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Attitudes and Subjective Norms, Not Perceived Behavioral Control, Predict Intention to Utilize Oncology Supportive Care for Health-Related Social Needs: A Mixed-Methods Pilot Application of the Theory of Planned Behavior

Munjireen S. Sifat
Thomas Jefferson University
Sophie Kvaratskhelia
Thomas Jefferson University
Kayla Madden
Thomas Jefferson University
Sandra Eggleston
Thomas Jefferson University
Nusayba Chowdhury
Thomas Jefferson University
Joshua Blanding Godbolt
Thomas Jefferson University
Nikki Hartman
Thomas Jefferson University
Michael Dimino
Thomas Jefferson University
Rebecca Cammy
rebecca.cammy@jefferson.edu

Sidney Kimmel Comprehensive Cancer Center

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Abstract

Background

Health-related social needs (HRSNs)—including transportation, food, housing, and utility insecurity—are prevalent among cancer patients and are linked to poorer treatment adherence and outcomes. Despite systematic HRSN screening, a substantial proportion of patients who screen positive decline connection to supportive care. The factors driving patients' intention to use available HRSN services remain poorly understood.

Methods

Fifty-four adult cancer patients who had completed HRSN screening at an NCI-designated comprehensive cancer center completed a cross-sectional survey assessing TPB constructs (attitude, subjective norm, perceived behavioral control [PBC], and intention). Composite scale reliability was assessed with Cronbach's α. Standardized ordinary least squares (OLS) regression tested attitude, subjective norm, and PBC as predictors of intention; variance inflation factors (VIF) screened for multicollinearity, and Bonferroni correction (α = .0167) was applied for three simultaneous predictor tests. In parallel, semi-structured qualitative interviews with a preliminary sample of cancer patients from the same analytic sample were analyzed using a hybrid deductive-inductive codebook grounded in TPB constructs, and thematic analysis was used to contextualize the quantitative findings.

Results

The three-predictor model explained 54.2% of variance in intention (adjusted R^2 = .514, $F(3,50) = 19.71$, $p < .001$). Attitude ($\beta = 0.486$, $p < .001$) and subjective norm ($\beta = 0.342$, $p = .005$) were significant predictors and survived Bonferroni correction; PBC was not significant ($\beta = -0.003$, $p = .975$). A supplementary model adding a count of self-reported practical barriers (time, transportation, access, stigma) did not change this pattern ($\beta = 0.104$, $p = .292$); all VIFs were below 1.7, indicating no problematic multicollinearity. Preliminary qualitative findings converged with these results: patients overwhelmingly described HRSN linkage as mediated by a trusted, named member of their care team rather than by a program or referral pathway, and self-reliance/pride-related themes—rather than logistical difficulty—emerged as the more salient psychological obstacle to accepting help.

Conclusions

In this pilot sample, patients' attitude toward HRSN services and their perception of healthcare team endorsement—not perceived logistical control or practical barriers—were the strongest correlates of intention to use oncology supportive care. Qualitative interviews support and extend this pattern,

suggesting that interventions emphasizing explicit, normalized, relationally-delivered endorsement of HRSN referrals by the oncology care team may be more effective than barrier-reduction strategies alone.

Introduction

Health-related social needs (HRSNs)—the individual-level, adverse social, economic, and environmental risk factors driven by social determinants of health, such as transportation access, food insecurity, housing instability, and utility needs—are increasingly recognized as modifiable contributors to cancer disparities (Cammy, 2024). Eliminating disparities linked to HRSNs has been estimated to potentially prevent up to one-third of cancer deaths among adults aged 25–74 in the United States by 2035 (Siegel et al., 2018).

Left unaddressed, HRSNs are linked to greater unmet need and higher downstream acute care utilization and cost among patients with chronic illness (Berkowitz et al., 2017), and broader evidence supports the potential of social needs interventions in health care settings to improve outcomes while reducing costs (Kreuter et al., 2021; Patel et al., 2024). Within oncology specifically, integrating social care into clinical workflows—including through electronic health record (EHR)-based screening and referral to services such as oncology social work—has been identified as an important, though still developing, component of comprehensive, equitable cancer care (Cotangco et al., 2023).

However, screening alone does not ensure that identified needs are addressed. Across health care settings broadly, a substantial share of patients who screen positive for social risk decline referral to available resources, and this decision point—rather than the screening process itself—has been identified as an understudied bottleneck in the social care pathway (Ruiz Escobar et al., 2021). Qualitative work in primary care and community health settings have identified patient-reported reasons for declining social care linkage, including limited expectations that providers can meaningfully resolve social needs, uncertainty about what accepting a referral entails, competing time demands, and, for a subset of patients, concerns about stigma associated with using targeted services (Pfeiffer et al., 2022; Sandhu et al., 2022). Threat-vigilance models of health care screening suggest that patients may approach social needs conversations with anticipatory concern about judgment or loss of autonomy, rather than simple disinterest (Bybee et al., 2025). Within oncology, most prior work on this decision point has approached the problem from the provider or system perspective, documenting staff-reported barriers such as time constraints, workflow burden, and discomfort raising HRSN topics (Yelton et al., 2023), leaving the patient-facing decision process comparatively unexamined.

The Theory of Planned Behavior (TPB) offers a parsimonious framework for understanding this patient-facing decision process (Ajzen, 1985, 1991). TPB posits that a person's intention to perform a behavior—the most proximal determinant of the behavior itself—is shaped by three constructs: attitude toward the behavior (the person's evaluation of its expected benefits and drawbacks), subjective norm (perceived social pressure or endorsement from important others, including one's healthcare team), and perceived behavioral control (PBC; the person's perceived ease or difficulty of performing the behavior, including

perceived logistical and access barriers). A meta-analysis of prospective TPB studies across health behavior domains found that intention accounted for meaningful variance in subsequent health behavior, supporting the model's predictive utility (McEachan et al., 2011). TPB has been applied productively across the cancer care continuum, including to exercise intention among patients with primary brain cancer (Jones et al., 2007), physical activity among adolescent cancer survivors (Keats et al., 2007), and cervical cancer screening uptake, where attitude and subjective norm have frequently emerged as salient predictors of intention alongside PBC (Wollancho et al., 2020).

No prior study, to our knowledge, has applied TPB specifically to cancer patients' intention to utilize supportive care services for HRSNs following a positive screen. Understanding which TPB constructs—attitude, subjective norm, or PBC—most strongly predict intention could meaningfully inform how oncology care teams frame and deliver HRSN referrals. The present pilot study addresses this gap as an early phase of a larger, funded, multi-method investigation examining why cancer patients identified as having unmet HRSNs do or do not pursue connection to available supportive care. To move beyond construct-level prediction toward the lived mechanisms underlying it, we integrate an early, parallel qualitative analysis of semi-structured patient interviews from the same sample, using these data to illustrate and contextualize the quantitative TPB findings rather than to test them independently.

Methods

Design and Setting

This was a cross-sectional pilot survey study, with an embedded preliminary qualitative component, conducted within a larger, American Cancer Society–funded, multi-method investigation of HRSN care linkage among cancer patients at Sidney Kimmel Comprehensive Cancer Center at Jefferson Health, an NCI-designated comprehensive cancer center. The pilot survey reported here represents an early analytic subset preceding the study's planned full-scale survey administration and is reported as a pilot/brief report consistent with recommended practice for underpowered preliminary analyses (Lancaster et al., 2004; Whitehead et al., 2014). The qualitative interviews are similarly reported as a preliminary, in-progress analysis intended to contextualize the survey findings, not as a completed independent qualitative study.

Participants and Recruitment

Eligible participants were adult oncology patients with a completed HRSN screening in the past year, drawn from an eligible pool previously characterized via EHR query (screening completed across four domains: transportation, food, housing, and utilities). Participants were recruited by phone, e-mail and electronic patient portal communication and provided electronic informed consent prior to survey completion. An attention-check item ("What is 2 + 2?") was embedded in the survey for data-quality screening. Fifty-four participants completed the survey and were retained in the primary analytic sample.

Recruitment initially focused on Cohort A: Patients whose EHR record documented an identified HRSN need for which the patient had declined connection to supportive care, reflecting the study's original aim of understanding why patients with an identified need decline care linkage. Recruitment from this eligibility pool (N = 413) proved slower than anticipated, thus eligibility was expanded to also include Cohort B: patients whose EHR record documented a desire to be linked to HRSN care (N = 247), on the reasoning that understanding this group's motivations would likewise inform the study's broader aim of characterizing HRSN care-linkage decision-making.

Measures

Survey items were adapted from standard TPB item-writing conventions (Ajzen, 1991) and tailored to the target behavior ("getting connected to services for food, utilities, transportation, or housing") using 7-point Likert response scales. Attitude was assessed with four items reflecting perceived value and helpfulness of connecting to services (e.g., "Linking to oncology supportive services will help me manage my health-related social needs"). Subjective norm was assessed with four items capturing perceived healthcare team endorsement (e.g., "My healthcare team [oncologist, nurse, social worker, etc.] thinks that I should be connected to services…") and perceived peer norms. Perceived behavioral control was assessed with four items reflecting perceived ease, availability, and personal control over connecting to services. Intention, the outcome variable, was assessed with two items (e.g., "I intend to get connected to services… soon"). Composite scale scores were computed as item means; internal consistency was evaluated using Cronbach's α (Cronbach, 1951).

Participants also indicated which of four practical barriers to HRSN linkage applied to them (time, transportation, access, and stigma), which were summed into a practical-barrier count for supplementary analysis, and reported which specific HRSN domains they were asked about, whether they requested help, whether help was offered, and whether it was accepted. Self-rated general health was assessed with a single item (poor to excellent).

Qualitative Interviews and Preliminary Thematic Analysis

Semi-structured, in-depth interviews were conducted with a subset of cancer patients who responded to the quantitative survey, purposively sampled to include patients who had and had not been linked to HRSN care per EHR records. Interview guides were developed with input from oncology social workers and incorporated shared decision-making process steps alongside TPB constructs. In total, 19 interviews were completed, yielding 276 coded excerpts.

Coding was conducted in Dedoose by two trained coders using a hybrid deductive-inductive codebook: deductive codes operationalized the TPB constructs (attitude, subjective norm, PBC, intention) together with contextual domains for screening experience, linkage process, barriers, and facilitators; inductive codes captured recurring themes not anticipated by TPB (e.g., trust in the health system, self-reliance,

cultural factors). Coders completed three iterative calibration rounds- with a third research team member serving as a tie-breaker- prior to independent coding, and a senior team member reviewed novice coders' transcripts. A subset of transcripts was independently double-coded, and all coding disagreements were resolved through team discussion until consensus was reached, with code definitions refined where disagreements were systematic. Consistent with consensus-based approaches to establishing rigor in qualitative coding (Hill et al., 1997; McDonald et al., 2019) and given ongoing debate about the appropriateness of chance-corrected agreement indices such as Cohen's kappa for small, code-rich qualitative samples (O'Connor & Joffe, 2020), we report the reconciliation process itself rather than a quantitative inter-rater reliability statistic.

Candidate themes were identified by examining code frequency and co-occurrence patterns across the full coded corpus, then reviewed against the underlying excerpts for coherence, internal consistency, and breadth across transcripts, following the general phases of Braun and Clarke's (2006, 2019) thematic analysis approach (familiarization and coding, searching for themes, reviewing themes, defining and naming themes). Consistent with the hybrid deductive-inductive approach to codebook development (Fereday & Muir-Cochrane, 2006), emergent themes were considered alongside the TPB-derived deductive domains rather than in place of them.

Statistical Analysis

Descriptive statistics characterized the sample. The primary analysis used standardized ordinary least squares (OLS) multiple regression to test attitude, subjective norm, and PBC as simultaneous predictors of intention, consistent with the standard TPB analytic approach (Ajzen, 1985, 1991). Predictor and outcome variables were standardized (z-scored) prior to entry to yield standardized β coefficients. Variance inflation factors (VIF) were examined to rule out multicollinearity among predictors (VIF < 5 considered acceptable). Because three simultaneous predictor tests were conducted, a Bonferroni-corrected α of .0167 (.05/3) was applied to guard against Type I error from multiple comparisons (Bland & Altman, 1995; Perneger, 1998). A supplementary model added the practical-barrier count as a fourth predictor to test whether concrete, logistical barriers explained additional variance in intention beyond the core TPB constructs.

Profiles were created to examine if EHR records of HRSN need and desire for care linkage were concordant with self report responses in this survey. For this descriptive analysis, N = 53 of the 54 survey participants are assigned to a recruitment cohort; 1 participant could not be assigned to either recruitment period and is excluded here. For cohort A, "concordance" would require a survey report of needing help that was offered and explicitly declined; no participant in this cohort met that criterion. "Indeterminate" denotes a reported need for which no offer of help was recorded, so a decline could not be assessed either way. For cohort B, for whom EHR eligibility did not require a specific linkage decision, concordance instead reflects only whether the participant confirmed an HRSN need on the survey. All analyses were conducted using SPSS.

Results

Sample Characteristics

The analytic sample (N = 54) had a mean age of 56.8 years (SD = 12.0; range, 33–88; N = 52 with valid birthdate). Self-rated health was most commonly “good” (37.0%) or “fair” (25.9%), with 22.2% rating their health “poor.” The large majority of participants (87.0%) recalled being asked about HRSNs during their cancer care, and 64.8% reported needing help with at least one HRSN domain, most commonly transportation (74.1% of those asked about that domain), followed by food (53.7%), utilities (46.3%), and housing (42.6%). Among participants who reported needing help, 76.5% recalled being offered assistance by their care team, and of those offered assistance, 96.2% accepted it. Nearly half of participants (44.4%) endorsed at least one practical barrier to linkage, most commonly time constraints; no participant identified stigma tied to being seen by a specific individual (e.g., care team, family, peers) as a barrier. Table 1 presents full sample characteristics.

Table 1
Sample characteristics (N = 54)

Characteristic	n	%
Total analytic sample	54	100
Age, years, mean (SD) [range]	56.8 (12.0) [33–88]	
Self-rated health		
Excellent/ Very Good	8	14.9
Good	20	37.0
Fair	14	25.9
Poor	12	22.2
Recalled being asked about HRSNs during cancer care	47	87.0
Reported needing help with ≥ 1 HRSN domain	35	64.8
HRSN domain asked about (not mutually exclusive)		
Transportation	40	74.1
Food	29	53.7
Utilities	25	46.3
Housing	23	42.6
Among those needing help, offered help by care team	26/34	76.5
Among those offered help, accepted help	25/26	96.2
Endorsed ≥ 1 practical barrier to linkage (time, transportation, access, or stigma)	24	44.4

Scale Reliability

Cronbach's α indicated acceptable internal consistency for the attitude (α = .74), PBC (α = .70), and intention (α = .90) scales. The subjective norm scale showed lower reliability (α = .53). Table 2 presents scale-level descriptive statistics.

Table 2
Scale-level descriptive statistics

TPB Scale	Items, No.	Cronbach's α	Mean (SD)	Range
Attitude	4	0.74	5.84 (1.24)	1–7
Subjective norm	4	0.53	5.10 (1.18)	2.5–7
Perceived behavioral control	4	0.70	5.24 (1.26)	2.5–7
Intention (outcome)	2	0.90	4.61 (1.93)	1–7

Predictors of Intention

The three-predictor TPB model explained 54.2% of the variance in intention to utilize HRSN supportive care (adjusted R^2 = .514; $F(3,50) = 19.71$, $p < .001$). As shown in Table 3, attitude was the strongest predictor (β = 0.486, $p < .001$), followed by subjective norm (β = 0.342, $p = .005$); both survived Bonferroni correction (α = .0167). Perceived behavioral control was not a significant predictor of intention (β = -0.003, $p = .975$). All VIFs were below 1.7 (range, 1.28–1.68), indicating multicollinearity did not materially affect coefficient estimates.

Table 3
Predictors of intention

TPB Construct	Standardized β	SE	t	p	VIF
Attitude	0.486	0.124	3.92	< .001*	1.68
Subjective norm	0.342	0.118	2.91	.005*	1.51
Perceived behavioral control	-0.003	0.108	-0.03	.975	1.28

*Significant at Bonferroni-corrected α = .0167 (.05/3 comparisons). SE = standard error; VIF = variance inflation factor.

In a supplementary model adding the count of self-reported practical barriers (time, transportation, access, stigma) as a fourth predictor, model fit was essentially unchanged (adjusted R^2 = .516) and the practical-barrier count did not significantly predict intention (β = 0.104, $p = .292$); attitude (β = 0.475, $p < .001$) and subjective norm (β = 0.330, $p = .007$) remained significant. These descriptive and exploratory findings—in contrast to the Bonferroni-confirmed attitude and subjective-norm effects—should be interpreted as hypothesis-generating rather than confirmatory, consistent with the pilot nature and limited power of the sample.

Table 4 presents EHR–survey concordance by recruitment cohort. Among the 19 participants recruited under Cohort A criteria (EHR notes indicating the patient had declined connection to HRSN care), none confirmed on the survey that they had been offered help and explicitly declined it. Instead, nine (47.4%) reported being offered help and accepting it, six (31.6%) denied having any HRSN need, and three

(15.8%) reported a need that had not been formally offered assistance, precluding assessment of a decline; offer/acceptance data were missing for the remaining participant (5.3%). Among Cohort A participants, self-reported survey and interview accounts did not always align. Three of these participants demonstrated discordance or indeterminate concordance with the EHR in their surveys but then showed concordance with the EHR in their interviews: they described being offered HRSN resources but denying assistance. For one of these participants, they were already receiving external help and thus did not need assistance from the cancer center. Another participant stated in their interview that over the course of two separate cancer treatment periods, they expressed HRSN needs and received help during the first phase and, during the second treatment period, felt that they did not have continuing need and thus denied assistance. Lastly, a participant who in their survey showed indeterminate concordance with the EHR (self-reported that they needed help but it was not offered) explained during their interview that while their care team connected them to various resources, they felt that the external organizations they were connected to were not effective; [ID #18] “I definitely needed help with the food assistance and the utility help...But not the doctor’s fault, but a lot of the programs out there are zero help...They make it extremely hard for anyone to get any help.”

Table 4
EHR-survey concordance by recruitment cohort, full quantitative sample (N = 54)

Cohort	Concordance category	N	% of cohort	Self-reported needed help	Self-reported accepted help
Cohort A: EHR notes patient declined connection to HRSN Care	Concordant—expressed need, declined help	0	0%	Yes	No
	Discordant — accepted offered help	9	47.4%	Yes	Yes
	Discordant — denied HRSN need	6	31.6%	No	n/a
	Indeterminate — need reported, not offered	3	15.8%	Yes	not offered
	Indeterminate — offer/acceptance not recorded	1	5.3%	Yes	not recorded
Total	—	19	100.0%	—	—
Cohort B: Expanded pool to include patients with EHR recorded noting patient desire to be linked to HRSN care	Concordant — confirmed HRSN need	21	61.8%	Yes	n/a
	Discordant — denied HRSN need	13	38.2%	No	n/a
Total	—	34	100.0%	—	—

Concordance was substantially higher among the 34 participants recruited under the expanded Cohort B criteria (EHR notes indicating any documented HRSN need, including patients noted as wanting linkage to care): 21 (61.8%) confirmed an HRSN need on the survey, consistent with the criterion under which they were recruited, while 13 (38.2%) denied having a need. Only one interviewed participant from this cohort showed EHR-survey discordance, where they self-reported a lack of HRSN need. However, this participant stated in their interview that they indeed had HRSN needs related to transportation and food, but that these issues were not discussed—indicating that help was not offered—by their care team during treatment.

Qualitative Findings

Analysis of 276 coded excerpts across 19 interview transcripts identified five themes that converge with, and help explain, the quantitative pattern above.

Qualitative Sub-Sample Characteristics. The interviewed subsample (N = 19) ranged in age from 33 to 75 years (mean 53.2 years) and reported self-rated health of good (5/19), fair (8/19), or poor (6/19); none rated their health excellent/very good. Twelve of the 19 were recruited under Cohort A (HRSN need identified, linkage to care declined per EHR); the remaining seven were recruited under Cohort B, the expanded criterion adopted after May 28, 2026 (EHR-documented desire to be linked to HRSN care). Four of the interviewed participants from Cohort A showed discordance between their survey and interview: 3 of these demonstrated EHR-interview concordance, as described above, and 1 showed indeterminate EHR-interview concordance (while denying HRSN need in their survey, stated in their interview that they had HRSN need, but help was not offered). All participants from Cohort B expressed HRSN need in their interviews, in concordance with the EHR screening, with 1 participant from this cohort showing discordance between their survey and interview (stating in their interview that they had HRSN need while denying need in their survey).

The care team relationships and personal trust, not the referral pathway, drives linkage. Across 12 of 19 transcripts, patients described HRSN linkage as mediated by a specific, trusted staff member rather than by a program or process. Named individual staff members recurred across multiple interviews as the practical mechanism of care ([ID #42] “There were no barriers to accepting help because of the comfortability I had with [Social Worker] and the team. And again, [Social Worker] has always been my go-between”; [ID #52] “She’s seen my vision. She heard me. I feel seen and heard.”). One participant in particular described the process of building trust with their care team as instrumental in their accepting care linkage: [ID #27] “It took me a time or two to know I could trust [Social Worker] and the Welcome Center people...I was reluctant. I was putting a toe in the water to see what would happen. And I was pleasantly surprised, and they’ve come through for me in the most amazing ways.” Further, patients frequently framed follow-through in relational rather than logistical terms (e.g., not wanting to disappoint a provider who had personally invested in them: [ID #44] “I’m not going to let down Dr. [Oncologist]...These people are so good to me.”). This theme directly parallels the quantitative finding that subjective norm—specifically, perceived care-team endorsement—was a significant predictor of

intention while PBC was not. This suggests that more proximal, relationally-specific mechanisms are those driving patients' actual decisions around accepting resource linkage.

Pride and self-reliance function as a psychological, not logistical, barrier. Several participants described that embarrassment about accepting help was either a personal barrier or perceived barrier for other patients like them ([ID #18] "Some doctors had a form that you could fill out, so it was more private and didn't make people uncomfortable to talk about because sometimes it would be humiliating or embarrassing for people"; [ID #52] "Some people will say, 'Oh, I'm okay,' and they're really not okay. But they feel ashamed or scared to ask for help."). Many of these participants also described a threshold moment in which identity-based values around self-sufficiency had to be reconciled before they themselves could accept help ([ID #44] "the pride part of me, how did I get in this position? I would never have done it until my priorities changed. And I was like...I've got to just do exactly what everybody's telling me to do"; [ID #43] "I grew up with parents always saying 'You don't rely on the government to take care of you. You take care of yourself...' It was hard for me to accept the help. It really was."). Although these participants did eventually accept care linkage, the qualitative data illustrates the internal stigma barriers that are suggestive of when some patients choose to decline linkage. This barrier operates on attitude and self-concept rather than on perceived ease or access, consistent with attitude—not PBC or practical barriers—emerging as the stronger quantitative predictor.

Declining linkage often reflects resolved need or process breakdown, not refusal. Excerpts coded as declined linkage rarely reflected active refusal of an offer. More often, patients described a need that resolved on its own before assistance was required, or a referral process that was inadequate or went silent after an initial contact. For example, one participant, when asked if they talked with anyone at the cancer center about needing help with bills and food, said [ID #4] "No, I didn't know if that was an option. I had no idea, so I definitely would have probably even begged for it." Another participant stated in their interview, when reflecting on their experienced lack of follow-up amidst the overwhelm of initial cancer diagnosis: [ID #41] "When people are coming in new and everything's so scary...when you first get diagnosed...They did they whole initial things of what they were offering the services, but there was never a callback." These distinctions are not currently captured by the binary "declined/wanted" classification used to define the EHR-based eligibility pool for this study, and may be a useful refinement for interpreting non-uptake in future analyses. Because every participant in the quantitative sample—not only the 19 who were interviewed—completed the same need/offer/acceptance items, this pattern could be checked against the full survey sample (Table 4). Among the 19 participants recruited under Cohort A (HRSN need identified, linkage declined per EHR), not one reported explicitly declining an offer of help: 9 (47%) instead reported being offered help and accepting it—the opposite of the "declined" classification the EHR record implied—six (32%) denied any HRSN need on the survey, three (16%) reported a need that had not been formally offered assistance (precluding assessment of a decline either way), and one (5%) had incomplete offer/acceptance data. By contrast, concordance was substantially higher among the 34 participants recruited under Cohort B, the expanded criterion adopted on/after May 28, 2026 (EHR-documented desire to be linked to HRSN care): 21 (62%) confirmed on the survey that they had needed help, consistent with the criterion under which they were recruited, while 13 (38%) denied any HRSN

need. Taken together, this sample-wide comparison suggests that EHR-coded “decline” status, as used for the earlier recruitment window, corresponded poorly to patients’ own contemporaneous account of their HRSN experience, and lends quantitative support to the qualitative pattern described above.

Tangible relief translates into felt capacity to engage with treatment. Across 13 of 19 transcripts, participants linked concrete assistance (transportation, food, financial support) not only to relief of the underlying need but to reduced stress and improved capacity to attend appointments and manage treatment ([ID #27] “I don’t have to deal with public transportation or the money it would take to normally pay for rideshare. That’s been invaluable. And getting me to my appointments...that’s one less thing I got to worry about.”; [ID #52] “It helped because I was able to focus a little bit more on my care versus what I was lacking at home or whatever was going on at home.”)—suggesting that HRSN linkage may act on cancer care engagement through a broader wellbeing pathway rather than a narrowly logistical one. Further, seven of the interviewed participants explicitly discussed how the economic and emotional stress of cancer treatment increased their readiness to accept care linkage after it was offered: [ID #18] “I think it was after my third surgery...where I was starting to feel like the pinch of trouble of keeping the food in house and the lights on...” This shows that participants often did not accept the resources offered to them until they felt a direct need for the support.

Discussion

In this pilot application of the Theory of Planned Behavior to HRSN care linkage among cancer patients, attitude toward HRSN services and subjective norm—specifically, perceived endorsement from the oncology care team—emerged as the only statistically robust predictors of intention to utilize supportive care, surviving correction for multiple comparisons. Perceived behavioral control, and a supplementary measure of concrete practical barriers (time, transportation, access, and stigma), did not independently predict intention once attitude and norm were accounted for. This pattern is consistent with prior TPB applications in cancer screening contexts, where attitude and subjective norm have frequently emerged as dominant predictors of intention relative to PBC (Wollancho et al., 2020). Our preliminary qualitative interviews offer a patient-voiced account of why: across the coded transcripts, patients rarely described HRSN linkage in terms of logistical ease or difficulty. Instead, they described a specific, trusted care-team member as the mechanism through which linkage happened, and, when hesitant, described the hesitation in terms of pride or self-reliance rather than access. Both patterns map onto the quantitative result that subjective norm and attitude, not PBC, carried predictive weight.

These findings offer a useful counterpoint to the existing HRSN literature, which has focused predominantly on removing logistical and access barriers to social care linkage—for example, simplifying referral pathways, expanding community-based organization capacity, and reducing paperwork burden (Ruiz Escobar et al., 2021; Sandhu et al., 2022). Such barrier-reduction strategies remain important, particularly given that a subset of our sample (44.4%) did endorse at least one practical barrier. However, our results suggest that barrier reduction alone may be insufficient to move patients from a positive HRSN screen to actual service linkage if their attitude toward the service, and critically, their perception

of whether their care team genuinely endorses it, are not also addressed. This is broadly consistent with qualitative findings that patients often decline social care referrals not purely because of access constraints but because of uncertainty about whether providers can meaningfully help, or ambivalence about whether a referral was a genuine recommendation versus a procedural formality (Pfeiffer et al., 2022; Sandhu et al., 2022). Our own qualitative data extend this point: excerpts coded as “declined” linkage in the interview sample rarely described a patient turning down a genuine offer, and instead more often described a need that resolved before help was needed or a referral process that was insufficient or had stalled after initial contact—raising the possibility that some proportion of EHR-coded decline in the broader eligible pool reflects the same two patterns rather than a considered rejection of care. The sample-wide concordance check reported in Table 4 substantiates this directly: among the 19 quantitative survey participants originally classified via EHR as having declined linkage despite an identified need, none confirmed on the survey that they had been offered help and declined it, and nearly half instead reported accepting help they were offered.

The prominence of subjective norm in our model has a direct clinical implication: how an HRSN referral is delivered—explicitly, personally, and as an endorsed recommendation from a trusted member of the care team, rather than as an automated screening-triggered checkbox—may matter as much as, or more than, whether logistical barriers to accessing the referred service have been minimized. This aligns with calls in the broader social determinants of health literature for relationship-centered, rather than purely transactional, approaches to social needs conversations. Qualitative interviews reinforced this directly: participants repeatedly identified a specific named staff member, rather than “the program” or “the hospital,” as the agent of facilitation, especially amidst the extreme stress of cancer diagnosis and treatment. However, the subjective norm scale showed only modest internal consistency ($\alpha = .53$), likely because it combined injunctive (care-team endorsement) and descriptive (peer-comparison) normative content—two related but conceptually distinct sources of social influence that may not covary strongly among cancer patients, for whom the care team relationship is likely a far more salient referent than same-diagnosis peers. This raises the possibility that the injunctive component alone—perceived care-team endorsement specifically—is driving the construct’s predictive strength, and that the pooled scale’s modest reliability may be *underestimating* rather than inflating the true effect of care-team-delivered endorsement. This is further supported by interviewees communicating a perception that patients like them are likely embarrassed to seek out HRSN resources, making it less likely that descriptive norms would drive them to accept linkage. The qualitative pattern of patients naming individual staff members rather than describing normative pressure from peers or the institution as a whole is consistent with this interpretation.

Although nine participants (16.7%) reported stigma as a barrier to care, none identified stigma tied to being seen by a specific individual as a barrier to linkage, in contrast to prior qualitative work identifying stigma as a salient concern in some populations (Sandhu et al., 2022). This may reflect true low stigma salience in this cancer-specific, single-institution sample, a measurement limitation of the branching-logic item used to probe stigma sources, or a social-desirability effect. Notably, the qualitative interviews suggest a related but distinct construct may be more relevant in this population than stigma as typically

operationalized: several participants described a self-reliance or pride-based reluctance to accept help that was not tied to fear of others' judgment, but to their own identity as someone who is self-sufficient. This distinction—stigma as social exposure versus self-reliance as an internal value conflict—was not separately captured by the survey's practical-barrier item and warrants a dedicated measure in future research.

Limitations

Several limitations should be considered in interpreting these findings. The analytic sample (N = 54) is underpowered to detect smaller effects, particularly for PBC and practical-barrier constructs, and estimates should be treated as preliminary pending replication in the full sample. Second, the cross-sectional design precludes causal inference regarding the relationship between TPB constructs and intention, and intention itself was measured rather than observed care-linkage behavior. Third, the internal consistency of the subjective norm scale was not strong; future iterations of the instrument should consider separating injunctive (care-team endorsement) and descriptive (peer-comparison) norms into distinct subscales, consistent with TPB measurement guidance (Ajzen, 1985). Fourth, the sample was drawn from a single comprehensive cancer center and recruited by phone and email, which may limit generalizability and introduce selection bias toward patients with reliable contact information and greater willingness to engage with research staff. Fifth, one case with an implausible date of birth was identified and excluded from age calculations, underscoring the importance of data-quality review in small pilot datasets; a sensitivity analysis excluding an additional case that failed an embedded attention-check item did not alter substantive conclusions.

The qualitative component carries its own limitations that should be weighed in interpreting the integrated findings. Coding disagreements were resolved through team consensus rather than reported as an independently computed, unreconciled inter-rater statistic; the small size of the double-coded subset in this pilot phase would in any case limit the interpretability of a chance-corrected index such as Cohen's kappa, which is known to behave unpredictably with small samples and low-prevalence codes (Hill et al., 1997; McDonald et al., 2019; O'Connor & Joffe, 2020). The themes reported here were derived from code frequency and co-occurrence patterns following this reconciled coding pass. As such, the qualitative findings should be read as illustrative and hypothesis-generating. Relatedly, the EHR–survey concordance check reported in Table 4 relies on the same self-report survey items used elsewhere in this study and cannot independently confirm which source—the EHR record or the participant's contemporaneous self-report—more accurately reflects what occurred; it is offered as evidence of a discrepancy worth resolving with EHR-based verification, not as proof that the EHR classification was itself in error. The discordance in the information between EHR, self-report survey, and qualitative interview for specific participants was also an interesting finding that may indicate recall bias or social desirability bias, either in the survey or during interview. Again, there is no way to confirm which source is most reflective of reality, even though the interviews may be the most nuanced and illustrative source of data.

Future Directions

The EHR–survey discordance identified across the quantitative sample (Table 4) also suggests a concrete next step: verifying, directly against EHR-documented linkage-decision fields, which of the Cohort A "declined" records reflect a genuine documented decline versus a resolved need or an unanswered follow-up, ahead of the full-scale study. Based on these findings, operationalizing HRSN care in clinical practice requires transitioning from transactional, automated screen-and-refer models to relationship-centered, team-endorsed delivery workflows. Care teams must be trained to offer explicit, personalized recommendations that frame social care as a standard, integral component of quality cancer treatment. To address the self-reliance and pride-based hesitation highlighted by patients in this study, supportive oncology care services such be poised as strategic tools for supporting treatment adherence rather than as discretionary financial or social assistance.

Operationally, clinical workflows and EHR tracking processes must be refined to distinguish true patient refusal from administrative drop-offs, stalled referrals, or self-resolved needs. Establishing closed-loop follow-up protocols in which a supportive care team member re-engages with the patient after initial referral could prevent process breakdowns and provide ongoing clinical support. By prioritizing relationship-driven endorsement alongside logistical barrier reduction, oncology practices can better translate positive HRSN screenings into meaningful service connections and sustained resource utilization.

Conclusion

In this pilot sample of cancer patients who completed HRSN screening, attitude toward supportive care services and perceived healthcare team endorsement—not perceived logistical control or practical barriers—were the strongest correlates of intention to utilize oncology supportive care for health-related social needs. Preliminary qualitative interviews corroborate this pattern from the patient's own perspective: linkage to care is experienced as a relationship with a trusted individual, and reluctance is experienced more often as a matter of pride than of access. If confirmed in the planned full-scale study, these findings suggest that interventions to improve HRSN care linkage should prioritize how referrals are framed and personally endorsed by the oncology care team, alongside continued efforts to reduce logistical barriers to access.

Declarations

Conflicts of interest:

The authors declare no conflicts of interest.

Ethics Approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board at Thomas Jefferson University's Office of Human Research (IRISID-2025-1005: From Screening to Support: A Multi-Method Analysis of HRSN Integration in Cancer Care).

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

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Author Contribution

Author Contributions: MS and RC served as co-Principal Investigators and contributed to study design, conceptualization, and overarching methodology. MS was responsible for study execution, resource allocation, budget management, and drafting the manuscript. RC served as a subject matter expert and operational advisor, and editing the manuscript. RC also facilitated clinical follow-up for participants expressing ongoing unmet health-related social needs (HRSNs). KM and JB served as protocol coordinators and primary site contacts, managing EPIC system optimization, REDCap data collection, and ClinCard participant reimbursement. SK and SE conducted qualitative interviews, assisted with qualitative data analysis, and contributed to drafting and editing the manuscript. NC assisted with coding the qualitative interviews. NH oversaw participant recruitment workflows, specifically optimizing and managing MyChart recruitment messaging. MD is a senior developer business analyst who assists with electronic health record reporting for this study, specifically assisting with the identification of the correct cohort of patients for the study sample. All authors reviewed and approved the final manuscript.

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