RESEARCH ARTICLE

The adoption of social determinants of health documentation in clinical settings

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Abstract

Objective: To understand the frequency of social determinants of health (SDOH) diagnosis codes (Z-codes) within the electronic health record (EHR) for patients with prediabetes and diabetes and examine factors influencing the adoption of SDOH documentation in clinical care.

Data Sources: EHR data and qualitative interviews with health care providers and stakeholders.

Study Design: An explanatory sequential mixed methods design first examined the use of Z-codes within the EHR and qualitatively examined barriers to documenting SDOH. Data were integrated and interpreted using a joint display. This research was informed by the Framework for Dissemination and Utilization of Research for Health Care Policy and Practice.

Data Collection/Extraction Methods: We queried EHR data for patients with a hemoglobin A1c > 5.7 between October 1, 2015 and September 1, 2020 ($n = 118,215$) to examine the use of Z-codes and demographics and outcomes for patients with and without social needs. Semi-structured interviews were conducted with 23 participants ($n = 15$ health care providers; $n = 7$ billing and compliance stakeholders). The interview questions sought to understand how factors at the innovation-, individual-, organizational-, and environmental-level influence SDOH documentation. We used thematic analysis to analyze interview data.

Principal Findings: Patients with social needs were disproportionately older, female, Black, uninsured, living in low-income and high unemployment neighborhoods, and had a higher number of hospitalizations, obesity, prediabetes, and type 2 diabetes than those without a Z-code. Z-codes were not frequently used in the EHR (<1% of patients), and there was an overall lack of congruence between quantitative and qualitative results related to the prevalence of social needs. Providers faced barriers at multiple levels (e.g., individual-level: discomfort discussing social needs; organizational-level: limited time, competing priorities) for documenting SDOH and identified strategies to improve documentation.

Conclusions: Providers recognized the impact of SDOH on patient health and had positive perceptions of screening for and documenting social needs. Implementation strategies are needed to improve systematic documentation.

What is known on this topic

- There is a need to optimize health care for historically marginalized populations.
- A critical first step in care redesign is to standardize SDOH screening and documentation in routine care.
- Ways to capture and document SDOH, such as Z-codes, exist yet are not consistently adopted in clinical settings.

What this study adds

- Provides mixed methods data that examined the use of SDOH codes and factors that influence adoption in clinical settings.
- Highlights multilevel barriers and facilitators of SDOH documentation using the Framework for Dissemination and Utilization of Research for Health Care Policy and Practice.
- Adds provider-identified strategies at multiple levels that could be used to increase the identification of patient social needs in clinical settings.

1 | INTRODUCTION

Social determinants of health (SDOH) are the "conditions in which people are born, grow, live, work and age" and "are shaped by the distribution of money, power and resources,"[1] which are distributed unevenly across society due to historical injustices and modern structures.[2] SDOH, such as housing, food, transportation, and employment, can act as risk or protective factors,[1,3] and often have a greater influence on health than genetics or medical interventions.[4] The health care landscape is evolving its focus from volume to value, driving attention to understanding SDOH and addressing social needs (i.e., patient-identified needs arising from adverse SDOH) during patient interactions.[1,5] Standardized social needs screening may reveal upstream impacts on health and the use of SDOH codes in the Electronic Health Record (EHR). Documenting such needs can generate rich data that may help providers and health care systems address patient medical and social needs to improve population health. This is particularly salient among historically marginalized patients who have disproportionate rates of chronic conditions, such as diabetes, which affects 30.3 million adults (90%–95% of cases are type 2 diabetes) in the United States (US). Historically marginalized populations include persons who are or have been peripheralized based on their identities, associations, experiences, and environment (e.g., minoritized racial and ethnic groups, low socioeconomic status groups). These populations face inequitable and discriminatory social, political, and economic structures,[2,6,7] including institutional racism, which create structural barriers to access and generate disproportionate social needs.[8,9]

There is a need to optimize health care for historically marginalized populations. By 2030, it is projected that 30% of all Americans will have prediabetes.[10] Without effective intervention to address unmet social needs that impede lifestyle choices (e.g., physical activity,

healthy food intake), up to a third of these individuals will develop diabetes within 5 years. Incorporating SDOH screening and documentation into the routine care of patients at-risk for or with type 2 diabetes is a critical step in health care delivery redesign and is a precursor to patient-centered care and intervention.[1,11,12] Yet, health care teams often lack the systems necessary to systematically and efficiently identify and address social needs within their practice.[13,14]

Identification of SDOH through careful, systematic screening and documentation is needed for social needs-informed care and subsequent intervention and may lead to (1) cost-effective, early intervention that prevents hospitalization[15]; (2) reduced recurrent hospitalizations and doctor's visits; (3) reduced missed opportunities for diagnoses; and (4) increased medication adherence and improved health via prescription of affordable medications.[16] Improving documentation of SDOH may not only allow for patient-centered care that meets the social needs of an individual but may also inform population-wide approaches to address social needs and reduce the burden of, and disparities within, type 2 diabetes. While systematic, consistent screening and documentation play an important role, it is critical that subsequent steps receive similar attention and investment to ensure patients receive the care they need and desire to improve their health.

Numerous SDOH screeners have been developed and deployed in clinical settings. Although a 2019 review found 21 multidomain SDOH screening tools, it was noted that, to date, there is limited evidence for the validity and reliability of such tools.[17] Recognizing the importance of SDOH on health outcomes and health care costs, the Centers for Medicare and Medicaid Services launched the Accountable Health Communities (AHC) Model, which developed an SDOH screening tool.[18] Among AHC Medicare patients who received screening and assistance for social needs, there was a 9% decrease in emergency department use,[15] indicating screening can lead to

decreased health care utilization and costs. Another widely used tool, PRAPARE (Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences), has been translated into 25 languages, integrated with the EHR, and used in an array of health care settings by various health care team members.[19,20] In addition, the Institute of Medicine's Committee on the Recommended Social and Behavioral Measures for EHRs convened to generate standard measures for SDOH.[11,14] As a result, the 10th revision of the International Classification of Diseases (ICD-10) allows for documentation of patient social needs in a uniform diagnostic and billing data system. The institution of the current study implemented the Epic EHR system in June of 2018, giving providers the ability to use ICD-10 codes for SDOH (Z-codes).

Although a critical step, the availability of screening and documentation mechanisms does not guarantee adoption by the medical community.[21] SDOH lie outside the medical model,[22] and there has been limited guidance for providers to systematically document and act on SDOH.[23] An overall lack of supportive policies, frameworks, and structures hampers systematic screening and documentation of SDOH.[24] Dissemination and implementation science recognize that multiple levels of determinants influence the dissemination, adoption, and utilization of a new practice in health care settings.[25] The Framework for Dissemination and Utilization of Research for Health Care Policy and Practice illustrates that adoption of practice within clinical settings involves complex interrelationships between the characteristics of a practice or innovation itself (i.e., SDOH documentation in the EHR using Z-codes), the individuals using or delivering the innovation (e.g., patients, providers), the organization or practice setting (e.g., clinic), and external environment (e.g., external organizations, payors).[25] These determinants influence the spread (i.e., diffusion) and adoption of new ideas, behaviors, or products, and in this case, the social needs documentation process, throughout the health care setting. This spread and adoption progresses through several stages, from knowledge of an innovation to the decision to use the innovation and steps of implementing the innovation into routine practice. We applied this framework to increase our understanding of the complexities of the dissemination and utilization of Z-codes for SDOH documentation and to assist in the development of future strategies to improve adoption and widespread use. Deliberate approaches to address these multilevel factors, rather than passive dissemination, may help to effectively facilitate the deployment and utilization of SDOH documentation.[26] Our research used an explanatory sequential mixed methods design to: (1) quantitatively assess the use of Z-codes within the EHRs of patients at a large, urban academic medical center and (2) qualitatively explain what factors are contributing to adoption.

2 | METHODS

2.1 | Mixed methods overview

This study was approved by the Washington University Institutional Research Board. We used an explanatory sequential mixed methods design that first examined the use of Z-codes within the EHR and then performed qualitative interviews to examine barriers and facilitators to using codes and documenting SDOH.[27–29] This study followed the Standards for Reporting Implementation Studies (StaRI; Appendix S1).[30] Quantitative analyses, along with the Framework for Dissemination and Utilization of Research for Health Care Policy and Practice, informed questions asked qualitatively. Data were integrated and interpreted together using a joint display (Table 2). The Framework for Dissemination and Utilization of Research for Health Care Policy and Practice was used to conceptualize how characteristics of the social needs documentation process (innovation-level), patients and providers (individual-level), the hospital (organization-level), and external actors (e.g., payors, professional societies; environmental-level) influence the adoption of SDOH documentation. The use of an established framework may lead to a more effective adoption of SDOH documentation by increasing the interpretability of study findings, helping to focus the intervention on the essential processes of behavior change, and ensuring that essential implementation strategies are included.[26]

2.2 | Quantitative sample and analysis

We queried EHR data at a large, urban academic medical center using the MDClone platform (Beer Sheva, Israel)[31] for patients with a hemoglobin A1c (HbA1c) higher than 5.7 seen for an outpatient visit between October 1, 2015 and September 1, 2020 ($n = 118,215$). Variables of interest included patient demographics, Z-codes, health insurance type, number of hospitalizations, neighborhood (zip-code level), household income and unemployment rate, prediabetes (HbA1c 5.7%–6.4%), and type 2 diabetes (HbA1c ≥ 6.5%), and diabetes-related outcomes (obesity, heart disease). Neighborhood (zip-code) income and employment data were from the 2010 US Census Bureau.

The use of Z-codes was calculated as the number of unique patients that had any Z-code and overall number of times a Z-code was used in the sample. The average number of times a Z-code was used for each patient was calculated as the number of unique patients divided by the number of times the code was used. Two groups were generated to compare patients with a documented social need (≥1 Z-code) to those without a Z-code.

Patient demographics, neighborhood characteristics, and diabetes-related outcomes were examined using mean and standard deviation, or percentages as appropriate, and compared by social need using Chi-square and t-tests as appropriate. All analyses were conducted in R Studio (version 4.0.2).

2.3 | Qualitative sample and analysis

Health care providers (e.g., physicians, nurses, social workers in outpatient and inpatient endocrinology and pediatric endocrinology) and other key stakeholders (compliance, billing and coding specialists)

were recruited using a nonpurposive, snowball sampling approach within related departments at an urban, academic medical center. Stakeholders related to billing and coding were recruited from the following departments: Health Care Analytics, Health Information Management, Enterprise Coding, Finance and Support Services, Clinical Operations, and Patient Accounts. Semi-structured interviews (average of 22 minutes in length) were conducted with 23 participants ($n = 15$ health care providers; $n = 7$ stakeholders). Questions were asked to understand how factors at the innovation-, individual-, organizational-, and environmental-level influence individuals' decision making regarding the use of Z-codes and documentation of SDOH. All interviews were conducted via Zoom software, audio recorded, and transcribed verbatim using a professional company.

Data were analyzed in NVivo Version 12 using a thematic analysis approach,[32] in which deductive codes were developed based on the framework, and inductive codes were added based on themes emerging from the transcripts. Two coders independently reviewed transcripts in a data immersion phase. Next, coders piloted the codebook with a random selection of three transcripts. The coders met to generate consensus and finalize the codebook. Then coders conducted dual independent coding of all transcripts and met weekly to resolve discrepancies and generate consensus. As 100% agreement was achieved through this consensus coding approach, a reliability statistic is not reported. Coded text was then organized into a memo summarizing key themes and exemplar quotes.

3 | RESULTS

3.1 | Sample demographics

The sample included 118,215 patients, of which 1019 (<1%) patients had a documented social need (≥1 Z-code) (Table 1). The mean age was 62.0 years, with less than 2% of the sample aged younger than 18 years. The sample was half (51.0%) female and the majority (68.9%) white. The sample predominantly lived in low- (<$50,000; 48.4%, $n = 52,993$) or middle-income ($50,000–$100,000; 49.3%, $n = 54,054$) neighborhoods. Just over half of participants (55.0%, $n = 60,384$) lived in neighborhoods with low unemployment rates (0%–4%); and 44.9% ($n = 49,303$) in neighborhood with 4%–20% unemployment.

3.2 | Differences in social need

All patient demographics (age, sex, race) significantly differed by patients with and without a Z-code (p-value <0.001) (Table 1). Those without a Z-code were older than those with (mean 62.1 vs. 53.1 years). Of those with a documented social need, 61.2% ($n = 624$) were female and 38.8% ($n = 395$) were male. Although individuals who identified as Black comprised only 26.8% of the population, they were 47.3% of the population with a documented Z-code. Insurance status, number of hospitalizations and neighborhood income, and unemployment all significantly differed (p-value <0.001).

Those with a documented social need had significantly higher hospitalizations during the study period versus those without a Z-code (9.4 vs. 4.0; p-value <0.001). A higher percentage of individuals with a documented social need lived in zip-codes with <$50,000 household income than those without a Z-code (61.3% vs. 48.2%). More individuals with a documented social need lived in neighborhoods that had an unemployment rate between 4% and 20% than individuals without a Z-code (58.0% vs. 44.8%). A higher percentage of individuals with a documented social need had a diagnosis for obesity compared to those without a Z-code (47.4% vs. 34.7%). The prevalence of prediabetes, diabetes, and heart disease did not differ between groups (p-values = 0.1, 0.1, and 0.3, respectively).

3.3 | Z-code use

There are seven categories with a total of 82 possible Z-codes that could be applied to document social needs (Table 2). In this sample, 14 (17%) of Z-codes across five categories (housing and economic circumstances, social environment, primary support group, problems related to psychosocial circumstances, problems related to upbringing) were used a total of 2147 times. Two social needs categories [employment (Z56) and/or education and literacy (Z55)] were not documented in this sample. Codes within the category "Problems related to other psychosocial circumstances (Z65)" accounted for 72.8% ($n = 1565$) of the codes used and were applied to 781 unique patients (76.6% of patients with ≥1 Z-code). The second most frequently used codes were those in the "social environment (Z60)" category, which accounted for 12.3% ($n = 264$) of codes among 121 (11.9%) unique patients. Third, 11.8% ($n = 257$) of codes were within the "Primary support group (Z63)" category and were applied to 231 (22.7%) unique patients.

Table 2 also reports the congruence between social needs reported via Z-codes and those mentioned in stakeholder interviews. In comparing the qualitative and quantitative findings, there was an overall lack of congruence in five of the seven categories of social needs. Two of the most commonly recognized social needs that emerged in the interviews (housing and economic circumstances and education and literacy) were rarely or never documented with Z-codes. Two of the most frequently applied Z-codes (social environment and primary support groups) were not recognized as common patient needs among interview participants.

3.4 | Qualitative results

The extent to which providers discussed SDOH with their patients depended upon their role. Social workers were most commonly involved in identifying and documenting patients' social needs. Diabetes educators indicated social needs often emerged as barriers to accessing care or adherence to provider recommendations, "...like food access or they've [patients] been told, 'We want you eating this', but they can't get it. Or unstable housing becomes an issue... whether they can maintain their supplies, are their supplies with them when

TABLE 1 Patient demographics and outcomes by social need

Variables	All (n = 118,215)	With social need (≥1 Z-code) (n = 1019)	No Z-code (n = 117,196)	p-value for difference
Age (mean, SD)	62.0 (±15.3)	53.1 (±19.3)	62.1 (±15.2)	<0.001
<=18 yo (n, %)	1491 (1.3%)	81 (7.9%)	1410 (1.2%)	<0.001
Sex (n, %)				<0.001
Female	60,234 (51.0%)	624 (61.2%)	59,610 (50.9%)	
Male	57,958 (49.0%)	395 (38.8%)	57,563 (49.1%)	
Unknown	23 (0.0%)	0 (0.0%)	23 (0.0%)	
Race (n, %)				<0.001
White	81,508 (68.9%)	503 (49.4%)	81,005 (69.1%)	
Black	31,718 (26.8%)	482 (47.3%)	31,236 (26.7%)	
Other	4989 (4.2%)	34 (3.3%)	4955 (4.2%)	
Insurance status (n, %)				
Uninsured/unknown	59,564 (50.4%)	367 (36.0%)	59,197 (50.5%)	<0.001
Medicaid/Medicare	28,310 (23.9%)	342 (33.6%)	27,968 (23.9%)	
Private	30,341 (25.7%)	310 (30.4%)	30,031 (25.6%)	
# of Hospitalizations (mean, SD)	4.1 (±6.0)	9.4 (±12.4)	4.0 (±5.9)	<0.001
Zip-code level household income (n, %)				<0.001
<$50,000	52,993 (48.4%)	596 (61.3%)	52,397 (48.2%)	
$50,000–$100,000	54,054 (49.3%)	366 (37.6%)	56,635 (49.0%)	
$100,000+	2535 (2.3%)	11 (1.1%)	2600 (2.2%)	
Zip-code level unemployment rate (%)				<0.001
0–4	60,384 (55.0%)	409 (41.9%)	59,975 (55.1%)	
4–20	49,303 (44.9%)	566 (58.0%)	48,737 (44.8%)	
20–100	146 (0.1%)	1 (0.1%)	145 (0.1%)	
Prediabetes (A1C 5.7–6.4%)	52,065 (44.0%)	475 (46.6%)	51,590 (44.0%)	0.1
Diabetes (A1C ≥ 6.5%)	66,150 (56.0%)	544 (53.4%)	65,606 (56.0%)	0.1
Obesity (n, %)	41,122 (34.8%)	483 (47.4%)	40,639 (34.7%)	<0.001
Heart disease (n, %)	42,467 (35.9%)	384 (37.7%)	42,083 (35.9%)	0.3
Average number of Z-codes	NA	2.1	NA	NA

they need them to be?" Most physicians indicated they did not systematically assess SDOH in their practice and that they relied on social work or psychology referrals to delve further into SDOH and to provide assistance to patients. Providers across roles indicated they mainly relied on narrative notes to document social needs. Several providers indicated they sometimes use dot phrases (i.e., a phrase that can be summoned when typing in the notes section of the EHR to pull a predefined note or description) to document information such as patient insurance status. A social worker indicated they have "…smart phrases or dot phrases that is a whole template of a note, and I've altered one to be diabetes specific… I use that."

3.5 | Innovation-level determinants

Table 3 summarizes barriers to systematically screening for and documenting social needs, as well as potential strategies to address these challenges. At the innovation level, providers suggested the complexity of using Z-codes could decrease willingness to use them. A physician indicated a preference for documenting social needs narratively, stating, "it's cumbersome to attach codes to your note. Because we know the names of the diagnoses, but I don't know the individual codes for anything off the top of my head." Several providers were concerned about the frequency with which SDOH information could be updated and whether it would be possible to indicate if a need had been resolved. Some providers were concerned about out-of-date information, especially of a sensitive nature, following patients. As one provider expressed, "…one thing that I would be kind of wary of is, when you document things and then it's not necessarily correct in the chart… and just keeps going on and on and on. So, something like a general risk factor might turn into something else… down the road, the patient will be like, 'wait, what? That's not true. Where did you get that?'"

TABLE 2 Mixed methods reporting of Z-code use

Category	Z-code	# of possible codes	Examples of codes	Codes used (n, %)[a]	# of times Z-code used	# unique patients	Summary of qualitative findings	Congruency between quantitative and qualitative data
Employment	Z56	12	Unemployment; sexual harassment on the job; change of job	0 (0%)	0	0	No provider mention of patient needs related to employment	yes
Adequate and safe housing and economic circumstances	Z59	10	Homelessness; lack of adequate food; extreme poverty	1 (10%)	4	3	Among the most frequently observed social need "…lack of housing or they could have like housing situation unstable. So those are the main things that we see as inpatient."	no
Education and literacy	Z55	7	Illiteracy; underachievement in school; schooling unavailable	0 (0%)	0	0	Several providers mentioned health literacy needs "Some people have a low health literacy."	no
Social environment	Z60	7	Acculturation difficulty; social exclusion and rejection; target of discrimination	4 (57.1%)	264	121	No mention of provider of patient needs related to the social environment	no
Primary support group	Z63	14	Death of family member; absence of family member; problems in relationship with spouse or partner	3 (21.4%)	257	231	No mention of provider of patient needs related to primary support group	no
Problems related to other psychosocial circumstances	Z65	8	Imprisonment; victim of crime and terrorism;	5 (62.5%)	1565	781	No mention of provider of patient needs related to other psychosocial circumstances	no
Problems related to upbringing	Z62	24	Child in welfare; history of physical and sexual abuse; parent–child conflict	1 (4.2%)	57	33	Several providers mentioned child neglect and reporting procedures "…a lot of our kids get neglected. So we do hotline a lot… it is not to be mean to these people, sometimes it's to keep these kids alive."	yes
Total		82	NA	14 (17.1%)	2147	1019[b]	NA	NA

[a]Percentage is calculated as the number of codes used divided by the total number of possible codes in the category.
[b]Number reflects total number of unique patients who had a Z-code. Since some participants had more than one Z-code this is not a sum of row values.

TABLE 3   Prominent determinants and suggested strategies to facilitate uptake of Z-codes

Level	Determinants	Strategies
Innovation	• Complexity of documentation method • Risk of SDOH information being out of date or inaccurate • Concern about sensitive information following patients	• EHR modifications to streamline documentation and SDOH data visibility • EHR reminders • Provide information on utility & impact of using Z-codes
Individual	• Lack of awareness of Z-codes • Limited knowledge about social needs • Discomfort discussing and documenting patient social needs	• Provider training (identifying and discussing SDOH, using Z-codes) • Ongoing online education • Use of clinical documentation improvement champions to increase SDOH screening and documentation • Brief instruction documents
Interpersonal	• Patient level of trust and comfort with provider • Patient fear of negative consequences of SDOH documentation	• Adaptability and tailoring of screening and documentation procedures • Demonstrations of how to discuss and document SDOH information
Organizational	• SDOH documentation not a departmental priority • Lack of tangible supports for systematic documentation • Limited time to address competing priorities	• Standardized SDOH screening tool • Standardize workflows for documenting SDOH, patient referrals to supportive services • Incorporation of SDOH-focused content in grand rounds • Dedicated social work staff to discuss patient social needs • Collaboration between billing and compliance department and clinical documentation team to create guidance on Z-code use
Environmental	• Higher rate of reimbursement for medical complexity compared to social complexity	• Guidance from professional organizations, such as the American Diabetes Association

3.6 | Individual-level determinants

The billing and compliance staff were more aware of Z-codes than providers. None of the providers indicated using Z-codes in their practice, and only two were aware of the existence of Z-codes. Providers had varying levels of knowledge about social needs in general. One physician indicated, "no one ever taught me about the Z-codes. Although I have seen in a couple of patient charts recently about social stressors or something in the problem list of that nature." Although most providers indicated that they would be comfortable systematically documenting social needs, several expressed discomfort for several reasons, including concern about stigmatizing patients or causing embarrassment. A diabetes educator noted, "I feel like that I'm maybe judging the way they live or view their world, and it's not really my place to judge. The only thing that I can do is be objective that their A1c is this, their understanding is this, their skill set is this. So that's why I have a hard time doing it [documenting social needs]."

Within the individual level, providers also described interactions and relationships with and potential impacts on patients related to identifying and documenting social needs. Providers noted that whether they discussed social needs was driven by patient priorities, as well as the level of patient trust and comfort. One physician stated, "if... you walk into a room and someone is guarded towards you, you need to back off," and noted the importance of establishing trust before delving into sensitive topics. Several providers suggested that patients with particularly sensitive and complex situations (e.g., a child placed in protective custody) were wary of SDOH information being

documented in the EHR. They indicated that whether SDOH information was documented would be driven by the patient's willingness to openly discuss a need. One diabetes educator gave an example, "I wouldn't mind putting it in the chart...if they [patient] said, 'Hey, I'm really having trouble with getting access to healthy foods.' Or whatever the case is, and wanted resources, then I think I feel more comfortable." Several providers regarded transparency as an important part of patient care, suggesting that patients should receive a clear explanation about why SDOH information is collected.

3.7 | Organization-level determinants

There were mixed sentiments regarding leadership and organizational prioritization of SDOH documentation. Although some providers expressed that their department leadership emphasized the importance of understanding SDOH and addressing patient social needs, there was little discussion or tangible support for systematic screening and documentation. Providers noted the need to build rapport with patients, address their most pressing medical needs, provide education, and complete documentation, all within a limited window of time during the appointment. Limited time and competing priorities with other care objectives and departmental goals were the most common hindrances to discussing and documenting patient social needs. Several providers also noted workflow and communication inefficiencies across departments hindered their ability to address social needs. One provider indicated, "frequently, our team asks the pharmacy team

to check the price, see if the patient's insurance will cover. So, we have to wait for the mobile pharmacy to check the price in order for us to teach the right medication. So that wastes a lot of time."

3.8 | Environment-level determinants

Participants indicated that beyond intrinsic motivation to improve patient care, there were few to no incentives to systematically document SDOH information. Billing for more complex health needs would be reimbursed at higher rates by payers; a billing staff person noted, "when the patient's coming in with respiratory failure and kidney failure and this failure, those are pretty severe cases that we want to get those diagnosis in there. And if there's a lack of housing, we're probably not going to put that one in because… they've got all these critical diagnoses, that's what we're going to choose over the lack of housing."

3.9 | Implementation strategies

Providers offered suggestions for improving the uptake of Z-codes (Table 3). Many providers indicated they wanted additional information on Z-codes, training on how to properly document SDOH, and standard workflows for identifying and documenting SDOH and referring patients to services to support needs that arise. Providers who had concerns about documenting patient needs in the EHR suggested they would be willing to incorporate this in their practice if they "could do it in a language that was nonjudgmental, and the patient understands it also and is educated on it." One provider noted their department included "physicians that are clinical documentation improvement champions" who could promote the use of Z-codes and raise provider awareness around SDOH. To better integrate systematic documentation of SDOH information into routine practice, providers suggested "carrot" rather than "stick" approaches. Although some providers felt EHR alerts could be useful reminders, others cautioned that there were already too many of such reminders. As one physician indicated, "Note Writer is a nice format because if you click the boxes, it's super easy and you're done. If you forget to click those boxes, nothing screams at you in your note like you didn't do this…. Doctors are really tired… we don't need more things beeping at us." Providers suggested EHR modifications to make SDOH information more readily visible, such as on side panels along with other key health indicators and care information.

3.10 | Potential impact of Z-codes

Despite little prior awareness about Z-codes, providers had overall positive perceptions of the potential utility of Z-codes or other methods to systematically document patient SDOH information. Several providers anticipated Z-codes might help them more readily identify patient social needs that may need to be accounted for in care

planning. A diabetes educator indicated Z-codes "…might be beneficial for our high-risk clinic because we have a lot of high-risk kids… that we wish there was a way that Epic could flag them." Most providers indicated challenges in readily identifying patient SDOH information using current methods, such as narrative notes. A physician stated, "currently, what I do is I'll go to the social worker's note. But sometimes that's hard to sift through… hard to find, especially in a child who's been hospitalized for a long time. So yeah, that [Z-codes] would be very helpful." Another potential benefit was improved communication across providers in a "multi-disciplinary [team] if they have those codes… if the healthcare team was aware of that, then they can address the patients'… issues."

Participants suggested several potential impacts on care practices and patient outcomes resulting from the uptake of Z-codes. Providers indicated that access to information about patient SDOH would help them to better tailor their care to a patient's situation and "avoid being insensitive to my patients' needs." Several providers suggested that improved SDOH documentation would allow them to better assist their patients in problem-solving barriers to adherence to care plans. Z-codes were also expected to improve the management of chronic conditions and facilitate patient connections to resources. As one provider noted, "what's good for the patient, is good for the healthcare system. So, if you can document that stuff and then get these people back to primary care and support primary care to keep them out of the hospital."

4 | DISCUSSION

Assessing SDOH has been recommended by several national initiatives and is considered one of the key principles for promoting equitable health outcomes for patients and communities.[18,33,34] Health care providers are expected to provide care for medically and socially complex patients, but many drivers of illness are outside the medical model.[22] Patients in this sample with social needs had significantly more hospitalizations and adverse health outcomes (e.g., obesity, type 2 diabetes).

The social environment and primary support groups were the most commonly documented social needs using Z-codes. Individuals who lack social support are less likely to succeed in self-management, which is a critical component of diabetes control.[35] While not systematically documented using Z-codes, qualitative findings suggest that housing and economic circumstances, education, and literacy are critical factors that impact patients. These unmet social needs contribute to uncontrolled diabetes, which leads to major health complications and contributes to diabetes-related morbidity, mortality, and health care costs.[36,37]

Quantitatively, there was low use of Z-codes within the EHR; this was not in alignment with the qualitative reports of patient social needs by providers. Providers informally discussed social needs with patients, but they were not systematically using standardized SDOH screeners and were generally unaware of Z-codes as a means to document social needs in the EHR. Providers suggested using EHR alerts,

tools to easily incorporate SDOH into documentation (e.g., Note Writer, dot phrases), and improving the accessibility of the SDOH information by locating it in areas providers frequently use (e.g., Epic side panel).

Systematically screening for and documenting social needs alongside patient health indicators could eliminate these discrepancies and offer providers a complete picture of patient needs. This type of documentation may ultimately lead to reductions in health disparities if similar investment in subsequent patient-centered care and intervention is made.[22] Conversely, inconsistent and inaccurate documentation could lead to misinformed care with misdiagnosis, a path of inappropriate investigations, or inappropriate care plans (e.g., prescribing medicines the patient cannot afford).[13] Furthermore, as noted in qualitative findings, lack of documentation leads to poor communication across multidisciplinary care teams, which are critical to providing quality care for patients with diabetes and multiple chronic diseases.[38,39]

This research demonstrates the complexity of screening for and documenting SDOH in clinical settings, which highlights the need for careful planning and implementation of SDOH screening and documentation in clinical care settings to improve the consistency and accuracy of social needs information. Providers recognized the impact of SDOH on patient health and had positive perceptions of screening for and documenting SDOH, yet lacked time, EHR supports, standardized workflows, and requisite training to incorporate this into their practice. Physicians often relied on social work and other behavioral health providers to identify and assist with social needs. Yet, these specialty providers are limited and stretched thin, especially during the COVID-19 pandemic, meaning many patients with social needs may not have the opportunity to see these providers and miss out on receiving the support they may desire. It is imperative and ethical that appropriate referral or linkage to resources is available before the screening,[40] as discovering a need and being ill-equipped to address that need creates potential harm to the patient and frustration or burnout for the provider.[41]

Similar barriers to SDOH screening and documentation have been reported in the literature,[42,43] and there has been increased attention to developing implementation strategies to overcome these barriers.[20] This research adds provider-identified barriers and strategies at multiple levels to the literature that could be used to increase the identification of patient social needs and uptake of Z-codes. Providers desired education on how to document SDOH and to increase their comfort in discussing social needs with patients. Providing demonstrations of how to discuss social needs with compassion and empathy may be a strategy that could result in patients being more forthcoming about their needs, resulting in more accurate diagnoses and better care.[16] Furthermore, research has demonstrated that while social needs screening is acceptable and patients generally want providers to be aware of SDOH, many patients experiencing unmet social needs do not desire assistance, such as resource referrals, from the health care system.[44] Therefore, training in patient-centered approaches to assessing and documenting social needs is critical to delivering care that is wanted and acceptable to patients.[42,45]

Providers wanted modifications to the EHR to streamline documentation, SDOH data visibility, and communication across the care team. The location and visualization of SDOH data in the EHR are important to reduce the burden on the care team, facilitate patient discussions, and aid in prioritizing social needs in care plans. While technology is a critical part of the solution, it remains important to develop implementation and workflow plans to decide who is responsible for administering the screener, how often the screener is administered, how results will be communicated to all care team members, how the patient's needs will be prioritized and how the care plan will be documented.[20]

Some strategies (e.g., staff to support SDOH screening and patient navigation, and value-based reimbursement models) require substantial organization and system-level investments. Advocates recommend creating national standards for representing SDOH data in EHRs and incentivizing the collection of these data through financial or quality measures.[46] Groups like the Gravity Project[47] are building data standardization that allows for aggregation across practices, EHR systems, and communities and could advance our understanding of the impact of SDOH screening on care practices and individual and population health.

This study used a comprehensive mixed methods approach; however, the sample demographics (e.g., only Black and White racial groups) and focus on a single academic health system may limit generalizability to other populations or clinic settings. SDOH leads to disproportionate adverse health outcomes in many other studies,[6,48,49] but this study did not examine causal relationships between SDOH and health outcomes. Furthermore, patients' social need was characterized by the presence or absence of Z-codes; we were not able to differentiate between patients without need and patients who experienced needs that were not documented or documented using a method other than Z-codes (e.g., provider narrative note).

This research highlights barriers to collecting and documenting SDOH information in clinical settings, which is only one part of this initiative. Similar investment is needed to understand solutions to providing care and intervention that accounts for social needs and as desired by the patient. Beyond individual-level intervention, documentation of SDOH may inform systemic and structural changes that are ultimately necessary to achieve health equity. Research is underway and needed to provide further implementation guidance on who should be screened for social needs, which SDOH domains are most important, how the SDOH information can be used in clinical care and referrals, and ultimately whether integrating this information into clinical care improves health.[50] Strategies identified through this research may not adequately address all barriers. Additional work is needed to operationalize and test these strategies and identify other potential solutions. Implementation science and quality improvement offer valuable methods for matching strategies to barriers, specifying strategies so they can be successfully enacted and replicated across settings, and developing processes to evaluate and improve clinical practice.[51,52]

Using multilevel strategies (e.g., provider-level training and clinic-level workflow) may be necessary to improve the systematic

documentation of SDOH in health care settings. Integrating SDOH data into clinical settings will enable more effective and proactive identification of levers of change to guide resource allocation, set objectives and targets for intervention, plan effective treatment, refer patients to resources, and evaluate the patient- and community-level impact. Ultimately, as suggested by the Institute of Medicine, addressing SDOH is necessary to increase both the sustainability and impact of efforts to prevent and manage chronic diseases, particularly diabetes.[34]

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.