetes Prevention Program (National DPP) is an evidence-based lifestyle intervention that aims to improve nutrition, increase physical activity, and promote weight loss in individuals at risk for type 2 diabetes (Gruss et al., 2019). The National DPP is facilitated by trained Lifestyle Coaches

and delivered in a variety of community-based, healthcare, and private settings in the United States.

The National DPP was initially designed for in-person delivery. Over time, the CDC expanded the delivery formats to include distance-learning (e.g., phone- and video-conferencing) and online modalities (e.g., mobile applications) (Cannon et al., 2022). Attendance and weight loss outcomes in distance-learning diabetes prevention programs can be equivalent to those achieved with in-person delivery (Vadheim et al., 2017). However, prior to the COVID-19 pandemic, delivery of the National DPP via distance-learning was uncommon (Cannon et al., 2022; Centers for Disease Control and Prevention, 2022), reaching just 1 % of National DPP participants by 2019. (Cannon et al., 2022) Prior to the pandemic, the majority (92.5 %) of organizations delivering the National DPP exclusively provided in-person group classes (Centers for Disease Control and Prevention, 2022). Further, the Centers for

\* Corresponding author.

E-mail address: [Madelyn.whitaker@psych.utah.edu](mailto:Madelyn.whitaker@psych.utah.edu) (M. Whitaker).

<https://doi.org/10.1016/j.pmedr.2024.102847>

Received 20 March 2024; Received in revised form 31 July 2024; Accepted 1 August 2024

Available online 3 August 2024

2211-3355/© 2024 Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Medicare and Medicaid Services (CMS) only provided coverage for in-person delivery (except during the public health emergency) (Centers for Medicare Medicaid Services, 2023).

Aside from delivery format, retention also complicates National DPP outcomes. Although completion of the program is key to outcomes (Gruss et al., 2019), just 10 % of individuals who begin the National DPP actually complete the year-long program (Ely et al., 2017). Low retention rates disproportionately impact communities that are marginalized, highlighting the need to adapt the National DPP to promote health equity (Cannon et al., 2020). Understanding adaptations made by Lifestyle Coaches in response to the pandemic may reveal insights for improving National DPP delivery and retention of participants, especially given concerns related to the limited reach and retention of participants in traditional in-person classes (Gruss et al., 2019).

Recent studies have described challenges for National DPPs due to the pandemic, including the difficulties with recruitment and retention (Spence et al., 2022; Bullock et al., 2023), the positives and negatives of transitioning to virtual delivery (Bullock et al., 2023; Wilson et al., 2022), and the need for increased support and communication (Bullock et al., 2023; Wilson et al., 2022), but these studies have limited

generalizability. One study included a nationwide sample but was restricted to the pharmacy setting (Spence et al., 2022), while other studies with more representative settings only sampled specific regions (Bullock et al., 2023; Wilson et al., 2022). Therefore, the goal of this project is to describe adaptations made in response to the COVID-19 pandemic from Lifestyle Coaches across a range of organizations in the United States.

## 2. Methods

Lifestyle Coaches with experience delivering the National DPP to at least one year-long cohort were eligible for this cross-sectional survey study. The research team emailed study information and a link to an online screening form to contacts at all organizations with “Preliminary” or “Full” recognition for their National DPP as designated by the CDC (National Diabetes Prevention Program, 2021). The surveys were completed between May and June 2021. The University of Utah Institutional Review Board (IRB # 137848) approved all study procedures and participants were provided with a consent cover letter prior to participation.

Lifestyle Coaches received a \$10 electronic gift card for completing a 30-minute online questionnaire about their experience delivering the National DPP. The questionnaire included items related to their background, training, and broader experiences with National DPP delivery. Two open-ended questions asked Lifestyle Coaches to describe the adaptations made to their classes and additional strategies they employed to support participants during the pandemic.

Demographic information for Lifestyle Coaches was analyzed descriptively. The first author coded and analyzed all open-ended responses using a qualitative descriptive inductive approach (Sandelowski, 2000). Initially, the author read all responses to the two items to formulate open coding dimensions. Given the similarity of responses across the two items, responses were collapsed for coding purposes. The author re-read and coded the content of responses in ATLAS.ti (Friese et al., 2018) using all applicable codes. Constant comparison was used to validate the codes, and (Sandelowski, 2000) similar codes were grouped into five overarching categories. Codes and categories were reviewed with the last author, who has expertise in qualitative description.

## 3. Results

Of the 335 Lifestyle Coaches eligible for the study, 305 completed the survey (91.0 % response rate). We analyzed responses from 300 Lifestyle Coaches (98.4 %) who responded to the open-ended questions about adaptations and additional strategies. As shown in Table 1, the majority of these Lifestyle Coaches identified as non-Hispanic white (77.3 %) and female (94.0 %), and had a Bachelor's degree or higher level of education (84.4 %). Their mean age was 47.9 years (SD=13.3). Most Lifestyle Coaches delivered the National DPP at organizations with Full CDC recognition (75.3 %), indicating successful retention and lifestyle change among their participants. Lifestyle Coaches delivered the program across various settings; including Hospital/Healthcare Systems (33.0 %), Community-Based Organizations/Community Health Centers/Federally Qualified Health Centers (13.3 %), YMCAs (12.7 %), and State or Local Health Departments (12.0 %).

The qualitative analysis of the open-ended responses yielded several key findings. The responses were grouped into four overarching categories based on the codes assigned: (1) Changing class format, (2) Changing contact with participants, (3) Increasing support of participants, and (4) Tailoring materials and resources (Table 2). Nearly all Lifestyle Coaches changed their class format (93.0 %;  $n = 279$ ), most frequently from in-person to a remote delivery format (79.6 %;  $n = 239$ ), via either unspecified remote delivery (53.3 %;  $n = 160$ ) or to a specified distance-learning format including video- or phone-conferencing (26.3 %;  $n = 79$ ). Less commonly, Lifestyle Coaches continued in-person classes with COVID safety procedures (e.g., masks, social distancing,

**Table 1**

Demographic characteristics of Coaches in the National Diabetes Prevention Program from May to June 2021.

Characteristic	<i>n</i> (%)
<b>Ethnicity and Race*</b>	
Non-Hispanic white	232 (77.3)
Hispanic/Latino/a	27 (9.0)
African American/Black	19 (6.3)
Arab/Middle Eastern	1 (0.3)
East/Southeast/South Asian	9 (3.0)
Native American/ Alaskan Native	7 (2.3)
Multiracial	4 (1.3)
<b>Sex*</b>	
Female	282 (94.0)
Male	16 (5.3)
Other	1 (0.3)
<b>Highest Level of Education*</b>	
Some high school	1 (0.3)
High school diploma or equivalent	4 (1.3)
Associate's degree/Technical certificates/Some college	35 (11.7)
Bachelor's degree	122 (40.7)
Master's degree	117 (39.0)
Doctorate or professional degree (e.g., PhD, MD)	14 (4.7)
Other	5 (1.7)
<b>Setting</b>	
Hospital/Healthcare System/Medical Group/Physician Practice	99 (33.0)
Community-Based Organization/Community Health Center/Federally Qualified Health Center	40 (13.3)
Local or Community YMCA	38 (12.7)
State/Local Health Department	36 (12.0)
For-Profit Private Business	16 (5.3)
University/School	15 (5.0)
Indian Health Service/Tribal/Urban Indian Health System	10 (3.3)
Senior/Aging/Elder Center	5 (1.7)
Health Plan/Insurer	5 (1.7)
Worksite/Employee Wellness Program	4 (1.3)
Faith-Based Organization/Church	4 (1.3)
Pharmacy/ Drug Store/Compounding Pharmacy	4 (1.3)
Business Coalition on Health/ Cooperative Extension Site	3 (1.0)
Other	21 (7.0)
<b>Organization Recognition Status*</b>	
Full	226 (75.3)
Preliminary	51 (17.0)

Note: N=300; \*For Ethnicity/ Race ( $n = 1$ ), Sex ( $n = 1$ ), Education ( $n = 2$ ) and Organization Recognition Status ( $n = 23$ ) some participants did not complete the item.

**Table 2**

Adjustments and Strategies Used by Coaches in the National Diabetes Prevention Program in Response to the COVID-19 Pandemic from May to June 2021.

Adjustment/Strategy	Exemplars (Case ID)	n	% <sup>a</sup>
<b>Changing Class Format</b>		279	<b>93.0</b>
Unspecified remote format	All classes are virtual (22)	160	53.3
Distance-learning	We ended up teaching cohorts over Zoom that we had started in-person (276)	79	26.3
COVID procedures	Moving to a café for larger space to support social distancing (46)	23	7.7
Hybrid classes	Offered hybrid program where people could attend either in-person or link in virtually on their computer (415)	13	4.3
Specified online curriculum	We offer HALT, a CDC-approved online curriculum (397)	4	1.3
<b>Changing Contact with Participants</b>		144	<b>48.0</b>
Contact by phone	More frequent phone calls or personal text messages (269)	51	17.0
Contact by email	Emails in the off weeks to continue engagement (256)	49	16.3
Unspecified increased contact	We are incorporating more communication between the coaches and participants (408)	38	12.7
Social media outreach	More communication through social media (338)	6	2.0
<b>Increasing Support of Participants</b>		110	<b>36.7</b>
Increasing engagement generally	Be creative connecting with participants, continue to inspire them and support their efforts (213)	49	16.3
Providing emotional support	We recognized that COVID-19 presented an additional layer of stress in their lives, and many of them needed more emotional support during that time (287)	26	8.7
One on one interactions	Checking in on them one on one more often (451)	22	7.3
Providing technology support	Technology help sessions to navigate virtual technology (361)	13	4.3
<b>Tailoring Materials and Resources</b>		85	<b>28.3</b>
Content tailoring	Adjusted materials to meet the current barriers with social distancing, inability to go to gym, how to find social support etc. (223)	40	13.3
Providing at home resources	Sent body weight scales and/or web cameras to those in need (267)	32	10.7
Adding related content and resources	Invite them to participate in online nutrition classes and physical activity classes with YMCA (466)	15	5.0
<b>No Changes/ Not Applicable</b>		52	<b>17.3</b>
Not applicable	N/A (200)	21	7.0
Stopped program	We did not run a cohort during 2020 because we were helping out with COVID relief (298)	23	7.7
No changes	We already hold our programs in an app and virtual setting, few changes were made (297)	8	2.7

Note. All responses from 300 Lifestyle Coaches were qualitatively coded; answers from the two questions were combined given the similarity of the questions; items that were left blank were not considered in the coding process.

7.7 %;  $n = 23$ ), used combined in-person and virtual classes (4.3 %;  $n = 13$ ), or specified online programs (e.g., HabitNu, 1.3 %;  $n = 4$ ).

Lifestyle Coaches reported the use of various contact methods to improve communication with participants (48.0 %;  $n = 144$ ), including phone (17.0 %;  $n = 51$ ), email (16.3 %;  $n = 49$ ), and social media (2.0 %;  $n = 6$ ). A number of Lifestyle Coaches also reported increased contact with participants overall (12.7 %;  $n = 38$ ).

Lifestyle Coaches also provided additional support to participants to address personal difficulties (36.7 %;  $n = 110$ ), including extra emotional support (8.7 %;  $n = 26$ ) and one-on-one interactions (7.3 %;  $n = 22$ ). Several coaches incorporated interactive components, such as games (e.g., icebreakers or puzzles, 16.3 %;  $n = 49$ ). Lastly, some coaches provided training in technology use to help participants access classes remotely (4.3 %;  $n = 13$ ).

Nearly a third of Lifestyle Coaches adapted program materials to address COVID-related concerns (28.3 %;  $n = 85$ ). Adapting program content was frequently reported (13.3 %;  $n = 40$ ), with coaches adjusting materials to accommodate barriers related to social distancing (e.g., lack of access to gyms, lack of social support). Coaches also provided their participants with home resources to use at home, such as scales or tablets (10.7 %;  $n = 32$ ), and offered supplementary content such as videos, webinars, and articles (5.0 %;  $n = 15$ ).

Lastly, a subset of Lifestyle Coaches reported that one or both questions regarding COVID-related adaptations were not applicable to their National DPP delivery (17.3 %;  $n = 52$ ). Most coaches in this category did not indicate why the questions were not applicable (7.0 %;  $n = 21$ ), but some specified that their organizations temporarily stopped their program (7.7 %;  $n = 23$ ) or did not make changes in response to the pandemic (2.7 %;  $n = 8$ ).

#### 4. Discussion

In response to the COVID-19 pandemic, Lifestyle Coaches adapted their National DPP classes by shifting to remote delivery, improving communication with participants, providing individualized support, and adjusting program materials. These adaptations may address identified barriers to participation in the National DPP. The most frequent

adaptation was remote delivery, which aligns with previous studies in pharmacy National DPPs (Spence et al., 2022), university National DPPs (Wilson et al., 2022), and National DPPs in Los Angeles County (Bullock et al., 2023). Remote delivery appears key to addressing gaps in geographic coverage of in-person classes (Ritchie et al., 2020). Additionally, by eliminating transit time and providing more flexibility, remote delivery may solve barriers to National DPP participation, such as lack of transportation (Ritchie et al., 2021) and conflicting work or school schedules (Baucom et al., 2022).

Recent research also suggests that distance learning and online versions of the National DPP implemented during the pandemic achieved better outcomes than in-person programs conducted before the pandemic (Barron et al., 2022; Welshons et al., 2023). For example, participants who completed a remote delivery version of the National DPP attained greater weight loss (i.e., average of 7.7 % body weight loss) compared with participants completing the in-person classes (4.7 %) (Welshons et al., 2023). Additionally, distance learning and online programs attracted participants who were significantly younger and/or had significantly higher weights (Barron et al., 2022), suggesting these formats may address gaps in reaching young adults with diabetes risks (Gruss et al., 2019).

However, remote programs have lower recruitment rates for participants of color and are primarily offered through employee and insurance benefits (Cannon et al., 2022). Thus, although remote delivery may increase access for some, the potential advantages may be limited among those without access to technology, consistent internet, or insurance and employment benefits (Cannon et al., 2022). The findings from our study and previous research add to the evidence supporting Medicare coverage of distance-learning formats beyond its current expiration date of December 2023 (Centers for Medicare & Medicaid Services, 2023; Spence et al., 2022). Additionally, the United States has dedicated funds to improving broadband internet access in rural communities, which may further alleviate barriers to remote delivery programs (U.S. Department of Agriculture, 2021). Lastly, loaning technology equipment and providing training for accessing this equipment may improve recruitment and retention (Bullock et al., 2023).

Personalized support, such as providing training for technology use,

in the National DPP may not only reduce barriers to remote delivery but also improve health behavior change efforts broadly in remote interventions. Our findings align with recent research emphasizing the importance of personalized communication and support from Lifestyle Coaches in overcoming barriers to health behavior change during the pandemic (Bullock et al., 2023; Wilson et al., 2022). Behavioral support provided through video-conferencing and personal communication methods (e.g., email, text, phone) may be especially important for achieving program goals in the context of remote delivery, as remote interventions with this support lead to nearly 1 % greater body weight loss compared with remote interventions without this support (Joiner et al., 2017). Further, Lifestyle Coaches identify participants' emotional symptoms among the top barriers to both participation and lifestyle change (Baucom et al., 2022), highlighting the potential for behavioral supports that address emotional symptoms and stress. Overall, our results suggest that tailoring the National DPP to the needs of individuals and specific communities may enhance program delivery compared to a standardized approach.

A unique contribution of this study is its illustration that Lifestyle Coaches across a wide range of settings and regions of the country can rapidly adapt their programs to address changing contexts to meet population health needs. Nonetheless, this study has limitations, including its exclusive focus on the perspectives of Lifestyle Coaches rather than participants and a lack of focus on the utility of these adjustments. Further research is needed to assess the impact of these adaptations on program outcomes. Furthermore, open-ended online survey items likely limited the amount of information shared compared with other qualitative methods, such as individual or focus group interviews.

## 5. Conclusion

Findings from this nationwide study of Lifestyle Coaches validate and extend previous research in this area. Our results highlight that adaptations made by Lifestyle Coaches can address barriers to National DPP participation and are consistent with previous studies demonstrating the effectiveness of remote delivery combined with behavioral support. These adjustments have the potential to enhance National DPP program outcomes and effectively reach and retain a larger number of participants at risk of developing diabetes. Despite the COVID-19 pandemic subsiding, distance-learning and related strategies should be further developed and implemented to ensure sustained improvements in program delivery and impact.

## 6. Informed consent and patient details

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The University of Utah Institutional Review Board approved all study procedures (IRB # 137848). Informed consent was obtained from all individual participants included in the study.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Institutes of Health (grant numbers K23DK115820 [PI: Katherine J.W. Baucom], K23MD015088 [PI: Megha Shah]); a Faculty Pilot Grant from University of Utah's Driving Out Diabetes, a Larry H. Miller Family Wellness Initiative (PI: Katherine J.W. Baucom); and a Research Incentive Seed Grant from the College of Social & Behavioral Sciences and University of Utah Vice President for Research (PI: Katherine J.W. Baucom). The contents of this publication are solely the responsibility of the authors and do not represent official

views of the funding organizations.

## Declaration of Generative AI and AI-assisted technologies in the writing process

During the final editing of this manuscript, the authors incorporated the use of ChatGPT to improve readability. All edits were carefully reviewed to assure appropriate language and the authors take full responsibility for the content of the publication

## CRediT authorship contribution statement

**Madelyn Whitaker:** Writing – review & editing, Writing – original draft, Formal analysis. **Megha Shah:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Manuel Gutierrez Chavez:** Writing – review & editing, Conceptualization. **Anu Asnaani:** Writing – review & editing, Conceptualization. **Cassidy A. Gutner:** Writing – review & editing, Conceptualization. **Natalie D. Ritchie:** Writing – review & editing, Funding acquisition, Conceptualization. **Katherine J.W. Baucom:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

## 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.

## Data availability

The authors do not have permission to share data.

## References

- Barron, E., Bradley, D., Safazadeh, S., et al., 2022. Effectiveness of digital and remote provision of the Healthier You: NHS Diabetes Prevention Programme during the COVID-19 pandemic. *Published Online Diabet Med.* e15028.
- Baucom, K.J.W., Bauman, T., Gutierrez Chavez, M., et al., 2022. Barriers to participation and lifestyle change among lower versus higher income participants in the National Diabetes Prevention Program: lifestyle coach perspectives. *Transl. Behav. Med.* 12 (8), 860–869. <https://doi.org/10.1093/tbm/ibac032>.
- Bullock, S.L., Menendez, T., Schwarte, L., et al., 2023. Transitioning to telehealth during COVID-19: experiences and insights from diabetes prevention and management program providers in Los Angeles County. *Diabetology.* 4 (1), 46–61.
- Cannon, M.J., Masalovich, S., Ng, B.P., et al., 2020. Retention among participants in the national diabetes prevention program lifestyle change program, 2012–2017. *Diabetes Care* 43 (9), 2042–2049. <https://doi.org/10.2337/dc19-2366>.
- Cannon, M.J., Ng, B.P., Lloyd, K., Reynolds, J., Ely, E.K., 2022. Delivering the National Diabetes Prevention Program: assessment of enrollment in in-person and virtual organizations. *J. Diab. Res.* 2022 <https://doi.org/10.1155/2022/2942918>. Saisho Y, ed.2942918.
- Centers for Disease Control and Prevention, 2022. The National Registry of Recognized Diabetes Prevention Programs. US Dep Health Hum Serv. Published online <https://dppr.cdc.gov/Registry>.
- Centers for Disease Control and Prevention, 2022. National Diabetes Statistics Report. US Dep Health Hum Serv. Published online. <https://www.cdc.gov/diabetes/data/statistics-report/index.html>.
- Centers for Medicare & Medicaid Services. Medicare Program; Extending the Medicare Diabetes Prevention Program's (MDPP) Expanded Model Emergency Policy Through CY 2023. <https://www.federalregister.gov/documents/2023/05/02/2023-09188/medicare-program-extending-the-medicare-diabetes-prevention-programs-mdpp-expanded-model-emergency>.
- Ely, E.K., Gruss, S.M., Luman, E.T., et al., 2017. A national effort to prevent type 2 diabetes: participant-level evaluation of CDC's national diabetes prevention program. *Diabetes Care* 40 (10), 1331–1341. <https://doi.org/10.2337/dc16-2099>.
- Friese, S., Soratto, J., Pires, D., 2018. Carrying out a computer-aided thematic content analysis with ATLAS.ti. *MMG Work Pap.* 18. <http://hdl.handle.net/21.11116/0000-0001-364E-C>.
- Gruss, S.M., Nhim, K., Gregg, E., Bell, M., Luman, E., Albright, A., 2019. Public health approaches to type 2 diabetes prevention: the US national diabetes prevention program and beyond. *Curr. Diab. Rep.* 19 (9), 78. <https://doi.org/10.1007/s11892-019-1200-z>.
- Joiner, K.L., Nam, S., Whittemore, R., 2017. Lifestyle interventions based on the diabetes prevention program delivered via eHealth: A systematic review and meta-analysis. *Prev. Med.* 100, 194–207. <https://doi.org/10.1016/j.jypmed.2017.04.033>.



- Khunti, K., Valabhji, J., Misra, S., 2023. Diabetes and the COVID-19 pandemic. *Diabetologia* 66 (2), 255–266.
- National Diabetes Prevention Program. Requirements for CDC Recognition. *Cent Dis Control Prev.* Published online 2021. Accessed August 18, 2022. <https://www.cdc.gov/diabetes/prevention/requirements-recognition.htm>.
- Ritchie, N.D., Sauder, K.A., Gritz, R.M., 2020. Medicare Diabetes Prevention Program: where are the suppliers? *Am. J. Manag. Care* 26 (6), e198–e201. <https://doi.org/10.37765/ajmc.2020.43496>.
- Ritchie, N.D., Phimphasone-Brady, P., Sauder, K.A., Amura, C.R., 2021. Perceived barriers and potential solutions to engagement in the national diabetes prevention program. *ADCES Pract.* 9 (1), 16–20. <https://doi.org/10.1177/2633559X20966275>.
- Sandelowski, M., 2000. Whatever happened to qualitative description? *Res. Nurs. Health* 23 (4), 334–340. [https://doi.org/10.1002/1098-240X\(200008\)23:4<334::AID-NUR9>3.0.CO;2-G](https://doi.org/10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G).
- Smith, S.M., Boppana, A., Traupman, J.A., et al., 2021. Impaired glucose metabolism in patients with diabetes, prediabetes, and obesity is associated with severe COVID-19. *J. Med. Virol.* 93 (1), 409–415. <https://doi.org/10.1002/jmv.26227>.
- Spence, R., Sisson, E.M., Dixon, D.L., 2022. Survey of CDC-recognized community pharmacies providing the National Diabetes Prevention Program and impact of the COVID-19 pandemic on program delivery. *J. Am. Pharm. Assoc.* 62 (5), 1581–1586.
- U.S. Department of Agriculture. *USDA to Make Up to \$1.15 Billion Available to Help People Living in Rural Communities Access High-Speed Internet.*; 2021. Accessed June 17, 2024. <https://www.usda.gov/media/press-releases/2021/10/22/usda-make-115-billion-available-help-people-living-rural>.
- Vadheim, L.M., Patch, K., Brokaw, S.M., et al., 2017. Telehealth delivery of the diabetes prevention program to rural communities. *Transl. Behav. Med.* 7 (2), 286–291. <https://doi.org/10.1007/s13142-017-0496-y>.
- Welshons, K.F., Johnson, N.A., Gold, A.L., Reicks, M., 2023. Diabetes prevention program outcomes by in-person versus distance delivery mode among ethnically diverse, primarily lower-income adults. *Digit Health.* 9, 20552076231173524.
- Wilson, H.K., Averill, B., Cook, G., Campbell, C.L., 2022. Implementation of the national diabetes prevention program in FCS extension during the COVID-19 pandemic: participant experiences, lessons learned. *J. Fam. Consum. Sci.* 114 (3), 11–19.