Socio Ecological Model (SEM) and Diffusion of Innovation (DOI) Integrated Framework: A Proposal for Integration to Improve Intervention in the Digital Age of Medicine

Yolene, Gousse, DrPH, MPH[1], Joseph Ravenell, MD, MPH[2], Robert Steptoe, MSW[3]; Dawn Douglas, LMSW[3]; Joanne Camille, PhD[4]; Chimene Castor, Ph.D., EdD, MS. RDN, LDN, CHES, FAND[5]

[1] St. John's University, College of Pharmacy and Health Sciences, Queens, NY
[2] New York University Grossman School of Medicine, Department of Population Health, New York, NY
[3] AIDS Center for Queens County (ACQC), Jamaica, NY
[4] New York University Langone, Department of Behavioral Health, Brooklyn, NY
[5] Howard University, Department of Nutritional Sciences, Washington, DC

Abstract

Health promotion intervention theory must adapt as evidence grows to support the complexities of social and behavioral health fields. Following the COVID-19 pandemic, digital health continues to grow, requiring a re-evaluation of traditional models' applicability to these approaches. The authors propose adapting and integrating the Socio-Ecological Model (SEM) and Diffusion of Innovation (DOI) models for application with digital health to deliver interventions. We also describe the application of the SEM-DOI integration in conjunction with a demonstration project, a digital intervention to improve Metabolic Syndromes (MetS) health outcomes. Future health interventions may consider the proposed SEM-DOI model to account for individual and community-level factors during implementation and use as a guide for meaningful evaluation. Adaptations of theoretical models to current-state interventions and integration of multiple, established models are needed to sustain prevention efforts and efficacy over time.

Keywords: Socio-Ecological Model; Diffusion of Innovation Model; Digital Medicine; Metabolic Syndromes (MetS); COVID-19

INTRODUCTION

Scientific theory continues to advance across fields of study with the purpose of identifying approaches and components of interventions that effectively translate practice to outcomes. Theoretical models have been proposed and combined from multiple fields, ranging from sociology to public health, integrating designs and strategies for novel practices based on efficacious past models. Across varying disciplines, the need to continuously adapt models in parallel with new scientific discoveries – both delivery approaches and clinical therapies – requires ongoing inquiry into the relevance of the theoretical frameworks and has raised questions regarding the flexibility and adaptability of the models themselves and their relevance to new intervention delivery.

In early 2020, the COVID-19 pandemic necessitated the broad implementation of remote, digital, and tele-health services, required for the continuity of care. In today's digital era, theoretical grounding models do not always adequately account for the increased fluidity between model domains and care modalities (e.g., in-person vs. digital care) and for the lessening of the tangible nature for other domains (e.g., the definition of 'communities' changing in the digital age).

Corresponding Author:

Yolene Gousse, Dr.PH, Associate Professor
St. John's University
Department of Pharmacy Administration and Health Sciences
8000 Utopia Parkway, Queens, NY 11439
Goussey@stjohns.edu

The authors propose the adaptation and integration of two theoretical models: the Socio Ecological Model (SEM), developed by Uriel Bronfenbrenner (Bronfenbrenner et al 1986; McLeroy, K.R. et al 1988), and the Diffusion of Innovation (DOI), developed by Rogers Everett M. (Rogers E.M. 1983; Rogers 2014). The SEM examines health outcomes through a holistic lens and captures the influence of multiple levels of influence. These levels range from individual to societal factors, all of which play a role in shaping health behaviors. For example, at the societal level public policies—such as federal and state regulations that promote or hinder access to telemedicine greatly influence health care access and outcomes. Policies that support reimbursement parity for telehealth services can increase access to care, particularly for those in rural or underserved areas. Similarly, community level factors might include the availability of telehealth infrastructure, such as broadband access, and interpersonal factors, such as the influence of family members encouraging the use of telehealth services. At the individual level, a person's comfort with technology and belief in the effectiveness of telehealth may impact willingness to adopt these services.

The Diffusion of Innovation (DOI) theoretical model describes how new ideas, behaviors, or technologies spread through populations. This DOI model highlights key factors that promote the adoption of new innovations, such as relative advantage (how much better the innovation is compared to what it replaces), compatibility (how well it fits with the values and needs of the population), complexity (how difficult the innovation is to understand and use), trialability (how easily people can try the innovation), and observability (the visible benefits of adopting the innovation) (Rogers E.M. 1983; Rogers

DOI: https://doi.org/10.24926/iip.v15i4.6271

2014). In the context of telehealth, DOI would support ways in which adoption is dependent on how these factors, together, influence healthcare providers and patients to accept and integrate telehealth into their practices and daily lives.

In the present paper, authors, describe the integration of the SEM and DOI models and demonstrate how the proposed SEMI-DOI integrated model may be applied to a health promotion intervention supporting metabolic syndromes (MetS) examining the model's alignment with SEM-DOI components.

APPROACH

The SEM integrates intra and interpersonal factors, community, and organizational factors, and public policies, thereby offering a broad, multi-level perspective to managing health conditions (Bronfenbrenner,1986; Stokols, 1996). The SEM underpins the multiple levels at which barriers to development and adoption of health interventions may occur. The SEM model has been successfully applied to describe individual health behaviors (Ma et al., 2017), nutritional practices among racial/ethnic minority groups with lower incomes (Robinson, 2008), and health care generally (Phelan et al., 2020). Additionally, the SEM may be applied to guide the exploration of the links between the social determinants of health (SDOH).

The DOI theory (Rogers, 2014) was created from two components: innovation and diffusion. 'Innovation' refers to novel thoughts, ideas, practices, services, or products that are perceived and recognized as 'new' by individuals or groups. There are five elements of 'innovation' within DOI that determine whether the adoption or diffusion of a novel activity will occur. These levels are relative advantage, compatibility, complexity, trialability, and observability. These levels are defined in Table 1.'Diffusion' is the process by which an innovation is communicated through channels within a specific period. The process of diffusion involves the following stages: dissemination, adoption, implementation, and maintenance (Rogers, 2014). The DOI model has been successfully applied to health promotion programs for diabetes care (Lien et al., 2017), autism (Pickard et al., 2016), HIV/AIDS (Wu et al., 2021), and the adoption of new healthcare information technologies (Zhang et al., 2015). In one example, the authors Lien and Jiang (2017), highlight a successful application of the DOI model to a health promotion intervention where the prevalence of tobacco use was reduced from 40% in 1983 to 15.9% in 2015 in Australia.

By integrating these two models, a robust framework is created that can explain both the contextual factors that influence health behaviors (through SEM) and the mechanisms by which new health innovations spread (through DOI). Continuing with a telehealth example, the diffusion of telehealth services during the COVID-19 pandemic highlights how public policies (SEM's societal level) and organizational adoption (SEM's institutional level) interact with DOI factors such as relative advantage (the ease and efficiency of telehealth) to influence individual and community-level adoption.

The SEM- DOI Integrated Framework

The impetus for the SEM-DOI integrated framework (Figure 1) development was the need to identify a model that identifies the layers of influence on health behavior, explains how new innovations, can be successfully adopted across these levels for both intervention adaptation, and subsequent spread of innovations.

The SEM is a grounding theory that anchors the elements of intervention adaptation from individual to community. The application of the first two levels of the SEM is critical to gain a better understanding of areas of consideration at multiple micro levels (e.g. individual and interpersonal) and improve the ability to develop multi-pronged approaches and improve quality of care across macro societal levels. SEM's broader focus on environmental and policy-level factors can enhance DOI's ability to account for external barriers to adoption. In turn, the DOI theory works at a macro level by which community-level innovations are adopted to change a population's health behavior. DOI is based on the premise that decision-making by individuals is faster than that by an organization or a group (Rogers, 2014). Therefore, to increase the acceptance rate of innovation, decision-making should focus on individual society leaders first and then disseminate through the entire population. The DOI provides a detailed framework for understanding the process of change within SEM's individual and interpersonal levels. For example, public policies promoting telehealth (SEM's societal level) can be better understood when simultaneously DOI's concepts of trialability and observability, whereby a positive trial of telehealth services may encourage policymakers to adopt supportive policies.

The DOI theory also offers an actionable framework for the implementation and adoption of health promotion strategy with concepts on how and at what rate of change new technologies spread through social systems given the differences in adopter groups, including innovators, early adopters, early majority, late majority, and laggards. Each group has distinct motivations, characteristics, and barriers to adopting new health behaviors (Rogers, 2003). Practically, examining these categories enables program planners to tailor interventions and outreach strategies to specific healthy behaviors across diverse patient populations. For example, early adopters may consist of patients who are highly motivated to change their lifestyles after receiving personalized education and support. These early adopters may then influence the early majority by sharing positive experiences, helping to accelerate the spread of new health practices within communities (Jolibert & Baumgartner, 2021). Similarly, programs can use data from early adopters to address the barriers faced by laggards, such as skepticism or lack of access to resources (Greenhalgh et al., 2004). By considering the

DOI: https://doi.org/10.24926/iip.v15i4.6271

specific needs of each adopter category health promotion efforts may achieve more effective, quality, and widespread adoption of health interventions.

SEM-DOI Framework: MetS Case Study

The application of proposed theoretical frameworks to real-world interventions is essential to examine feasibility and applicability of new theory to practice. Here, we applied the SEM-DOI framework to a community-based health promotion project. The project addressed MetS and quality of care during the COVID-19 pandemic among a sample of 40 participants representing historically marginalized populations in Queens, New York. MetS poses a serious health and economic burden to adults aged 40 years and older, is associated with comorbidities including Type -II diabetes mellitus and cardiovascular diseases, and renders patients more susceptible to COVID-19 (Gou et al., 2024; Huang et al., 2020). The application of the SEM and DOI integrates an approach that may inform quality of care across micro and macro societal levels among low-income populations and minority groups, those who are essential to benefit from novel public health interventions.

This study was administered during a one-year period in 2020. Study data were collected remotely and on-site. Institutional Review Board approval was obtained from St. John's University, Queens, NY (FWA # 00009066) prior to the start of program activities. Participant data were assessed through medical charts abstraction to compare number and types of medical visits, and differences in health outcomes pre and during the pandemic. Three focus groups were conducted with participants, and one conducted with providers to elicit barriers and facilitators to care and telehealth uptake. Though this study was a demonstration project, authors explored access and utilization factors that may inform the development of a culturally sensitive telehealth intervention.

Applying the SEM-DOI Integrated Framework

The proposed, integrated framework (Figure 1) summarizes the interrelationship between MetS (pre-disease and diseased) and digital health intervention.

Implementation of MetS interventions is often not systematic across different strata of the community, limiting their reach and effectiveness. The SEM framework helps identify the factors that make individuals susceptible to MetS and pre-MetS at the individual, organizational, and community levels, providing a foundation for designing targeted interventions. However, applying the Diffusion of Innovation model is crucial to ensure these interventions are systematically disseminated and adopted across all community strata. Additionally, the frameworks help identify which strategies may sustain and allow for remote continuity of care during the pandemic and beyond.

SEM-DOI Alignment with Intervention Components

The focus groups illuminated areas along the SEM framework levels where additional attention may be required to ensure alignment for new interventions, particularly for telehealth or smart app-based interventions.

At the individual level, age and familiarity with new technologies were cited barriers whereas interpersonal level factors included reduced face-to-face interaction with providers, which has both positive and some negative implications. At the organizational level, providers noted that there was still the need to send (mail) participants medications, a feature of the intervention which could not be changed through a smart-app intervention.

Complexity: Individuals who lack access to technology to maintain health services may experience a gap in healthcare quality and continuity. In the focus groups, providers spoke to the challenges of using health monitoring tools. [Table 1]

Relative Advantage: Factors directly interact with the individual and intrapersonal SEM levels to decrease disparities in intervention non-adherence to the digital health program or related therapies. Participants spoke about the helpfulness and enjoyment in using smart-app technologies, particularly for those integrated onto existing smart devices. [Table 1]

Compatibility: This DOI-model factor directly influences *organization, community, and interpersonal* SEM levels. The pandemic created a need for the rapid adoption of technology to access care, as well as sustain continuity of care while providing an opportunity to connect with social networks, especially for those who were in nursing home facilities. Furthermore, when the Center for Medicare and Medicaid Services approved the reimbursement parity for telehealth services, it created a pathway to increase and sustain utilization (Centers for Medicare & Medicaid Services (CMS), 2021). There remain disparities in the use of telehealth among marginalized communities, requiring that the digital technology should be *compatible* across different income groups and population demographics (rural and marginalized communities) and should ensure its adoption both on an *interpersonal* level, and *organizational* level and holistically across the *community*. Participants spoke about their existing health data tools, and how helpful these tools have become in their health monitoring. [Table 1]

***Trialability and Observability*:** These DOI factors influence the *interpersonal*, *community* and *organization* levels of the SEM. A culturally sensitive, remote health intervention for MetS that can be deployed through inexpensive means will allow different segments of the population to simultaneously test the solution, provide feedback and allow for the development of a more comprehensive solution. Addressing these syndromes thereby decreases complications associated with COVID-19 infections and severity. Participants spoke about how having apps on their

DOI: https://doi.org/10.24926/iip.v15i4.6271

existing phones, was helpful in adopting the app and using it. Because technology was integrated it was also immediately useful and helpful to participants. [Table 1]

CONSIDERATIONS AND RECOMMENDATIONS

The integration of the SEM and DOI models supports a novel intervention development approach which will allow researchers and health care professionals to develop informed digital health solutions that promote successful adoption through the validated channels of the existing SEM and DOI models. Previously, both the SEM and DOI theories have been successfully applied to the development, management, and evaluation of health promotion interventions. Our demonstration project illustrates how the SEM-DOI integrated framework may be applied to a health promotion intervention and may be used to inform future studies.

Further research must focus on the evaluation of the SEM-DOI integrated framework to assess broader feasibility and acceptability in health care programs and document uptake considerations. The SEM-DOI framework may be used to both guide and ground the development of new interventions, tailor existing interventions, and evaluate interventions to gaining insights and generating recommendations based on the components.

Additionally, future research of the SEM-DOI framework should evaluate the multiple contextual factors that influence adoption of a new program: social structures, organization, environmental, and cultural. For example, both social structures and culture including dynamics of peers may influence the uptake of new technology. Research shows that individuals are more likely to adopt new health technologies if trusted peers or community leaders have already done so, suggesting that early adopters can significantly influence the diffusion process (Greenhalgh et al., 2004). There are significant factors across organizations and environments, impacted nationally by geography like State-level policies, where access to telehealth or other health care may vary across State lines. The Socio-Ecological Model underscores that these environmental and institutional structures—such as geographic location, access to digital services, and economic conditions—are crucial determinants of health behaviors (McLeroy et al., 1988). Additionally, cultural factors and cultural competency impact how both patients and providers interact with new health care interventions.

From a policy and practice perspective, new health promotion interventions must consider sustainability and be adopted by payors, including Medicare and Medicaid, to ensure patient access and adequate providers reimbursement for services associated with the program. Over time, relative advantage, a key component of the SEM-DOI framework, would create cost-effectiveness and accessibility considerations between health care intervention modalities across payors. The shift in health care delivery modalities, particularly to telehealth, has raised challenges for provider reimbursement, and, while many states have changed policies to improve parity between telehealth and in-person health care visits, there are still areas for improvement, particularly in historically under-funded areas of care. Adequate reimbursement rates for providers will encourage more widespread adoption of new interventions and ensure long-term program sustainability, both critical to ensure innovation in practice and equity in health.

Funding Statement: This work was supported by the National Institutes of Health [Grant No: 5R25HL105444-11; Subaward No. 18-A0-00-001801].

Ethics Approval: Approval was obtained from the ethics committee of St. John's University (FWA # 00009066). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Conflict of Interest /Competing interests: The authors have no relevant financial or non-financial interests to disclose.

Consent to Participate: Informed consent was obtained from all individual participants included in the study.

Acknowledgements: The authors would like to thank study participants, and the AIDS Center of Queens County (ACQC) sites staff for their contributions to this work.

Disclaimer: The statements, opinions, and data contained in all publications are those of the authors.

References

1. Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. Developmental Psychology, 22(6), 723–742. https://doi.org/10.1037/0012-1649.22.6.723

2. Centers for Medicare & Medicaid Services (CMS) Physician Payment Rule Promotes Greater Access to Telehealth Services, Diabetes Prevention Programs. 2021, Nov 02. https://www.cms.gov/newsroom/press-releases/cms-physician-payment-rule-promotes-greater-access-telehealth-services-diabetes-prevention-programs

3. Gou, R., Xiong, S., Liang, X., Wu, H., Qin, S., Li, B., Luo, C., & Chen, J. (2024). Relationship between Life's Essential 8 and metabolic syndrome among older Americans (NHANES, 2007–2010): Navigating biological aging and inflammation. Frontiers in Medicine, 11, 1380464. https://doi.org/10.3389/fmed.2024.1380464

4. Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service

organizations: Systematic review and recommendations. The Milbank Quarterly, 82(4), 581–629.

5. Huang Y, Lu Y, Huang YM, Wang M, Ling W, Sui Y, Zhao HL. Obesity in patients with COVID-19: a systematic review and meta-analysis. Metabolism. 2020 Dec; 113:154378. doi: 10.1016/j.metabol.2020.154378.

6. Lien, A. S., & Jiang, Y. D. (2017). Integration of diffusion of innovation theory into diabetes care. *Journal of diabetes investigation*, *8*(3), 259–260. https://doi.org/10.1111/jdi.12568

7. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. Health Educ Q. 1988 Winter;15(4):351-77. doi: 10.1177/109019818801500401. PMID: 3068205.

8. Ma, P., Chan, Z., & Loke, A. Y. (2017). The Socio-Ecological Model Approach to Understanding Barriers and Facilitators to the Accessing of Health Services by Sex Workers: A Systematic Review. AIDS and behavior, 21(8), 2412–2438. https://doi.org/10.1007/s10461-017-1818-2.

9. Phelan A, Kirwan M (2020) Contextualising missed care in two healthcare inquiries using a socio-ecological systems approach. Journal of Clinical Nursing 29, 3527–3540.

10. Pickard, K. E., Kilgore, A. N., & Ingersoll, B. R. (2016). Using community partnerships to better understand the barriers to using an evidence-based, parent-mediated intervention for autism spectrum disorder in a Medicaid system. *American Journal of Community Psychology*, *57*(3/4), 391–403.https://doi.org/10.1002/ajcp.12050.

11. Robinson T. (2008). Applying the socio-ecological model to improving fruit and vegetable intake among low-income African Americans. Journal of community health, 33(6), 395–406. https://doi.org/10.1007/s10900-008-9109-5

12. Rogers, Everett M., Diffusion of Innovations (1983). University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. https://ssrn.com/abstract=1496176

13. Rogers, E. M. (2003). Diffusion of Innovations (5th ed.). Free Press.

14. Rogers, E.M., Singhal, A., & Quinlan, M.M. (2014). Diffusion of Innovation in an Integrated Approach to Communication Theory and Research (pp. 432-448). Routledge.

15. Shaw, T., Hines, M., Kielly-Carroll, C., & Pinkerton, R. (2017). The use of mobile apps and digital tools for health education: Integrating cultural considerations in health promotion. Health Communication Research Journal.

16. Wu, Y., Yang, G., & Meyers, K. (2021). Acceptability, Appropriateness, and Preliminary Effects of the PrEP Diffusion Training for Lay HIV Workers: Increased PrEP Knowledge, Decreased Stigma, and Diffusion of Innovation. *AIDS and behavior*, 10.1007/s10461-021-03248-2. Advance online publication. https://doi.org/10.1007/s10461-021-03248-2.

17. Zhang, X., Yu, P., Yan, J., & Ton A M Spil, I. (2015). Using diffusion of innovation theory to understand the factors impacting patient acceptance and use of consumer e-health innovations: a case study in a primary care clinic. *BMC health services research*, *15*, 71. https://doi.org/10.1186/s12913-015-0726-2.

Figure 1: Socio Ecological – Diffusion of Innovation (SEM-DOI) Integrated Framework

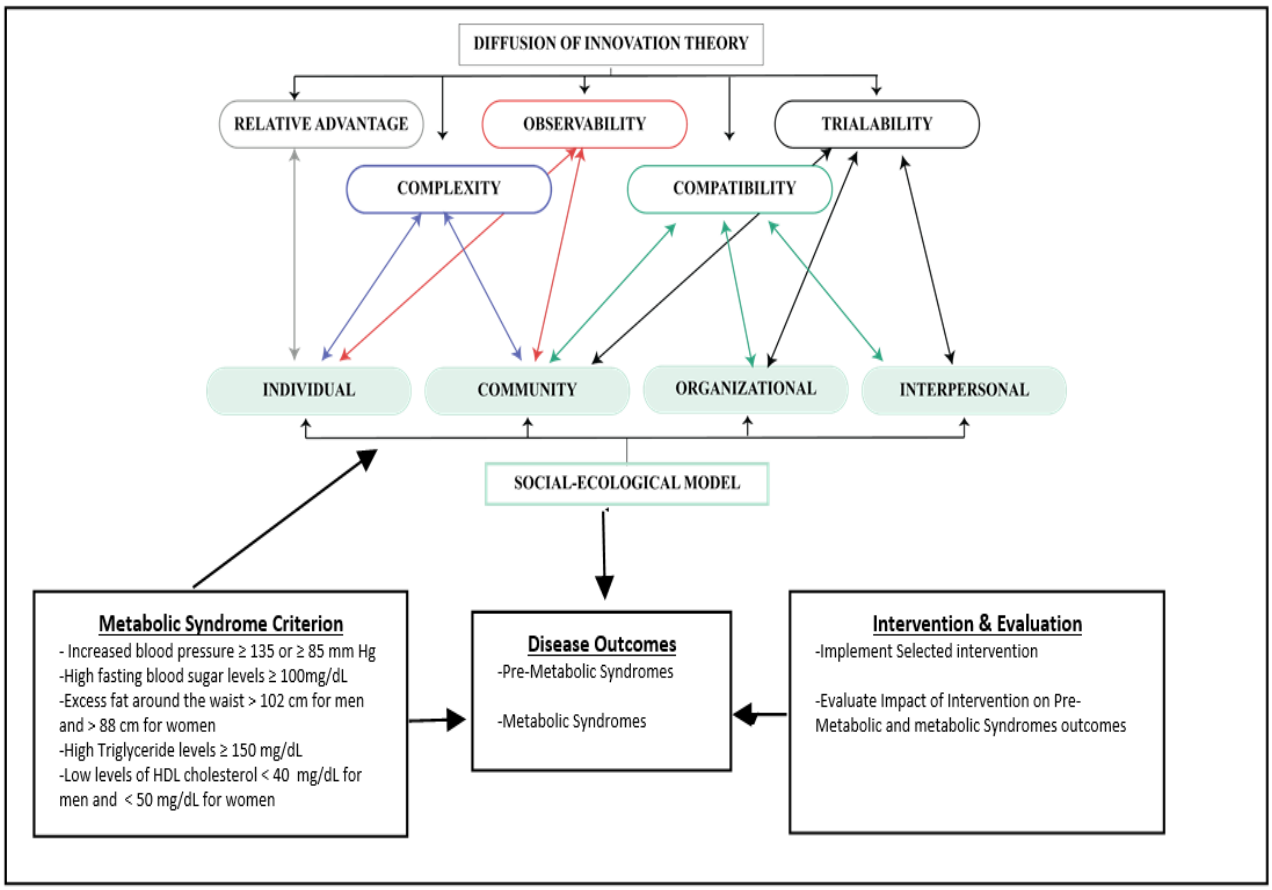

Table 1: Interrelationships Within Socio Ecological – Diffusion of Innovation (SEM-DOI) Model and select focus group quotes from the 'quality of care during the COVID-19 pandemic, among hypertensives and type II diabetics pilot study.'

Diffusion of Innovation Model (DOI) Levels	Soco-Ecological Model (SEM) levels	Focus Groups Quotes(s)
Relative Advantage -The degree to which an innovation is seen as better than the idea, program, or product it replaces.	***Individual – health technology usefulness***	*C-FG Speaker 3:* My Fitbit makes me aware of my heart rate and the fact that when I'm working out, it'll reach a certain level, and it won't go higher than that, and I'm aware. *P-FG-Speaker* 2: Having the monitors accessible to [the patients], if there's an emergency, whether it's a pandemic or whether there's a snowstorm, or just something going on and the client cannot leave home - they can still monitor their health.
	Community – food pantries (delivering food directly to clients' homes offered a clear relative advantage over the traditional in-person pantry visits, thus providing a more effective and safer method of distribution for both clients and staff)	*P-FG Speaker 4:* I also want to add that most of the time, because of the pandemic, a lot of clients, even staff could not go outside. We were concentrating more on providing food, things that [clients] are going to need while sheltering in. We deliver pantries, we call them and send them food, go to their homes… So that's what we were doing during the pandemic, making sure we served as a community also so as pantry and food.
Compatibility- How consistent the innovation is with the values, experiences, and needs of the potential adopters.	***Individual – health technology usefulness***	*C-FG 1 Speaker 2:* my diabetes machine is what I use to keep track and monitor. I can always tell that I ate something wrong in the morning when I check my blood sugar, or I must monitor what I'm eating right. When I'm eating wrong to keep my sugars at a level that's supposed to be just right.
	Interpersonal – delivery of food, medication delivery	*P-FG Speaker 3:* Providers did send medication throughout the whole pandemic. Medication delivery was up and running in AIDS Healthcare Foundation (AHF). And because they were considering [providers] essential staff, we were at the site and some of my clients were coming to the site for services.
	Public policy - Reimbursement issues- allowed for use of telehealth.	P-*FG Speaker 3:* And [a patient] had her Medicaid and the services are billable encounters. It doesn't really affect us because I talked to my clients, [telehealth] is a billable service. Even if I was calling clients and asking them about their medication adherence, asking whether they've taken their medicine, today, and how? That counts as a billable service. (policy)
Complexity- How difficult the innovation is to understand and/or use.	***Individual - Age of Patients/ Familiarity with Technology***	***Challenges in using health monitoring tools*** *P-FG Speaker 3*: We're [seeing] barriers because a lot of our clients are older; they don't know how to use smartphones..... *P-FG Speaker 3*: Even internet access, [the clients] can't pay for internet. They don't know, [will ask] "Can I come to your place and use the internet if you have it" We've gotta look at what the lack of resources in the area, really.

DOI: https://doi.org/10.24926/iip.v15i4.6271

	Community/Interpersonal – education on technology	*P-FG Speaker 6*: I would recommend that, but just as [other provider participant] said, you have to be educating [the patients], letting them know how to use these devices because you have a lot of clients who don't even know how to go on to do a zoom or email or an email. You understand that the [clients] would have to do maybe a mini workshop or have someone come in and show them how to work the devices. And then I think that would be a really good
Trialability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.	***Individual – health technology usefulness***	*C-FG Speaker 3*: It was extremely helpful. It was extremely helpful. Because you can go on your phone and do so many things, like if you want to walk you can track on your phone. You don't have a bigger Fitbit - you can use your phone. So, if I go walking and I forget my Fitbit, I'll remember, wow! you have a tracker on your phone, use your phone! So, it was extremely helpful.
Observability - The extent to which the innovation provides tangible results.	***Individual – health technology usage***	*C-FG 1 Speaker 3*: For me, due to my high blood pressure, I have a pressure kit at home. My doctor would call me, and say, listen, my pressure may have been a certain number. Say when I went in the office to do my blood work and blood pressure, they monitored me and said, 'I need you to go home and, in the morning, take the pressure at night, take a pressure, screenshot it and send it to me.' That was a plus, that continued monitoring because there was days that I would go to the clinic and my pressure was like to the roof. They told me this must be a white coat syndrome thing.
	Interpersonal – provider interaction and importance of face-to-face interactions	*C-FG 1 (Speaker 2)*: I think I got one (appointment) in person and that was right when [COVID-19 hit], but for the most part, my doctors did call and check on me, to see where I'm at, and did I need anything? Which is awesome.

DOI: https://doi.org/10.24926/iip.v15i4.6271