Title

Interventions addressing health-related social needs among patients with cancer.

Journal

Journal of the National Cancer Institute, 116(4)

Authors

Graboyes, Evan

Lee, Simon

Lindau, Stacy

et al.

Publication Date

2024-04-05

DOI

10.1093/jnci/djad269

Peer reviewed

JNCI: Journal of the National Cancer Institute, 2024, **116(4),** 497–505
https://doi.org/10.1093/jnci/djad269
Advance Access Publication Date: January 4, 2024
Commentary

Interventions addressing health-related social needs among patients with cancer

Evan M. Graboyes, MD, MPH,[1,2,3,*] Simon C. Lee, PhD, MPH,[4,5] Stacy Tessler Lindau, MD, MAPP,[6,7,8] Alyce S. Adams, PhD,[9,10] Brenda A. Adjei, EdD, MPA,[11] Mary Brown, MSW, LISW-S,[12] Gelareh Sadigh, MD,[13] Andrea Incudine, MPH,[14] Ruth C. Carlos, MD, MS,[15,16] Scott D. Ramsey, MD, PhD,[17,18] Rick Bangs, MBA, PMP[19]

[1]Department of Otolaryngology-Head and Neck Surgery, Medical University of South Carolina, Charleston, SC, USA
[2]Department of Public Health Sciences, Medical University of South Carolina, Charleston, SC, USA
[3]Hollings Cancer Center, Medical University of South Carolina, Charleston, SC, USA
[4]Department of Population Health, University of Kansas School of Medicine, Kansas City, KS, USA
[5]University of Kansas Cancer Center, University of Kansas, Kansas City, KS, USA
[6]Department of Obstetrics and Gynecology, The University of Chicago, Chicago, IL, USA
[7]Department of Medicine-Geriatrics and Palliative Medicine, The University of Chicago, Chicago, IL, USA
[8]Comprehensive Cancer Center, The University of Chicago, Chicago, IL, USA
[9]Departments of Health Policy/Epidemiology and Population Health, Stanford University School of Medicine, Stanford, CA, USA
[10]Office of Cancer Health Equity and Community Engagement, Stanford Cancer Institute, Stanford Medicine, Stanford, CA, USA
[11]Office of the Associate Director, Healthcare Delivery Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute, Rockville, MD, USA
[12]Adena Cancer Center, Hematology and Oncology, Chillicothe, OH, USA
[13]Department of Radiological Sciences, University of California-Irvine, Irvine, CA, USA
[14]Family Reach, Boston, MA, USA
[15]Department of Radiology, University of Michigan, Ann Arbor, MI, USA
[16]Rogel Cancer Center, University of Michigan, Ann Arbor, MI, USA
[17]Department of Pharmacy, University of Washington, Seattle, WA, USA
[18]Fred Hutchinson Cancer Center, University of Washington, Seattle, WA, USA
[19]SWOG Cancer Research Network, Portland, OR, USA

*__Correspondence to:__ Evan M. Graboyes, MD, MPH, Department of Otolaryngology-Head and Neck Surgery, Medical University of South Carolina, 135 Rutledge Ave, MSC 550, Charleston, SC 29425, USA (e-mail: graboyes@musc.edu).

Abstract

Health-related social needs are prevalent among cancer patients; associated with substantial negative health consequences; and drive pervasive inequities in cancer incidence, severity, treatment choices and decisions, and outcomes. To address the lack of clinical trial evidence to guide health-related social needs interventions among cancer patients, the National Cancer Institute Cancer Care Delivery Research Steering Committee convened experts to participate in a clinical trials planning meeting with the goal of designing studies to screen for and address health-related social needs among cancer patients.

In this commentary, we discuss the rationale for, and challenges of, designing and testing health-related social needs interventions in alignment with the National Academy of Sciences, Engineering, and Medicine 5As framework. Evidence for food, housing, utilities, interpersonal safety, and transportation health-related social needs interventions is analyzed. Evidence regarding health-related social needs and delivery of health-related social needs interventions differs in maturity and applicability to cancer context, with transportation problems having the most maturity and interpersonal safety the least. We offer practical recommendations for health-related social needs interventions among cancer patients and the caregivers, families, and friends who support their health-related social needs. Cross-cutting (ie, health-related social needs agnostic) recommendations include leveraging navigation (eg, people, technology) to identify, refer, and deliver health-related social needs interventions; addressing health-related social needs through multilevel interventions; and recognizing that health-related social needs are states, not traits, that fluctuate over time. Health-related social needs–specific interventions are recommended, and pros and cons of addressing more than one health-related social needs concurrently are characterized. Considerations for collaborating with community partners are highlighted. The need for careful planning, strong partners, and funding is stressed. Finally, we outline a future research agenda to address evidence gaps.

Tamara (pseudonym) is a mother aged 43 years with stage III cervical cancer who has 2 children. Tamara is the only person in the family with a car and usually drives herself to medical appointments. She missed her first cycle of chemotherapy and some of her radiation therapy because she had to take her son to his job. Tamara does not have health insurance and stopped paying rent to try to cover the out-of-pocket expenses for her chemotherapy and radiation therapy. When she got behind on rent and was going to be evicted, Tamara decided to stop treatment. When she later was able to return to her cancer team, restaging scans showed that her cervical cancer had metastasized widely.

Received: November 10, 2023. **Revised:** December 11, 2023. **Accepted:** December 18, 2023

Health-related social needs are adverse social determinants of health for which the person indicates a desire for support (1,2). Health-related social needs, which include conditions like food insecurity, transportation problems, and housing instability, are a critical issue for patients with cancer (3,4). It is estimated that approximately 25%-60% of patients with cancer experience food insecurity, 20% suffer from housing instability, and 15% struggle with transportation for cancer care (5-9). By impairing access, utilization, and timely delivery of quality oncology care, health-related social needs contribute to adverse cancer outcomes (3,4,9). The relationship between health-related social needs and delaying or postponing seeking medical care, missed medical care, treatment nonadherence, treatment delays, and interruptions is well documented (10-13). For patients with cancer, health-related social needs are also associated with worse health-related quality of life (14) and may contribute to higher rates of recurrence and worse survival (15-17). In addition, health-related social needs contribute to observed inequities in cancer incidence, severity, access to care, and outcomes (3,4).

Identifying and addressing health-related social needs within cancer care delivery are necessary to achieve optimal health outcomes and reduce pervasive inequities (3,18). Leading organizations such as the National Cancer Institute (NCI); American Society of Clinical Oncology; American Cancer Society; the National Cancer Policy Forum; and National Academies of Sciences, Engineering, and Medicine (NASEM) have emphasized the importance of identifying and addressing health-related social needs among patients with cancer (3,4,19-21). Although recent advances have improved our understanding of the role that health-related social needs play in health disparities, rigorous clinical trials evaluating approaches to address health-related social needs among patients with cancer are needed (22).

To address this gap, the NCI Cancer Care Delivery Research Steering Committee convened a clinical trials planning meeting on addressing health-related social needs. The primary goal of the meeting was "to create consensus on the design of a multi-practice, multi-intervention prospective controlled study aimed at screening for and addressing HRSNs [health-related social needs] among patients with newly diagnosed cancer." (23) The clinical trials planning meeting focused on trial design for deployment within the NCI Community Oncology Research Program (NCORP). NCORP is a national network that provides infrastructure for therapeutic, screening and prevention, care delivery, and supportive care oncology clinical trials. NCORP consists of 7 research bases and 46 community sites of which 14 are designated as minority/underserved community sites (24). Within the clinical trials planning meeting, the intervention group focused specifically on 1) identifying interventions addressing health-related social needs related to food insecurity, transportation problems, housing instability, utility help needs, and interpersonal safety among patients with cancer and 2) evaluating the potential of the interventions to improve clinical and health-related quality-of-life outcomes within community-based oncology care practice settings. The interventions group was composed of a multidisciplinary team of stakeholders including patients, NCORP-affiliated clinicians and researchers (from academic minority/underserved and community oncology sites), NCORP-affiliated administrators and staff, NCI staff, and community-based content experts. The interventions group divided into 5 teams, each tasked with reviewing evidence for 1 of the 5 health-related social needs identified above.

This commentary provides a framework for considering interventions to address common health-related social needs for patients with cancer and an overview of interventions that have been developed and used in practice. It also discusses key areas of controversy and emerging thought and outlines a future agenda for intervention design options addressing health-related social needs among patients with cancer.

Developing interventions to address health-related social needs among patients with cancer: aligning with the NASEM 5As framework

The NASEM, in its landmark publication *Integrating Social Care into the Delivery of Health Care*, proposed 5 health-care activities (the 5As) that enable health systems to enhance the integration of health-related social needs care into the delivery of health care: Awareness, Adjustment, Assistance, Alignment, and Advocacy (Table 1) (25). The 5As provide a framework for conceptualizing how health-related social needs interventions fit into a broader plan of health system action in this area. Attention to health-related social needs for patients with cancer and their social unit (eg, caregiver, family, friends) is essential for addressing baseline social conditions that can impede treatment planning and initiation; accommodating the time demands and costs of cancer care including time away from work and parenting responsibilities to coordinate and participate in care; and ensuring adequate nutrition, stable housing, and interpersonal safety for the patients and their social unit throughout the cancer care continuum. For patients and families to benefit and recover fully from cancer treatment, their basic material and social needs must be met throughout the course of care.

For Awareness, there is important variability in how point-of-care screening and assessment of health-related social needs among patients with cancer occur in clinical practice (26). This variability reflects, in part, the lack of validated health-related social needs screening measures for patients with cancer. As a result, some cancer centers use assessments validated in non-cancer populations, whereas others use institution-specific tools that have not undergone validity testing in any population (26). Important sources of health-related social needs screening variability also relate to screening via single domain assessments [eg, 2-item Hunger Vital Sign (27) for food insecurity] or multidomain measures [eg, Accountable Health Communities Health-Related Social Needs Screening Tool (28)]. In addition, differences in practice exist for the method of collecting the information, with some practices using direct patient self-report (eg, asynchronously via the electronic health record prior to the clinical encounter), while

Table 1. The National Academy of Sciences, Engineering, and Medicine 5As framework for conceptualizing health-care system activities that strengthen social care integration (25)

Awareness	Identifying a patient's social risks and assets
Adjustment	Altering clinical care to accommodate health-related social needs
Assistance	Providing patients with, or connecting patients to, social care resources to reduce their health-related social risk
Alignment	Actions by health systems to understand, align with, organize, and invest in community-based social care assets to positively affect health outcomes
Advocacy	Actions by health systems to partner with social care organizations to promote policies that facilitate the creation and/or redeployment of resources to address health-related social risks

others conduct point-of-care screening with in-person assessment(s) (eg, by a nurse, medical assistant, social worker) (29). In some settings, assistance is provided universally without screening (eg, everyone receives community resource information) (30). Finally, there is important variability in who to screen (no one, everyone, high-risk groups), when to screen (upon cancer diagnosis, serially), why to screen (assess individual or population risk, estimate potential demand, guide targeted interventions), how to assess patient need and preference after a positive screen, and how to link patients with a need and preference to the appropriate intervention (eg, assistance, adjustment).

Most interventions fall in the 5As category of Assistance (ie, the process of connecting patients to relevant resources to address their health-related social needs). These resources may come from within the 4 walls of the cancer care setting or from community-based organizations. For patients with cancer, assistance provided by the oncology team might include provision of transportation vouchers or waiving cancer center parking fees for patients receiving weekly chemotherapy infusions. Two major types of Assistance have been implemented in cancer care to address health-related social needs: 1) co-located supportive oncology services (10,12) and 2) community-based support services (typically not cancer specific). Colocated or clinically subsidized supportive oncology services include provision of transportation to the clinical site for daily radiation therapy, on-site food pantries, and psychosocial support from on-site navigators or social workers. Community-based assistance interventions address health-related social needs by linking patients to existing community-based resources outside the clinical cancer care setting. Examples of linkage-based interventions include referrals to a community-based food pantry, coordinating rides from the American Cancer Society Road to Recovery program for daily radiation therapy, and referral to community-based social workers for counseling or other psychosocial support.

Another intervention category is Adjustment: alterations in health-care delivery to accommodate identified needs. Although considerations related to techquity remain, examples of adjustment include switching an in-person follow-up visit to a telemedicine encounter for a patient lacking transportation or finding a radiation oncology provider closer to home to minimize travel burden for daily radiation. Challenges to studying adjustment in care delivery include difficulties with standardizing adjustment interventions (eg, dose, intensity, frequency), abstracting adjustment decisions from narrative information in the electronic health record, and its widespread prevalence in modern patient-centered care delivery paradigms (and resultant challenge for designing true control conditions).

Because the underlying causes of health-related social needs reflect adverse social conditions upstream from the oncology clinic, addressing health-related social needs at a population level requires actions such as alignment and advocacy. Health systems can address health-related social needs through alignment activities to map, organize with, and invest in community social care assets. Indeed, the success of linking patients with health-related social needs to assistance requires that health systems understand the strengths, limitations, and dynamic nature of their community partner ecosystem where referrals are made. In addition to mapping, alignment can also include active investment by the health-care system in social care organizations to build capacity and strengthen relationships. Finally, advocacy is critical to addressing health-related social needs among patients with cancer at the population level. Providing a transportation voucher in clinic, while alleviating a transportation barrier for an individual patient, does not target the root cause of the problem. At a population level, advocacy by health systems has the potential to change the upstream adverse social conditions (eg, inequitable housing policy, inequitable transportation systems) that give rise to health-related social needs for which downstream interventions are needed.

Evidence base for health-related social needs interventions among patients with cancer

Robust evidence supports the association of social needs with health, and several social care intervention studies have included—even if they have not focused exclusively on—people with cancer. However, studies showing how the health-care sector can effectively intervene to address health-related social needs are nascent, especially in cancer-specific contexts, and vary with respect to rigor and applicability to cancer context (22,26,31). In addition, studies are also lacking that evaluate the effectiveness of interventions already in widespread use in oncology clinical care (eg, Adjustment) in different contexts and what it takes to de-implement a health-related social need intervention if it were found to lack effectiveness. Relatively speaking, evidence on health-related social needs interventions addressing food insecurity and transportation challenges among patients with cancer is the most mature. For example, a scoping review of food insecurity and related factors among cancer survivors found evidence to support the effectiveness of patient navigation and social worker–related interventions for improving the quality of cancer care and quality of life (32). The evidence for interventions to address food insecurity among patients with cancer included findings from a randomized clinical trial that compared 1) hospital cancer clinic–based food pantry, 2) food voucher plus pantry, and 3) home grocery delivery plus pantry among 117 food-insecure patients with cancer (33). In this preliminary study, food voucher plus pantry was the most effective intervention at improving treatment completion (94.6%), exceeding the prespecified 90% threshold for further study (33).

To supplement limited published evidence for effective health-related social needs interventions among patients with cancer, findings from interventions conducted with other populations, some including oncology and nononcology patients (but providing no cancer subgroup analysis) and others not indicating participants' cancer status, were considered (34,35). For example, a meta-analysis described the evidence base for interventions for nonemergent medical transportation in contexts that were not oncology specific, concluding that interventions such as van rides, bus or taxi vouchers, and ride-sharing services were associated with a lower likelihood of missed appointments (36).

Practical recommendations for health-related social needs intervention trials among patients with cancer

General recommendations

Table 2 shows general (ie, health-related social needs agnostic) recommendations regarding health-related social needs interventions for people with cancer and their support units. First, reflecting that health-related social needs can be stigmatizing conditions (7), intervention design should minimize unintended negative consequences that lead to further discrimination or marginalization of people with health-related social needs. Future clinical trials assessing health-related social needs

Table 2. Key general recommendations regarding health-related social needs interventions among patients with cancer and associated domains according to the National Academies of Sciences, Engineering, and Medicine 5As framework

General recommendation	National Academies of Sciences, Engineering, and Medicine 5As domains
Intervention design should minimize unintended negative consequences like discrimination or further marginalization of people with health-related social needs.	Adjustment, Assistance
Health-related social needs identified via screening (ie, awareness) in a clinical trial should receive some form of intervention for legal (eg, interpersonal safety) and/or ethical (eg, food insecurity) considerations.	Awareness, Adjustment, Assistance
Evaluation of social care interventions should align with a reasonable target given features of the clinical setting, like readiness for change and capacity for social care delivery.	Assistance, Alignment
To address the multilevel determinants of health-related social needs, interventions should consider components across multiple levels (eg, patient, social unit, provider) and across time.	Adjustment, Assistance, Alignment
Intervention design should recognize that health-related social needs are states, not traits, that may change across the cancer continuum.	Awareness, Adjustment, Assistance

screening and interventions should engage deeply with the patient community to understand preferences for health-related social needs assessment as well as considerations related to privacy and confidentiality. Second, health-related social needs identified via screening (thereby creating clinician awareness) in a clinical trial should receive some form of intervention for legal (eg, interpersonal safety) and/or ethical (eg, food insecurity) considerations. Third, evaluation of social care interventions should align with a reasonable target given features of the clinical setting, like readiness for change and capacity for social care delivery. For example, in a cancer care setting that has no social care practice, a proximal implementation objective like acceptability or feasibility may be appropriate. In other settings, receipt of referral coordination may be more attainable than receipt of the actual support service or resolution of the health-related social need. Referral to services can be accomplished by deploying clinical staff, technology, and vendors to identify, refer, and deliver the health-related social needs intervention. Fourth, to address the multilevel determinants of health-related social needs, interventions should consider components across multiple levels (eg, patient, social unit, provider). Fifth, intervention design should recognize that health-related social needs are states, not traits, that may change across the cancer continuum. Intervention design should reflect the dynamic nature of social needs. These key considerations are critical for scalability and sustainability of social care interventions in the cancer care context.

Research recommendations for specific interventions

Whole-person interventions

Health-related social needs commonly co-occur, especially in the context of a costly medical diagnosis like cancer. Whole-person interventions that concurrently address co-occurring health-related social needs and other self-care needs should be considered for patients with cancer (26,37). When compared with interventions that target a single health-related social need, interventions targeting multiple health-related social needs concurrently could potentially 1) enhance intervention effectiveness and efficiency, 2) prevent dilution of intervention effects on a downstream outcome (eg, treatment completion) from failure to address a co-occurring health-related social need, and 3) ameliorate potential moral and ethical concerns from failing to address an identified social need (7,38). Although studies examining the effects of single vs multiple health-related social needs interventions are lacking, the potential effectiveness of bundling interventions will depend, at least in part, on the state of the evidence for each intervention in a putative bundle.

CommunityRx, an electronic health record–integrated, universally delivered social care intervention, is perhaps the most evidence-based whole-person intervention to date. Trials in mixed (ie, nononcology and oncology) populations demonstrated that it was feasible and acceptable (30), associated with lower hospitalization and emergency department utilization, and improved confidence and knowledge about finding resources but did not improve mental or physical health-related quality of life (39,40).

In addition to whole-person interventions, specific issues could be considered when developing interventions to evaluate individual health-related social needs (Table 3).

Food insecurity

First, although not applicable to all people with cancer or their social units, the Supplemental Nutrition Assistance Program and the Special Supplemental Nutrition Program for Women, Infants, and Children are well-studied interventions shown to mitigate food insecurity. Efforts (on-site or via referral to a community organization) to ensure public benefit enrollment of eligible people with cancer and their social units could be considered in implementing food security interventions in the cancer care setting. In addition, interventions could consider including home food delivery service and grocery voucher programs (12). Last, given the length of ambulatory visits for cancer care and the high cost of food in most clinical settings, food insecurity interventions could consider on-site emergency food support such as a colocated food pantry, snack and nutrition cart, or voucher to on-site vendors (41).

Transportation problems

Transportation is a direct and immediate cost for the patient and social unit for accessing cancer screening and early detection, diagnosis, treatment, and follow-up and can quickly generate substantial unplanned out-of-pocket expenses. Transportation problems among the cancer-affected population are diverse and include lack of access to a vehicle or public transportation; lack of safe transportation; inability to pay for gas, parking, public transit, or temporary lodging near specialty centers; and physical limitations to traveling long distances because of illness (10). Accordingly, health-related social needs interventions addressing

Table 3. Recommendations regarding health-related social needs interventions among patients with cancer and associated domains within the National Academies of Sciences, Engineering, and Medicine 5As framework

Health-related social needs domain	Health-related social needs intervention recommendation	National Academies of Sciences, Engineering, and Medicine 5As domain(s)
Food insecurity	Enhance enrollment of eligible people with cancer and their social units to public benefit programs.	Awareness, Assistance, Alignment
	Consider including home food delivery service and grocery voucher programs.	Assistance
	Consider on-site emergency food support such as a colocated food pantry, snack and nutrition cart, or voucher to on-site vendors.	Assistance
Transportation problems	Tailor interventions to the diverse ways in which transportation may affect the ability to access cancer care, calibrate to the patient and social unit, and consider relevant contextual geographic factors.	Adjustment, Assistance, Alignment
	Consider intervention components related to direct reimbursement or vouchers for travel, public transportation, hotel subsidies, and links to community resources that address transportation problems for patients with cancer.	Assistance, Alignment
	Explore rideshare-based approached in the appropriate context.	Assistance, Alignment
Housing and utilities instability	Package housing interventions under broader interventions to address financial insecurity.	Adjustment, Assistance
	Provide referrals to financial counseling, social work, emergency legal intervention, and provision of emergency or short-term subsidy for hotel or rental assistance.	Assistance, Alignment
Interpersonal safety	Consider the necessity of screening vs routinely providing patients with interpersonal safety resource information, how to conduct assessments in a manner that facilitates self-disclosure while maintaining privacy, and ensuring the capability to promptly refer people with safety needs to appropriate resources.	Awareness, Adjustment, Assistance

transportation problems should ideally be 1) tailored to the diverse ways in which transportation may affect the ability to access cancer care, 2) calibrated to the patient and social unit (eg, patient health status, availability of informal caregiver), and 3) consider relevant contextual geographic factors (eg, travel distance, rurality). Health-related social needs interventions such as direct reimbursement or vouchers for travel (including gas, tolls, and parking), public transportation, hotel subsidies, and links to community resources that address transportation problems for patients with cancer (eg, American Cancer Society Road to Recovery) are widely used in clinical practice for patients with cancer and could be considered as components of interventions addressing transportation problems (29). These programs can be funded and sustained through partnerships with nonprofits, philanthropy, grants, operational funds, and reimbursement from insurance (29). Rideshare-based approaches, which are associated with improved cancer treatment completion, decreased appointment no-show rates, enhanced patient satisfaction, and net revenue generation for the health system, could be explored as a health-related social need intervention for patients with cancer in the appropriate contexts (42,43). However, important potential limitations for rideshare-based interventions among patients with cancer include 1) variable coverage, particularly in rural areas; 2) liability issues regarding transport safety and/or medical appropriateness for discharge to a vehicle; and 3) uncertain applicability of Anti-Kickback and Stark laws.

Housing and utilities instability

Interventions to address housing and utilities instability focus on community and policy-oriented strategies that can be achieved via alignment and advocacy interventions (44-47). In many cases, housing interventions could be wrapped under broader interventions addressing financial insecurity. Given that lack of stable shelter presents a major and immediate threat to health and safety of people affected by cancer, effective housing and utility-specific interventions likely require financial counseling, social work, emergency legal intervention, and provision of emergency or short-term subsidy for hotel or rental assistance.

Interpersonal safety

Interpersonal safety is prevalent especially among women, underreported in health-related social risk assessment screening (compared with estimates from other sources) (48) and may be triggered by loss of employment or other vulnerability resulting from cancer diagnosis. Interventions to screen for and address interpersonal safety have generally focused on specific populations based on vulnerability (eg, elders, pregnant women) rather than disease-specific populations (49,50). Important considerations relevant to screening and intervention for interpersonal safety include whether to assess (vs routinely providing cancer patients with interpersonal safety resource information), how to conduct assessments in a manner that facilitates self-disclosure while maintaining privacy (51), and ensuring the capability to promptly refer people with safety needs to appropriate resources (52).

Considerations for collaboration with community partners on health-related social needs interventions

For clinic or health system–based interventions addressing health-related social needs among patients undergoing cancer treatment, meaningful and deep collaboration with strong community partners should be developed. These relationships should be dynamic, bidirectional, and sustained. The community partner ecosystem for social care will vary by geography and, like health-related social needs, is dynamic. Availability of resources and access (eg, time, location, eligibility criteria) changes over time. Engagement with community resource organizations, increasingly via resource referral platform technologies, could

help ensure high-quality resource information to address health-related social needs. Resource referrals may be to supportive services inside the 4 walls of the health-care system, to the local community, or to national organizations with remote delivery of services.

For interventions involving community-based organizations, the quality of referrals will likely depend on partner engagement. Although many social support organizations likely serve people affected by cancer, they may be unaware that this is the case (eg, food pantries do not routinely assess patron's health conditions). A strong ecosystem for cancer patient referral would involve outreach to, and education for, key support organizations about cancer-specific referrals. Community organizations wishing to receive cancer patient referrals would ideally communicate their capacity, eligibility criteria, and other expectations for delivering support to this patient population. On one hand, closed-loop resource referral interventions, created through partnerships between referring health-care systems and community-based support organizations using shared technology platforms, could generate useful data to evaluate and optimize the effectiveness of integrating social with medical care for cancer. On the other hand, closed-loop referrals may create administrative burden for community-based organization and be a deterrent for patients who want resource information but are not ready to share their needs. Both present state and future plans landscape analyses at the institution, site, and practice levels may be required and should reflect staff and capacity; availability, accessibility, and scope of services provided by community partners; screening mechanisms; and other considerations. An important concern will be developing workflow processes that minimize risk of patient stigma and response burden (eg, eligibility documentation) as well as burden on clinical staff.

Future research agenda for interventions to address health-related social needs among patients with cancer

Figure 1 highlights critical knowledge gaps to be addressed in future research. First, the relationship of financial toxicity to the development of incident health-related social needs and exacerbation of preexisting health-related social needs among patients with cancer remains unknown and understudied (53,54). Factors influencing financial toxicity include direct medical costs and nonmedical costs from health-related social needs like transportation, temporary housing, and incremental food along with lost wages; child, elder, and special needs costs; and other collateral expenses. Short of governmental support for coverage of cancer care costs, research and innovation are needed to identify sustainable business models for cancer support organizations focused on alleviating financial toxicity and health-related social needs.

Second, the design of health-related social needs interventions for patients with cancer to properly reflect intensity, frequency, timing, and type of intervention, as well as adaptation for local context, remains unknown. Features of intervention delivery in relation to the trajectory of cancer care warrant consideration, but given the dynamic nature of health-related social needs in relation to cancer care, longitudinal intervention and assessment of impact are needed. In addition, because of the lack of evidence related to the time course for health-related social needs, research should address considerations related to optimal timing for intervention delivery vs opportunistic delivery approaches (eg, anytime, every time). In the context of the 5As framework from NASEM, health-related social needs intervention studies have focused heavily on assessment-driven assistance. However, the framework—and the theory behind it—suggest a potential role for multi-A interventions (eg, data generated via assessment can be aggregated and used for alignment and advocacy activities). Future research can test the effectiveness and implementation of multi–health-related social needs and multi-A interventions.

Third, concurrent with studies evaluating the effectiveness of health-related social needs–based interventions among patients with cancer, research should evaluate implementation determinants and identify strategies to facilitate implementation across diverse care delivery settings. Important differences are likely to exist, varying by geographic location in the United States, rurality, patient catchment areas, practice type, and practice size. Such factors may impact administrative capacity, resources, and expertise necessary to develop, implement, and sustain context-appropriate interventions to address health-related social needs among patients with cancer.

Fourth, the characteristics of the health-related social needs intervention portfolio among patients with cancer should be diversified. A recent landscape analysis of the NCI health-related social needs portfolio showed that ongoing NCI-funded research consisted primarily of observational studies, heavily focused on patients with breast cancer, and primarily delivering assistance-based intervention (18). The research to date has primarily addressed transportation as an individual patient-level health-related social need (18). A robust health-related social needs research portfolio comprising a wide variety of study designs (including rigorous clinical trials) that test health-related social needs interventions in varied cancer care delivery settings and across different cancer types will be necessary to address critical gaps in knowledge and improve access, outcomes, and equity among patients with cancer. The NCI's National Clinical Trials Network and NCORP are particularly well suited to achieve key strategic goals of the current NCI National Cancer Plan: 1) to deliver optimal care and 2) eliminate inequities (55).

Integration of social care with medical care is increasingly recognized as necessary to address and ultimately promote equity in

Unknown relationship of financial toxicity to the development of incident health-related social needs and exacerbation of preexisting health-related social needs
Uncertain design of health-related social need interventions in terms of intensity, frequency, timing, type, fit with local context, and relation to screening
Unknown health-related social need intervention implementation determinants and implementation strategies
Insufficient diversity in health-related social need intervention research portfolio in terms of patient population (eg, type of cancer), health-related social need of study (including single vs multiple health-related social needs), and care delivery settings

Figure 1. Key knowledge gaps about health-related social need interventions among patients with cancer and proposed research agenda.

access, quality, cost, and outcomes among patients with cancer. Recent scientific advances are improving our understanding of how to intervene on health-related social needs among patients with cancer, but the evidence remains weak. A prioritized and sequenced research agenda, informed by best available evidence, can close this gap. An evaluative framework should be developed that comprehends the relationship of health-related social needs screening to health-related social needs intervention delivery, builds on the NASEM 5As framework, considers differences in health-related social needs–specific vs whole-person intervention–based approaches, and addresses how cancer care systems productively engage with community partners. Mitigating health-related social needs through intervention and related studies should be a priority of our cancer care system and will likely serve to improve health equity and outcomes among patients with cancer.

Data availability

No new data were generated for or analyzed in this commentary.

Author contributions

Evan Graboyes, MD, MPH (Conceptualization; Writing—original draft; Writing—review & editing), Simon Lee, PhD, MPH (Conceptualization; Supervision; Writing—original draft; Writing—review & editing), Stacy Lindau, MD, MAPP (Conceptualization; Writing—original draft; Writing—review & editing), Alyce Adams, PhD (Conceptualization; Writing—original draft; Writing—review & editing), Brenda Adjei, EdD, MPA (Conceptualization; Writing—original draft; Writing—review & editing), Mary Brown, MSW, LSIW-S (Conceptualization; Writing—original draft; Writing—review & editing), Gelareh Sadigh, MD (Conceptualization; Writing—original draft; Writing—review & editing), Andrea Incudine, MPH (Conceptualization; Writing—original draft; Writing—review & editing), Ruth Carlos, MD, MS (Conceptualization; Writing—review & editing), Scott Ramsey, MD, PhD (Conceptualization; Writing—review & editing), and Rick Bangs, MBA, PMP (Conceptualization; Supervision; Writing—original draft; Writing—review & editing).

Funding

EMG's effort was supported by K08 CA237858, R01 CA282165, U10 CA180868 and the American College of Surgeons/Triologic Society. STL's effort was supported by The University of Chicago Medicine NCI Comprehensive Cancer Center Program Pilot Project Grant, U01 DK137262, R01 DK127961, R01 AG064949, R01 HL150909, P30 CA014599 and philanthropic support from the University of Chicago Comprehensive Cancer Center. GS's effort was supported by R01 CA262312 and R01 CA272680.

Conflicts of interest

EMG reports receiving research support from Castle Biosciences, honorarium from Castle Biosciences, and personal fees from the National Cancer Institute, all outside of the submitted work. STL reports being the founder and owner of NowPow, LLC, which was acquired by Unite USA Inc in 2021, and is currently an unpaid advisor to and holds stock in Unite USA Inc; receiving royalties of less than $100 per year in 2019, 2020 from UpToDate, Inc; and owning equity in Glenbervie Health, LLC along with her husband. The University of Chicago has filed patents (pending) for the Bionic Breast Project, a project led by STL. All other authors have no conflicts of interest.

Acknowledgements

The Clinical Trials Planning Meeting was supported by the National Cancer Institute (NCI) Coordinating Center for Clinical Trials and was developed under the leadership of the NCI Division of Cancer Control and Population Sciences and the NCI Cancer Care Delivery Research Steering Committee.

The funders had no role in the writing of the manuscript or the decision to submit the manuscript for publication. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

1. Alderwick H, Gottlieb LM. Meanings and misunderstandings: a social determinants of health lexicon for health care systems. *Milbank Q*. 2019;97(2):407-419. doi:10.1111/1468-0009.12390
2. Green K, Zook M. When talking about social determinants, precision matters. *Health Affairs Blog*. October 29, 2019. doi:10.1377/hblog20191025.776011
3. Alcaraz KI, Wiedt TL, Daniels EC, Yabroff KR, Guerra CE, Wender RC. Understanding and addressing social determinants to advance cancer health equity in the United States: A blueprint for practice, research, and policy. *CA Cancer J Clin*. 2020;70(1):31-46. doi:10.3322/caac.21586
4. Patel MI, Lopez AM, Blackstock W, et al. Cancer disparities and health equity: a policy statement from the American society of clinical oncology. *J Clin Oncol*. 2020;38(29):3439-3448. doi:10.1200/JClinOncol.20.00642
5. Jiang C, Yabroff KR, Deng L, et al. Self-reported transportation barriers to health care among US cancer survivors. *JAMA Oncol*. 2022;8(5):775-778. doi:10.1001/jamaoncol.2022.0143
6. Gany F, Lee T, Ramirez J, et al. Do our patients have enough to eat?: food insecurity among urban low-income cancer patients. *J Health Care Poor Underserved*. 2014;25(3):1153-1168. doi:10.1353/hpu.2014.0145
7. Vu M, Boyd K, De Marchis EH, et al. Perceived appropriateness of assessing for health-related socioeconomic risks among adult patients with cancer. *Cancer Res Commun*. 2023;3(4):521-531. doi:10.1158/2767-9764.CRC-22-0283
8. Hastert TA. The potential of cancer care settings to address food insecurity. *J Clin Oncol*. 2022;40(31):3569-3572. doi:10.1200/JClinOncol.22.01109
9. McDougall JA, Anderson J, Adler Jaffe S, et al. Food insecurity and forgone medical care among cancer survivors. *J Clin Oncol Oncol Pract*. 2020;16(9):e922-e932. doi:10.1200/JOP.19.00736
10. Graboyes EM, Chaiyachati KH, Sisto Gall J, et al. Addressing transportation insecurity among patients with cancer. *J Natl Cancer Inst*. 2022;114(12):1593-1600. doi:10.1093/jnci/djac134
11. Costas-Muniz R, Leng J, Aragones A, et al. Association of socioeconomic and practical unmet needs with self-reported nonadherence to cancer treatment appointments in low-income Latino and Black cancer patients. *Ethn Health*. 2016;21(2):118-128. doi:10.1080/13557858.2015.1034658
12. Raber M, Jackson A, Basen-Engquist K, et al. Food insecurity among people with cancer: nutritional needs as an essential component of care. *J Natl Cancer Inst*. 2022;114(12):1577-1583. doi:10.1093/jnci/djac135

13. Fan Q, Keene DE, Banegas MP, et al. Housing insecurity among patients with cancer. *J Natl Cancer Inst*. 2022;114(12):1584-1592. doi:10.1093/jnci/djac136
14. Gany F, Leng J, Ramirez J, et al. Health-related quality of life of food-insecure ethnic minority patients with cancer. *J Oncol Pract*. 2015;11(5):396-402. doi:10.1200/JOP.2015.003962
15. Hanna TP, King WD, Thibodeau S, et al. Mortality due to cancer treatment delay: systematic review and meta-analysis. *BMJ*. 2020;371:m4087. doi:10.1136/bmj.m4087
16. Cone EB, Marchese M, Paciotti M, et al. Assessment of time-to-treatment initiation and survival in a cohort of patients with common cancers. *JAMA Netw Open*. 2020;3(12):e2030072. doi:10.1001/jamanetworkopen.2020.30072
17. Jiang C, Yabroff KR, Deng L, et al. Transportation barriers, emergency room use, and mortality risk among US adults by cancer history. *J Natl Cancer Inst*. 2023;115(7):815-821. doi:10.1093/jnci/djad050
18. Sanchez JI, Adjei BA, Randhawa G, et al. National Cancer Institute-funded social risk research in cancer care delivery: opportunities for future research. *J Natl Cancer Inst*. 2022;114(12):1628-1635. doi:10.1093/jnci/djac171
19. National Cancer Institute. *Addressing Social Risks in Cancer Care Delivery Virtual Workshop*. 2023. https://events.cancer.gov/hdrp/ncisocialrisksmeeting. Accessed July 8, 2023.
20. National Academies of Sciences, Engineering, and Medicine. *Promoting Health Equity in Cancer Care: Proceedings of a Workshop*. Washington, DC: The National Academies Press; 2022. https://nap.nationalacademies.org/catalog/26661/promoting-health-equity-in-cancer-care-proceedings-of-a-workshop#:~:text=This%20virtual%20workshop%20featured%20presentations,care%20delivery%3B%20the%20potential%20for. Accessed July 10, 2023.
21. *Transportation Needs among Patients with Cancer: A Virtual Webinar*. https://www.nationalacademies.org/event/09-21-2021/transportation-needs-among-patients-with-cancer-a-virtual-webinar. Accessed February 16, 2022.
22. Bona K, Keating NL. Addressing social determinants of health: now is the time. *J Natl Cancer Inst*. 2022;114(12):1561-1563. doi:10.1093/jnci/djac137
23. National Cancer Institute. *Executive Summary: National Cancer Institute Cancer Care Delivery Research (CCDR) Steering Committee Health-Related Social Needs Clinical Trials Planning Meeting November 17–18, 2022 (Virtual and In-Person)*. 2023. https://www.cancer.gov/about-nci/organization/ccct/steering-committees/ncorp/cancer-care/ccdr-2022-ctpm-executive-summary.pdf. Accessed July 10, 2023.
24. National Cancer Institute. *About NCORP*. https://ncorp.cancer.gov/about/. Accessed December 3, 2024
25. National Academies of Sciences, Engineering, and Medicine. *Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation's Health*. Washington, DC: The National Academies Press; 2019. https://doi.org/10.17226/25467
26. Eder M, Henninger M, Durbin S, et al. Screening and interventions for social risk factors: technical brief to support the US Preventive Services Task Force. *JAMA*. 2021;326(14):1416-1428. doi:10.1001/jama.2021.12825
27. Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010;126(1):e26-e32. doi:10.1542/peds.2009-3146
28. Centers for Medicare & Medicaid Services. The Accountable Health Communities Health-Related Social Needs Screening Tool. https://www.cms.gov/priorities/innovation/files/worksheets/ahcm-screeningtool.pdf. Accessed January 8, 2024.
29. Chaiyachati KH, Krause D, Sugalski J, Graboyes EM, Shulman LN. A survey of the national comprehensive cancer network on approaches toward addressing patients' transportation insecurity. *J Natl Compr Canc Netw*. 2023;21(1):21-26. doi:10.6004/jnccn.2022.7073
30. Lindau ST, Makelarski J, Abramsohn E, et al. CommunityRx: a population health improvement innovation that connects clinics to communities. *Health Aff (Millwood)*. 2016;35(11):2020-2029. doi:10.1377/hlthaff.2016.0694
31. Fichtenberg CM, Alley DE, Mistry KB. Improving social needs intervention research: key questions for advancing the field. *Am J Prev Med*. 2019;57(6 suppl 1):S47-S54. doi:10.1016/j.amepre.2019.07.018
32. Parks CA, Carpenter LR, Sullivan KR, et al. A scoping review of food insecurity and related factors among cancer survivors. *Nutrients*. 2022;14(13):2723. doi:10.3390/nu14132723
33. Gany F, Melnic I, Wu M, et al. Food to overcome outcomes disparities: a randomized controlled trial of food insecurity interventions to improve cancer outcomes. *J Clin Oncol*. 2022;40(31):3603-3612. doi:10.1200/JClinOncol.21.02400
34. De Marchis EH, Torres JM, Benesch T, et al. Interventions addressing food insecurity in health care settings: a systematic review. *Ann Fam Med*. 2019;17(5):436-447. doi:10.1370/afm.2412
35. Gottlieb LM, Wing H, Adler NE. A systematic review of interventions on patients' social and economic needs. *Am J Prev Med*. 2017;53(5):719-729. doi:10.1016/j.amepre.2017.05.011
36. Shekelle PG, Begashaw MM, Miake-Lye IM, Booth M, Myers B, Renda A. Effect of interventions for non-emergent medical transportation: a systematic review and meta-analysis. *BMC Public Health*. 2022;22(1):799. doi:10.1186/s12889-022-13149-1
37. National Center for Complementary and Integrative Health. *Whole Person Health: What You Need To Know*. https://www.nccih.nih.gov/health/whole-person-health-what-you-need-to-know. Accessed August 14, 2023.
38. Lindau ST. CommunityRx, an E-prescribing system connecting people to community resources. *Am J Public Health*. 2019;109(4):546-547. doi:10.2105/AJPH.2019.304986
39. Lindau ST, Makelarski JA, Abramsohn EM, et al. CommunityRx: a real-world controlled clinical trial of a scalable, low-intensity community resource referral intervention. *Am J Public Health*. 2019;109(4):600-606. doi:10.2105/AJPH.2018.304905
40. Tung EL, Abramsohn EM, Boyd K, et al. Impact of a low-intensity resource referral intervention on patients' knowledge, beliefs, and use of community resources: results from the CommunityRx trial. *J Gen Intern Med*. 2020;35(3):815-823. doi:10.1007/s11606-019-05530-5
41. Frazier CRM, Pinkerton EA, Grana M, et al. Feed1st, no questions asked: how a hospital-based food pantry program grew its impact during the COVID-19 pandemic. *Am J Public Health*. 2022;112(10):1394-1398. doi:10.2105/AJPH.2022.306984
42. Marquez R. Implementing a transportation hub: a holistic approach to a systemic problem. *Oncol Issues*. 2021;36(3):30-39.
43. Chen E, Deshane A, Damico N, et al. An analysis of cancer center-provided rideshare utilization for radiation therapy. *J Am Coll Radiol*. 2023;20(1):40-50. doi:10.1016/j.jacr.2022.12.007
44. Weiner C, Szep T. The Hungarian utility cost reduction programme: an impact assessment. *Energy Strategy Rev*. 2022;40:100817.,
45. Hernandez D. Understanding 'energy insecurity' and why it matters to health. *Soc Sci Med*. Oct. 2016;167:1-10. doi:10.1016/j.socscimed.2016.08.029
46. Chirakijja J, Jayachandran S, Ong P. *Inexpensive Heating Reduces Winter Mortality*. NBER Working Paper No w25681. 2019. https://

www.nber.org/system/files/working_papers/w25681/w25681.pdf. Accessed August 14, 2023.
47. Kottke T, Abariotes A, Spoonheim JB. Access to affordable housing promotes health and well-being and reduces hospital visits. *Perm J*. 2018;22:17-079. doi:10.7812/TPP/17-079
48. De Marchis EH, McCaw B, Fleegler EW, et al. Screening for interpersonal violence: missed opportunities and potential harms. *Am J Prev Med*. 2021;61(3):439-444. doi:10.1016/j.amepre.2021.02.010
49. McCaw B, Berman WH, Syme SL, Hunkeler EF. Beyond screening for domestic violence: a systems model approach in a managed care setting. *Am J Prev Med*. 2001;21(3):170-176. doi:10.1016/s0749-3797(01)00347-6
50. Young-Wolff KC, Kotz K, McCaw B. Transforming the health care response to intimate partner violence: addressing "wicked problems". *JAMA*. 2016;315(23):2517-2518. doi:10.1001/jama.2016.4837
51. Gottlieb L, Hessler D, Long D, Amaya A, Adler N. A randomized trial on screening for social determinants of health: The iScreen study. *Pediatrics*. 2014;134(6):e1611-8-e1618. doi:10.1542/peds.2014-1439
52. Fiori K, Patel M, Sanderson D, et al. From policy statement to practice: integrating social needs screening and referral assistance with community health workers in an urban academic health center. *J Prim Care Community Health*. 2019;10:2150132719899207. doi:10.1177/2150132719899207
53. Yabroff KR, Mariotto A, Tangka F, et al. Annual report to the nation on the status of cancer, part 2: patient economic burden associated with cancer care. *J Natl Cancer Inst*. 2021;113(12):1670-1682. doi:10.1093/jnci/djab192
54. Tucker-Seeley RD, Yabroff KR. Minimizing the "financial toxicity" associated with cancer care: advancing the research agenda. *J Natl Cancer Inst*. 2016;108(5):djv410. doi:10.1093/jnci/djv410
55. National Cancer Institute. *National Cancer Plan Goals*. 2023. https://nationalcancerplan.cancer.gov/goals. Accessed July 13, 2023.