LifeLine: Mobile Phones and Health Care Continuity for the Homeless

Hailey N. Haug

Edson College of Nursing and Health Innovation, Arizona State University

Author Note

This project was reviewed and approved by the Arizona State University Institutional Review Board. There are no conflicts of interest to disclose.

Correspondence regarding this report should be addressed to Hailey N. Haug. Email: hhaug@asu.edu

Abstract

Due to complexities surrounding healthcare for individuals experiencing homelessness, continuity of care is virtually nonexistent. Continuity of care refers to individualized, comprehensive health care services that are timely, accessible, and coordinated. Health care continuity has been demonstrated to reduce mortality and improve health outcomes. A literature review determined access to mobile phones could improve health care continuity among homeless individuals. LifeLine is a state and federal program providing free phones and phone service to impoverished Americans. Enrollment into LifeLine can be challenging for the homeless, who lack access to even the most basic necessities. A project was developed to assist homeless individuals with enrollment into LifeLine in order to increase mobile phone access and improve care continuity. For four weeks, LifeLine enrollment assistance was offered to homeless clients of a mobile health outreach organization in San Francisco, California. Original, anonymous pre- and post-intervention surveys were administered to collect data regarding phone access and healthcare utilization patterns among this population. All 13 participants endorsed mobile phone access; only one participant completed enrollment into LifeLine. Seventy percent of participants reported health care continuity was directly improved by phone access, endorsing consistent healthcare visits and low hospitalization rates. Ninety-two percent of participants reported preexisting awareness of LifeLine, which likely contributed to low program enrollment. This project yielded clinically significant results indicating access to mobile phones can improve health care continuity for the homeless. Improving health care continuity for this population has both ethical and economic implications and remains a public health priority.

Keywords: homeless, continuity of care, mobile phones, health care continuity

LifeLine: Mobile Phones and Health Care Continuity for the Homeless

Homelessness has a profoundly negative impact on health. Homeless individuals not only experience more insults to health than their sheltered counterparts, they also encounter more challenges in managing acute and chronic conditions and encounter more barriers when attempting to seek health care (Moses, 2019). Due to the complexities surrounding health care for the homeless, continuity of care is virtually nonexistent (Lamanna et al., 2017). Mobile phones have been demonstrated as a useful intervention to reduce barriers and improve health care continuity among homeless individuals (Asgary et al., 2015; Krishna et al., 2009; Lamanna et al., 2017; McInnes et al., 2014). By increasing continuity of care among homeless individuals, the health outcomes of this vulnerable population may experience improvement.

Background and Significance

Problem Statement

Homeless individuals experience negative health effects due to a lack of secure and safe housing (San Francisco Health Improvement Partnership [SFHIP], 2019). Without a place to prepare and store food, access to clean water and sanitation facilities, protection from the elements, and a safe place to rest, it is almost impossible for promote health and prevent disease (SFHIP, 2019). The social determinants of health individuals experiencing homelessness face compounded by a lack of a permanent address and communication source make it difficult for health care providers and patients who are homeless to establish continuity of care (McInnes, Li, & Hogan, 2013). The lack of care continuity exacerbates acute and chronic conditions of individuals experiencing homelessness.

Continuity of care is a construct that refers to integrated and coordinated health services that are timely, accessible, individualized, and comprehensive (Lamanna et al., 2017). Care

continuity is a long-standing feature of healthcare associated with increased adherence to treatment plans and health promotion and decreased use of acute care services and mortality rates (Gray et al., 2018). Although homeless individuals experience many challenges to their health, the absence of care continuity is one of the most significant, leading to health and health care disparities. Individuals experiencing homelessness are significantly more likely to suffer from almost every category of chronic disease compared to their sheltered counterparts (National Coalition for the Homeless [NCH], 2006). The increased prevalence of chronic conditions combined with a lack of adequate nutrition, hygiene, shelter, and health care continuity leads to deleterious health outcomes for individuals experiencing homelessness (NCH, 2006).

In 2019, it was estimated that over half a million U.S. residents were homeless (U.S. Department of Housing and Urban Development [HUD], 2019, p. 1). Homeless individuals often have complex medical needs that go unmet and acute and chronic conditions that are poorly managed. Due to a lack of care continuity and social determinants of health, individuals typically only seek treatment for medical emergencies, placing a significant burden on emergency and acute care services (Garret, 2012; Warshaw, 2017). The healthcare needs of the homeless are unable to be met with sporadic care that continues the cycle of exacerbations and use of emergency and acute care services. Fragmented care is costly, inefficient, and ultimately leads to poor health outcomes and a mortality rate up to ten times higher than that of sheltered counterparts (Office of Disease Prevention and Health Promotion, 2020, para. 8; Warshaw, 2017). The majority of individuals experiencing homelessness lack health insurance; unpaid emergency and acute care services can cost local communities up to one million dollars annually per individual (Garret, 2012, p. 17). For both ethical and economic reasons, improving continuity of care for homeless individuals is of the utmost priority.

Purpose and Rationale

Homelessness is a public health issue (Centers for Disease Control and Prevention [CDC], 2019). Individuals experiencing homelessness will continue to experience disparities in both health care access and outcomes unless continuity of care is established. The purpose of this project is to thoroughly review the literature and implement an evidence-based intervention to improve health care continuity among the homeless. Literature from beyond the past five years was included as there are valuable insights gathered prior to 2016. California has one of the highest rates of homelessness in the nation, particularly in urban areas (HUD, 2019). Therefore, improved care continuity for homeless urban residents of California would have both local and national implications.

Internal Evidence

A mobile health care outreach organization in San Francisco, California specializes in providing street medicine to homeless urban residents (San Francisco Community Clinic Consortium [SFCCC], 2019). Street medicine refers to health and social services that address the unique needs of individuals experiencing homelessness delivered in their own environment (Street Medicine Institute, 2020). By providing care in a mobile van, the organization is able to bypass traditional barriers that prevent clients from receiving health care. However, continuity of care remains an issue. The program manager reports that even when follow up or primary care appointments are scheduled for homeless clients, they often have no way of contacting the client regarding appointment time or location. For clients who do have mobile phones, information regarding the appointment time and location is automatically sent to the client's phone once the appointment is made, as well as automated reminders. The program manager

reports there may be an increase in adherence to appointments and improved care continuity among clients with mobile phone access compared to those who lack access.

PICOT Question

This inquiry has led to the PICOT question: "For homeless urban residents (P), how does access to mobile phones (I) compared to no mobile phone access (C) affect health care continuity (O) over the course of one month (T)?"

Evidence Synthesis

Search Strategy

This question guided a thorough review of the existing literature regarding this topic. Literature in this area is fairly novel and limited, so the inclusion criteria was broad: any peer-reviewed literature from the past 15 years that examined the effects of mobile phones on the health of homeless individuals published in the English language was included. Exclusion criteria include literature that is specific to mental health, not published in English, not peer-reviewed, or that is outside the 15-year limit.

A structured keyword search was conducted across four databases: PubMed, Academic Search Premier, CINAHL, and Wiley Online Library. Several variations of the initial phrase "homeless urban residents" were trialed, including "housing insecure" or "unstably housed", however the final initial keyword selected was "homeless." Similarly, different versions of searchable term "access to mobile phones" were trialed, such as "cell phone access" or "access to cell phones," with "mobile phone" selected as a final keyword included in the search. The term "health care continuity" was substituted with "health" as a final keyword for three of the databases due to a lack of results from searches with "health care," "care continuity," and "health

care continuity." Only one database, Wiley Online Library, was successfully searched with the keywords "homeless" and "continuity of care."

An advanced search was conducted in the PubMed, Academic Search Premier, and CINAHL databases using the keywords "homeless," "mobile phone," and "health." This search yielded 37 results in PubMed, nine results in CINAHL, and 15 results in Academic Search Premier. All of the literature provided by the search results was reviewed to determine if inclusion criteria were met. A total of 16 literary works from all three databases met the inclusion criteria and were selected; five from the CINAHL database, three from the Academic Search Premier database, and eight from the PubMed database.

An advanced search of the Wiley Online Library database with the keywords "homeless" and "continuity of care" initially yielded 164 results. These results were narrowed by selecting results published only in journals, which led to 144 results. Narrowing the time range to meet the inclusion criteria led to 110 results. These results were further narrowed through the selection of individual journals relevant to the PICOT, which led to the inclusion of one study featured in a health and social care journal.

Due to the limited existing literature on this topic, the ancestry method was also utilized. By reviewing literature cited in the selected studies, three additional literary works were identified and included. At the conclusion of the search, 20 studies were selected for appraisal (Appendix A, Tables 1 and 2).

Critical Appraisal

Of the 20 studies, 12 were selected for synthesis (Appendix A, Table 3). These studies were selected for synthesis due to significance and relevance of the findings. There was significant heterogeneity among the major variables, themes, and outcomes of the studies. Six of

the selected studies focused on mobile phones and continuity of care among homeless individuals; two focused on mobile phone use among homeless individuals; two focused on continuity of care among homeless individuals; one focused on mobile phones and continuity of care; and another focused solely on continuity of care (Appendix A, Table 3).

Of the 12 studies, six are quantitative, four are qualitative, and one is a mixed method study. Half of the quantitative studies are high-level evidence (systematic reviews) and half are cross-sectional surveys. All of the qualitative studies utilized an interview method; one study included focus groups. The mixed method study utilized a survey questionnaire method (Appendix A, Table 3).

The studies were conducted in a variety of settings, including shelters, urban areas, clinics, and emergency departments in three Western countries (Appendix A, Tables 1 and 2). Seven studies reported sources of funding; no bias was identified in any study. There was a wide range of sample sizes, however all appropriately corresponded to the method or design utilized by each study (Appendix A, Table 3). The number of studies included in the systematic reviews was similar, likely due to the limited amount of existing research regarding this topic (Appendix A, Table 3). Due to the significant heterogeneity in the types of studies (qualitative, quantitative, and mixed), data analysis techniques were largely variable. Content analysis and thematic analysis were used by almost all the qualitative studies; data analysis techniques for the quantitative studies were unique to each study (Appendix A, Tables 1 and 2).

All of the studies were evaluated with rapid critical appraisal tools and found to be valid, reliable, and applicable (Melnyk & Fineout-Overholt, 2019, p. 657). However, these findings do come with some limitations. Due to inherent difficulties in collecting data on a vulnerable, transient population, most of the sampling utilized was convenience or snowball sampling. Only

two studies employed random selection and one study utilized quota sampling (Appendix A, Table 1). However, this sampling is appropriate given the population of interest. Additionally, only three of the quantitative studies were high-level evidence (systematic reviews). Although the remaining quantitative studies (cross-sectional surveys) are not considered high-level evidence, this study design is appropriate due to the existing challenges regarding research in this population and topic. Traditionally, qualitative studies have not been regarded as high-level evidence. However, due to the diversity in qualitative study methods, a single set of criteria cannot be accurately applied to evaluate qualitative approaches (Melnyk & Fineout-Overholt, 2019, pp. 192-193). When the traditional evidence hierarchy is used to address qualitative research, the evidence is misrepresented because this linear approach does not apply to the non-linear nature of qualitative research designs (Melnyk & Fineout-Overholt, 2019, pp. 192-193). Instead, qualitative evidence hierarchies guide the selection of studies to answer meaning questions (Melnyk & Fineout-Overholt, 2019, pp. 192-193). All of the qualitative studies selected are appropriate in design and method relevant to the research question(s), and therefore should not be considered lower level evidence.

Synthesis of Evidence

Study results demonstrate that mobile phone access among homeless individuals is similar to the general population; up to 87 percent of homeless individuals use a mobile phone daily (Moczygemba et al., 2017). Up to 71 percent of homeless individuals report using a mobile phone for health-related reasons, which is higher than the general population (McInnes et al., 2014). Study results demonstrated that homeless individuals feel positively toward mobile phone interventions directed at improving continuity of care (Asgary et al., 2015; Bender et al., 2014; McInnes et al., 2014; Moczygemba et al., 2017) (Appendix A, Table 3). Studies that

examined the effect of these interventions demonstrated improved health promotion, clinical condition, and continuity of care, and decreased emergency department visits, hospital visits, appointment no-shows, and costs (Asgary et al., 2015; Bender et al., 2014; Krishna et al., 2009; McInnes et al., 2014; Moczygemba et al., 2017; Post et al., 2013) (Appendix A, Table 3). Homeless individuals reported that they valued interventions that were easy to read and understand (Asgary et al., 2015; McInnes et al., 2014; Rhoades et al., 2017). Cost was frequently reported as a barrier to mobile phone access; free, reduced, or pay-as-you-go phones and plans were reported as facilitators to access (Asgary et al., 2015; Bender et al., 2014; Krishna et al., 2009; Lamanna, 2017; McInnes et al., 2013, 2014; Moczygemba et al., 2017; Post et al., 2013) (Appendix A, Table 3). Health care providers cited a lack of stable follow-up and communication as main difficulties in caring for homeless patients (Jego et al., 2016). One systematic review concluded that increased continuity of care is significantly associated with lower mortality (Gray et al., 2018).

The evidence suggests that in order to improve health care continuity among homeless individuals, mobile phones should be made accessible to this population. LifeLine is a state and federal program that provides mobile phones at free or reduced prices to impoverished Americans (Federal Communications Commission, 2020). Enrollment into LifeLine can be challenging for the homeless, who lack access to even the most basic necessities. Due to these barriers, homeless individuals could greatly benefit from enrollment assistance. Cost is one of the largest barriers to mobile phone access among homeless individuals; even clients who have access to a mobile phone may benefit from enrollment into LifeLine. Due to the impacts of mobile phone access on health care continuity, and the resultant impacts of improved care

continuity on health outcomes and cost reduction, an intervention to increase mobile phone access among the homeless is critical.

Theoretical Framework

Interventions to address health care continuity can be examined through several different theoretical and conceptual frameworks. Brandenberger et al. (2019) developed the 3C model in order to provide a simple, comprehensive, patient-centered summary of key challenges in health care delivery for refugees and migrants in high-income countries (Appendix B, Figure 1). Although the population of interest for this conceptual framework is refugees not homeless, both refugees and homeless individuals experience similar significant barriers when seeking health care, including a lack of care continuity (Brandenberger et al., 2019). Due to the similarities within these populations as it relates to challenges in health care delivery, the 3C model is applicable to homeless individuals. The 3C model represents three main topics of challenges in health care delivery for this population: communication, continuity of care, and confidence (Brandenberger et al., 2019).

When applied to the evidence, the 3C model suggests that communication, continuity of care, and confidence are all interrelated, directly influencing each other (Appendix B, Figure 1). The model also depicts the importance of a patient-centered perspective when addressing these three challenges in health care delivery (Appendix B, Figure 1). According to this model, a patient-centered intervention that addresses one of the 3C model components will have direct effects on the other two model components. This model suggests that a communication-based intervention, such as access to mobile phones, would have direct impacts on continuity of care and confidence for homeless individuals. Similarly, an intervention focused on continuity of

care would have direct impacts on communication and confidence, and a confidence-based intervention would have direct impacts on communication and continuity of care.

Implementation Framework

In order to guide the application of the synthesized evidence to a project, an evidence-based practice (EBP) model was selected. The Star Model of Knowledge Transformation was selected because of its succinct, cohesive depiction of translating evidence into practice (Stevens, 2013, para. 14). The Star Model is a five-point star; each point represents a different stage in the EBP cycle (Appendix B, Figure 2). Point one, discovery, represents the gathering of primary research studies (Stevens, 2013, para. 14). This step was completed through rigorous searches of multiple databases to determine if evidence exists regarding the impact of mobile phone access on health care continuity for homeless individuals (Appendix A, Tables 1 and 2). Point two, evidence summary, represents the synthesis of available knowledge (Stevens, 2003, para. 14). This step was completed through careful critical appraisal and synthesis of existing evidence (Appendix A, Table 3). Point three, translation into guidelines, represents the combination of evidence and expertise to create EBP guidelines (Stevens, 2003, para. 14). This involves translating the synthesized evidence into a recommendation for action. This step is fulfilled by the recommendation that access to mobile phones should be provided to homeless individuals in order to improve health care continuity. Point four, integration into practice, represents practice aligned to reflect best evidence (Stevens, 2003, para. 14). Providing the homeless with LifeLine enrollment assistance in order to improve phone access and consequently health care continuity would fulfill this step. Point five, evaluation, represents the impact of EBP on health outcomes, satisfaction, efficacy and efficiency of care, and health policy (Stevens, 2003, para. 14).

Evaluating the impact of LifeLine enrollment assistance and the impact of phone access on health care continuity completes this step.

Methods

The goal of this project was to assist homeless individuals with enrollment into LifeLine in order to increase mobile phone access and improve care continuity. The target population for this project was all clients (age 18 or older) of a street medicine mobile health outreach organization in San Francisco, California. This organization specializes in connecting homeless city residents to health care by removing barriers to care. Lacking access to a mobile phone is a barrier to care, particularly during the height of the COVID-19 pandemic when telehealth and virtual visits were often the only healthcare options available. The project was approved by the director of the organization and granted Expedited Review Approval by the ASU Institutional Review Board on November 5, 2020.

The project was conducted once a week for four weeks at various sites in San Francisco, including a shelter-in-place encampment and two neighborhoods frequented by homeless individuals. A recruitment script and consent were read to all clients prior to participation. Consent was implied if clients elected to participate. Participants completed a pre-intervention survey, then were offered assistance with enrollment into the LifeLine program. A post-intervention survey was administered to participants who completed enrollment.

The original, anonymous pre- and post-intervention surveys were created with assistance from an Arizona State University health literacy expert to ensure questions were the appropriate literacy level for this population. A Flesch Kincaid grade level literacy goal of five or lower was met for both surveys. The pre-intervention survey was comprised of nine to 10 questions regarding mobile phone access, annual number of visits to the mobile van, a provider, and a

hospital, perception of phone access as it relates to care continuity, and awareness of, interest in, and knowledge to join the LifeLine program (Appendix D). The post-intervention survey was comprised of four questions regarding client understanding of and satisfaction with the assisted enrollment process (Appendix E).

This project was conducted without funding. The estimated budget for this project was approximately $500 (Appendix C). Actual costs were much lower; $70 total was spent printing the consent, recruitment flyer, and survey questionnaires. Due to time constraints of the organization no time was spent training staff, dramatically lowering the total cost of the project.

Results

Thirteen clients participated in the project and completed the pre-intervention survey questionnaire. Only one of the 13 participants completed enrollment into LifeLine and completed the post-intervention survey questionnaire. Descriptive statistics were used to analyze survey results. All 13 participants endorsed mobile phone access. Seventy percent of participants reported health care continuity was directly improved by phone access, endorsing consistent healthcare visits and low hospitalization rates. Ninety-two percent of participants reported preexisting awareness of the LifeLine program, likely contributing to low program enrollment. Although statistical analysis cannot be performed on one post-enrollment survey, it is worth noting that understanding of and satisfaction with enrollment assistance was rated a score of 10 out of 10.

This project translated the theoretical concepts of communication, continuity of care, and confidence into implications for practice. Improved communication (demonstrated through improved mobile phone access) did improve continuity of care and confidence among the target population. There is current discussion about sustaining the project at the outreach organization

to continue efforts to improve care continuity among individuals experiencing homelessness in San Francisco. There is also discussion with Arizona State University faculty about implementing this project in an emergency care setting to benefit vulnerable residents of Arizona. The LifeLine program and the 3C theoretical model are applicable to any impoverished population in the United States; this project could be successfully implemented and sustained for any vulnerable Americans that lack health care continuity.

Discussion

This project demonstrated that mobile phone access can improve health care continuity among the homeless. This conclusion aligns with results of similar studies discussed in the literature review. These results must be interpreted with caution due to the small sample size and single geographical location. Original surveys were used therefore validity and reliability cannot be established. Partnership with a mobile outreach team allowed this project to be implemented where the homeless live and congregate, bypassing typical barriers that would prevent this population from receiving this intervention. However, many potential participants avoided interaction with the mobile van due to concern for COVID-19 infection, which greatly limited the amount of participation in the project.

Homeless individuals experience disparities in both health care access and health outcomes. The fragmented health care that this population experiences is both inefficient and ineffective, never succeeding in fulfilling the complex care needs of homeless individuals. Evidence from the literature review and this project suggest that access to mobile phones is an essential component of any intervention aimed at improving health care continuity for this population. Mobile phone access is increasingly important as telemedicine becomes more commonplace and other aspects of life are increasingly digitized.

Multiple interventions have been attempted to improve health outcomes for individuals experiencing homelessness, with varying degrees of success. Existing evidence has not demonstrated any single intervention that eliminates the incredibly complex health disparities faced by individuals experiencing homelessness. Further study is indicated as improving health outcomes and care continuity for individuals experiencing homeless remains a public health priority.

References

Asgary, R., Sckell, B., Alcabes, A., Naderi, R., Adongo, P., & Ogedegbe, G. (2015). Perceptions, attitudes, and experience regarding mHealth among homeless persons in New York City shelters. *Journal of Health Communication, 20*, 1473-1480. doi:10.1080/10810730.2015.1033117

Bender, K., Begun, S., DePrince, A., Haffejee, B. & Kaufmann, S. (2014). Utilizing technology for longitudinal communication with homeless youth. *Social Work in Health Care, 53*(9), 865-882. doi:10.1080/00981389.2014.925532

Brandenberger, J., Tylleskar, T., Sontag, K., Peterhans, B., & Ritz, N. (2019). A systematic literature review of reported challenges in health care delivery to migrants and refugees in high-income countries – the 3C model. *BMC Public Health, 19*, 1-11. doi:10.1186/s12889-019-7049-x

Burda, C., Haack, M., Duarte, A. C., & Alemi, F. (2012). Medication adherence among homeless patients: A pilot study of cell phone effectiveness. J*ournal of the American Academy of Nurse Practitioners, 24*(11), 675-681. doi: 10.1111/j.1745-7599.2012.00756.x

Centers for Disease Control and Prevention. (2019). *Homelessness as a public health law issue: Selected resources.* https://www.cdc.gov/phlp/publications/topic/resources/resources-homelessness.html

Eyrich-Garg, K. M. (2010). Mobile phone technology: A new paradigm for the prevention, treatment, and research of the non-sheltered "street" homeless? *Journal of Urban Health, 87*(3), 365-380. doi:10.1007/s11524-010-9456-2

Federal Communications Commission. (2020). *Lifeline program for low-income consumers.* https://www.fcc.gov/general/lifeline-program-low-income-consumers

Garret, D. G. (2012). The business case for ending homelessness: Having a home improves health, reduces healthcare utilization and costs. *American Health and Drug Benefits, 5*(1), 17-19. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4046466/

Gray, P., Sidaway-Lee, K. White, E., Thorne, A. Evans, P. H. (2018). Continuity of care with doctors – a matter of life and death? A systematic review of continuity of care and mortality. *BMJ Open, 8*(6), 1-11. doi:10.1136/bmjopen-2017-021161

Jego, M., Grassineau, D., Balique, H., Loundou, A., Sambuc, R., Daguzan, A., Gentile, G., & Gentile, S. (2016). Improving access and continuity of care for homeless people: how could general practitioners effectively contribute? Results from a mixed study. *BMJ Open, 6(*11), 1-14. doi:10.1136/bmjopen-2016-013610

Jennings, L., Lee, N., Shore, D., Strohminger, N., Allison, B., Conserve, D., & Cheskin, L. J. (2016). U.S. minority homeless youth's access to and use of mobile phones: Implications for mHealth intervention design. *Journal of Health Communication, 21*, 725-733. doi:10.1080/10810730.2015.1103331

Krishna, S., Boren, S. A., & Balas, E. A. (2009). Healthcare via cell phones: A systematic review. *Telemedicine and e-Health, 15*(3), 231-240. doi:10.1089/tmj.2008.0099

Lamanna, D., Stergiopoulos, V., Durbin, J., O'Campo, P., Poremski, D., & Tepper, J. (2017). Promoting continuity of care for homeless adults with unmet health needs: The role of brief interventions. *Health and Social Care, 26*(1), 56-64. doi:10.1111/hsc.12461

McInnes, D. K., Fix, G. M., Solomon, J. L., Petrakis, B. A., Sawh, L., & Smelson, D. A. (2015). Preliminary needs assessment of mobile technology use for healthcare among homeless veterans. *PeerJ, 3*, 1-19. doi: 10.7717/peerj.1096

McInnes, D. K., Li, A. E., Hogan, T. P. (2013). Opportunities for engaging low-income,

vulnerable populations in health care: A systematic review of homeless person's access to and use of information technologies. *American Journal of Public Health, 103*(2), 11-24. doi:10.2105/AJPH.2013.301623

McInnes, D. K., Petrakis, B. A., Gifford, A. L., Rao, S. R., Houston, T. K., Asch, S. M., & O'Toole, T. P. (2014). Retaining homeless veterans in outpatient care: A pilot study of mobile phone text message appointment reminders. *American Journal of Public Health, 104*(4), S588-S594. doi:10.2105/AJPH.2014.302061

McInnes, D. K., Sawh, L., Petrakis, B. A., Rao, S. R., Shimada, S. L., Eyrich-Garg, K. M., Gifford, A. L., Anaya, H. D., & Smelson, D. A. (2014). The potential for health-related uses of mobile phones and the internet with homeless veterans: Results from a multisite survey. *Telemedicine and e-Health,* 20(9), 1-24. doi:10.1089/tmj.2013.0329

Melnyk, B. M. & Fineout-Overholt, E. (2019). *Evidence-based practice in nursing and healthcare: A guide to best practice* (4th ed.). Lippincott, Williams & Wilkins.

Moczygemba, L. R., Cox, L. S., Marks, S. A., Robinson, M. A., Goode, J. R., & Jafari, N. (2017). Homeless patients' perceptions about using cell phones to manage medications and attend appointments. *International Journal of Pharmacy Practice, 25*, 220-230. doi:10.1111/ijpp.12321

Moses, J. (2019). *New research: Unsheltered homelessness is a health crisis*. National Alliance to End Homelessness. https://endhomelessness.org/new-research-unsheltered-homelessness-is-a-health-crisis/

National Coalition for the Homeless. (2006). *Health care and homelessness*. https://www.nationalhomeless.org/publications/facts/Health.pdf

Office of Disease Prevention and Health Promotion. *Housing instability*. Healthy People 2020.

https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/housing-instability

Post, L. A., Vaca, F. E., Doran, K. M., Luco, C., Naftilan, M., Dziura, J., Brandt, C., Bernstein, S., Jagminas, L., & D'Onofrio, G. (2013). New media use by patients who are homeless: The potential of mHealth to build connectivity. *Journal of Medical Internet Research, 15*(9), 1-10. doi:10.2196/jmir.2724

Rabiner, M. & Weiner, A. (2012). Health care for homeless and unstably housed: Overcoming barriers. *Mount Sinai Journal of Medicine, 79,* 586-592. doi:10.1002/msj.21339

Raven, M. C., Kaplan, L. M., Rosenberg, M., Tieu, L., Guzman, D., & Kushel, M. (2018). Mobile phone, computer, and internet use among older homeless adults: Results from the HOPE HOME cohort study. *JMIR mHealth and uHealth, 6*(12), 1-24. doi:10.2196/10049

Rhoades, H., Wenzel, S., Rice, E., Winetrobe, H., & Henwood, B. (2017). No digital divide? Technology use among homeless adults. *Journal of Social Distress and the Homeless, 26*(1), 73-77. doi: 10.1080/10530789.2017.1305140

Rice, E., Lee, A., & Taitt, S. (2011). Cell phone use among homeless youth: Potential for new health interventions and research. *Journal of Urban Health, 88*(6), 1175-1182. doi:10.1007/s11524-011-9624-z

Ryan, M. H., Yoder, J., Flores, S. K., Soh, J., & Vanderbilt, A. A. (2016). Using health information technology to reach patients in underserved communities: A pilot study to help close the gap with health disparities. *Global Journal of Health Science, 8*(6), 86-94. doi:10.5539/gjhs.v8n6p86

San Francisco Community Clinic Consortium. (2019). *Street outreach services (SOS).* https://www.sfccc.org/street-outreach

San Francisco Health Improvement Partnership. (2019). *San Francisco community health needs assessment 2019.* https://www.sfdph.org/dph/hc/HCAgen/2019/May

Stennett, C. R., Weissenborn, M. R., Fisher, G. D., & Cook, R. L. (2012). Identifying an effective way to communicate with homeless populations. *Public Health, 126*(1), 54-56. doi:10.1016/j.puhe.2011.09.020

Stevens, K. R. (2013). The impact of evidence-based practice in nursing and the next big ideas. *OJIN, 18*(2). doi:10.3912/OJIN.Vol18No02Man04

Street Medicine Institute. (2020). *About us*. https://www.streetmedicine.org/about-us-article

U.S. Department of Housing and Urban Development. (2019). *The 2019 annual homeless assessment report (AHAR) to Congress.* https://files.hudexchange.info/resources/documents/2019-AHAR-Part-1.pdf

Warshaw, R. (2017). *Delivering meaningful, not marginalized, care to the homeless.* Association of American Medical Colleges. https://www.aamc.org/news-insights/delivering-meaningful-not-marginalized-care-homeless

Appendix A

Evaluation and Synthesis Tables

Table A1

Evaluation Table of Qualitative Studies

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
McInnes et al. (2015) Preliminary needs assessment of mobile IT use for HC among HP Funding: VA EHQRI Bias: None Country: U.S.	IT-assisted outreach among HP may lead to improved engagement in care.	Method: Grounded theory Purpose: Examine HP A/U IT, AT toward HR IT use, BAR to IT in context of homelessness	n = 30 HP S: 4 different housing programs in 5 different geographical locations around Boston D: Ages 33-65 87% white males 17% black 7% Native American	1. How accessible are IT to HP 2. What level of interest do HP have in using IT to communicate with HCP	In-depth semi-structured qualitative interviews.	Inductive analysis & coding used constant comparative method with emphasis on allowing emergence of themes from data.	90% use MP. Many use IT for HC. Strong interest in HR reminders & check-ins. Positive attitude re: HCP using IT to connect with them / address	LOE: VI Strengths: Urban setting Limitations: Small sample, mostly white males Applicability: High Decision: Include

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
							HCN	
Raven et al. (2018) MP, C, & I use among older HP: Results from the HOPE HOME cohort study Funding: NIH, NIA, NIMHD grants Bias: 0 Country: U.S.	A/U MP & I can help lower BAR to HC, social support, social services for HP	Method: cohort Purpose: Describe the A/U MP & IT among a cohort of 350 HP over age 50	n = 350 S: shelters, encampments, meal program, centers close to HP agencies in Oakland, CA D: HP Ages 54-61 75% male 81% black 100% English-speaking Sampling: population-based, random selection	1. Prevalence of MP & IT access 2. Purposes of use 3. Types of service contracts & charging locations 4. Factors associated with A/U MP	Trained staff did baseline interviews & f/u interviews at 6-month intervals. Participants checked in monthly b/t study visits. During the 6-month f/u interview, participants completed module on IT use	Descriptive analysis	72% reported MP access 66% reported using MP to contact HCP 50% used MP to contact social service agencies 15% reported using I for H info	LOE: IV Strengths: large sample, random selection Limitations: Self-reports, limited variance in demographics Applicability: High Decision: Reject
Asgary et al. (2015)	HP have good EX with MP &	Method: semi-structured	n = 50	MH = MT for providing HIS	Enrollment days randomly	Qualitative descriptive	Majority had MP, use	LOE: VI

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
Perceptions, AT & EX re: MH among HP in NYC shelters Funding: 0 Bias: 0 Country: U.S.	IT, have positive AT re: using MT to improve HCA	individual interviews Purpose: evaluate perceptions, attitudes & experiences regarding MH Sampling: Random & criteria	S: 6 different shelters in NYC D: HP 29 women 21 men Age 25-79	1. MP possession 2. Attitudes toward/acceptance of MH strategies 3. Ideas on content of texts 4. Perceived effect of free-of-charge MP to improve HC	selected for each site Formal discussions with key informants to inform interview tool Interviews recorded & documented verbatim	approach Coded transcripts & analyzed for major themes. Content analysis performed Coding reviewed to achieve agreement	texts Majority like MH, simple messages w/ necessary info, feel empowered & better able to follow H recs if given free MP	Strengths: sampling Limitations: Sheltered not street HP, small sample Applicability: High Decision: Include
Bender et al. (2014) Utilizing tech for longitudinal comm. with HP Funding: 0	Tech use among HP suggests novel approaches to successfully maintaining contact with this population	Method: open-ended interviews Purpose: Examine utility of various IT approaches for contact with HP in longitudinal	n = 98 (76 retained) S: Homeless youth shelter in midsized city in southwest U.S.	HP's preferred methods of comm. b/t 5 options 1. Phone call 2. Text 3. Facebook 4. Email 5. In person	HP contacted via call, text, email, Facebook, in-person to participate in 6-week & 3-month f/u up Open-ended	Answers to open-ended questions categorized using iterative content analysis Categories compared	Contact best with MP (59% text/call) HP texted regardless of contact method 88% & 70% extremely	LOE: IV Strengths: longitudinal, large sample Limitations: Sheltered HP, limited age

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
Bias: 0 Country: U.S.		research	D: HP Age 18-21 62% male 37% female 40% white 27% bi-racial 24% black		questions regarding communication & preferred contact method	across coders Divergent codes discussed & reconciled	positive AT toward calls & texts Text/call promising for retention	Applicability: Moderate Decision: Include
Burda et al. (2012) Med adherence among HP: Pilot study of MP effectiveness Funding: University of Maryland School of Nursing DRIF Award & Bay Pines VA HCS Bias: 0 Country: U.S.	MP may be useful in monitoring med adherence among homeless psychiatrically ill patients	Method: quasi-experimental prospective pilot study without control group Purpose: Examine feasibility of using MP to monitor med adherence among HP & collect data for research purposes	n = 10 S: patients of a PMHNP at facility in Baltimore City D: HP Age 21-64 Mainly black males Substance use disorder & co-morbid axis I DSM-IV-TR Prescribed psychotropic meds	Med adherence = daily probability of med use Survey: 1. Did you take your med as prescribed? (Y/N) 2. Any difficulty or side effects with med? (Y/N) Exit interview: 1. General impressions of study? 2. What did you like or not like?	MP provided with unlimited service for 45 days Automated system called daily (30 days) 2-item survey asked about self-reported med intake & side effects 2-question exit interview	All responses reported to computer, reviewed by staff daily Descriptive analyses of survey data included frequencies & percentages Themes gathered from response to exit questions	Calls reached HP 93% 100% adherence with med regimen when reached Exit interviews strongly support MP usefulness	LOE: III Strengths: quasi-experimental Limitations: Self-reported, small sample Applicability: Moderate Decision: Reject

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
Eyrich-Garg (2010) MP tech: A new paradigm for prevention, treatment, & research of non-sheltered "street" homeless? Funding: Temple University grant Bias: None Country: U.S.	MP may make comm. more feasible for HP, leading toward better H outcomes	Method: open-ended interviews Purpose: Examine if & how street HP use MP Sampling: convenience and snowball	n = 100 S: Philadelphia D: HP 73% male Mean age: 45 78% black 11% white	1. MP use 2. Reason for use (safety (H), responsibility (comm. with HCP))	Open-ended interviews: History of housing Shelter use Homelessness DIS/HS Tech use info	Inductive approach	44% had MP Key reason for use was health/safety No funding was key reason for no MP	LOE: VI Strengths: large sample size Limitations: Only 1 city Applicability: High Decision: Reject
Jego et al. (2016) Improving access & COC	Involving non-specialized GPs could improve H of HP through	Method: semi-structured interviews Purpose:	n = 33 S: low-income urban areas in Marseille, FR	1. Analyze GPs' views about HPs' care 2. Explore which measures could	Face to face interviews recorded & fully transcribed,	Content analysis Inductive thematic	Maintaining stable f/u essential for GPs to effectively	LOE: VI Strengths: deep analysis

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
for HP: how could GP effectively contribute? Results from a mixed study. Funding: AP-HM, ARS PACA, research scholarship Bias: None Country: FR	better access & COC	Analyze views of GPs caring for HP & explore measures that could influence their views Sampling: snowball and quota	D: primary care GPs involved with HP	influence views 3. Describe knowledge of GPs working in low-income area about homelessness 4. Identify difficulties & BAR that GPs face in HP care	notes taken	content, comprehensive analyses Analysis process & conclusions discussed on critical times of data interpretation	care for HP Main difficulties in HP care: 1. Comm. 2. BAR to proper f/u	Limitations: Small sample Applicability: Moderate Decision: Include
Jennings et al. (2016) U.S. minority HP A/U MP: Implications for MH intervention design Funding: 0	MH can be tailored to target hard-to-reach populations	Method: qualitative focus group discussions Purpose: Potential of MH interventions among HP to improve access to HIS	n = 52 S: underserved communities in Baltimore & DC D: HP Ages 15-24 Affiliated with CBO	How HP perceive MP, acquired & maintained service, thought MH programs should be designed MP use, function, source, duration of ownership	9 focus groups moderated by experienced qualitative researcher using open-ended question guide Conducted in private room at	Iterative approach for themes. Codebook of themes & subthemes created. Text groups extracted according to codes.	90% MP MP themes: Beneficial Protective MH themes: Adaptable Authentic Private Controllable Maintaining	LOE: VI Strengths: moderate sized sample Limitations: limited demographics Applicability:

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
Bias: 0 Country: U.S.		Sampling: Purposive selection & recruitment via flyers & emails from CBOs	60% female 100% black		CBO facility, 90 min. long	Progressive focusing technique. Direct quotes extracted to illustrate key findings.	connectivity challenging (finances) Most prefer interactive content & MH/MP HCP comm.	High Decision: Reject
Lamanna et al. (2017) Promoting COC for HP with unmet HN: The role of brief interventions Funding: CIHR grant Bias: None Country: CA	Explore diverse stakeholder perspectives on role of brief interventions in supporting COC for HP	Method: focus groups, individual semi-structured interviews Purpose: Examine role of brief ID intervention in supporting COC Sampling: random selection	n = 52 S: large urban center in Toronto, Canada D: HP discharged from hospital (n = 22) Program staff (n = 8) CBO manager (n = 7) Prior HP	Intervention: time-limited case management, primary & psychiatric care, peer accompaniment Intervention aimed to provide time-limited services while establishing COC through timely referral to & coordination of	3 semi-structured focus groups of service providers & HP 29 individual semi-structured interviews conducted with HP & informants	Transcripts analyzed using thematic analysis Analysis informed by existing frameworks for COC, remaining open to additional findings	Brief ID interventions can promote COC Can promote COC through low-barrier service design relevant to realities HP	LOE: VI Strengths: random selection Limitations: small sample Applicability: High Decision: Include

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
			(n = 8) Provider (n = 7)	appropriate HIS				
McInnes et al. (2014) Retaining HP in outpatient care: A pilot study of MP text message apt. reminders Funding: VA H/H QUERI, EH QUERI, CDA & NCHV Bias: 0 Country: U.S.	If texts feasible, effective & acceptable way to reach HP, provides low-cost efficient way to increase engagement in outpatient care, improve H, reduce ED & hospital visits	Method: qualitative semi-structured interviews Purpose: Examine feasibility of using texts with HP to increase engagement & reduce apt. no-shows Sampling: Recruited from VAMC	n = 20 S: homeless-oriented clinic at Providence VAMC in Rhode Island D: Veteran receiving care at VAMC Read/speak English Own MP 81% male 62% white Age 25-68	Broad questions re: intervention: experience, usefulness, privacy, confidentiality, overall satisfaction	8-week intervention period 2 text appointment reminders 5 days & 2 days before appointment F/u qualitative semi-structured interview	Interview data analyzed by qualitative software. Thematic analysis of interview transcripts conducted. Close reading of transcripts for coding. Reviewed coded data, consensus reached.	Easy usability, liked text reminders, strong interest in continuing No privacy concerns, high satisfaction	LOE: VI Strengths: overwhelming results Limitations: small sample Applicability: High Decision: Reject
Rhoades et al. (2017)	HP have increased risk of negative H	Method: interviews	n = 421 S: LA & Long	1. MP & IT device ownership 2. MP use	1. Author-created instrument	Descriptive statistics	94% own MP 85% use	LOE: VI Strengths:

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision/ Application to practice
No digital divide? Tech use among HP Funding: NIDA grant Bias: 0 Country: U.S.	outcomes, tech-based interventions may provide opportunity for improving H in this population	Purpose: present descriptive info from sample of HP about I & MP access & use	Beach, CA D: HP moving into PSH Male 72% Mean age 54 Black 56% White 24% Sampling: referred from 26 agencies or recruited	activity 3. Frequency of MP use	assessed MP & IT device ownership 2. MP use instrument adapted from Pew Research Center 3. Frequency of use instrument adapted from Rice et al.		daily 76% use texts 51% use I	large sample Limitations: use for HIS not directly assessed Applicability: High Decision: Include

Key: **A/U** – access to/use of; **AP-HM** – Assistance Publique Hopitaux de Marseille; **apt**. – appointment(s); **ARS PACA** – regional health agency of PACA region; **AT** – attitudes; **BAR** – barriers; **b/t** – between; **CBO** – community-based organization; **CDA** – career development award; **CIHR** - Canadian Institutes of Health Research; **COC** – continuity of care; **comm.** – communicate/communication; **DIS/HS** - Homeless Supplement to the Diagnostic Interview Schedule; **ED** – emergency department(s); **EHQRI** – eHealth Quality Enhancement research initiative; **EX** – experiences; **f/u** – follow up; **GP** – general practitioners; **HCA** – health care access; **HCN** – health care needs; **HCP** – health care provider(s); **HCS** – health care system; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HN** –health needs; **HP** - homeless people; **HR** - health-related; **I** – Internet; **ID** – interdisciplinary; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **MT** – mobile technology; **n** – number of participants; **NCHV** - National Center on Homelessness among Veterans; **NIA** – National Institute on Aging; **NIDA** – National Institute of Drug Abuse; **NIH** – National Institute of Health; **NIMHD** - National Institute on Minority Health and Health Disparities; **PSH** - permanent supportive housing; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **tech** – technology; **VA** – Veterans Affairs

Table A2

Evaluation Table of Quantitative Studies

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
Gray et al. (2018) COC with doctors – a matter of life & death? A SR of COC & mortality Funding: 0 Bias: 0 Country: UK	Are higher levels of COC in any setting & any patient group associated with changed mortality?	Design: SR without meta-analysis Purpose: Examine if relationship b/t COC & mortality exists	N = 22 S: 9 countries D: all patient groups	IV: COC DV: mortality	All studies cohort or cross-sectional Newcastle-Ottawa Scale to rate studies (all 22 studies rated as high-quality on this scale)	Studies analyzed for relationship b/t COC & mortality rates Obtained risk metric from each study for an adjusted model of data analysis	82% studies showed greater COC significantly associated with lower mortality	LOE: I Strengths: SR Limitations: analysis not clearly described Applicability to PICOT: Moderate Decision for practice: Include
McInnes et al. (2014) The potential for HR uses of MP & I with HP: Results from a multisite survey	HP's use of IT to comm. with HCS can potentially improve access to/engagement in care	Design: cross-sectional survey Purpose: survey HPs' use of IT & AT re: use of IT to access	n = 106 S: VA homeless programs in Massachusetts D: English speaking homeless	1. MP access 2, 3, 4. Use of texts, I, email 5. AT re: HCS contact via MP	Survey questionnaire	Bivariate analyses Chi-squared analysis Fisher's exact tests 2-sided p-value <0.05 significant	89% have MP 71% text 76% I 81% email 71% use MP for HCS 93% approve of	LOE: IV Strengths: Large sample Limitations: not "street" homeless Applicability to PICOT: High

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
Funding: VA H/H QUERI, NCHV, CDA Bias: 0 Country: US		HCS	veterans in emergency housing Sampling: convenience				messages from HCS	Decision for practice: Include
Moczygemba et al. (2017) HP perceptions about using MP to manage meds & attend apts. Funding: 0 Bias: 0 Country: US	MP may help HP with managing meds & attending apts.	Design: cross-sectional survey Purpose: Describe HP A/U MP, perceptions about using MP to manage meds, attend HC apts. & identify characteristics associated with these behaviors	n = 290 S: Virginia homeless clinic D: HP 65% men 35% women 72% black 22% white Sampling: convenience	1. MP access 2. MP use 3. Med use 4. Apt. hx 5. Perceptions of using MP to manage H	22 question survey Likert scale	Logistic regression	89% have MP 77% want MP reminders Those who believe MP reminders were helpful positively predicted interest in MP reminders Hx of running out of meds & forgetting apts. positive predictor of interest in MP reminders	LOE: IV Strengths: large sample Limitations: 1 site Applicability to PICOT: High Decision for practice: Include
Post et al.	"New media"	Design:	n = 5788	New media:	4 questions re:	Descriptive	70% have MP	LOE: IV

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
(2013) New media use by HP: Potential of MH to build connectivity Funding: Dept. of EM, Yale School of Medicine Bias: 0 Country: US	may better service HP who routinely access ED for their HC	observational cross-sectional survey Purpose: determine prevalence & types of "new media" use among homeless ED patients	S: 3 urban high-volume EDs in Connecticut D: 55% male Mean age 40 39% black 25% Latino	on-demand interactive 24/7 access to content using a digital device (I, MP, etc.)	housing 8 questions re: MP, IT use, interest in receiving HIS via MP 1 question re: demographics	statistics Bivariate data analysis Adjusted odds ratio	64% use MP for HIS (compared to 60% of housed ED patients)	Strengths: large sample Limitations: lower LOE Applicability to PICOT: High Decision for practice: Include
Rice et al. (2011) MP use among HP: Potential for new H interventions & research Funding: 0 Bias: 0 Country: US	Potential for MP to facilitate intervention, research & care for HP	Design: Survey Purpose: preliminary exam of MP ownership & use among homeless youth	n = 169 S: drop-in homeless agency in LA D: Age 13-24 Living on street/in shelter Sampling: Non-probability	1. Levels of ownership 2. Use 3. Patterns of connecting to various networks	60 min. C-administered self-interview at agency	t-test & chi-square to assess differences b/t MP owners & non-owners	62% own MP 16% some form of access 22% have no MP access 17% used for HIS	LOE: IV Strengths: large sample Limitations: only 1 site Applicability to PICOT: High Decision for practice: Reject

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
Ryan et al. (2016) Using H IT to reach patients in underserved communities: A pilot study to help close the gap with HD Funding: 0 Bias: 0 Country: US	Strategies for using health IT can be used to enhance comm. b/t HCP & patients in low-income communities	Design: cross-sectional survey Purpose: Are H IT usage patterns among these patients like those of similar populations surveyed elsewhere in U.S.?	n = 39 S: free clinic in downtown Richmond, VA D: 200% below federal poverty level 3% white 46% Latino 26% black 2% other 70% age 25-64	Survey questions re: demographics, HCA, H, IT ownership, general IT use, IT use for HIS, IT devices	Survey tool borrowed elements from PEW Research Center	Cronbach's alpha	92% own MP 64% HIS use 38% text 59% email 72% I (89% for HIS) 38% social media (38% for HIS) 8% video call	LOE: IV Strengths: strong results, variety of ethnicities Limitations: small sample, 1 site Applicability to PICOT: High Decision for practice: Reject
Stennett et al. (2012) Identifying effective way to comm. with HP Funding: 0 Bias: 0	It is possible to establish an effective way to comm. with HP	Design: Likert-type survey Purpose: Ascertain the predominant info-seeking behaviors of HP to identify	n = 39 S: 2 facilities serving free meals in Texas Sampling: convenience	How many days per week read newspaper, check email, watch news, ate at local shelter, check bulletins at shelter	Series of questions to characterize his/her info-seeking behaviors	Not described	54% own MP 40% check email weekly Best method: verbal announcement at meal times (87% eat free meals at least 4x/week)	LOE: IV Strengths: Likert-type survey Limitations: Data analysis not described Applicability to

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
Country: US		the most efficient contact method		Own MP				PICOT: High Decision for practice: Reject
McInnes et al. (2014) Retaining HP in outpatient care: A pilot study of MP text message apt. reminders. Funding: VA H/H QUERI, EHQUERI, CDA, NCHV Bias: 0 Country: US	Texts provide low-cost efficient way to increase engagement in outpatient care, improve health, reduce ED & hospital visits	Method: survey questionnaire Purpose: Feasibility of using MP texts with HP to increase engagement in care & reduce appointment no-shows Sampling: Recruited from VAMC	n = 20 S: homeless-oriented clinic at Providence VAMC in Rhode Island D: Veterans receiving care at VAMC that own MP & speak English 81% male 62% white Age 25-68	2 text reminders before each outpatient apt. Administered pre/post survey questionnaire	Estimated costs & savings of large-scale implementation	2-sided t tests ($p<0.05$) & confidence intervals Average cost approach	Cancelled visits & no-shows trended down: 53 to 37 31 to 25 (respectively). Statistically significant reduction in ED visits: 15 to 5 & borderline significant reduction in hospitalizations: 3 to 0 Up to $115.7 million per year in savings	LOE: IV Strengths: strong results Limitations: small non-random sample Applicability to PICOT: High Decision for practice: Include
McInnes et al. (2013) Opportunities for engaging	MP & IT improve comm. b/t HCP & HP	Method: SR Purpose: Synthesize what's known	N – 16 n - 1082 (combined) S: variety of	1. Prevalence of A/U of IT 2. Purposes for using IT 3. BAR & F	All studies were cross-sectional PRISMA checklist used	Young & Solomon critical appraisal methodology	Substantial A/U IT: 62% MP; 55% C; 84% I. IT often used for H.	LOE: I Strengths: SR Limitations: small

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Results	Level/Quality of Evidence; Decision/ Application to practice
low-income, vulnerable populations in HC: SR of HP's A/U IT Funding: VA Bias: 0 Country: US		about A/U IT in HP to improve HCC Sampling: convenience	settings in 3 countries D: HP	of A/U IT			BAR: cost, availability F: pay-as-you go plans HP A/U IT for H- purposes	samples in studies Applicability to PICOT: High Decision for practice: Include
Krishna et al. (2009) HC via MP: SR Funding: 0 Bias: 0 Country: US	Comm. tech can help in providing care & support for H outcomes	Method: SR Purpose: Evaluate evidence r/t MP & text in improving H outcomes & processes of care	N = 25 n = 38,060 (combined) S: 12 clinical areas in 13 countries D: variety	MP was the tech used in all studies Processes & outcomes of care measured (activities involved in HC delivery, behavior change, clinical improvement, & social functioning)	20 RCTs & 5 controlled studies found in MEDLINE search	Data collected from all articles: sample, tech used (MP), duration, frequency, intervention, process & outcome measures, statistical significance	Significant improvements noted in activities involved in HC delivery, behavior change, clinical improvement, social functioning Lower apt. no-shows, quicker diagnosis & treatment	LOE: I Strengths: SR Limitations: some studies had small samples Applicability to PICOT: High Decision for practice: Include

Key: **A/U** – access to/use of; **apt**. – appointment(s); **AT** – attitudes; **BAR** – barriers; **b/t** – between; **C** - computer; **CDA** – career development award; **COC** – continuity of care; **comm.** – communicate/communication; **D** – demographics; **ED** – emergency department(s); **EHQ** – eHealth Quality Enhancement; **EM** – emergency medicine; **F** - facilitators; **HCA** – health care access; **HCC** – health care continuity; **HCP** – health care provider(s); **HCS** – health care system; **HD** – health disparities; **H/H** – HIV/Hepatitis; **HIS** – health information or services; **HP** - homeless people; **HR** - health-related; **hx** – history; **I** – Internet; **IT** – information technology; **LOE** – level of evidence; **med(s)** – medication(s); **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **NCHV** - National Center on Homelessness among Veterans; **PRIMSA** - Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QUERI** – Quality Enhancement Research Initiative; **re** – regarding; **S** – setting; **SR** - systematic review; **tech** – technology; **urban** – urban area(s); **VA** – Veterans Affairs

Table A3

Synthesis Table

Author	Asgary	Bender	Gray	Jego	Krishna	Lamanna	McInnes	McInnes	McInnes	Moczygemba	Post	Rhoades
Year	2015	2014	2018	2016	2009	2017	2014	2013	2014	2017	2013	2017
Data	Qual	Qual	Quant	Qual	Quant	Qual	Quant	Quant	Mixed	Quant	Quant	Qual
LOE	VI	IV	I	VI	I	VI	IV	I	IV	IV	IV	VI
D/M	Interview	Interview	SR	Interview	SR	FG/Interview	CSS	SR	SQ	CSS	CSS	Interview
Study Topic(s)												
HP	X	X		X		X	X	X	X	X	X	X
MP	X	X			X		X	X	X	X	X	X
COC	X		X	X	X	X	X	X	X	X	X	
Study Characteristics												
n/N	n = 50	n = 76	N = 22	n = 33	N = 25	n = 52	n = 106	N = 16	n = 20	n = 290	n = 5788	n = 421
Mean Age	51	19		50		42	55		55	47	40	54
Male	42%	62%		58%		73%	96%		81%	65%	55%	72%
Setting	Shelter	Shelter	≈	Urban	≈	Urban	Shelter	≈	Clinic	Clinic	ED	Shelter
Major Variables/Themes												
MP Access	78%	100%			X		89%	62%	100%	89%	70%	94%
Daily Use								62%		87%		85%
Feature	Text	Text/call			Text/call		Call/text		Text	Text	Call/text	Text
MH Use	X				X		71%	X			84%	
Reminders	X	X			X		X		X	X		
Cost BAR	X				X	X	X	X		X		
Free MP	X	100%								50%	9%	
Simplicity	X								X			X
COC			↑									
Outcomes												
BAR	↓			↓		↓		↓				
AT re: MH	Positive	Positive							Positive	Positive		
AT re:	Positive	Positive					Positive		Positive	Positive		

Key: **AT** – attitudes; **BAR** – barriers; **COC** – continuity of care; **CSS** – cross-sectional survey; **D/M** – design/method; **ED** – emergency department(s); **FG** – focus group(s); **Hosp**. – hospital; **HP** - homeless people; **LOE** – level of evidence; **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **Qual** – qualitative; **Quant** – quantitative; **re** – regarding; **SQ** - survey questionnaire; **SR** - systematic review; **urban** – urban area(s); **X** – present; ≈ – variety of settings; ↑ - increase; ↓ - decrease

reminders												
Health promotion		↑			↑							
ED visit									↓			
Hosp. visit									↓			
No-shows					↓				↓			
Costs									↓			
Clinical condition					↑							
Mortality			↓									
COC	↑			↑	↑	↑						

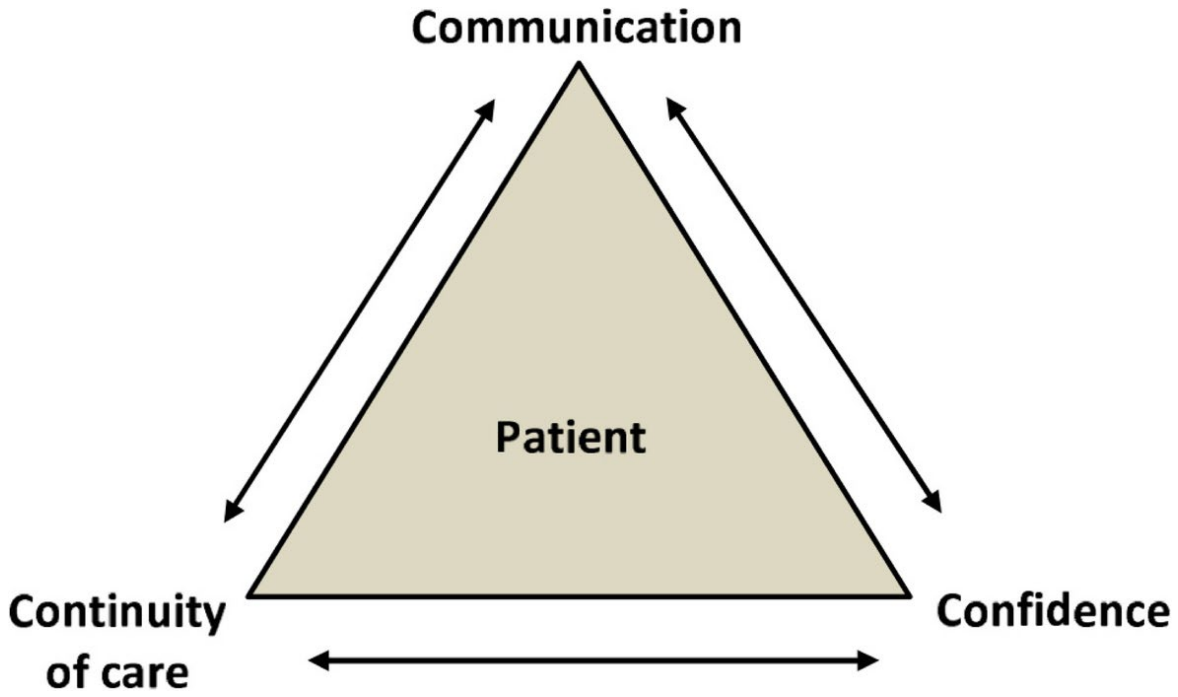
Key: **AT** – attitudes; **BAR** – barriers; **COC** – continuity of care; **CSS** – cross-sectional survey; **D/M** – design/method; **ED** – emergency department(s); **FG** – focus group(s); **Hosp**. – hospital; **HP** - homeless people; **LOE** – level of evidence; **MH** – mHealth, **MP** – mobile phone(s); **n** – number of participants; **N** – number of studies; **Qual** – qualitative; **Quant** – quantitative; **re** – regarding; **SQ** - survey questionnaire; **SR** - systematic review; **urban** – urban area(s); **X** – present; ≈ – variety of settings; ↑ - increase; ↓ - decrease

Appendix B

Model and Framework

Figure B1

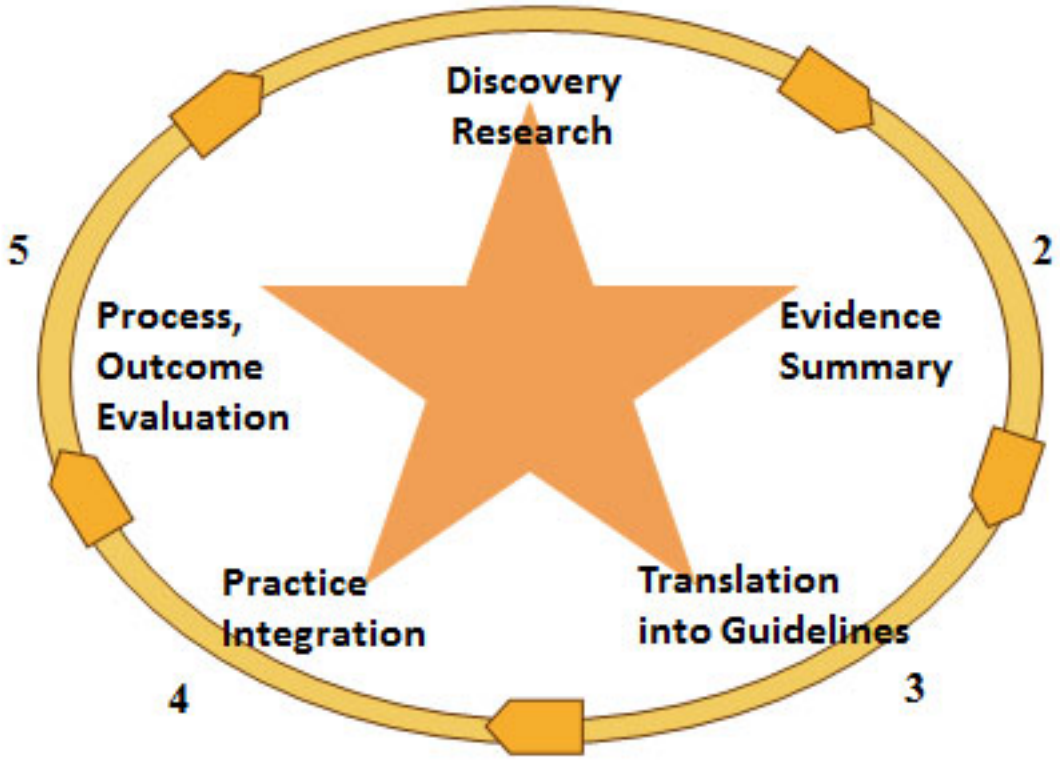
The 3C Model



Brandenberger et al. (2019).

Figure B2

The Star Model of Knowledge Transformation



Stevens (2013).

Appendix C

Budget

Phase	Activities	Cost	Subtotal	Total
Preparation	Design and print evaluation tools - survey questionnaires	$200	$200	
	Provide questionnaires to clients	$0	$200	
	Train staff on how to perform this process	$300	$500	
Evaluation	Review and analysis of survey results with SPSS software	$0	$500	**$500**
Funding	None	$0	$0	**$0**
Revenue/Savings	None	$0	$0	**$0**

Appendix D

Pre-Intervention Survey

Survey 1

1. Do you have access to a phone?
   a. Yes
   b. No

If you said "yes," please fill out only part A, then go to section 2.
If you said "no," please fill out only part B, then go to section 2.

Part A: Fill out only if you DO have access to a phone

1. Is it easier to visit your doctor because you have a phone?
   a. Yes b. No
2. Do you visit the hospital less because you have a phone?
   a. Yes b. No

Part B: Fill out only if you do NOT have access to a phone

1. Do you want a phone?
   a. Yes b. No
2. Would it be easier to visit your doctor if you had a phone?
   a. Yes b. No
3. Would you visit the hospital less if you had a phone?
   a. Yes b. No

Section 2

2. How many times a year do you visit the SOS mobile van?
   a. 1-2
   b. 3-4
   c. 5 or more
3. How many times a year do you visit your doctor?
   a. 1-2
   b. 3-4
   c. 5 or more
4. How many times a year do you visit the hospital?
   a. 1-2
   b. 3-4
   c. 5 or more
5. Have you heard of the LifeLine program ("free or cheap phone")?
   a. Yes
   b. No
6. Do you want to join the LifeLine program so you can get a free or cheap phone?
   a. Yes
   b. No
7. Do you know how to join the LifeLine program so you can get a free or cheap phone?
   a. Yes
   b. No

Participant ID Number:

Appendix E

Post-Intervention Survey

Survey 2

1. **Do you understand the help you got today?**
   (0 = no, 5 = some of it, 10 = all of it)

0	1	2	3	4	5	6	7	8	9	10

2. **Was signing up for LifeLine easier with help?**
   a. **Yes**
   b. **No**

3. **Would you join LifeLine without help?**
   a. **Yes**
   b. **No**

4. **How happy are you with the help you got today?**
   (0 = not happy, 5 = kind of happy, 10 = very happy)

0	1	2	3	4	5	6	7	8	9	10

Participant ID Number: