Telehealth for Young Adults With Diabetes: Addressing Social Determinants of Health

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Type 1 diabetes is a challenging chronic condition and can lead to diabetes-related distress and disengagement. Historically disadvantaged, racially and ethnically diverse young adults (YAs) with type 1 diabetes experience higher blood glucose levels and encounter more barriers to care than their White counterparts. Current research shows that telehealth may provide a route for improving psychosocial issues and diabetes care among YAs.

Telehealth is an innovative and flexible care model that uses secure online platforms to connect patients to their health care providers (HCPs) from anywhere, including the comfort of their homes (1). The use of this model has increased significantly during the coronavirus disease 2019 (COVID-19) pandemic, as patients of all ages adapted to communicate with HCPs while on lockdown. Telehealth may be especially attractive to young adult (YA) patients with type 1 diabetes, who are accustomed to using mobile phones and could benefit from the flexibility it offers.

Emerging research indicates that telehealth may facilitate access to care for YAs. In a recent telehealth intervention for predominately White YAs with type 1 diabetes, YAs were able to connect to their diabetes visit from their parked car, between classes, or in break rooms at their place of work (2). Telehealth reduces the commute time needed for in-person visits, especially for patients who live far away. Additionally, it can also significantly reduce the number of hours missed from work and/or school to attend in-person appointments. In comparison with lengthy in-person visits, virtual appointments can be more convenient, requiring only that patients have a reliable Internet connection, camera, and microphone, which many patients have access to on mobile phones or computers (3).

On the other hand, COVID-19 and the subsequent rapid implementation of telehealth exacerbated disparities among YAs from diverse backgrounds, and the impact has yet to be thoroughly investigated. Due to the significant impact on disease burden, inequities in social determinants of health (SDOH) must be considered when reviewing the use of telehealth in YAs with type 1 diabetes. Interconnected socioeconomic factors, or SDOH, impact an individual's health, including their sociocultural background, economic conditions, available social support, and access to care and technological resources (4,5). For example, patients with low socioeconomic status (SES) are likely to experience food insecurity (6), housing instability, and overcrowding (7–9) and inability to pay for basic needs (10,11). Additionally, YAs who are not financially secure may not have a reliable source of transportation to get to in-person appointments. All of these factors create barriers to health care access and delivery and affect an individual's overall physical and mental well-being. For example, food insecurity and housing instability can lead to anxiety and increase a person's probability of experiencing adverse health events (6,11). These economic problems are not only associated with higher A1C among YAs (12), but also are found more frequently among ethnically diverse, non-White patients, who already carry significantly greater disease burden (13).

As the incidence of type 1 diabetes continues to increase more rapidly for YAs with diverse backgrounds, type 1 diabetes care delivery must shift to engage low-SES, ethnically diverse YA patients who are less likely to achieve health goals. Psychosocial issues related to diabetes are highly prevalent in YAs (14,15), and often unmet psychosocial concerns affect diabetes care. In a study conducted in Australia, one-third of YAs with type 1 diabetes reported experiencing psychological distress related to diabetes, and those with more symptoms were found to have higher A1C levels (16). A study found that one of the major factors that contributed to loss to follow-up in ethnically diverse,

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low-SES YAs with type 1 diabetes was experiencing psychosocial challenges (17). A substantial amount of research points to the need for developmentally appropriate interventions that address psychosocial concerns in YAs with type 1 diabetes (14). Telehealth may be helpful in improving care for YAs and has shown promise for improving psychosocial outcomes in YAs with type 1 diabetes (2,15).

This literature review will examine how telehealth may provide improved care for diverse YAs with type 1 diabetes. Additionally, benefits and challenges to the implementation of telehealth among historically disadvantaged, ethnically diverse populations will be discussed.

Benefits of Telehealth

Few studies have been conducted on the impact of telehealth on health outcomes in diverse YAs with type 1 diabetes, as most studies examine predominately younger and older White populations. A study of White, rural pediatric patients with type 1 diabetes (<17 years of age) reported that the use of telehealth was associated with increasing frequency of visits, maintaining A1C, and decreasing absences from work or school (18). In a randomized trial of school-based telehealth compared with usual care for routine type 1 diabetes care visits, those in telehealth decreased and maintained their A1C, showed improvements in some health-related quality-of-life measures, and had fewer emergency room visits and hospitalizations (19). Most recently, a nonrandomized trial conducted among mostly White, English-speaking children and adolescents (3–17 years of age) with type 1 diabetes found several positive results. In addition to decreased mean A1C in telehealth participants, 83% of those in telehealth attended four or more appointments per year, compared with 21% during the previous year (20). Telehealth participants also reported high satisfaction (97% satisfied), and 93% reported better access to staff and diabetes care (e.g., more blood glucose checks) (20). Although previous reviews reported mixed findings on the effectiveness of telehealth among pediatric populations with type 1 diabetes (21,22), more recent studies have elucidated the positive impact of telehealth in managing this chronic condition, including facilitating meeting American Diabetes Association (ADA) standards of care with regard to attending four or more visits per year, reducing diabetes-related symptoms, and improving psychosocial outcomes.

Only two studies examined the impact of telehealth on YAs with type 1 diabetes in the United States specifically. In a nonrandomized trial in predominately White YAs with type 1 diabetes, telehealth participants reported greater appointment attendance (3.5 visits per year), as well as reduced diabetes-related distress compared with participants in usual care, who reported reduced attendance (1.0 visit per year) and increased distress (2,15). Similarly, in another study of predominately White YAs with type 1 diabetes, a five-group diabetes education program (i.e., expert presentation followed by moderated group discussion) offered online over 8 weeks was associated with high attendance and satisfaction (23). Collectively, these studies show how telehealth may assist YAs in the United States with type 1 diabetes by improving psychosocial outcomes and increasing attendance in a population typically difficult to engage.

International studies of patients from all age-groups have shown similar improvements in psychosocial outcomes. Italian people with type 1 diabetes (5–50 years of age) who were randomized to web-based care had less severe hypoglycemic events, were more satisfied, and improved their diabetes self-management compared with those in usual care (24). A study of adults in the Netherlands with either type 1 or type 2 diabetes found a web-based cognitive behavior therapy program effective in reducing depressive symptoms and emotional distress (25). Although more research on telehealth is needed in YAs with type 1 diabetes, results to date have been encouraging.

Barriers to Telehealth

Although telehealth services were rapidly implemented and brought many benefits during the COVID-19 pandemic, many challenges exist across populations and institutions. While telehealth has improved diabetes care and allowed patients to reduce their exposure to COVID-19, it has also highlighted health care disparities and inequities among low-SES racially and ethnically diverse minority groups, especially in rural locations (26). The Federal Communications Commission has reported that 30 million Americans still do not have access to high-speed Internet (27), which is essential for the use of telehealth (15). In California, adults (≥18 years of age) living in rural areas are less likely to use telehealth services than those in urban areas (28). Low-SES non-Whites in rural areas encounter disproportionately larger barriers to telehealth because of a lack of reliable Internet access.

In general, the use of video chats, text messaging, and mobile apps has increased over the past few years in most sociodemographic groups except for historically disadvantaged populations (e.g., Medicaid recipients and those with low SES) (29). Racially and ethnically diverse patients with low SES may have to share devices or use limited data plans, affecting their ability to schedule appointments and attend telehealth visits (30). Furthermore, many of these patients may lack a private space in which to conduct appointments and discuss treatment goals, as Black, Latinx, and Native

American people in the United States more often live in overcrowded, multigenerational homes (31).

Low uptake of diabetes technology and lack of insurance among low-SES, diverse patients compound these access problems (32,33). For telehealth to serve as a replacement for in-person care, diabetes technology is needed to effectively communicate essential diabetes data to HCPs. Recent studies have found that ethnically diverse YAs (18–28 years of age) use diabetes technology (e.g., insulin pumps and continuous glucose monitoring [CGM] systems) less than Whites despite controlling for SES and insurance status (33–35). HCPs may be directly or indirectly perpetuating unequal access to diabetes technology, demonstrating implicit biases, concern/hesitancy, and other reasons for not implementing technologies in YAs with diverse backgrounds (33,35). The cost of diabetes technology and supplies has also been found to be a barrier for adults with type 1 diabetes (36) and likely presents a challenge for YAs as well.

Of the YAs who use diabetes devices, many encounter problems getting data to their HCPs (36). The availability of multiple diabetes device platforms (37–44) and lack of integration to the electronic medical records systems at some institutions can be challenging for HCPs and clinic staff. When patients have difficulties connecting their diabetes device (e.g., glucose meter, CGM system, or pump), manual glucose logs must be generated and sent to the HCP via e-mail. Although there can be challenges with manually tracking blood glucose, some patients and HCPs find the process helpful. Although YAs encounter multiple challenges with accessing their data and delivering it to their HCPs, multiple diabetes platforms exist to help with these tasks.

Insurance coverage is also an obstacle for some historically disadvantaged YAs on public or private insurance. If disruptions in coverage occur, patients encounter problems maintaining and accessing diabetes devices, supplies, and care (45). YAs with either no insurance, public coverage, or a private plan may have different telehealth utilization rates; a secondary analysis of the California Health Interview Survey showed that adults (≥18 years of age) who were uninsured or had Medicaid have lower odds of participating in telehealth compared with those with private insurance (28).

Insurance issues can also be associated with worse diabetes outcomes. In one study, 24.3% of adults (19–64 years of age) with type 1 diabetes who lost their insurance coverage experienced higher A1C and were five times more likely to use acute services (46). In an urban-based study with racially and ethnically diverse and low-SES YAs with type 1 diabetes, researchers found that, when patients missed some of their scheduled appointments, the long wait times to reschedule appointments also contributed to insurance lapses (17). Not meeting insurance requirements (e.g., missing multidisciplinary team appointments) can lead to lapses in insurances and can prevent YAs from also being able to schedule telehealth appointments and engaging in their care.

Discussion

Although telehealth shows promise as a health care delivery model that can increase care adherence and improve psychosocial outcomes in people with type 1 diabetes, these benefits are less likely to reach low-SES, racially and ethnically diverse YAs, who are the most in need of accessible and engaging care models. COVID-19 has highlighted existing health inequities and the importance of addressing these barriers to care among historically disadvantaged, racially and ethnically diverse populations (47). Many telehealth studies have included predominately White children, YAs, and adults, whereas very few have considered how telehealth might bridge this larger cultural and economic divide.

Notably, telehealth has been shown to engage YAs with type 1 diabetes and improve their psychosocial outcomes (2,15), with recent studies demonstrating promise for diverse YAs. For example, a virtual intervention for YAs with type 1 diabetes, Colorado Young Adults with Type 1 Diabetes (CoYoT1) Clinic, was adapted from an in-person shared medical appointment (SMA) model for adolescents with type 1 diabetes and their families (48,49). CoYoT1 Clinic was developed as a virtual option for a predominately White YA population (18–25 years of age) with type 1 diabetes who were receiving care in a standalone diabetes center. It consisted of three home telehealth visits and one in-person visit on a quarterly basis (49). The telehealth visits included a SMA and an individual visit with a diabetes provider (nurse practitioner or pediatric endocrinologist) who used patient-centered care, a collaborative model of health care provision (2,3,49). This pilot study improved YA adherence to ADA standards (e.g., attending quarterly clinic visits, seeing all members of the diabetes team, and receiving transition preparation), diabetes technology uptake, psychosocial outcomes, and retention compared with control subjects who did not receive the intervention (2,15). This success may have been the result of the intervention providing a way for YAs to feel more comfortable during appointments and enabling them to connect with other YAs living with type 1 diabetes. Furthermore, patient-driven group sessions may have also positively affected their diabetes care.

Although this model was found to be successful in a predominately White population, it yielded some logistical lessons crucial for future implementation in other populations, including the importance of using a single diabetes data platform, uncoupling SMA appointments (i.e., holding SMAs with peers and individual diabetes HCP visits on different days), creating YA-friendly SMAs, and allowing patients to select days to attend based on their schedules and needs (3).

In the next phase of their project, the researchers successfully adapted the CoYoT1 Clinic model for racially and ethnically diverse, urban, low-SES YAs with type 1 diabetes (2,3). The adaptation process was informed by input from a patient advisory board, stakeholder focus groups, and data from a survey conducted in the target population (3). These data led to modifications to the model to best serve the needs of the more diverse population. The adapted model, CoYoT1 to California (CTC), similarly included three telehealth visits and one in-person visit over the study year. However, major changes to the original intervention included having formal patient-centered care trainings (including shared decision-making tools) for HCPs, providing after-visit video summaries for YAs, having family involvement at patients' discretion, uncoupling group and individual appointments, and providing formalized peer-led SMAs based on YAs' availability (3). CTC is currently being tested in an urban hospital setting, and preliminary feedback from YAs suggests it may be positively affecting their psychosocial well-being and diabetes care.

Historically, telehealth has been hindered by many restrictions on HCP licensure, reimbursement, and eligible services. As COVID-19 surged throughout the country, regulatory changes were needed to provide care at a time when physical distancing was necessary for the safety of all patients. In response, Congress signed the Coronavirus Aid, Relief, and Economic Security (CARES) Act into law in March 2020 (50,51). The CARES Act was an important first step in providing federal funding for Internet access to support telehealth services, improving reimbursement processes, providing allowances for HCPs to see out-of-state patients, offering utilization waivers for patients, and making other beneficial changes to support telehealth use (50,52). Additionally, rural and historically disadvantaged areas are also slated to receive more equitable Internet access through this legislation (50). As clinic models are adapted for the use of both telehealth and in-person visits, health care team members must keep advocating for additional support on the local, state, and national levels.

Before the COVID-19 pandemic, researchers noted that successful implementation of a diabetes telehealth program would require a culture change among HCPs and institutions (53), as telehealth was scarcely being studied or used at that time. During the early months of the pandemic, medical institutions scrambled to equip and train staff to deliver telehealth services as quickly as possible. Although this rapid implementation has benefited some YAs with type 1 diabetes, it has not provided equitable care to all. Some researchers have proposed ways of making telehealth care models for YAs more equitable, including increasing affordability (e.g., by reducing onboarding cost/time), reducing the cognitive burden on users, improving interoperability and accessibility (e.g., by addressing health literacy and numeracy challenges), and allowing episodic use (e.g., by allowing patients to opt in and out of telehealth visits) (47).

In summary, telehealth has great potential to improve psychosocial and diabetes outcomes, lessen diabetes disease burden, and address disparities in care for YAs with type 1 diabetes. More research is needed to develop and evaluate strategies to lessen the digital, cultural, and economic divides, as some YAs continue to experience more challenges than others. Current telehealth research has demonstrated improvements in diabetes outcomes and care engagement. These results suggest that reaching YAs, often considered to be a hard-to-reach population, requires care models enabling HCPs to meet these patients where they are (2). Models such as CoYoT1 Clinic, which demonstrated a threefold increase in attendance for participating YAs, could turn the tide for YAs with type 1 diabetes. The adaptation and implementation of CoYoT1 Clinic for racially and ethnically diverse YAs may provide further insights into improved models of care for those from disadvantaged and marginalized backgrounds. Although much needs to be done to develop telehealth models applicable for all YAs with type 1 diabetes, apparent improvements in clinical attendance, psychosocial outcomes, and overall diabetes care to date are encouraging.

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DUALITY OF INTEREST

No potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

J.F.G. reviewed the literature and wrote the manuscript. J.F., M.R., D.I.B., and J.K.R. reviewed and edited the manuscript. All authors contributed to the discussion. J.F.G. is the guarantor of this work and, as such, had full access to all the data included and takes responsibility for the integrity and accuracy of the review.

REFERENCES

1. Health Resources & Services Administration. What is telehealth? Available from https://telehealth.hhs.gov/patients/understanding-telehealth. Accessed 8 April 2021

2. Reid MW, Krishnan S, Berget C, et al. CoYoT1 Clinic: home telemedicine increases young adult engagement in diabetes care. Diabetes Technol Ther 2018;20:370–379
3. Raymond JK, Reid MW, Fox S, et al. Adapting home telehealth group appointment model (CoYoT1 clinic) for a low SES, publicly insured, minority young adult population with type 1 diabetes. Contemp Clin Trials 2020;88:105896
4. Healthy People. 2020. Social determinants of health. Available from https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health. Accessed 8 April 2021
5. World Health Organization. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the commission on social determinants of health. Available from https://www.who.int/publications/i/item/WHO-IER-CSDH-08.1. Accessed 8 April 2021
6. Althoff RR, Ametti M, Bertmann F. The role of food insecurity in developmental psychopathology. Prev Med 2016;92:106–109
7. Kushel MB, Gupta R, Gee L, Haas JS. Housing instability and food insecurity as barriers to health care among low-income Americans. J Gen Intern Med 2006;21:71–77
8. Frederick TJ, Chwalek M, Hughes J, Karabanow J, Kidd S. How stable is stable? Defining and measuring housing stability. J Community Psychol 2014;42:964–979
9. Meltzer R, Schwartz A. Housing affordability and health: evidence from New York City. Hous Policy Debate 2016;26:80–104
10. Joint Center for Housing Studies of Harvard University. The State of the nation’s housing. Available from https://www.jchs.harvard.edu/sites/default/files/reports/files/Harvard_JCHS_State_Nations_Housing_2021.pdf. Accessed 6 August 2021
11. California Office of Environmental Health Hazard Assessment. Housing burden. Available from https://oehha.ca.gov/calenviroscreen/indicator/housing-burden. Accessed 8 April 2021
12. Mendoza JA, Haaland W, D’Agostino RB, et al. Food insecurity is associated with high risk glycemic control and higher health care utilization among youth and young adults with type 1 diabetes. Diabetes Res Clin Pract 2018;138:128–137
13. Centers for Disease Control and Prevention. Incidence of newly diagnosed diabetes. Available from https://www.cdc.gov/diabetes/data/statistics-report/newly-diagnosed-diabetes.html. Accessed 8 April 2021
14. Monaghan M, Helgeson V, Wiebe D. Type 1 diabetes in young adulthood. Curr Diabetes Rev 2015;11:239–250
15. Bakhach M, Reid MW, Pyatak EA, et al. Home telemedicine (CoYoT1 Clinic): a novel approach to improve psychosocial outcomes in young adults with diabetes. Diabetes Educ 2019;45:420–430
16. Hislop AL, Fegan PG, Schlaeppi MJ, Duck M, Yeap BB. Prevalence and associations of psychological distress in young adults with type 1 diabetes. Diabet Med 2008;25:91–96
17. Pyatak EA, Sequeira PA, Whittemore R, Vigen CP, Peters AL, Weigensberg MJ. Challenges contributing to disrupted transition from paediatric to adult diabetes care in young adults with type 1 diabetes. Diabet Med 2014;31:1615–1624
18. Wood CL, Clements SA, McFann K, Slover R, Thomas JF, Wadwa RP. Use of telemedicine to improve adherence to American Diabetes Association standards in pediatric type 1 diabetes. Diabetes Technol Ther 2016;18:7–14
19. Izquierdo R, Morin PC, Bratt K, et al. School-centered telemedicine for children with type 1 diabetes mellitus. J Pediatr 2009;155:374–379
20. Crossen SS, Marcin JP, Qi L, et al. Home visits for children and adolescents with uncontrolled type 1 diabetes. Diabetes Technol Ther 2020;22:34–41
21. Guljas R, Ahmed A, Chang K, Whitlock A. Impact of telemedicine in managing type 1 diabetes among school-age children and adolescents: an integrative review. J Pediatr Nurs 2014;29:198–204
22. Dougherty JP, Lipman TH, Hyams S, Montgomery KA. Telemedicine for adolescents with type 1 diabetes. West J Nurs Res 2014;36:1199–1221
23. Albanese-O’Neill A, Beauchamp G, Thomas N, et al. Transition education for young adults with type 1 diabetes: pilot feasibility study for a group telehealth intervention. JMIR Diabetes 2018;3:e10909
24. Bertuzzi F, Stefani I, Rivolta B, et al. Teleconsultation in type 1 diabetes mellitus (TELEDIABE). Acta Diabetol 2018;55:185–192
25. van Bastelaar KMP, Pouwer F, Cuijpers P, Riper H, Snoek FJ. Web-based depression treatment for type 1 and type 2 diabetic patients: a randomized, controlled trial. Diabetes Care 2011;34:320–325
26. Hirko KA, Kerver JM, Ford S, et al. Telehealth in response to the COVID-19 pandemic: implications for rural health disparities. J Am Med Inform Assoc 2020;27:1816–1818
27. Federal Communications Commission. Homework gap and connectivity divide. Available from https://www.fcc.gov/about-fcc/fcc-initiatives/bridging-digital-divide-all-americans. Accessed 8 April 2021
28. Rodriguez JA, Saadi A, Schwamm LH, Bates DW, Samal L. Disparities in telehealth use among California patients with limited English proficiency. Health Aff (Millwood) 2021;40:487–495
29. Park J, Erikson C, Han X, Iyer P. Are state telehealth policies associated with the use of telehealth services among underserved populations? Health Aff (Millwood) 2018;37:2060–2068
30. Lu J, Bollinger L. Navigating telehealth in limited English proficiency populations. Available from https://ethnomed.org/resource/navigating-telehealth-in-limited-english-proficiency-populations. Accessed 8 April 2021
31. Lopez L 3rd, Hart LH 3rd, Katz MH. Racial and ethnic health disparities related to COVID-19. JAMA 2021;325:719–720
32. Willi SM, Miller KM, DiMeglio LA, et al.; T1D Exchange Clinic Network. Racial-ethnic disparities in management and outcomes among children with type 1 diabetes. Pediatrics 2015;135:424–434
33. Agarwal S, Schechter C, Gonzalez J, Long JA. Racial-ethnic disparities in diabetes technology use among young adults with type 1 diabetes. Diabetes Technol Ther 2021;23:306–313
34. Foster NC, Beck RW, Miller KM, et al. State of type 1 diabetes management and outcomes from the T1D Exchange in 2016–2018. Diabetes Technol Ther 2019;21:66–72
35. Agarwal S, Kanapka LG, Raymond JK, et al. Racial-ethnic inequity in young adults with type 1 diabetes. J Clin Endocrinol Metab 2020;105:E2960–E2969
36. Arbiter B, Look H, McComb L, Snider C. Why download data: the benefits and challenges of more diabetes data. Diabetes Spectr 2019;32:221–225
37. LifeScan. OneTouch Reveal mobile and web apps. Available from https://www.onetouch.com/products/softwares-and-apps/one-touch-reveal-mobile-and-web-app. Accessed 4 May 2021
38. LibreView. LibreView homepage. Available from https://pat.libreview.io. Accessed 4 May 2021
39. Accu-Chek. Accu-Chek homepage. Available from https://www.accu-chek.com. Accessed 6 August 2021

40. Tandem Diabetes Care. Tandem Diabetes Care homepage. Available from https://www.tandemdiabetes.com. Accessed 4 August 2021
41. Medtronic. CareLink. Available from https://carelink.medtronic.com. Accessed 4 May 2021
42. Dexcom. Welcome to Dexcom Clarity, your diabetes management application. Available from https://clarity.dexcom.com. Accessed 4 May 2021
43. Tidepool. Welcome to Tidepool, your gateway to understanding your diabetes data. Available from https://www.tidepool.org. Accessed 4 May 2021
44. Glooko. Glooko homepage. Available from https://www.glooko.com. Accessed 4 May 2021
45. Naranjo D, Hessler DM, Deol R, Chesla CA. Health and psychosocial outcomes in U.S. adult patients with diabetes from diverse ethnicities. Curr Diab Rep 2012;12:729–738
46. Rogers MAM, Lee JM, Tipirneni R, Banerjee T, Kim C. Interruptions in private health insurance and outcomes in adults with type 1 diabetes: a longitudinal study. Health Aff (Millwood) 2018;37:1024–1032
47. Kerr D, Warshaw H. Clouds and silver linings: COVID-19 pandemic is an opportune moment to democratize diabetes care through telehealth. J Diabetes Sci Technol 2020;14:1107–1110
48. McClain MR, Klingensmith GJ, Anderson B, et al. Team Clinic: group approach to care of early adolescents with type 1 diabetes. Diabetes Spectr 2018;31:273–278
49. Raymond JK, Berget CL, Driscoll KA, Ketchum K, Cain C, Fred Thomas JF. CoYoT1 Clinic: innovative telemedicine care model for young adults with type 1 diabetes. Diabetes Technol Ther 2016;18:385–390
50. Pew Charitable Trusts. States tap federal CARES Act to expand broadband. Available from https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2020/11/states-tap-federal-cares-act-to-expand-broadband. Accessed 8 April 2021
51. Lee NT, Karsten J, Roberts J. Removing regulatory barriers to telehealth before and after COVID-19. Available from https://www.brookings.edu/wp-content/uploads/2020/05/Removing-barriers-to-telehealth-before-and-after-COVID-19_PDF.pdf. Accessed 8 April 2021
52. Koonin LM, Hoots B, Tsang CA, et al. Trends in the use of telehealth during the emergence of the COVID-19 pandemic: United States, January–March 2020. MMWR Morb Mortal Wkly Rep 2020;69:1595–1599
53. Crossen S, Raymond J, Neinstein A. Top 10 tips for successfully implementing a diabetes telehealth program. Diabetes Technol Ther 2020;22:920–928