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Social Needs Assessment and Linkage to Community Health Workers in a Large Urban Hospital System

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Abstract

Objectives: Identifying social needs is a growing priority in primary care, but there is significant variation in how patients access services to meet such needs. This study identifies predictors of successful linkage with a community health worker (CHW) among patients with social needs seen in an outpatient setting. **Methods:** This study uses a cross-sectional analysis of social needs assessments administered in an urban health system between April 2018 and December 2019. Social needs included: food insecurity, housing quality, housing instability, healthcare cost, healthcare related transportation, utilities, care for dependents, legal assistance, safety, and getting along with household members. Patients with at least 1 social need and accepting help were included in the analysis. On contact with a CHW, patients were entered into a separate database. The primary outcome was successful "linkage," defined by having a positive social needs assessment in the medical record and a corresponding record in the CHW database. Multivariate logistic regression was used to assess predictors of linkage. **Results:** Among patients with at least 1 social need accepting help, 25% (758/3064) were linked to a CHW. Positive predictors included female gender (OR 1.28 [95% CI 1.01-1.63]), Spanish language preference compared to English (1.51 [1.14-1.03]), and having a food related need (1.35 [1.03-1.79]). Negative predictors included age 18 to 65 (0.34 [0.17-0.71] for age 18-24) and 0 to 5 (0.45 [0.24-0.78]) compared to over 65, non-Hispanic White race compared to Hispanic race (0.39 [0.18-0.84]), and having needs of getting along with household members (0.52 [0.38-0.71]) and safety (0.64 [0.42-0.98]). **Conclusions:** Twenty-five percent of patients who had at least 1 social need and were accepting help had a successful CHW linkage. Predictors of linkage suggest areas of further system-level improvements to screening and referral interventions to target at risk patients and communities.

Keywords
community health, primary care, underserved communities, social needs, social determinants of health

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Introduction

American healthcare is increasingly recognizing the need to address social determinants of health (SDH), particularly among patients in marginalized communities.[1,2] As a result, healthcare institutions are making a concerted effort to incorporate systematic screening for social needs—the tangible social priorities that patients identify as impacting their health or health access—into routine outpatient practice.[3-5] Furthermore, health care payment models are expanding to support and incentivize such screening.[6,7] While there is significant variation in how screening is implemented across studies, including personnel involved, modality used, and screening questions asked, current evidence suggests that screening for social needs in primary care settings is reliably able to identify social needs among vulnerable patients,[8-11]

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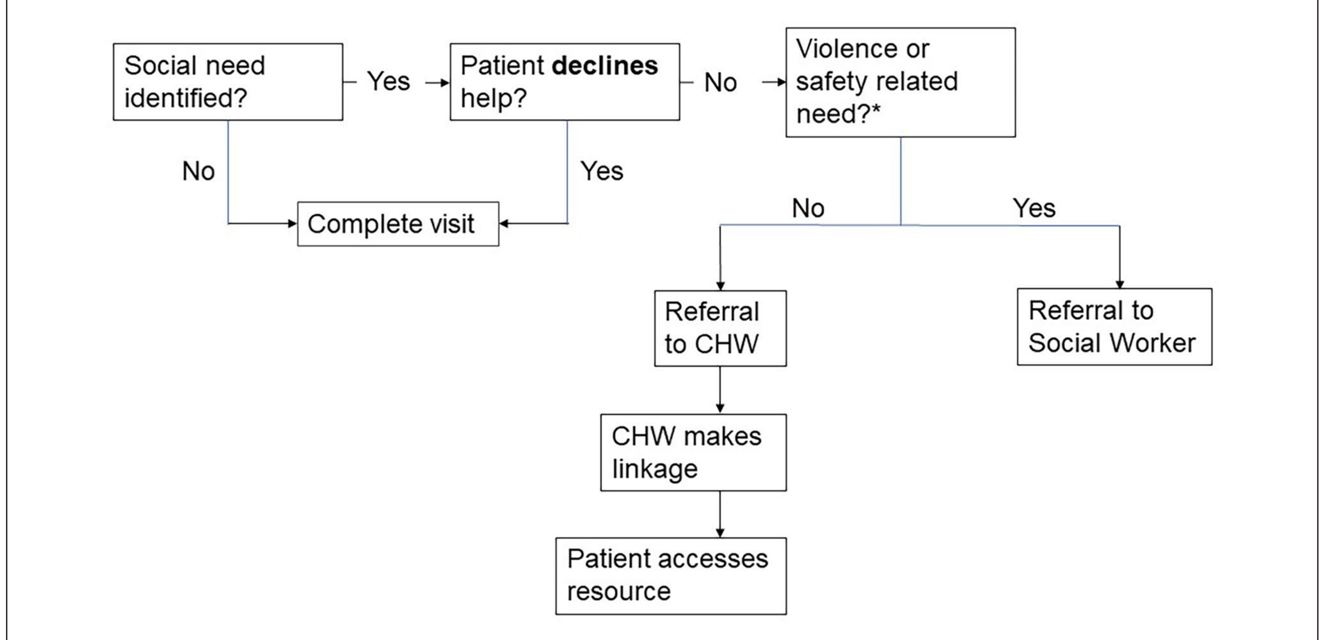

Figure 1. Workflow for screening and referral to resources in the Community Linkage to Care Program.
Abbreviation: CHW, Community Health Worker.

and connection to social resources can improve outcomes such as self-reported assessment of health[12] and emergency department utilization.[13]

There are fewer guidelines regarding connecting patients to resources to address their needs once identified. Possible strategies have ranged from the provision of resource handouts to interventions such as incorporating care navigators or other intermediaries to follow up with patients on their social needs.[3] These latter interventions are more resource intensive, but have the benefit of individualized follow up for patients. While a growing number of studies report the ability of patients to access resources once referred, there are fewer data exploring engagement of patients with these intermediary figures who may play a role in the patient's ability to access said resources. Studies that do examine this step of the referral process show significant variability in successful connection to care navigators. One systematic review of interventions in the United Kingdom described attendance at initial appointment with a care navigator to range from 50% to 79% across 7 studies.[3] Given the variability in these findings across settings and intervention types, further clarification is needed on what factors may influence successful connection to intermediary assistance.

The current study is based in an academic medical system in the Bronx, New York. The Bronx is notable for its racial diversity, with 56.4% of its population identifying as Hispanic, 29.0% identifying as Black, and 8.8% identifying as White. Prior analysis in this population has also demonstrated a high degree of unmet social needs, with 20% of patients screened in the outpatient setting endorsing at least 1 need.[8] Further analysis has also demonstrated the relationship between unmet social needs and chronic medical conditions.[14] At the same time, the Bronx is home to numerous local resources, including a robust local health department, plentiful community-based organizations and academic and health institutions.[15] This context of high need with existing social resources thus provides a unique opportunity to explore the role a health system and providers can have in linking patients to resources to meet social needs. This study has the following aims: (1) to identify the prevalence in our cohort of successful linkage to community health workers (CHW) after positive social needs identification and (2) to identify demographic level predictors of successful CHW linkage.

Methods

In 2016 the health system implemented a system-wide social needs screening and referral initiative called the Community Linkage to Care Program. The program, which has been previously described,[16] is a multi-pronged approach that involves integrating social needs assessments during clinical encounters, capturing that data in the electronic medical record (EMR), embedding CHWs in clinical practice for resource referral and follow up, utilizing provider champions to support implementation, and using a programmatic database for monitoring outcomes.

Figure 1 displays the generalized workflow for social needs assessment and referral across all sites, however site-specific clinical times had flexibility in determining exact

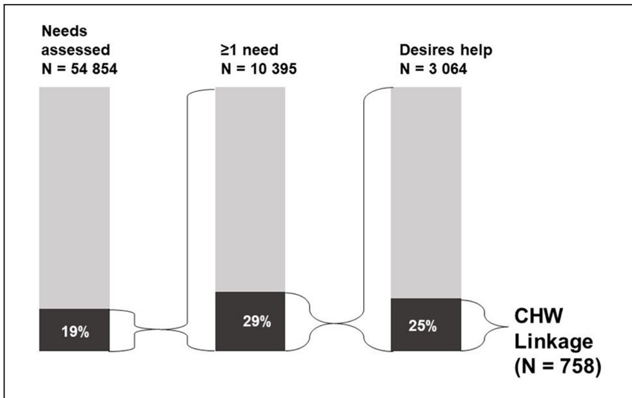

Figure 2. Cascade from social needs screening to linkage to CHW in the Community Linkage to Care Program.
Abbreviation: CHW, Community Health Worker.

personnel and workflow for administering assessments. Assessments were completed by clinic staff at outpatient visits and entered in the EMR.

The social needs assessment tool was adapted from a validated social needs screening tool[4] and available in 9 languages. The social needs assessed were: food insecurity, housing quality, housing instability, healthcare cost, healthcare-related transportation, utilities, care needs for dependents, legal assistance, safety, and getting along with household members. As the latter 2 needs were out of the scope of practice of CHWs due to the additional skills required in addressing concerns for interpersonal safety, patients with these needs were first referred via EMR referral or in-person verbal handoff to licensed social workers (SW) for urgent counseling and intervention prior to addressing any other social needs with the CHW. Patients with at least 1 other need—including those with urgent needs as described above—were given the opportunity to accept or decline further help related to social needs. The response to this question was then input manually into the EMR. If patients accepted help screening teams were instructed to notify providers of their needs via in-person handoff, at which point providers were trained to perform further assessment and to electronically refer patients to CHWs for further assistance. CHWs made a minimum of 3 phone outreach attempts to patients, recording the outcome of the outreach effort. When contact with a patient was made, CHWs provided referrals to targeted resources, assistance with applications, and ongoing follow up to ensure needs were met.

A total of 54 854 social needs assessments were completed between April 2018 and December 2019 across 19 outpatient practices. 10 395 were positive for at least 1 social need. Of patients with at least 1 need, the sample for this study was made up of the 3064 (29%) that accepted further help (Figure 2). This sample was then cross-referenced with records in the CHW program database. Records were excluded from the CHW database sample if: there was a more recent social needs assessment for the same patient, there was a file in the CHW database without a documented social needs assessment, or the file had missing outcome data. A successful CHW "linkage" was defined as having a positive social needs assessment in the medical record in a patient desiring referral assistance, with a corresponding record in the CHW database. Conversely, a positive social needs assessment in the EMR in a patient desiring referral assistance without a corresponding record in the CHW database was considered an unsuccessful "linkage."

Multivariable logistic regression using forward variable selection was used to identify predictors of linkage. Demographic variables included a priori included: age (categorized as 0-5, 6-11, 12-17, 18-24, 25-44, 45-64, 65 years, and over), gender, race/ethnicity, preferred language spoken (English, Spanish, Other), insurance type (Medicare, Medicaid, Private). Needs-related variables included a priori included number of social needs (1, 2, 3, and above), having a safety or getting along with household members need, and having a food security, housing quality, or housing stability need. Safety-related needs were included given the alternative pathway for these patients, and food and housing related needs were included given prior literature demonstrating the prevalence of these needs in similar patient populations. Additional candidate variables for forward selection included: patient residence in public housing, whether screening site was a Federally Qualified Health Center, poverty quintile of patient's census block, percent of households in poverty in patient's census block, as well as each of the screened social needs. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were computed and reported for significant variables.

Results

Of the patients who endorsed at least 1 social need and accepted help, 61% were female, 25% were non-Hispanic Black, and 22% identified Spanish as their preferred language. 58% used Medicaid as their primary insurance (Table 1). Among patients with at least 1 social need who requested assistance, 25% (758/3064) had a successful linkage to a CHW, as defined by having a documented record in the CHW database.

Positive predictors of successful linkage included: female gender (OR 1.28 [1.01-1.63]), Spanish language preference compared to English (OR 1.52 [95% CI: 1.14-2.03]) and having a food related need (OR: 1.35 [95% CI: 1.03-1.79]) (Table 2). Other individual needs were not significantly associated with successful or unsuccessful linkage, though having a housing quality need trended toward significance as a predictor of successful linkage (OR 1.29 [95% CI: 0.99-1.66]).

Table 1. Baseline Characteristics of Patients With At Least 1 Social Need Who Desired Help.

		Total	Linkage	No linkage
		3064 (100.0)*	758 (100.0)*	2306 (100.0)*
Age category (years)	<0-5	426 (13.9)	114 (14.5)	312 (13.5)
	6-11	234 (7.6)	67 (8.8)	167 (7.2)
	12-17	172 (5.6)	55 (7.3)	117 (5.1)
	18-24	164 (5.4)	27 (3.6)	137 (18.1)
	25-44	664 (21.7)	124 (16.4)	540 (23.4)
	45-64	858 (28.0)	193 (25.5)	665 (28.8)
	>65	546 (17.8)	178 (23.5)	368 (16.0)
Gender	Male	1181 (38.5)	291 (38.4)	890 (38.6)
	Female	1883 (61.5)	467 (61.6)	1416 (61.4)
Race/Ethnicity	Hispanic	1436 (46.9)	376 (49.6)	1060 (46.0)
	Non-Hispanic Black	774 (25.3)	159 (21.0)	615 (26.7)
	Non-Hispanic White	103 (3.4)	10 (1.3)	93 (4.0)
	Non-Hispanic Asian Pacific Islander	41 (1.3)	10 (1.3)	31 (1.3)
	Non-Hispanic American Indian/Native Hawaiian	15 (0.4)	4 (0.52)	11 (0.5)
Spoken language preference	English	2293 (74.8)	486 (64.1)	1807 (78.3)
	Spanish	665 (21.7)	250 (33.0)	415 (18.0)
	Other	62 (2.0)	15 (1.9)	47 (2.0)
FQHC	No	1453 (47.4)	485 (64.0)	968 (42.0)
	Yes	1611 (52.6)	273 (36.0)	1338 (58.0)
% Poverty	Mean	30	32	29
Insurance	Commercial	439 (14.3)	86 (11.3)	353 (15.3)
	Medicaid	1786 (58.3)	446 (58.8)	1340 (58.1)
	Medicare	656 (21.4)	186 (24.5)	470 (20.4)

*Percentages listed for each demographic category may not sum to 100% due to missing data for different variables.

Negative predictors of successful linkage included: each age category from 18 to 65 years or age under 5 years compared to age over 65, non-Hispanic White race compared to Hispanic race (OR: 0.39 [95% CI: 0.18-0.84]), and having a positive screen for needs of getting along with household members (OR: 0.52 [95% CI: 0.38-0.71]) or safety (OR: 0.64 [95% CI: 0.42-0.98]). Cumulative number of needs was not associated with linkage (Table 2).

Discussion

This study describes prevalence and characteristics of connection to CHWs in a social needs screening and referral program in a large, urban hospital system. Notably, only 25% of patients who endorsed needs and requested referral assistance were ultimately linked to a CHW. Multivariate analysis identified demographic variables associated with this linkage.

Negative predictors of linkage include being of age 18 to 65 or less than 5, and non-Hispanic White race. The specific mechanisms driving these associations require further exploration, and may suggest specific barriers faced by these patients. Further negative predictors include having positive screens for needs of getting along with household members or safety, reflecting the alternative workflow for these patients. While the degree of association here is not as strong and in the case of the safety need just meets significance, it does suggest that this alternative workflow may influence patients' ability to ultimately meet social needs resources. Patients with these urgent needs would first be referred to licensed SWs for counseling, and thus may not be then directed to engage with CHWs for other needs. This suggests a target for improvement in the referral workflow, specifically communication between interdisciplinary teams. It also suggests a possible area of bias in our sample, as patients who are first seen by SWs for urgent safety needs, and who as such may be most vulnerable to unstable social situations, are less likely to connect to a CHW.

Positive predictors of successful linkage included Spanish-language preference, having a food-related need and to a lesser degree female gender. Female gender has previously been linked to increased care-seeking.[17] Of note a stronger association is the finding that Spanish-speaking patients have higher rates of successful linkage, which was also noted in prior analyses of data from this program.[16] While this finding may seem to contradict literature[18,19] on decreased access to and usage of healthcare resources in immigrant populations compared to US-born populations, another interpretation is that it emphasizes how disparities in health access are a product of systemic barriers rather

Table 2. Predictors of Linkage to CHW in Patients With At Least 1 Social Need Who Desired Help.

Predictor	Odds ratio [95% CI]
Age in years (vs >64)	
<0-5	0.45 [0.25-0.78]†
6-11	0.59 [0.33-1.05]
12-17	0.64 [0.33-1.19]
18-24	0.34 [0.16-0.71]†
25-44	0.40 [0.25-0.65]†
45-64	0.55 [0.36-0.82]†
Preferred language spoken (vs English)	
Spanish	1.52 [1.14-2.03]†
Other	1.36 [0.50-3.70]
Gender (vs male)	
Female	1.28 [1.01-1.63]*
Race (vs Hispanic)	
Non-Hispanic Black	0.79 [0.60-1.05]
Non-Hispanic White	0.39 [0.18-0.84]*
Non-Hispanic American Indian/Alaskan Native	0.88 [0.23-3.39]
Non-Hispanic Asian/ Pacific Islander	0.95 [0.38-2.40]
Need (yes vs no)	
Food	1.35 [1.03-1.79]*
Housing quality	1.29 [0.99-1.66]
Housing situation	1.24 [0.94-1.64]
Getting along	0.52 [0.38-0.71]†
Safety	0.64 [0.42-0.98]*
# Social needs identified (vs 1)	
2	1.05 [0.77-1.44]
3 or more	0.74 [0.49-1.11]

*$P<.05$. †$P<.001$.

than features of a particular patient population. That is, when provided with a robust infrastructure to target and reach such patients, those disparities in access can be effectively reduced. In support of this are findings in a similar resource referral program, showing that while non-citizen and low-English proficiency caregivers were more likely to be lost to follow-up than their citizen and high-English proficiency counterparts, respectively, if they were maintained in the program they were in fact more likely to use referred resources.[20] Similarly, cross-national studies between the US and Canada showed that insurance coverage explained differences in unmet medical needs and having access to a regular doctor between immigrant and non-immigrant populations in both countries.[21] In the system in which this study was conducted, availability of linguistically appropriate resources and a workforce of CHWs with significant ethnic and language concordance with patients may have been able to address barriers to accessing resources in this population, thus allowing for increased resource utilization. These findings support the idea that marginalized communities are not inherently less likely to engage with resources, but that structural barriers exist for specific populations that contribute to disparities. Health systems can use patient demographic information to identify barriers that certain populations may face, and examine how implementation of targeted interventions can be better tailored to target existing structural barriers.

Also notable is the finding that in this population the presence of food-related needs was associated with successful CHW linkage. Food insecurity is a frequently identified need across multiple settings, including in prior research in the system discussed in this paper.[8,10,22,23] Accordingly, there is particular interest in addressing food insecurity in healthcare settings.[24] That having this need predicts linkage to CHWs may reflect the availability of tangible resources to meet this need compared to others. Alternatively, as noted in prior research on patient perspectives of social needs assessment,[25] it may reflect the acceptability of this need being addressed in clinical settings. Further elucidating whether availability of resources, their acceptability or other mechanisms are more prominent among specific patient populations is required to inform further targeting of social needs screening and referral interventions.

This study is limited by its use of administrative program data that was not systematically collected. This resulted in missing data for key analytic variables. Specifically patients' interest in help was not reliably documented at time of screening, and so the workflow relied on either the screening personnel verbally notifying providers of a patient's result or providers proactively identifying them, both of which were variable across sites. Recognizing this gap, this study still looked specifically at patients with a documented acceptance of help to highlight a population that would be most likely to be engaged in further referral, and in so doing explore a "best case" for linkage. Regarding referral from providers to CHWs, while the intended workflow was for patients to be directed to CHWs through their medical providers, internal programmatic evaluation found that there were multiple pathways by which a patient may connect to a CHW, including without an electronic referral order. There are ongoing efforts to improve implementation of this step in the workflow; however, given the current degree of missingness in provider referrals, this analysis focuses on the 2 most reliably documented steps, screening for needs and contact with CHW, to determine if patients who have identified needs are able to connect to a CHW. Further exploration of how patients make that contact, and how providers act as mediators in this process is required.

Further limitations include that the sample is a convenience sample drawn from patients screened for social needs, and thus has embedded selection bias; patients who attend primary care visits and agree to initial screening may

be more motivated or able to engage in resource assistance. The system-wide nature of the program also led to variability in implementation across various sites; prior analysis within this population showed that prevalence of screening varied by practice location and medical specialty.[26] Furthermore, there was significant variability in the CHW workforce, including variable protocols for duration of follow up, varying demographic characteristics and experience in the role, all of which was not captured in the current study. Specifically, follow up duration was not included in the model as this was not reliably documented in the program database. As such, the model assumes follow up time is evenly distributed across variables, which may not be an appropriate assumption given site and practitioner level variability.

Conclusions

Screening and referral for social needs is a growing priority in primary care, particularly in the care of marginalized communities. Given the high degree of need, and possible concerns about health systems' ability to meet these needs without robust organizational support,[27] it is crucial to identify best practices for health systems in addressing these needs. In this study of a large, urban academic healthcare system, linkage to care navigators, in this case Community Health Workers, was successful for 25% of the sample, suggesting that social needs referral in primary care settings can lead to intervention on social needs, but that there are still significant barriers preventing many patients with needs from accessing services. Further work must be done to clarify the mechanisms for why certain populations are more likely to connect to a Community Health Worker than others; specifically qualitative research that explores the experiences of different patient populations including non-English speakers, patients with specific social needs, and patient who do not accept help, can further elucidate barriers and facilitating factors for linkage to services. Understanding how different patient populations engage with a primary care-based social needs referral program, either in terms of acceptability of or access to such interventions, can help further tailor these interventions to meet the needs of vulnerable patients and communities.

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