Implementation of Standardized Screening for Social Determinants of Health in Persons with Serious Mental Illness

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Abstract

Persons with serious mental illness (SMI) often struggle to obtain the resources, both physical and medical, needed to achieve optimal wellness. By screening for social determinants of health (SDoH) in this population, medical comorbidities may be reduced, benefiting both the lives of patients and the healthcare system in the United States. After completion of a literature review led by the guiding theory of Maslow's Hierarchy of Needs and ethics approval from a university human subjects committee, participants were enrolled in the social determinants of health screening project at an urban Southwestern United States clubhouse-model SMI clinic. Participating adult SMI patients anonymously completed the Centers for Medicare and Medicaid Services *Accountable Health Communities Health-Related Social Needs* screening tool, which is relatively new and uses both original questions and those obtained from other SDoH assessments and therefore has had no published psychometric testing completed yet. Data analysis will be completed using statistical software and this data will be used to help guide the creation of a patient-centered resource guide for the various different domains of the SDoH. It is anticipated that this guide will empower SMI patients to take charge of their needs and navigate community resources with greater autonomy, facilitated by guidance from social practitioners. By screening for and helping meet the SDoH needs of SMI patients, it is known that overall health and wellness will be increased both physically and mentally for these patients, allowing them a greater level of independence and self-actualization.

Keywords: social determinants of health, serious mental illness, health-related social needs

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Persons diagnosed with serious mental illness (SMI) often struggle to receive proper support. Screening for social determinants of health (SDoH) at medical clinics and community centers is an opportunity to help improve their lives. By determining the biggest deficits and needs of their patients, staff at community mental illness clinics and clubhouses are better able to provide resources to their patients. The outcome of screening for SDoH may improve both the physical and mental health of their served population as well as the overall community.

Problem Statement

SDoH have long affected health equity for people across the world. Evidence has shown that the non-medical aspects of living conditions and social background in which one grows up and lives may affect overall physical and mental health. Those in disadvantaged areas have less resources to health care and poorer outcomes (Commission on Social Determinants of Health, 2008; Office of Disease Prevention and Health Promotion, n.d.a). With mental health becoming a growing problem in the United States (U.S.), it is imperative that healthcare professionals screen for social determinants of health, such as housing, transportation, poverty, and education to aid in their holistic care of the patient and reduce overall health system burden (Office of Disease Prevention and Health Promotion, n.d.a). Notably, the Healthy People 2030 initiative by the Office of Disease Prevention and Health Promotion (n.d.b) includes many indicators relating to SDoH, such as an overarching goal to “create social, physical, and economic environments that promote attaining the full potential for health and well-being for all.”

Purpose and Rationale

The United States (U.S.) far outspends other countries on medical care for its citizens with approximately $12,530 spent per person in 2020; however, the United States has an overall lower life expectancy (Reed, 2022). A lack in education on social determinants of health was noted by Wakefield et al. (2021) to impact the care patients receive as both Registered Nurses and Nurse Practitioners note that they felt unprepared to care for patients with complex needs. Therefore, it is imperative that nurse practitioners begin learning about and understanding social determinants of health so that they can appropriately screen and care for their patients. The purpose of this paper is to provide evidence for the importance of screening those with serious mental illness for social determinants of health

Background and Significance

SDoH influence a person's overall well-being. Large discrepancies in the environments in which United States citizens were raised and currently live impact their social determinants and their access to equitable healthcare. In screening for these SDoH, nurse practitioners (NPs) and other healthcare providers can better care for and provide appropriate resources for their patients leading to stronger health equity.

Persons with Serious Mental Illness

In the U.S., approximately 21% of the adult population has been diagnosed with some form of mental illness; however, only 5.6% of the adult population has officially been termed to have serious mental illness (National Institute of Mental Health, 2022). Serious mental illness is defined as having a diagnosed mental illness which limits functionality in daily activities of living (Sanchez et al., 2020). This equates to approximately 14.2 million adults, of which only 9.1 million reported seeking and receiving support for their SMI diagnosis (National Institute of Mental Health, 2022).

A subset of persons diagnosed with SMI have the opportunity to be members in a peer mental rehabilitation program called a clubhouse. According to Clubhouse International (2022), these day programs are a form of a health home for SMI diagnosed individuals that includes a myriad of opportunities for socialization, work, physical and mental healthcare, and education. Persons with SMI who attend clubhouses are called "members" rather than patients—this encourages them to take a sense of ownership in the daily activities of the environment and work alongside a minimal number of staff to make their day program a welcoming and successful part of the local community (Clubhouse International, 2022). Clubhouse members frequently report a growing sense of self-worth and quality of life while also having the day program as an anchor from which they can step out into and participate in the local community (Kinn et al., 2018; McKay et al., 2018).

The Clubhouse Model and Screening for Social Determinants

The clubhouse can increase access to resources and improve SDoH for those with SMI. While many clubhouses aim to provide holistic care resources for their members, funding for persons with SMI can often be difficult due to inequities in healthcare coverage and access to care (Corrigan & Ballentine, 2021). Multiple screening tools have been developed for use in family practice clinics for health-related social needs; however, none have been endorsed by a preventive services taskforce, such as the US Preventive Services Taskforce ([USPSTF]; O'Gurek, 2018). Several tools have been developed from organizations such as the National Association of Community Health Centers, the American Academy of Family Physicians, and the Centers for Medicare & Medicaid Services (O'Gurek, 2018). These tools may aid in providing data to help achieve additional funding as well as provide individualized resources to members with SMI and can be utilized in various healthcare settings for all types of patients.

Screening Leads to Improved Health Resources and Equity

The desired future state of SMI patients, specifically those participating in a clubhouse, is to continue their personal growth in the community as well as prevent increased hospitalizations for SMI symptoms. Additionally, members should be receiving individualized assistance with finding resources based on their screening answers. By screening for SDoH in a more thorough and evidence-based manner, better health equity may be achieved for members. It is known that persons with SMI are more likely to have comorbid physical illnesses at a higher rate than the general population; these comorbid conditions increase hospitalizations, decrease life expectancy, and place burden on the healthcare system (Corrigan & Ballentine, 2021; Stefancic et al., 2021). Furthermore, *Healthy People 2030* includes many concepts and outcomes related to social determinants of health (Office of Disease Prevention and Health Promotion, n.d.a). Therefore, increasing health equity itself would help promote health and wellness through disease progression and prevention in the SMI population.

Guiding Theory: Maslow's Hierarchy of Needs

Social determinants of health and health-related social needs start with the very basic needs of patients and then use these needs to improve overall health. Maslow's Hierarchy of Needs similarly fits this model of care and is the guiding theory for this project. Maslow believes that basic needs must be met before a person has the ability to grow and achieve self-actualization (Mcleod, 2023). Physiologic needs, such as food, shelter, and sleep are a priority over needs such as employment and health. This is evident at this project site as many of the members of the clubhouse struggle with their physiologic needs which further affects their mental and physical health. Through the clubhouse model, they develop resources to help them achieve stability in the lower physiologic tiers of Maslow's pyramid before progressing to the

higher tiers (see Appendix B, Figure B1). Peer support at the clubhouse further helps the members to develop meaningful relationships, giving them a sense of belonging and aiding in growing their self-esteem. This model allows them to come closer to their ultimate goal of self-actualization.

Implementation Framework: RE-AIM

The implementation of this project was guided by the RE-AIM Framework. RE-AIM is a public health-focused implementation framework that encourages long-term maintenance of change within an organization. It was developed in 1999 and has been used in over 700 studies to help "translate research into practice" (RE-AIM, 2023). There are five elements to RE-AIM: reach, effectiveness, adoption, implementation, and maintenance (see Appendix B, Figure B2). By reaching the population and effectively adopting and implementing a screening tool for social determinants of health, there is a greater chance that the project site will be able to maintain the screening process. The RE-AIM framework acknowledges the importance of working together to achieve the desired outcome—both as a group and individually for the staff and intended population.

Implications for Practice Change

With increasing numbers of patients experiencing chronic medical conditions in addition to psychiatric diagnoses, it is imperative that healthcare providers begin screening their patients for ways to prevent these chronic conditions from occurring or worsening. Through screening for health-related social needs and social determinants of health, providers can determine the needs of their patients that may affect both their physical and mental health. While this is being incorporated in many clinics to help with reimbursement and patient care, few standardized screening tools exist. By implementing one of these standardized screenings at the community

mental health site where this project was completed, social practitioners and psychiatric nurse practitioners are better able to help patients with basic needs. Using a standardized tool supported by the Centers for Medicare and Medicaid Services should be a sustainable method of screening for the facility for years to come.

Methods

Setting and Stakeholders

There is a relatively new clubhouse model community center for those with SMI in the Southwestern U.S. that serves as a place of psychosocial rehabilitation. Per the clinical director, the clubhouse's mission includes a work-ordered day, peer support, overall wellness, and the "need to be needed." The majority of members at this clubhouse are homeless or living in shelters and come from disadvantaged backgrounds with limited education and work experience. Per staff, struggles to provide needed support for the clubhouse members include limited funding and inadequate screening for SDoH. By implementing a standardized screening tool, the clubhouse staff hoped to provide more resources for their members. Stakeholders in the organization included the CEO, clinical director, social practitioner staff, medical staff, the funding donor, and the clubhouse members. The social practitioners directly provide resources to the clubhouse members regarding SDoH. As the ones completing the surveys, the clubhouse members were the largest stakeholders in this project as their responses dictated the resources they received. The clinical director and medical staff also benefitted from this information as it helped guide their practice and encouraged better overall mental/physical health for the members. The CEO and funding donor may benefit from improved reimbursement rates and ability to make connections with local resources for their patients.

Participants and Recruitment

The clubhouse members were the primary subjects of this project. Members have been diagnosed with SMI, such as bipolar disorder, schizophrenia, and major depressive disorder among other mental and physical health comorbidities. Participants were recruited through verbal communication. Announcements were made at the morning meetings for the clubhouse members and staff. Exclusion criteria included those under the age of 18 and who are non-English speaking due to consent purposes. There were no members at the project site who met this exclusion criteria, so it was not a problem for participant recruitment.

Intervention

An IRB application through Arizona State University was approved in August 2023. The project was discussed with staff and presented to members at the clubhouse's morning meeting on dates when data collection occurred. Data was collected by the co-primary investigator (co-PI) at the project site on two different occasions in January and February 2024. The co-PI was present and available for assistance with completion of the screening tool when needed by the participant. Return of the completed screening tool was implied consent for the project per IRB recommendations, and the project coordinator was available to answer any questions. Data was then assigned a number and deidentified for further data analysis for the purpose of the project. Data analysis occurred in Spring 2024. Aggregate results were presented to the staff at the project site upon completion.

Outcome Measures

There are several long-term outcome measures that were not addressed during this project, such as improvement of health, reduction of hospitalizations, and reduction of homelessness. After consideration of the project site's greatest needs, the following evaluation question was developed: After project implementation, did staff and members at the project site

feel like they were provided with necessary resources for improvement of social determinants of health?

The CMS HRSN Screening Tool

In line with *Healthy People 2030* goals, the Centers for Medicare and Medicaid Services (CMS) recognizes that social determinants of health (SDoH) impact the overall health of Americans. To help with recognizing limitations in these areas, CMS developed a health-related social needs (HRSN) screening tool to help standardize the evaluation process for each patient in their accountable health communities (AHC) program. This tool became known as the AHC-HRSN (see Appendix E). To do this, CMS used questions developed from different screening tools that had been validated for various social determinants of health. They received approval from the authors to combine the questions into standardized and comprehensive HRSN/SDoH screening tool.

There is little psychometric testing available for the various SDOH screening tools available since 2014. Henrikson et al. (2019) found that, while there is good pragmatic research evidence in the available studies, most do not have any psychometric testing. Their systematic review found no reported validity or reliability for the AHC-HRSN. This was also confirmed through both database searches and Google Scholar searches. Due to these results, it was difficult to find a SDoH screening tool with adequate psychometric evaluation, so one that is widely used by the United States government was chosen as the results may help improve Medicare/Medicaid reimbursement for the project site. CMS does state that a technical expert panel was used to help finalize the development of the AHC-HRSN (Billioux et al., 2017). Furthermore, the AHC-HRSN has been utilized for many studies regarding SDoH and has particularly been used to evaluate SDoH in those with a mental illness diagnosis.

Several questions for the tool did come from another organization's screening tool called the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE). Some validity information is available for this screening tool, including a Cronbach's alpha of 0.86 (good) and a greatest lower bound of 0.935 (excellent) (NACHC & AAPCHO, 2019). Henrikson et al. (2019) furthermore gave the PRAPARE a convergent validity score of 4, which they indicated was excellent but a poor predictive validity score of -1. Henrikson et al. (2019) were unable to provide any scoring for the AHC-HRSN due to a lack of available psychometric testing.

Overall, the decision to use the AHC-HRSN was largely due to its development by CMS for community health clinics. Furthermore, the tool has been widely used despite a lack of psychometric testing. As noted by Henrikson et al. (2019), this is not limited solely to the AHC-HRSN as they found that, of 21 studies evaluated in their systematic review, very few had any level of psychometric testing completed. This indicated a further need for study into this rapidly developing subject as SDoH screening is recommended by several government agencies in the United States.

Ethical Considerations

Three ethical principles guided this project: respect for persons, beneficence, and justice. Respect for persons is the maintenance of autonomy. Autonomy is the right for patients to make their own decisions regarding their care and that healthcare providers should provide information to help them make their own decisions (Stanford 2023). The project adhered to this principle by allowing clubhouse members the right to either participate or refuse to participate in this project. Beneficence is the intent to do good for the patient by taking all aspects of their lives into consideration (Stanford, 2023). The project adhered to this principle by assessing for varying

needs of the members that participate at the project site and took their overall health and wellness into consideration. Justice is the final principal and is the equality of all persons (Stanford, 2023). The project adhered to this principle by focusing on a vulnerable population to provide them with equal access to healthcare and social resources that affect their overall wellbeing. The project's methodology will be reviewed by faculty mentors and the IRB.

The IRB application approval was indicative of adequate and appropriate protection for the human subjects involved in this doctoral project. Information regarding the project was presented at morning meetings at the project site with staff and clubhouse members. Given the vulnerable population, a verbal explanation was provided to the patients and all questions were answered before the patient participated in this project. While there were no appreciable risks to participating in the social determinants of health screening, the human subjects had the ability to revoke their consent at any time during the project.

Results

Data Analysis

Data was analyzed using deidentified data from the clubhouse members at the project site who chose to participate in this project. Analysis was completed through descriptive statistics using the Intellectus Statistics program after entry of validated data (Intellectuse Statistics, 2023). Assistance and advice were obtained from Dr. Johannah Uriri-Glover to determine appropriate tests to run and discussion of data output and significance. This analysis was completed in March 2024.

Descriptive Data

Output from Intellectus Statistics was analyzed using descriptive statistics. Demographics were analyzed and are presented in Appendix F. The population of the participants was primarily

Male (*n* = 5, 71.4%) with a total participant *n* = 7. Ethnically, the majority of participants were white (*n* = 5, 71.4%) with the minority participants being Black (*n* = 1, 14.3%) and Hispanic/Latino (*n* = 1, 14.3%). All patients were on government-funded insurance plans with Medicare (*n* = 3, 42.9%) and Medicaid (*n* = 3, 42.9%) being most common and one participant being dual eligible (*n* = 1, 14.3%). Education levels varied from those with a High School Diploma/GED (*n* = 1, 14.3%), some college education (*n* = 4, 57.1%), a Bachelor's Degree (*n* = 1, 14.3%), to a Master's Degree (*n* = 1, 14.3%).

All of the 26 items on the screening tool were analyzed using descriptive statistics and results are presented in Appendix G. The Patient Health Questionnaire-2 (PHQ-2), a standardized brief depression screening, was included as part of the HRSN screening tool. The average depression score was 2.86 (*SD* = 2.79) and the scores ranged from 0 to 6 points. Physical activity was measured in days per week and minutes per day. The mean number of days exercised each week was 3.71 (*SD* = 3.04) and the average number of minutes per day exercised was 22.86 (*SD* = 17.99). The minimum number of days exercised each week was 0 and the maximum was 7. The minimum number of minutes exercised per day was 0 and the maximum was 50.

Through filtered data analysis by insurance (see Appendix H), it was determined that those with Medicaid seemed to have greater needs for assistance with SDoH resources than those on Medicare or who were dual eligible. All three participants on Medicaid reported housing instability, food scarcity and worry, and need for assistance with transportation to appointments. Two of the three Medicaid participants also reported having threats to shut off their utilities or loss of utilities. In comparison, of the Medicare participants, only one reported housing instability, food scarcity and worry, need for transportation assistance to appointments, and

utility concerns. The participant with dual eligibility for Medicare and Medicaid reported no concerns or needs. Additionally, those with higher PHQ-2 scores also had less stability in their SDoH reporting and required increased assistance.

Impact of Project

By screening for SDoH needs in SMI patients, a greater understanding of needs and concerns of clubhouse members was assessed. For clubhouse members, the ability to state areas in which they need further assistance is extremely beneficial and has greater impact for them than they may be aware. The social practitioners and medical practitioners at the clubhouse also likely experienced significant benefits from this screening tool implementation as it allowed for practitioners to determine areas in which they can further assist the clubhouse members. By directly impacting member SDoH needs through provision of resources, the practitioners also indirectly improved overall mental and physical wellbeing for the participants. For the community, screening for SDoH also leads to improvements. By determining areas in which needs are greatest, nonprofits and charity organizations may be able to improve their donations and funding through evidence of need by consumers. Additionally, by improving SDoH for persons with SMI, there is likely a decreased burden on the healthcare system as a whole. Further research is needed to generalize these impacts, but this can be easily achieved through broader implementation of screening at all healthcare facilities.

Sustainability of Social Determinants of Health Screening

Screening for SDoH in an urban SMI clinic is beneficial for patients, staff, and the local community. Given that quality improvement projects persist over time in different iterations, it is imperative that a sustainability process is in place to ensure the continuation of this doctoral project. At the project site, the Clinical Director is the site champion for this SDoH screening

tool implementation. She has been working closely with the development of this project and understands the importance of continuing screening after the project's completion.

The project entailed the provision of a standardized screening tool for SDoH developed by the Centers for Medicare and Medicaid Services to those with SMI. Maintaining a screening tool requires only the support of facility staff. The clinical director has a good working relationship with all staff at the project site and holds daily meetings where she can remind them of the importance of screening and check in to see if any changes need to be made to the process. Additionally, if the screening goes well, it can be implemented into the electronic health record to be completed annually at one of their SMI clinic appointments. For clubhouse members who do not attend the SMI clinic, they can be screened during check-ins with their assigned social practitioners. There is also the opportunity for a legacy project if another ASU student wanted to continue the project by using the data obtained to help with funding as well as coding and CMS reimbursement rates. Overall, given support for the project from facility staff and the simplicity of screening, sustainability should not be a concern for this project.

Discussion

Summary of Findings

The results from this project have limited but promising applications to future research and practice. While the main aim of this project was to determine the domains of SDoH that are most troublesome for persons with SMI, some surprising data emerged. Despite all participants being on government insurance, those with Medicaid reported poorer SDoH situations than those on Medicare. Further and more specific research is required to determine the reasons for these findings. Unsurprisingly, those with worse depression scores on the PHQ-2 also reported increased SDoH concerns. This could be due to depression affecting the person's ability to

provide for themselves, or the opposite could be true: those with worse SDoH outcomes could have increased depression due to their life circumstances.

The aim of this project was to determine the most affected domains of SDoH. However, it was determined through the screening tools that those in need of SDoH assistance and resources experienced needs in all domains rather than just one or two areas. Therefore, the assumption is that overall assistance in finding programs and charities to assist those with SMI would be most beneficial. Because of this, the project's aim of creating a resource binder focused on specific domains of SDoH resources evolved into creation of a more comprehensive resource guide instead.

Limitations

There were several barriers to this project and limitations to the results that will affect future recommendations. Firstly, it was difficult to coordinate dates to collect data with the project site due to limited communication and initial pushback from the CEO about the project intervention. As someone protective of the organization and the clubhouse members, the CEO wanted to make sure the project was safe for all participants and was slow to agree to the intervention despite approval from the ASU IRB indicating adequate human subjects protection. Additionally, data was only able to be collected on two days due to conflicts between the investigator's schedule and the schedule of the site champion. Attrition was also an issue as 11 screening tools were administered but only 7 were returned and completed.

Ultimately, the reason for limited participation may have been due to the lengthy nature of the 26-question screening tool. While all questions were multiple choice, the tool did require clubhouse members to take time from their busy days to complete the screening. Additionally, given the low socioeconomic status and mental illness severity of many participants, the tool

may have been difficult for them to comprehend and focus on while completing it. The co-PI did sit with the majority of participants during completion and was available to help explain and interpret the questions as needed. At least 2 participants required help with screening tool completion due to comprehension of the questions.

Future Recommendations

This project is one that is very valuable to all healthcare providers—not just those in psychiatry and low socioeconomic areas such as the environment in which this project took place. For future projects or research involving the use of this screening tool, provision of adequate time for survey completion as well as the availability of multiple dates to collect data is recommended. Additionally, expansion of the project to multiple sites would be beneficial to help with generalizability of the data and findings. A broader scope implementation with participants of all socioeconomic backgrounds would also provide valuable information; therefore, it would benefit a larger mental health system with locations in different areas to adopt this screening tool and determine results.

Conclusion

With increasing numbers of patients experiencing chronic medical conditions in addition to psychiatric diagnoses, it is imperative that healthcare providers begin screening their patients for ways to prevent these chronic conditions from occurring or worsening. Through screening for health-related social needs and social determinants of health, providers can determine the needs of their patients that may affect both their physical and mental health. While this is being incorporated in many clinics to help with reimbursement and patient care, few standardized screening tools exist. By proactively screening for and addressing the SDoH among SMI patients, the goals of SDoH resource provision aim to enhance both physical and mental well-

being, fostering increased independence and self-actualization. Ultimately, this will contribute to a healthcare landscape that prioritizes holistic patient care and equitable access to resources for vulnerable populations.

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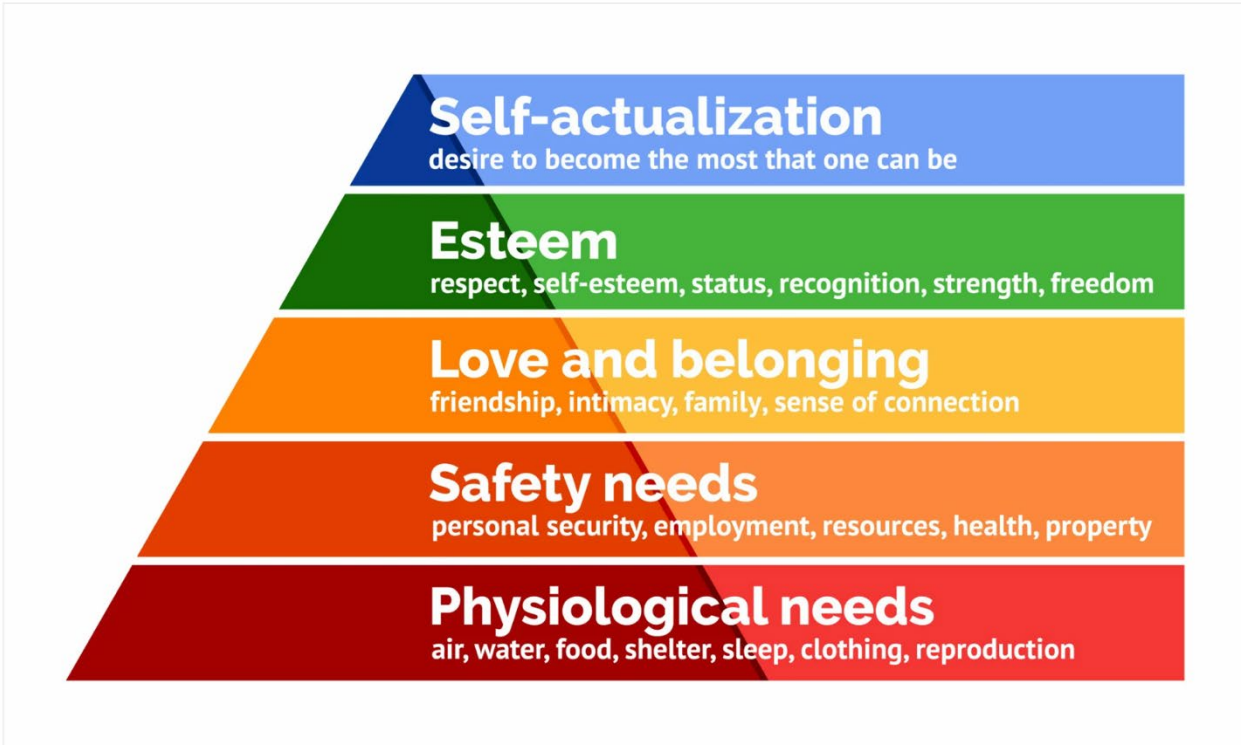
Appendix A

Models and Frameworks

Figure A1

Maslow's Hierarchy of Needs



(Mcleod, S., 2023)

Figure A2

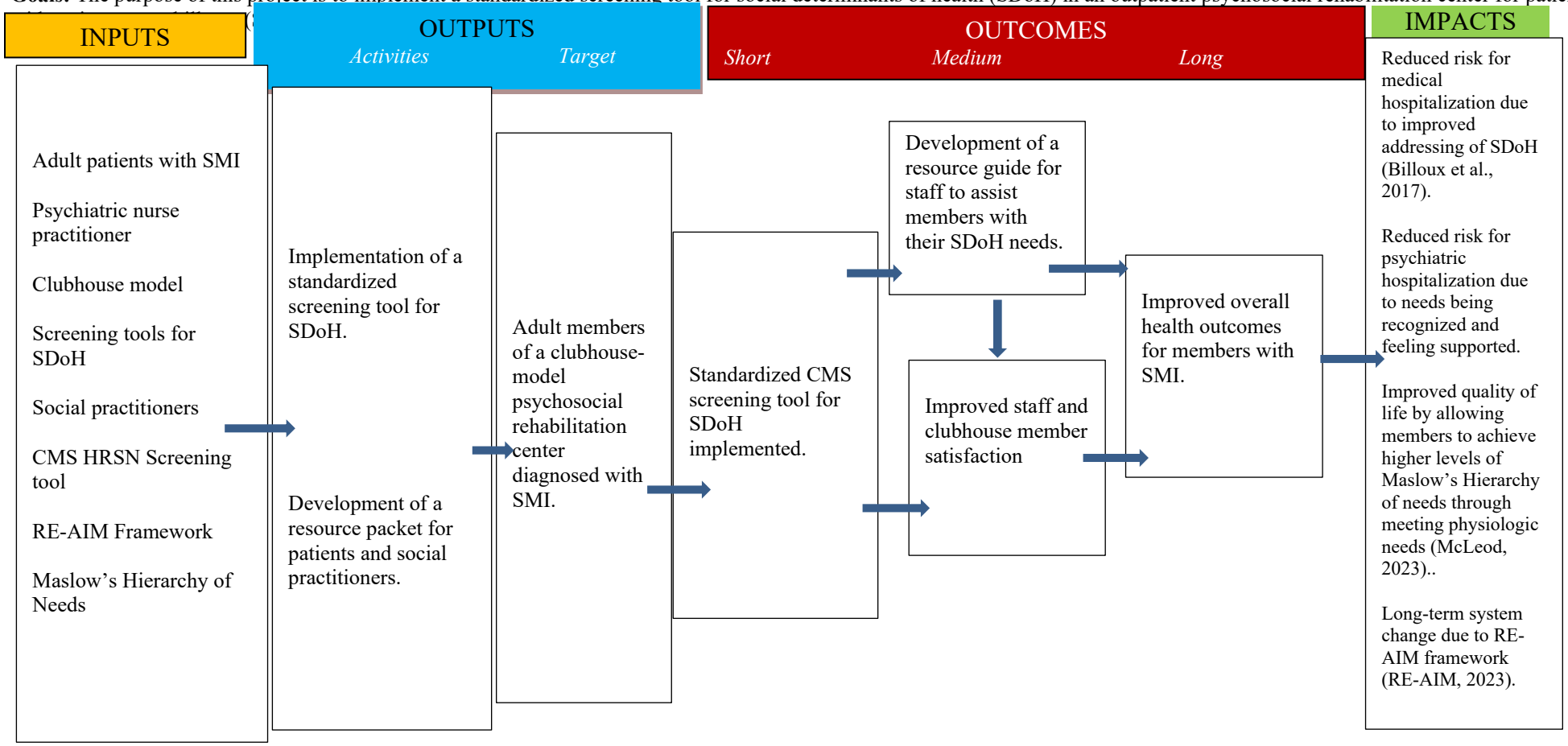
RE-AIM Framework

(Ory et al., 2015)

Figure A3

Logic Model: Screening for Social Determinants of Health in Serious Mental Illness

Goals: The purpose of this project is to implement a standardized screening tool for social determinants of health (SDoH) in an outpatient psychosocial rehabilitation center for patients



Assumptions: Patients will be better able to identify their needs through clearly stated questions referring to social determinants of health/health-related social needs. Through this detailed information, facility staff will be able to provide better resources to SMI patients and standardize their approach to addressing these needs. By using the RE-AIM framework, long-lasting change can occur within the facility leading to continued implementation of the screening tool on each patient (RE-AIM, 2023). Additionally, this will improve overall health for the patients of the facility.

Appendix B

Evaluation and Synthesis Tables

Table B1

Evaluation Table for Quantitative Studies

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Adepoju, O.E. et al., (2022), Assessment of unmet health-related social needs among patients with mental illness enrolled in medicare advantage. **Country**: USA **Funding**: No funding explicitly stated; however Humana was	Danaher framework	**Design:** Retrospective cohort study of Humana Medicare Advantage members. **Purpose:** To determine the results of HSRN screening tools of the patients.	**N=** 56,081 **Demographics:** Mean age of 71.31 years, 58.3% female, and 77.6% white. **Setting:** Surveys were conducted in Humana Medicare Advantage members by voice call, SMS, or email. **Exclusion:** Enrollment in group plans	**IV1:** Presence of mental illness up to 12 months before screening **DV1:** Serious and persistent mental illness (SPMI) **DV2:** Those with mental illness that is not SPMI **DV3:** Patients with both SPMI and non-SPMI	**Tools:** AHC HSRN Screening Tool **Validity/ Reliability:** No information presented regarding the tool's validity or reliability; however, it is a survey provided by Medicare to its AHCs.	**Statistical Tests Used:** Descriptive analysis of demographics, cross-tabulations among 4 cohorts, 7 logistic regressions regarding 7 HSRN domains	**DV1:** 16.9% of SPMI had at least 2 HRSN **DV2:** 15.6% had at least 2 HRSN **DV3:** 19.2% had at least 2 HRSN **DV4:** 12.2% had at least 2 HRSN p <0.001 for all above data.	**Level of Evidence**: 3 **Strengths**: Large number of responses, **Weakness**: Limited to Humana Medicare Advantage members, Results subject to recall bias due to psychiatric symptoms

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
the main focus of this study, **Bias**: Several study members stated affiliations with Humana, such as employment and stock ownership.			**Attrition:** Of the original 329,008 eligible, 70,273 responded to the survey and 56,081 had full survey responses.	**DV4:** non-mentally ill **Definitions:** **SPMI:** Bipolar disorders, Major Depressive disorders, Schizophrenia/ other psychotic disorders **Non-SPMI:** Adjustment disorders, anxiety disorders, dissociative disorders, PTSD, eating disorders, neurocognitive disorders, and other mood disorders				**Feasibility**: Implementation of HSRN screening is a quick, easy tool to identify patient needs. **Application**: Improvement in HSRN screening has an overall implication on public health needs—increased payments and care management
Berkowitz, R. L. et al., (2021), Evaluation of	RE-AIM framework	**Design:** Pilot study	**N=** 289 patients, 20 clinical staff	**IV1:** Implementation	**Tools:** EPIC EHR module for SDOH that has 24	**Statistical Tests Used:** Descriptive	**DV1:** Visit was only 1.7 minutes longer than the control group in 2019.	**Level of Evidence**: 3

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
a social determinants of health screening questionnaire and workflow pilot within an adult ambulatory clinic. **Country**: USA **Funding**: None **Bias**: None		**Purpose:** To determine the effects of SDOH screening and its impact on the workflow of an ambulatory clinic in 2020 comparison to regular workflow in 2019.	**Demographics** **Patients:** 57.6% female, 36.4% between the ages of 35-54, 32.51% white, 19.08% black, 3.53% Asian, 36.40% Hispanic/Latinx **Clinical staff**: 3 physicians, 7 MAs, 5 patient service reps, and 5 other staff **Setting:** Ambulatory internal and family medicine clinics that are part of Sutter Health in California using EPICs charting system. **Exclusion:** Visits in other areas of the clinic and	of SDOH screening **DV1:** Effect on appointment length **DV2:** Completion of SDOH screening tool	questions; transitioned to a paper format **Validity/Reliability:** No information	statistics for demographics, chi-square test, Fisher's exact test, two-sample t-tests, Kruskal-Wallis tests	Not statistically significant. **DV2:** 83% of participants answered questions within at least one SDOH domain, but only 3.5% completed the screening entirely, likely due to stigma and sensitivity of questions	**Strengths**: **Weakness**: Limited to 5 weeks due to Covid-19 outbreak, inability to see how the social needs were addressed by staff, research completed at a single clinic, inability to follow up with patients due to Covid-19 **Feasibility**: Implementation of a SDOH screening tool is a beneficial and time-efficient means of addressing a patient's social needs and overall health.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
			those with appts that aren't: Medicare Annual Wellness, Health Maintenance Exam, New Patient, or Transfer of Care.					**Application**: In screening for SDOH, practitioners are able to provide more holistic care to their patients and address social concerns that may impact overall health.
Kuhn et al., (2020), Links between health-related social needs and mental health care disparities: Implications for clinical practice. **Country**: USA **Funding**: AHRQ grant	Danaher framework	**Design:** Retrospective EMR data abstractions **Purpose:** To determine if a parent's HRSN answers for their child (and therefore, themselves) affects mental illness in children.	**N=** 2,695 **Demographics:** 50.5% female, mean age of 9.35, primarily black children on public insurance **Setting:** Child & Adolescent Psychiatry Outpatient office at an urban hospital **Exclusion:**	***Hypothesis 1:*** Higher parent report of psychosocial dysfunction will be associated with increased pediatric mental health service utilization ***Hypothesis 2:*** Unmet HRSNs will weaken the relationship between higher parent report of	**Tools:** Pediatric Symptoms Checklist-17 (PCS-17) for psychiatry. THRIVE tool for HRSN **Validity/Reliability:** Information not provided and not easily determined with a Google search.	**Statistical Tests Used:** SPSS was used to perform descriptive statistics as well as a negative binomial regression model.	**1 &2:** Parent-reported unmet HRSNs moderated the positive relationship between child psychiatric symptoms and mental health care utilization: For every additional unmet HRSN, the rate of visits per psychiatric symptoms was statistically significantly reduced by 1.5%. Unmet HRSNs may represent barriers to accessing pediatric mental health care. **3:** Food pantry use was not found to have a	**Level of Evidence**: 4 **Strengths**: Found that HRSN can increase referrals for patients. **Weakness**: Temporality with data collected across 13 months, parents may have experienced social

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Bias: None noted			Children aged 1-3. Those with EMRs that did not include results to 2 parent-report screenings. **Attrition:** 15 not included due to missing chart data	psychosocial dysfunction and higher pediatric mental health service utilization ***Hypothesis 3:*** On-site food pantry visits will strengthen the relationship between higher parent report of psychosocial dysfunction and higher pediatric mental health service utilization			relationship between pediatric mental health care utilization and psychosocial dysfunction.	desirability bias when filling out screenings **Feasibility**: Based on this data, it is easy to gather data from an EMR on SDOH/HRSN and would be easy to include in appointments. **Application**: Through completing screenings, providers would be able to better acknowledge their patients with HRSN and perform more in-depth mental health screening and referrals if needed.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Bharmal et al., (2023), Health-related social needs: Which patients respond to screening and who receives resources? **Country**: USA **Funding**: KL2 grant from NCATS **Bias**: None noted	Danaher framework	**Design:** Retrospective observational study **Purpose:** To describe the variation in responding to an HRSN questionnaire delivered via patient portal, and whether referral to and resources provided by social workers differed by response status.	**N=** 386,997 **Demographics:** **5**8% female, 75% white, 55% had private insurance. Average age of patients was 54-years-old. **Setting:** Virtual or office visits at primary care offices within a large integrated health system in Ohio. 46 clinics were involved. **Exclusion:** Adults without a home address and those outside of Ohio. **Attrition:** 196,544	**IV1:** Implementation of HRSN screening tool on patient portal prior to visit **DV1:** Effect on referral to LMSW **DV2:** Patient response to screening tool **DV3:** Resource referral rate	**Tools:** Unnamed HRSN screening tool **Validity/Reliability:** N/A due to unknown tool name	**Statistical Tests Used:** Multilevel logistic regressions; repeated tests to determine if there was significance between virtual and in-person visits.	**DV1:** 0.32% of patients (n = 1229) received a referral to a social worker within 7 days of their index visit. 700 patients without screening received LMSW referral while only 529 who responded did. **DV2:** Out of 386,997 patients, 51% completed at least one HRSN questionnaire question **DV3:** Out of the population referred, social workers provided resources to 78% of patients (n = 962). A slightly higher percentage of responders received resources from a social worker (81% versus 76%, p = 0.04) than non-responders.	**Level of Evidence**: 3 **Strengths**: Large population of patients; integration of screening into charting system for LMSW to view results after referral and better find applicable resources. **Weakness**: Limited to NE Ohio. No documentation of what resources were provided to patients or the needs reduction by individual LMSWs **Feasibility**: Introduction of a HRSN tool to

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								the patient portal a week before an appointment is feasible. **Application**: Reporting HRSN and having a referral to social work to help with resources would benefit patients' overall health.
Baiden et al., (2017), Examining the independent effect of social support on unmet mental healthcare needs among Canadians: Findings from a population-based study **Country**: Canada	Social support theory	**Design:** Population-based study **Purpose:** To examine the independent effect of social support on unmet mental healthcare needs among adult Canadians after taking into account predisposing, enabling, and	**N=** 3,857 **Demographics:** Participants in the CCHS-MH who state they have a mental health need. **Setting:** This is data from a 2012 survey of Canadians across all provinces and representative of the Canadian population.	**IV1:** Unmet healthcare needs **DV1:** Social support **DV2:** Mental health diagnosis	**Tools:** The CCHS-MH is a cross-sectional survey that gathers information on factors that influence mental health through a multidisciplinary approach focusing on social and economic determinants of health. **Validity/Reliability:**	**Statistical Tests Used:** Binary logistic regression; Chi square test of model coefficient; Nagelkerke pseudo R^2	**DV1:** Nearly one in five Canadians (19.6 %) had mental healthcare needs, of which 68 % had their needs fully met and 32 % had unmet needs. **DV2:** Once social support was accounted for, a diagnosis of major depressive episode no longer significantly predicted unmet mental healthcare needs. The presence of an anxiety disorder continued to predict unmet mental	**Level of Evidence**: 3 **Strengths**: Determined social support may be beneficial in decreasing unmet mental health needs. **Weakness**: Secondary analysis of data gathered limits

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Funding: None listed **Bias**: None listed		need factors of the behavioral model of healthcare service use.	**Exclusion:** Those who completed the CCHS-MH who did not identify a mental health need. Those under 15. **Attrition:** N/A		The reliability (i.e., internal consistency) of the measure was adequate (α = .79). Instrument determined to be valid and reliable by Southcott, J. (2021).		healthcare needs, but to a lesser extent. The same was true for SI and child abuse.	the information available. Additionally, data was gathered in 2012, 5 years before this analysis was published. **Feasibility**: Social support is very important in mental health patients. Peer support programs and LMSW/LCSW are beneficial in this. **Application**: The Clubhouse model applies the importance of social support through social practitioners and peer support, which was found to be of great

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								importance in this study.
Nohria et al., (2022), Implementing health related social needs screening in an outpatient clinic. **Country**: USA **Funding**: National Institute on Minority Health and Health Disparities **Bias**: None listed	RE-AIM Framework	**Design:** Cross-sectional study – EMR data extracted for all clinic patients screened for unmet HRSN between January 2016 and December 2020 **Purpose:** To determine the benefits of implementing health related social needs screening in FQHCs.	**N=** 4,731 **Demographics:** Primary care patients—In screened patients: Mean age 48, 69% female, 74% Spanish-speaking, 85% on Medicare/Medicaid. **Setting:** 7 FQHC within Greater Lawrence Family Health Centers **Exclusion:** Patients under the age of 18 and those who died during the study period. **Attrition:** N/A—EMR review	**IV1:** Screening for HRSN **DV1:** Patient outcomes **DV2:** Patient satisfaction **DV3:** Benefit of screening for HRSN	**Tools:** Hunger Vital Signs—expanded to include other areas of HRSN: housing quality and security, financial need, food insecurity, health literacy, immigration needs, transportation, utilities, domestic violence, and social isolation **Validity/Reliability:** Uncertain	**Statistical Tests Used:** Multivariate logistic regression; Sensitivity analysis	**DV1:**. Screening practices that prioritize including all patients may offer benefits for both the patient and provider. **DV2:** Patients who are screened reported higher patient satisfaction scores after screening. **DV3:** HRSN screening tool is necessary, but insufficient for FQHCs to achieve a higher saturation with social needs screening depending on how it is implemented.	**Level of Evidence**: 4 **Strengths**: **Weakness**: Visit type was not identified; those with more chronic health conditions may be screened more frequently. Captured less than 1% of all clinic patients. **Feasibility**: It is feasible to implement HRSN screening tools in outpatient clinics. **Application**: Medicaid agencies are incentivizing

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								screening for all enrollees so that care teams can identify HRSN and provide resources that improve health and reduce cost. This would improve practice at the project site.

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Table B2

Evaluation Table for 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 for/ Application to practice; Generalization
Broaddus-Shea, E. T. et al., (2022), Implementing health related social needs screening in western Colorado primary care: Qualitative research to inform improved communication with patients. **Country:** USA **Funding:** Health Resources and Services Administration (HRSA) and UCSF.	None explicitly stated	**Design:** A purposive sample was obtained at two AHC clinics. Patients were identified by staff at the clinics and staff provided patient contact info to the research team with the permission of the patients. **Method:** Qualitative interviews were conducted virtually using semi-structured interview guides specific to the patients and to the staff.	**Sample:** (n=) 27 patients 10 staff **Demographics:** Those who have personal experience with the practice's HRSN screening process, having currently or recently experienced HRSN, and being over 18 years of age.17 female patients, 3 male patients. 9 female staff, 1 male staff. Primarily white with a limited number of Hispanic participants. **Setting:**	**RQ1**: How does communication about HRSN screening occur with patients? **RQ2**: How can the HRSN screening process be improved?	**Data Collection:** Phone interviews by two female study team members in May/June 2020 **Data Dependability:** Two semi-structured interview guides were used and then the interview was later transcribed. Researchers also took supplemental notes.	**Rapid analysis approach:** transcripts were summarized across previously identified key domains and then themes from each domain were identified. These were later placed in a spreadsheet to help identify the themes. Finally, the findings were presented to staff and a subset of participants to verify that their feelings were appropriately summarized/38dentified.	(1)Normalize the process of HRSN screening (2) Assure patient privacy (3) Clarify the purpose of screening for HRSN (4) Respect autonomy (5) Emphasize screening benefits to the community (6) Describe the relationship between social needs and health	**Level of Evidence:** Cohort study/3 **Strengths:** Research occurred during Covid-19 when social needs were higher than average. **Weakness:** Interviews only conducted in English; research occurred during Covid-19 when unemployment was high; **Feasibility:** HRSN is important to include in patient screening at each appointment. It is easy to complete

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Bias: None		**Purpose:** Identify strategies to make patients more comfortable with the HRSN screening and referral process. *This was the first phase of a multi-phase study called Improving Messaging Around Gaps in Needs and referals (IMAGINE).*	Participate or work in an AHC in Grand Junction, CO. **Attrition:** 7 patients could not be reached or attend the scheduled interview; therefore 20 patients and 10 staff participated.					and time-efficient. **Application:** Screening for HSRN is an important tool for addressing resource needs in patients. But providing greater resources and education to patients on HRSN, greater overall health can be achieved.
Eder, M., et al. (2021), Screening and interventions for social risk factors: **Country:** USA **Funding:**	None explicitly stated	**Design:** Technical brief (meta-analysis/meta-synthesis) **Method:** Evaluation of randomized and nonrandomized study designs that entailed the use of screening tools that evaluated at	**Sample:** 106 studies, N= 5,978,596 **Demographics:** N/A **Setting:** N/A	**RQ1:** What are the available multidomain screening tools available to determine social risk? Validity? **RQ2:** What social risk-related interventions have been evaluated?	**Data Collection:** Data abstractions forms were used to assist with data extraction. Interviews with key informants were recorded and transcribed. **Data Dependability:**	**Analysis** The guiding questions were used to analyze data from the various studies and to organize them into appropriate categories.	(1) 71% of tools had been modified from their original form, making it hard to form conclusions. Only 7 tools had validity and reliability testing. (2) Food security, transportation, housing	**Level of Evidence:** 2 **Strengths:** A large number of studies were included. **Weakness:** Searches were limited to the needs of the USPSTF, studies

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AHRQ & USPSTF **Bias:** None		least 2 domains of HRSN **Purpose:** To determine the evidence for using SDOH screening and interventions to help the USPSTF make recommendations.	**Attrition:** N/A	**RQ3:** What are the effects in improvements of process outcomes, healthcare utilization outcomes, or social risk outcomes on physiologic/mental health? **RQ4:** What are the challenges for implementation of widespread screening? Solutions? **RQ5:** What are the challenges of screening to patients and providers? What is the acceptability of screening for and intervening on social risks?	Because it is a technical briefing, bias and strength of evidence were not evaluated.		instability, financial strain, education, utility needs, and interpersonal violence were evaluated in many of the studies. (3) Studies are lacking in their evaluation of the effectiveness of an intervention to address intermediate health outcomes to physiologic and behavioral health outcomes. (4) Key informants and a scan of reviews helped determine this evidence and included stigma/privacy concerns, lack of referral resources, and social risk data	focusing on specific diseases were excluded **Feasibility:** Evidence is present for the implementation of HRSN/SDOH screening **Application:** Screening for SDOH/HRSN is something that should be considered for application in healthcare settings to improve patient overall health.

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							collection and management. (5) 31 articles showed patient satisfaction with screening, 11 showed concerns about challenges with screening for patients. 17 providers found screening beneficial and 1 did not due to the time challenges with screening.	
Sippel, L.M. et al., (2022), Risk and protective factors in relation to early mortality among people with serious mental illness: Perspectives of peer support	None explicitly stated	**Design:** Purposive sampling at a single mental health clinic led to recruitment of patients to participate in face-to-face interviews. **Method:** Qualitative	**Sample:** 17 service users 15 peer support specialists **Demographics:** English-speaking, able to provide consent, have a DSM-V diagnosis of schizophrenia,	**RQ1:** Why do you think people with a lived mental health condition have a shorter lifespan than those without? **RQ2:** What types of interventions could help those with SMI live longer?	**Data Collection:** 30-to-60 minute individual interviews **Data Dependability:** A semi-structured guide was used to help with the interview. Group disputes were solved with	**Analyzed using the grounded-theory approach.** Themes were identified from the data and not a priori. Peer support specialists were contacted to validate key themes.	(1) Social connectedness (2) Treatment (3) Coping (4) Physical health/wellness	**Level of Evidence:** Cohort study/3 **Strengths:** First study to explore the beliefs behind causes of death in both those with SMI and peer support specialists;

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Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
specialists and service users. **Country:** USA **Funding:** National Institute of Mental Health (NIMH) **Bias:** None		interviews were conducted until saturation of data related to the original research question about engagement in digital peer support interventions was detected **Purpose:** To determine the effects of peer support on SMI patients and their overall health and wellbeing as well as to ask more probing questions regarding SDOH.	schizoaffective, bipolar, or major depression, have a chronic medical condition, and have been in mental health treatment for at least 3 months. Participants were largely white, middle-aged males. **Setting:** Urban community mental health center **Attrition:** No data on this; presumably all those recruited participated in the study.	**Definitions:** SMI = those with a DSM-V diagnosis of schizophrenia, schizoaffective, bipolar, or major depressive disorder.	"member-checking"		(5) Resilience/mental health	identified protective factors for those with SMI **Weakness:** Convenience sample from 1 agency in 1 location. Asked open-ended questions and did not specifically ask about several SDOH that affect mortality. **Feasibility:** Community mental health centers, such as the clubhouse model, already involve peer support. Community clinics could also develop peer support groups for their patients. **Application:**

Key: **AHC** Accountable Health Communities, **SDOH** Social Determinants of Health, **SMI** Serious Mental Illness, **HRSN** Health-Related Social Needs, **EMR** Electronic Medical Record, **AHRQ** Agency for Healthcare Research and Quality, **FQHC** Federally Qualified Health Center **LMSW** Licensed Master Social Worker **SI** Suicidal Ideation

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
								Peer support groups for those with SMI are easy to organize and are helpful for all involved.
Greenwood-Ericksen, et al., 2021, Implementation of health-related social needs screening at Michigan health centers: A qualitative study. **Country:** USA **Funding:** Blue Cross Blue Shield Foundation of Michigan & Michigan Institute for Clinical and	Danaher framework	**Design:** Qualitative study that was part of a larger, mixed-methods study **Method:** Purposive, snowball sampling led to interviews with staff from 5 FQHCs. Interviews were conducted with 4-5 staff per role, per site. **Purpose:** To identify the drivers of social needs screening variations in order to improve	**Sample:** n = 23 **Demographics:** N/A **Setting:** 5 Michigan FQHCs **Attrition:** N/A	**T1:** Variation in screening practices **T2:** Shift in community health worker roles **T3:** Variable integration of screening data **T4**: Barriers limited impact	**Data Collection:** Semi-structured one-on-one interviews **Data Dependability:** Interviews completed by one person trained in interview techniques/qualitative research and then overseen by a qualitative methodologist. Transcripts were uploaded to a qualitative analysis tool through SocioCultural	**Analysis**: Transcripts analyzed by a descriptive approach. A codebook marking meaningful text was compiled by 4 researchers. Themes were then identified and compared across roles and sites.	(1) Sometimes, funding affects which patients are screened. No guide to selecting a screening tool, but all sites tailored them to their patient population. (2) Community health workers are vital to the ability to screen patients in FQHCs. (3) EMRs are useful for inclusion of screening tools with some using them already and	**Level of Evidence:** 6 **Strengths:** Focused on the barriers to implementation of screening tools. Ensured a variety of FQHC locations with purposive sampling. **Weakness:** Limited to self-reported results from FQHC staff perspectives **Feasibility:** HRSN/SDOH screening tools is feasible, but

Key: **AHC** Accountable Health Communities, **SDOH** Social Determinants of Health, **SMI** Serious Mental Illness, **HRSN** Health-Related Social Needs, **EMR** Electronic Medical Record, **AHRQ** Agency for Healthcare Research and Quality, **FQHC** Federally Qualified Health Center **LMSW** Licensed Master Social Worker **SI** Suicidal Ideation

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
Health Research **Bias:** None		alignment of screening efforts.			Research Consultants (Dedoose).		others using paper tools having plans to transfer to an EMR. Sites at the time were not using data for population health management. (4) Limited resources, staff availability, and sustainability are noted barriers.	budget makes it difficult to sustain in some cases. **Application:** Screening for HRSN/SDOH is important to help improve the lives and health of patients.

Key: **AHC** Accountable Health Communities, **SDOH** Social Determinants of Health, **SMI** Serious Mental Illness, **HRSN** Health-Related Social Needs, **EMR** Electronic Medical Record, **AHRQ** Agency for Healthcare Research and Quality, **FQHC** Federally Qualified Health Center **LMSW** Licensed Master Social Worker **SI** Suicidal Ideation

Table B3

Synthesis Table

Study (Author, year)	Adepoju et al., 2022	Berkowitz et al., 2021	Broaddus-Shea et al., 2022	Eder et al., 2021	Sippel et al., 2022	Kuhn et al., 2022	Greenwood-Ericksen et al., 2021	Bharmal et al., 2023	Baiden et al.,	Nohria et al., 2022
Design/LOE	CS/3	Pilot Study/3	CS/3	Meta-analysis & Meta-synthesis/2	CS/3	Cross-Sectional Study/4	Qualitative Study/6	Retrospective Observational Study/3	Population-based study/3	Cross-Sectional Study/4
Sample										
n subjects	56,081	309	37	5,978,596 (106 studies)	32	2,659	23	386,997	3,857	4,731
M-Age	71.31				39.7	9.35		54		48
% female	58.3	61	86		29.4	50.5		58	43	69
Mental Illness	X				X	X			X	X
Setting										
Medicare/Medicaid Members	X		X				X			X
Primary Care Office		X	X				X	X		X
AHC/FQHC			X							X
Community Mental Health Center					X					
Outpatient Psychiatry						X				
Government Survey									X	
Interventions										
HRSN/SDOH Survey	X	X		X		X		X	X	X
Interview			X	X	X		X			
Peer/Social Support					X	X		X	X	
Outcomes/ Themes										
Screening is beneficial	X	X	X	X		X	X		X	
Benefit to mental health/SMI	↑				↑	↑			↑	↑

Key: **LOE** Level of Evidence **M-Age** Mean Age, **AHC** Accountable Health Communities, **SDOH** Social Determinants of Health, **SMI** Serious Mental Illness, **HRSN** Health-Related Social Needs, **CS** Cohort Study,

Study (Author, year)	Adepoju et al., 2022	Berkowitz et al., 2021	Broaddus-Shea et al., 2022	Eder et al., 2021	Sippel et al., 2022	Kuhn et al., 2022	Greenwood-Ericksen et al., 2021	Bharmal et al., 2023	Baiden et al.,	Nohria et al., 2022
Screening is time efficient/cost-effective	X	X	X	X		X	X	X		X

Key: **LOE** Level of Evidence **M-Age** Mean Age, **AHC** Accountable Health Communities, **SDOH** Social Determinants of Health, **SMI** Serious Mental Illness, **HRSN** Health-Related Social Needs, **CS** Cohort Study,

Appendix C

Budget

Phase	Activities	Cost	Subtotal	Total
Preparation	Print recruitment flyers	$5		
	Print SDoH screening tools (x100 copies)	$100	$100	
Delivery	Gas for co-PI to drive to site weekly (x8 weeks) for participant recruitment and consenting.	$350	$350	
Evaluation	Review and analysis of results ~ 15 hours @ 20/hr	$300	$300	**$750**

Budget Justification:

This budget will primarily be ink and paper and the gas required to drive from Gilbert to Downtown Phoenix once weekly for the fall semester. Funding will be from the student's own funds including those obtained from working as an RN and from student loans. Data will be stored in a locked filing cabinet that already exists at the project site, eliminating the need to purchase one.

The results of this study may impact the reimbursement of care from CMS patients at the project site. Therefore, this project may improve their overall budget.

Appendix D

IRB Approval

APPROVAL: EXPEDITED REVIEW

Lauren Shurson
EDSON: DNP
lshurson@asu.edu

Dear Lauren Shurson:

On 8/10/2023 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Implementation of Standardized Screening for Social Determinants of Health in Persons with Serious Mental Illness
Investigator:	Lauren Shurson
IRB ID:	STUDY00018403
Category of review:	7
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• DNP Project Consent Form , Category: Consent Form; • IRB Protocol, Category: IRB Protocol; • Letter of Support, Category: Other; • Modification Letter, Category: Other; • Recruitment Script, Category: Recruitment Materials; • Screening Tool, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB approved the protocol effective 8/10/2023. Continuing Review is not required for this study.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Appendix E

Health-Related Social Needs Screening Tool

Age

18-24 _____

25-39 _____

40-64 _____

65+ _____

Ethnicity

White _____

Hispanic _____

Black or African American _____

American Indian or Alaska Native _____

Asian _____

Native Hawaiian or Other Pacific Islander _____

Insurance

No insurance ____

Medicaid ____

Medicare ____

Private insurance ____

Gender

Male _____

Female _____

Other (please specify) _____

Education

Less than high school _____

High School/GED _____

Some college _____

Associate Degree _____

Bachelor's Degree _____

Master's Degree _____

Doctorate ____

Trade/Technical school _____

AHC HRSN Screening Tool Core Questions

If someone chooses the underlined answers, they might have an unmet health-related social need.

Living Situation

1. **What is your living situation today?**[3]
   - ☐ I have a steady place to live
   - ☐ I have a place to live today, but **I am worried** about losing it in the future
   - ☐ I do not have a steady place to live (I am temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)

2. **Think about the place you live. Do you have problems with any of the following?**[4]
   CHOOSE ALL THAT APPLY
   - ☐ Pests such as bugs, ants, or mice
   - ☐ Mold
   - ☐ Lead paint or pipes
   - ☐ Lack of heat
   - ☐ Oven or stove not working
   - ☐ Smoke detectors missing or not working
   - ☐ Water leaks
   - ☐ None of the above

Food

Some people have made the following statements about their food situation. Please answer whether the statements were OFTEN, SOMETIMES, or NEVER true for you and your household in the last 12 months. [5]

3. **Within the past 12 months, you worried that your food would run out before you got money to buy more.**
   - ☐ Often true
   - ☐ Sometimes true
   - ☐ Never true

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[3] National Association of Community Health Centers and partners, National Association of Community Health Centers, Association of Asian Pacific Community Health Organizations, Association OPC, Institute for Alternative Futures. (2017). PRAPARE. http://www.nachc.org/research-and-data/prapare/

[4] Nuruzzaman, N., Broadwin, M., Kourouma, K., & Olson, D. P. (2015). Making the Social Determinants of Health a Routine Part of Medical Care. Journal of Healthcare for the Poor and Underserved, 26(2), 321-327.

[5] Hager, E. R., Quigg, A. M., Black, M. M., Coleman, S. M., Heeren, T., Rose-Jacobs, R., Frank, D. A. (2010). Development and Validity of a 2-Item Screen to Identify Families at Risk for Food Insecurity. Pediatrics, 126(1), 26-32. doi:10.1542/peds.2009-3146

4. **Within the past 12 months, the food you bought just didn't last and you didn't have money to get more.**
   - ☐ Often true
   - ☐ Sometimes true
   - ☐ Never true

Transportation

5. **In the past 12 months, has lack of reliable transportation kept you from medical appointments, meetings, work or from getting things needed for daily living?**[6]
   - ☐ Yes
   - ☐ No

Utilities

6. **In the past 12 months has the electric, gas, oil, or water company threatened to shut off services in your home?**[7]
   - ☐ Yes
   - ☐ No
   - ☐ Already shut off

Safety

Because violence and abuse happens to a lot of people and affects their health we are asking the following questions. [8]

7. **How often does anyone, including family and friends, physically hurt you?**
   - ☐ Never (1)
   - ☐ Rarely (2)
   - ☐ Sometimes (3)
   - ☐ Fairly often (4)
   - ☐ Frequently (5)

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[6] National Association of Community Health Centers and Partners, National Association of Community Health Centers, Association of Asian Pacific Community Health Organizations, Association OPC, Institute for Alternative Futures. (2017). PRAPARE. http://www.nachc.org/research-and-data/prapare/

[7] Cook, J. T., Frank, D. A., Casey, P. H., Rose-Jacobs, R., Black, M. M., Chilton, M., . . . Cutts, D. B. (2008). A Brief Indicator of Household Energy Security: Associations with Food Security, Child Health, and Child Development in US Infants and Toddlers. Pediatrics, 122(4), 867-875. doi:10.1542/peds.2008-0286

[8] Sherin, K. M., Sinacore, J. M., Li, X. Q., Zitter, R. E., & Shakil, A. (1998). HITS: a Short Domestic Violence Screening Tool for Use in a Family Practice Setting. Family Medicine, 30(7), 508-512

8. **How often does anyone, including family and friends, insult or talk down to you?**
   - ☐ Never (1)
   - ☐ Rarely (2)
   - ☐ Sometimes (3)
   - ☐ Fairly often (4)
   - ☐ Frequently (5)

9. **How often does anyone, including family and friends, threaten you with harm?**
   - ☐ Never (1)
   - ☐ Rarely (2)
   - ☐ Sometimes (3)
   - ☐ Fairly often (4)
   - ☐ Frequently (5)

10. **How often does anyone, including family and friends, scream or curse at you?**
    - ☐ Never (1)
    - ☐ Rarely (2)
    - ☐ Sometimes (3)
    - ☐ Fairly often (4)
    - ☐ Frequently (5)

A score of 11 or more when the numerical values for answers to questions 7-10 are added shows that the person might not be safe.

AHC HRSN Screening Tool Supplemental Questions

Financial Strain

11. How hard is it for you to pay for the very basics like food, housing, medical care, and heating? Would you say it is:[9]

- ☐ Very hard
- ☐ Somewhat hard
- ☐ Not hard at all

Employment

12. Do you want help finding or keeping work or a job?[10]

- ☐ Yes, help finding work
- ☐ Yes, help keeping work
- ☐ I do not need or want help

Family and Community Support

13. If for any reason you need help with day-to-day activities such as bathing, preparing meals, shopping, managing finances, etc., do you get the help you need?[11]

- ☐ I don't need any help
- ☐ I get all the help I need
- ☐ I could use a little more help
- ☐ I need a lot more help

14. How often do you feel lonely or isolated from those around you?[12]

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ Always

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9 Hall, M. H., Matthews, K. A., Kravitz, H. M., Gold, E. B., Buysse, D. J., Bromberger, J. T., . . . Sowers, M. (2009). Race and Financial Strain are Independent Correlates of Sleep in Midlife Women: The SWAN Sleep Study. Sleep, 32(1), 73-82. doi:10.5665/sleep/32.1.73

10 Identifying and Recommending Screening Questions for the Accountable Health Communities Model (2016, July) Technical Expert Panel discussion conducted at the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, Baltimore, MD.

11 Kaiser Permanente. (2012, June). Medicare Total Health Assessment Questionnaire. Retrieved from https://mydoctor.kaiserpermanente.org/ncal/Images/Medicare%20Total%20Health%20Assessment%20Questionnaire_tcm75-487922.pdf

12 Anderson, G. Oscar and Colette E. Thayer. Loneliness and Social Connections: A National Survey of Adults 45 and Older. Washington, DC: AARP Research, September 2018. https://doi.org/10.26419/res.00246.001

Education

15. Do you speak a language other than English at home?[13]

- ☐ Yes
- ☐ No

16. Do you want help with school or training? For example, starting or completing job training or getting a high school diploma, GED or equivalent.[14]

- ☐ Yes
- ☐ No

Physical Activity

17. In the last 30 days, other than the activities you did for work, on average, how many days per week did you engage in moderate exercise (like walking fast, running, jogging, dancing, swimming, biking, or other similar activities)?[15]

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

18. On average, how many minutes did you usually spend exercising at this level on one of those days?[16]

- ☐ 0
- ☐ 10
- ☐ 20
- ☐ 30
- ☐ 40
- ☐ 50
- ☐ 60

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[13] United States, US Census Bureau. (2017). American Community Survey. Retrieved from https://www.census.gov/programs-surveys/acs/

[14] Identifying and Recommending Screening Questions for the Accountable Health Communities Model (2016, July) Technical Expert Panel discussion conducted at the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, Baltimore, MD.

[15] Coleman, K. J., Ngor, E., Reynolds, K., Quinn, V. P., Koebnick, C., Young, D. R., . . . Sallis, R. E. (2012). Initial Validation of an Exercise "Vital Sign" in Electronic Medical Records. Medicine and Science in Sport and Exercise, 44(11), 2071-2076. doi:10.1249/MSS.0b013e3182630ec1

[16] Ibid

☐ 90
☐ 120
☐ 150 or greater

Follow these 2 steps to decide if the person has a physical activity need:

1. Calculate ["number of days" selected] x ["number of minutes" selected] = [number of minutes of exercise per week]
2. Apply the right age threshold:
   - Under 6 years old: You can't find the physical activity need for people under 6.
   - Age 6 to 17: Less than an average of 60 minutes a day shows an HRSN.
   - Age 18 or older: Less than 150 minutes a week shows an HRSN.

Substance Use

The next questions relate to your experience with alcohol, cigarettes, and other drugs. Some of the substances are prescribed by a doctor (like pain medications), but only count those if you have taken them for reasons or in doses other than prescribed. One question is about illicit or illegal drug use, but we only ask in order to identify community services that may be available to help you. [17]

19. How many times in the past 12 months have you had 5 or more drinks in a day (males) or 4 or more drinks in a day (females)? One drink is 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof spirits.

☐ Never
☐ Once or Twice
☐ Monthly
☐ Weekly
☐ Daily or Almost Daily

20. How many times in the past 12 months have you used tobacco products (like cigarettes, cigars, snuff, chew, electronic cigarettes)?

☐ Never
☐ Once or Twice
☐ Monthly
☐ Weekly
☐ Daily or Almost Daily

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[17] United States, U.S. Department of Health and Human Services, National Institutes of Health. (n.d.). Helping Patients Who Drink Too Much: A Clinician's Guide (2005 ed., pp. 1-34).

21. How many times in the past year have you used prescription drugs for non-medical reasons?

- ☐ Never
- ☐ Once or Twice
- ☐ Monthly
- ☐ Weekly
- ☐ Daily or Almost Daily

22. How many times in the past year have you used illegal drugs?

- ☐ Never
- ☐ Once or Twice
- ☐ Monthly
- ☐ Weekly
- ☐ Daily or Almost Daily

Mental Health

23. Over the past 2 weeks, how often have you been bothered by any of the following problems?[18]

a. Little interest or pleasure in doing things?

- ☐ Not at all (0)
- ☐ Several days (1)
- ☐ More than half the days (2)
- ☐ Nearly every day (3)

b. Feeling down, depressed, or hopeless?

- ☐ Not at all (0)
- ☐ Several days (1)
- ☐ More than half the days (2)
- ☐ Nearly every day (3)

If you get 3 or more when you add the answers to questions 23a and 23b the person may have a mental health need.

[18] Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The Patient Health Questionnaire-2: validity of a two-item depression screener. Medical Care, 41(11), 1284-1292.

24. Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his or her mind is troubled all the time. Do you feel this kind of stress these days?[19]

- ☐ Not at all
- ☐ A little bit
- ☐ Somewhat
- ☐ Quite a bit
- ☐ Very much

Disabilities

25. Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?[20] (5 years old or older)

- ☐ Yes
- ☐ No

26. Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?[21] (15 years old or older)

- ☐ Yes
- ☐ No

[19] Elo, A.L., Leppänen, A., & Jahkola, A. (2003). Validity of a Single-Item Measure of Stress Symptoms. Scandinavian Journal of Work, 29(6), 444-451.
[20] United States, U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (n.d.). (2011). Implementation Guidance on Data Collection Standards for Race, Ethnicity, Sex, Primary Language, and Disability Status. Retrieved from https://aspe.hhs.gov/basic-report/hhs-implementation-guidance-data-collection-standards-race-ethnicity-sex-primary-language-and-disability-status
[21] Ibid.

Appendix F

Demographic Results

Frequency Table of Demographics

Variable	*n*	*%*
Age		
25-39	4	57.14
40-64	2	28.57
65+	1	14.29
Gender		
Male	5	71.43
Female	2	28.57
Ethnicity		
White	5	71.43
Black	1	14.29
Hispanic	1	14.29
Education		
High school/GED	1	14.29
Some college	4	57.14
Bachelor's Degree	1	14.29
Master's Degree	1	14.29
Insurance		
Medicare	3	42.86
Medicaid	3	42.86
Dual	1	14.29

Note. Due to rounding errors, percentages may not equal 100%.

Appendix G

Screening Tool Results

Table G1

Frequency Table for Nominal and Ordinal Variables

Variable	*n*	*%*
Living Situation		
Worried about losing	1	14.29
Do not have steady place	3	42.86
Steady place	3	42.86
Living Problems		
None	5	71.43
Pests, Mold	1	14.29
Mold, water leaks	1	14.29
Food Worry		
Often	3	42.86
Never	3	42.86
Sometimes	1	14.29
Food Scarcity		
Often	2	28.57
Never	3	42.86
Sometimes	2	28.57
Physical Abuse		
Never	3	42.86
Frequently	1	14.29
Fairly often	1	14.29
Rarely	2	28.57
Scream or Curse At		
Never	5	71.43
Frequently	1	14.29
Fairly often	1	14.29
Insulted		
Never	2	28.57
Frequently	2	28.57
Rarely	1	14.29
Sometimes	1	14.29
Fairly often	1	14.29

Threatened Harm		
Never	4	57.14
Frequently	1	14.29
Fairly often	1	14.29
Sometimes	1	14.29
Transportation Difficulty to Appts		
No	3	42.86
Yes	4	57.14

Table G2

Frequency Table for Nominal and Ordinal Variables

Variable	*n*	*%*
Utilities Shut Off		
No	4	57.14
Yes	3	42.86
Financial Strain		
Very hard	3	42.86
Not hard	3	42.86
Somewhat hard	1	14.29
Employment Help		
No help	5	71.43
Help finding work	2	28.57
Help Needed with ADLs		
No help	4	57.14
A little more	1	14.29
A lot more	2	28.57
Lonely or Isolated		
Never	2	28.57
Always	2	28.57
Often	1	14.29
Rarely	1	14.29
Sometimes	1	14.29
Speak Language Other than English at Home		
No	4	57.14
Yes	3	42.86
Help with Education Needed		
No	5	71.43

Yes	2	28.57

Note. Due to rounding errors, percentages may not equal 100%.

Table G3

Frequency Table for Nominal and Ordinal Variables

Variable	*n*	%
Alcohol Use		
Never	5	71.43
Weekly	2	28.57
Tobacco Use		
Never	3	42.86
Daily	3	42.86
Weekly	1	14.29
Prescription Drug Abuse		
Never	7	100.00
Illegal Drug Use		
Never	7	100.00
Difficulty Concentrating		
No	3	42.86
Yes	4	57.14
Difficulty with Errands		
No	3	42.86
Yes	4	57.14
Stress		
Not at all	2	28.57
Very much	3	42.86
A little bit	1	14.29
Quite a bit	1	14.29

Note. Due to rounding errors, percentages may not equal 100%.

Table G4

Summary Statistics Table for PHQ-2

Variable	*M*	*SD*	*n*	Min	Max
Depression	2.86	2.79	7	0.00	6.00

Table G5

Summary Statistics Table for Physical Activity

Variable	*M*	*SD*	*n*	Min	Max
Days of Exercise Per Week	3.71	3.04	7	0.00	7.00
Minutes of Exercise Per Week	22.86	17.99	7	0.00	50.00

Appendix H

Filtered Data

Frequency Table for Nominal and Ordinal Variables by Insurance Type

	Insurance			
Variable	Medicare	Medicaid	Dual	Missing
Living Situation				
Worried about losing	0 (0.00%)	1 (33.33%)	0 (0.00%)	0 (0.00%)
Do not have steady place	1 (33.33%)	2 (66.67%)	0 (0.00%)	0 (0.00%)
Steady place	2 (66.67%)	0 (0.00%)	1 (100.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)
Home Concerns				
None	2 (66.67%)	2 (66.67%)	1 (100.00%)	0 (0.00%)
Pests, Mold	1 (33.33%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Mold, water leaks	0 (0.00%)	1 (33.33%)	0 (0.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)
Food Worry				
Often	1 (33.33%)	2 (66.67%)	0 (0.00%)	0 (0.00%)
Never	2 (66.67%)	0 (0.00%)	1 (100.00%)	0 (0.00%)
Sometimes	0 (0.00%)	1 (33.33%)	0 (0.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)
Food Scarcity				
Often	1 (33.33%)	1 (33.33%)	0 (0.00%)	0 (0.00%)
Never	2 (66.67%)	0 (0.00%)	1 (100.00%)	0 (0.00%)
Sometimes	0 (0.00%)	2 (66.67%)	0 (0.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)
Transportation to Appts				
No	2 (66.67%)	0 (0.00%)	1 (100.00%)	0 (0.00%)
Yes	1 (33.33%)	3 (100.00%)	0 (0.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)
Utilities Shut Off				
No	2 (66.67%)	1 (33.33%)	1 (100.00%)	0 (0.00%)
Yes	1 (33.33%)	2 (66.67%)	0 (0.00%)	0 (0.00%)
Total	3 (100.00%)	3 (100.00%)	1 (100.00%)	0 (100.00%)

Note. Due to rounding error, percentages may not sum to 100%.