Original Article

Addressing social determinants of health for oncology patients: can we reduce hospital readmissions?

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Background: Cancer patients with health-related social risks may be at higher risk for readmissions. This study assesses the impact of the recently integrated social determinants of health (SDOH) survey on inpatient oncology 30-day hospital readmissions.

Methods: We evaluated readmissions data from inpatient oncology units from January 1, 2019–December 31, 2021 using our internal Electronic Medical Record (EMR), and Vizient Clinical Data Base linked to patients' socioeconomic status (SES) data. Secondary analyses included patient demographics and others as main predictors of readmissions. Logistic regression models controlled for various patient demographic factors. We compared the readmission rate before and after the EMR integration of the SDOH survey.

Results: A total of 1,853 solid tumor oncology patients were admitted during the study period, among which 751 admissions were before the SDOH survey, and 1,102 were after the survey. Although there were no significant differences in the 30-day readmissions before *vs.* after the EMR integration of the SDOH survey, there were significant subgroup differences. For example, in the readmission cohort, the following differences were observed: a higher proportion of patients were younger (25%, P<0.001), non-Hispanic Black (NHB) patients (25%, P=0.002), Medicaid users (28%, P=0.002), and lived in a ZIP Code with a larger percentage of households using public assistance (12%, P=0.04). Logistic regression models predicting the likelihood of readmissions found adults aged 75 years and older were less likely to be readmitted compared to adults 18 to 54 years [odds ratio (OR) =0.48; 95% confidence interval (CI): 0.29–0.78; P=0.003], NHB patients had an increased risk of being readmitted compared to their counterparts (OR =1.42; 95% CI: 1.04–1.92; P=0.025), patients using Medicaid as their primary insurance were more likely to be readmitted compared to patients using commercial/private insurance (OR =1.54; 95% CI: 1.05–2.26; P=0.027), and urgent admissions were less likely to be readmitted (OR =0.64; 95% CI: 0.42–1.00; P=0.047).

Conclusions: Our study results demonstrated no overall differences in the 30-day readmission rate before *vs.* after implementation of the SDOH survey, however, NHB patients and Medicaid users have a higher risk for readmission even with the examination of their barriers to SDOH at the time of admission. This study shows that additional factors such as disease complexity and comorbidities may impact hospital readmissions.

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Introduction

Although most oncology treatments utilize outpatient settings, hospitalizations are inevitable for acute illness among cancer patients (1). Similar to other medical specialties, hospital readmissions for oncology patients depend on the complexity of acute medical illness, comorbidities, and health-related social risks. Other barriers to various domains of social determinants of health (SDOH) also impact readmissions (2-5). However, it is unclear if oncology patients with financial, food, and housing insecurities are at risk for readmissions (6). To address some of the barriers associated with various domains of SDOH, healthcare organizations are attempting to implement instruments such as SDOH surveys in the inpatient and outpatient settings to identify patients' needs early during the hospitalization and improve outcomes (5,7-9).

SDOH survey instruments are geared to the needs of the local communities, and the specific domains included in SDOH surveys vary across the institutions (10). Overall, the SDOH surveys are designed to inquire about patients' needs and barriers across multiple domains: financial, food, and housing insecurities, physical activity, psychosocial aspects (stress, social networks, depression), intimate partner violence, and access. To optimize their use, SDOH surveys are sometimes incorporated into patients' Electronic Medical Record (EMR); however, the frequency of SDOH assessment remains unknown. At our institution, we assess the SDOH survey once every 6 months as patients' needs may evolve over time (5). Prior studies reported higher rates of SDOH-related impediments and prolonged hospital length of stay (LOS) among hospitalized cancer patients from racial minorities, communities from low socioeconomic status (SES), American Indian, African American (AA), and other minority communities (11). However, there is limited data on SDOH survey implementation and the related outcomes among oncology patients (12). We recently integrated the SDOH survey into patients' EMR, through which our social workers identify patients' needs and barriers across various domains of SDOH, enabling them to provide additional assistance to facilitate a timely discharge with outpatient referrals and collaborations with community organizations and partnerships. Within 24 hours of hospitalization, patients were asked to complete a survey that explored patients' needs and barriers across several domains of SDOH: food, housing and financial insecurities, community networks, stress, depression, domestic violence, and access (transportation barriers etc.) (5,11). We reported our pilot data suggesting

Highlight box

Key findings

- Our study results demonstrated no overall differences in the 30-day readmission rate before *vs.* after implementation of the social determinants of health (SDOH) survey, however, non-Hispanic Black patients and Medicaid users have a higher risk for readmission even with the examination of their barriers to SDOH at the time of admission. This study shows that additional factors such as disease complexity and comorbidities may impact hospital readmissions.

What is known and what is new?

- Previous reports suggest high rates of readmissions for patients from the minority communities, and Medicaid insurance users and addressing patients' barriers related to social risks may reduce hospital admissions.
- Our study reported no changes in the hospital readmission rates among cancer patients after implementing SDOH survey but African American patients and Medicaid patients had higher admission rates. This may reflect those additional factors such as cancer, its complexity or other comorbidities may play a role in hospital readmissions; providers need to address patients' barriers to SDOH and steps to reduce readmissions such as timely outpatient follow-up.

What is the implication, and what should change now?

- In this study, we found that even after addressing patients' barriers and needs as identified on the SDOH survey, a higher number of Black patients and Medicaid users had higher rates of readmissions compared to their non-Hispanic White counterparts. Future studies may need to investigate interventions optimizing patients' needs and barriers across various domains of SDOH dedicated specifically to Black patients, Medicaid users, and other high-risk patients both in the inpatient and outpatient settings to reduce hospital readmissions.

an improvement in LOS for oncology patients after EMR integration of the SDOH-survey, which also facilitated hospital discharge and care coordination through the outpatient settings (5). However, it is unknown if the SDOH survey implementation reduced readmission rates.

It is well known that hospital readmissions contribute significantly to the healthcare burden in the U.S., with $52.4 billion spent for 30-day readmissions annually (8,13). While examining the patient demographics contributing to higher readmission rates, multiple studies identified that patients from low SES groups, Medicaid users, and Black and other minority populations had higher readmission rates (14,15). Furthermore, specific oncologic diseases, and their associated complex treatments, toxicities, and higher symptom burden may further increase readmissions and healthcare expenditure (1). Although readmission rates among cancer patients are nearly as high as 24–27% (8), interventions to reduce readmission are limited. Herein, we report the results of 30-day hospital readmission rates before *vs.* after the implementation of the SDOH survey among hospitalized solid tumor oncology patients at an academic tertiary cancer center. We present this article in accordance with the STROBE reporting checklist (available at https://ace.amegroups.com/article/view/10.21037/ace-23-5/rc).

Methods

Study cohort and eligibility

This study cohort included inpatient solid tumor oncology patient data from the institutional EMR (EPIC) data and Vizient Clinical Database (CDB) (16). Adult patients who were admitted to inpatient oncology units from January 1, 2019 through December 31, 2021 were included in the cohort. Patients' diagnoses included various solid tumors and gynecological cancers. We excluded patients admitted on 24-observation, palliative, and hospice status. The final study cohort included 1,853 patients.

SDOH survey

At our institution, patients are asked to complete the SDOH survey within 24 hours of hospitalization. The survey results are integrated into EMR-EPIC, the results of which are reviewed by our social workers and case mangers daily. Patients are encouraged to complete the survey once every 6 months and answer the questions across all the domains. The SDOH survey completion rate is nearly 80%. Our social workers coordinate and facilitate their discharge by coordinating referrals to various community partnerships: shared food programs (Impact 211), debriefing sessions & behavioral health referrals for those with intimate partner violence, Milwaukee Health Care Partnership Program (MCHP) for those with financial insecurities, collaboration with Milwaukee Rescue Mission and repairs of Breach and Community Advocates for housing insecurities (5).

Study variables

Study variables were obtained from our internal EMR (EPIC), which was merged with the CDB. Patient sociodemographic factors included age, sex, race/ethnicity, primary insurance, and SES. Age group included 18–54 years, 55–64 years, 65–74 years, and 75 years and older. Race/ethnicity groups included non-Hispanic (NH) White, NH Black (NHB)/AA, Hispanic, and NH others. Primary insurance groups include commercial/private, Medicaid, Medicare and self-pay/others. Admission types included elective, urgent and emergency, and the type of discharge facility (home *vs.* other hospitals or other skilled facilities). Patients' outcomes, such as LOS were evaluated from the internal EMR, and the readmissions and mortality data were obtained through the Vizient CDB.

Data on median household income in the past 12 months and the percent of households in a specific ZIP Code that received public assistance income or food stamps/Supplemental Nutrition Assistance Program (SNAP) in the past months was obtained from the IPUMS National Historical Geographic Information System (NHGIS) and U.S. Census Bureau. Collectively, we refer to these variables as U.S. Census SES. SDOH survey was integrated into EMR-EPIC on April 30, 2020, which inquired patients' needs and barriers across multiple domains: food, financial and housing insecurities, intimate partner violence, social connections, stress, depression, physical activity, and barriers to access and transportation.

Study outcome

The primary outcome, 30-day readmission, was obtained.

Statistical analyses

Descriptive statistics were calculated for demographic and clinical characteristics by protocol implementation group (*Table 1*) and whether or not the patient was admitted within

Table 1 Demographic and clinical characteristics of the cohort by protocol group

Characteristics	Before (n=751)	After (n=1,102)	P value[†]
30-day readmission	142 (19%)	201 (18%)	0.72
Age			0.08
18–54 years	185 (25%)	240 (22%)	
55–64 years	212 (28%)	274 (25%)	
65–74 years	222 (30%)	368 (33%)	
75+ years	132 (18%)	220 (20%)	
Sex			0.75
Female	359 (48%)	535 (49%)	
Male	392 (52%)	567 (51%)	
Race/ethnicity			0.05
NH White	539 (72%)	849 (77%)	
NH Black	161 (21%)	181 (16%)	
NH other	23 (3.1%)	31 (2.8%)	
Hispanic	28 (3.7%)	41 (3.7%)	
Primary payer			0.61
Commercial/private	224 (30%)	320 (29%)	
Medicaid	105 (14%)	134 (12%)	
Medicare	412 (55%)	631 (57%)	
Self-pay/other	10 (1.3%)	17 (1.5%)	
Admission status			<0.001
Elective	83 (11%)	61 (5.5%)	
Urgent	277 (37%)	464 (42%)	
Emergency	391 (52%)	577 (52%)	
Discharge status			0.16
Home	680 (91%)	1,018 (92%)	
Hospital	71 (9.5%)	84 (7.6%)	
Expected mortality			
Median [IQR]	0.01 [0.00, 0.03]	0.02 [0.01, 0.04]	<0.001
Mean [SD]	0.03 [0.06]	0.04 [0.08]	<0.001
Observed LOS (days)			
Median [IQR]	5 [3, 9]	5 [3, 8]	0.03
Mean [SD]	8 [8]	7 [8]	0.03
Expected LOS (days)			
Median [IQR]	4.9 [3.9, 6.6]	5.4 [4.1, 7.5]	<0.001
Mean [SD]	6.0 [4.1]	6.6 [4.3]	<0.001
Household income ($) in the past 12 months (in 2020 inflation-adjusted dollars)			
Median [IQR]	63,280 [49,994, 83,143]	66,706 [51,156, 85,429]	0.03
Mean [SD]	65,987 [22,492]	68,500 [22,897]	0.03
Unknown	6	5	
Public assistance income or food stamps/SNAP in the past 12 months for households (% of households in ZIP Code)			
Median [IQR]	10 [4, 22]	8 [4, 15]	0.007
Mean [SD]	14 [12]	13 [12]	0.007
Unknown	6	5	

[†], Pearson's Chi-squared test, Wilcoxon rank sum test. NH, non-Hispanic; IQR, interquartile range; SD, standard deviation; LOS, length of stay; SNAP, Supplemental Nutrition Assistance Program.

30 days from the discharge date of the index admission (*Table 2*). Logistic regression models estimated the association between the protocol implementation group and 30-day readmission, stratifying for age, sex, race, ethnicity, primary payer, admission status, and U.S. Census SES. Interaction terms between the primary indicator and covariates were included in some models to determine if the effect of the protocol implementation group varied by other covariates. Models excluded patients who had a discharge status of "Hospice" or "Died".

Ethical statement

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was exempt from formal IRB approval by institutional ethics board of Medical College of Wisconsin. Individual consent for this retrospective analysis was waived.

Results

The study cohort included 1,853 solid tumor oncology patients hospitalized between January 1, 2019 and December 31, 2021. Patients who had an admission during the COVID-19 pandemic (April 1, 2020 to September 30, 2020) were excluded from the analysis to decrease pandemic-related confounders such as reduced rates of hospitalizations, workforce shortages, and delays in timely treatments.

Table 2 Demographic and clinical characteristics of the cohort by 30-day readmission status

Characteristics	No (n=1,510)	Yes (n=343)	P value[†]
Protocol implementation group			0.72
Before	609 (81%)	142 (19%)	
After	901 (82%)	201 (18%)	
Age			<0.001
18–54 years	320 (75%)	105 (25%)	
55–64 years	393 (81%)	93 (19%)	
65–74 years	498 (84%)	92 (16%)	
75+ years	299 (85%)	53 (15%)	
Sex			0.21
Female	739 (83%)	155 (17%)	
Male	771 (80%)	188 (20%)	
Race/ethnicity			0.002
NH White	1,155 (83%)	233 (17%)	
NH Black	255 (75%)	87 (25%)	
NH other	42 (78%)	12 (22%)	
Hispanic	58 (84%)	11 (16%)	
Primary payer			0.002
Commercial/private	449 (83%)	95 (17%)	
Medicaid	173 (72%)	66 (28%)	
Medicare	867 (83%)	176 (17%)	
Self-pay/other	21 (78%)	6 (22%)	
Admission status			0.08
Elective	110 (76%)	34 (24%)	
Urgent	619 (84%)	122 (16%)	
Emergency	781 (81%)	187 (19%)	
Discharge status			<0.001
Home	1,368 (81%)	330 (19%)	
Hospital	142 (92%)	13 (8.4%)	
Expected mortality			
Median [IQR]	0.01 [0.01, 0.04]	0.01 [0.01, 0.04]	0.75
Mean [SD]	0.04 [0.07]	0.04 [0.09]	0.75
Observed LOS (days)			
Median [IQR]	5 [3, 9]	5 [3, 8]	0.60
Mean [SD]	7 [8]	6 [5]	0.60
Expected LOS (days)			
Median [IQR]	5.3 [4.0, 7.3]	5.1 [4.1, 7.0]	0.56
Mean [SD]	6.4 [4.4]	6.2 [3.6]	0.56
Household income ($) in the past 12 months (in 2020 inflation-adjusted dollars)			
Median [IQR]	66,706 [50,839, 85,429]	61,875 [48,879, 83,143]	0.10
Mean [SD]	67,846 [22,655]	65,888 [23,188]	0.10
Unknown	9	2	
Public assistance income or food stamps/SNAP in the past 12 months for households (% of households in ZIP Code)			
Median [IQR]	9 [4, 15]	10 [4, 25]	0.04
Mean [SD]	13 [12]	14 [12]	0.04
Unknown	9	2	

[†], Pearson's Chi-squared test, Wilcoxon rank sum test. NH, non-Hispanic; IQR, interquartile range; SD, standard deviation; LOS, length of stay; SNAP, Supplemental Nutrition Assistance Program.

Among a total of 1,853 patients, 751 patients were admitted before the SDOH survey was implemented and 1,102 patients were admitted after implementation. *Table 1* shows demographic and clinical characteristics by SDOH survey protocol group. There were no statistically significant differences between patients' age, sex, or primary payer. A larger proportion of NHB patients had an initial admission before the SDOH survey was implemented (21% compared to 16% after implementation). A similar proportion of emergency admissions occurred both before and after the SDOH survey was implemented (52% of the patients for both groups). Expected mortality and LOS was significantly different between the groups, with the post-implementation group having larger median and mean rates and days, respectively. However, the observed LOS was significantly lower for the after group. Median household income in the past 12 months was significantly higher among the group who was admitted after the SDOH survey was implemented. Similarly, percentage of households receiving public assistance income or food stamps/SNAP in the past 12 months was significantly lower among the after group.

Table 2 shows demographic and clinical characteristics

Table 3 Logistic regression model

Characteristics	OR	95% CI	P value
Protocol implementation group			0.80
Before	–	–	
After	1.04	0.81, 1.33	0.80
Age			0.01
18–54 years	–	–	
55–64 years	0.72	0.52, 0.99	0.05
65–74 years	0.50	0.32, 0.77	0.002
75+ years	0.48	0.29, 0.78	0.003
Sex			0.09
Female	–	–	
Male	1.23	0.97, 1.57	0.09
Race/ethnicity			0.08
NH White	–	–	
NH Black	1.42	1.04, 1.92	0.03
NH other	1.20	0.59, 2.28	0.59
Hispanic	0.72	0.35, 1.37	0.35
Primary payer			0.10
Commercial/private	–	–	
Medicaid	1.54	1.05, 2.26	0.03
Medicare	1.42	0.96, 2.11	0.08
Self-pay/other	1.75	0.62, 4.34	0.25
Admission status			0.14
Elective	–	–	
Urgent	0.64	0.42, 1.00	0.05
Emergency	0.72	0.48, 1.12	0.14

OR, odds ratio; CI, confidence interval; NH, non-Hispanic.

by the outcome, 30-day readmission. Overall, 18.5% of the cohort was readmitted within 30-day of their first admission (n=343). Among the demographic characteristics, age, race/ethnicity, primary payer, and percent of households who received public assistance income or food stamps/SNAP in the past 12 months were significantly different between the two groups. We found that a higher proportion of patients who were younger, NHB, Medicaid users, and received public assistance income experienced readmission within 30 days compared to the no-readmissions group. In logistic regression models, age, race/ethnicity, primary payer, and admission status were associated with 30-day readmissions (*Table 3*). Compared to patients who were 18 to 54 years old, all other age groups were less likely to be readmitted. NHB patients had a 69% greater odds of being readmitted compared to NH White patients [odds ratio (OR) =1.69; 95% confidence interval (CI): 1.12–2.53; P=0.011]. Patients on Medicaid had a 58% greater odds of being readmitted than those who used commercial/private insurance (OR =1.58; 95% CI: 1.06–2.33; P=0.023) (*Table 4*).

Discussion

Our study focused on 30-day readmission rates before *vs.* after integrating the SDOH survey protocol into EMR among solid tumor cancer patients admitted to the oncology units. Although there were no statistically significant differences in the readmission rates between the groups, there were significant subgroup differences. NHB patients, public income assistance users, and Medicaid users showed readmissions rates than their counterparts (*Table 2*). In addition, even after addressing patients' barriers and needs, as identified in the SDOH survey, Black patients and Medicaid users experienced higher readmission rates than their NH White counterparts (*Tables 3*,*4*).

Hospitalizations and readmissions may be inevitable among cancer patients, given the symptom burden associated with the disease and or its treatment. For example, chemotherapy-induced side effects, such as refractory nausea/vomiting, pain related to metastatic lesions, and recurrent malignant effusions requiring procedures and deconditioning, may lead to hospitalizations and readmissions regardless of patients' social risks (17,18). Furthermore, preexisting comorbidities amplify disease-related and side effects of cancer treatment (19). At our institution, patients' needs and barriers, as reported on the SDOH survey, were addressed by our social workers: rides to appointments, community referrals for housing/food/financial insecurities, and transportation guidance. Our study results confirm that oncology patients may have readmissions related to the complexity of cancer and its treatment-related issues even when their health-related social needs are addressed (14,20). While the majority of previous literature focused on non-oncology patients, only a few studies directly addressed readmission rates for oncology patients. Our data is consistent with some of the previous reports highlighting that patients' social risk factors are not directly associated with readmissions (6,14,20). Previous studies reported mixed results; some

Table 4 Logistic regression model with U.S. Census SES

Characteristics	OR	95% CI	P value
Protocol implementation group			0.69
Before	–	–	
After	1.05	0.82, 1.35	0.69
Age			0.008
18–54 years	–	–	
55–64 years	0.70	0.51, 0.98	0.04
65–74 years	0.49	0.32, 0.76	0.001
75+ years	0.46	0.28, 0.75	0.002
Sex			0.08
Female	–	–	
Male	1.24	0.97, 1.57	0.08
Race/ethnicity			0.04
NH White	–	–	
NH Black	1.69	1.12, 2.53	0.01
NH other	1.26	0.62, 2.39	0.51
Hispanic	0.78	0.37, 1.51	0.49
Primary payer			0.08
Commercial/private	–	–	
Medicaid	1.58	1.06, 2.33	0.02
Medicare	1.46	0.98, 2.17	0.06
Self-pay/other	1.81	0.64, 4.51	0.23
Admission status			0.14
Elective	–	–	
Urgent	0.64	0.41, 1.00	0.05
Emergency	0.72	0.47, 1.11	0.13
The household income for $10,000 change in income	1.01	0.91, 1.11	>0.99
Public assistance income or food stamps/SNAP	0.99	0.97, 1.01	0.47

SES, socioeconomic status; OR, odds ratio; CI, confidence interval; NH, non-Hispanic; SNAP, Supplemental Nutrition Assistance Program.

investigators reported higher readmission rates among non-oncology patients from minority communities and low-income groups (3,21), while others found no clear association (20).

Investigators at the University of Chicago evaluated the predictive performance of Hospital Risk Score (HRS) when combined with SDOH. The study investigators reviewed more than 37,000 inpatient records among all hospitalized patients where a HRS was evaluated as a predictor of 30-day readmissions and compared to the combined HRS and SDOH (social HRS) and found no improvement in the readmission rates. Authors reported a significantly higher HRS (P<0.05) for those with unfavorable SDOH such as older age, disability status, low SES, a barrier to transportation etc. (20). While this study focused on inpatients admitted to local hospitals in the Chicago area, other investigators focused on readmissions after adjusting for SES and found no improvements in the readmission rates (6,14). In a separate study, Solomon *et al.* evaluated the prevalence of potentially preventable admissions and associated factors in patients with metastatic cancer. The 30-day readmission rate for metastatic cancer patients was nearly 24.5%, and among Blacks [hazard rate (HR) =1.26; 95% CI: 1.17–1.35], younger patients (HR =0.95; 95% CI: 0.91–0.99). The authors identified that preventable admissions were associated with younger age (HR per 10 years, 0.98; 95% CI: 0.98–0.99), and discharge home with services (HR =0.76; 95% CI: 0.59–0.99) (13).

Several investigators examined the impact of various interventions to reduce the readmission rates and reported their success among non-oncology patients. For example, in a meta-analysis, Leppin *et al.* examined 42 intervention trials among non-oncology patients, which successfully prevented early readmissions (22). Examples of these interventions included early discharge planning, case management involvement, telephone follow-up upon discharge, patient education, medication interventions, scheduled outpatient follow-up appointments, home visits, patient-centered discharge instructions, and increasing patient access through a hotline, etc. (22). However, only limited number of studies examined interventions to address the readmission rates for oncology patients. During a quality improvement project, Montero *et al.* successfully implemented various steps to improve 30-day readmissions among oncology services at Cleveland Clinic: (I) provider education, (II) post-discharge nurse phone calls within 2 days of discharge, and (III) post-discharge outpatient follow-up within five business days (8). As a result, the authors reported a 4.5% decrease in readmission rates (P<0.01; relative risk reduction, 18%) with a mean cost of one readmission being $10,884 and an annualized cost savings of $1.04 million (8).

While we actively address the disease-related issues and treatments for hospitalized patients, we also believe that ongoing efforts should continue to reduce readmissions

among those with health-related social risks, such as NHB patients, Medicaid users and those from low-income groups. Given that these patients continue to have a high risk of readmissions, appropriate discharge planning and care coordination for outpatient follow-up appointments may help us with treatments through the outpatient setting whenever appropriate. The authors acknowledge the limitations that may have impacted the results as it was conducted during the coronavirus disease (COVID) pandemic during which hospital admissions or LOS may have been impacted due to multiple reasons. For example, workforce shortages, and limited number of available skilled facilities (e.g., rehabilitation centers or nursing homes). In addition, higher number of readmissions among NHB may be related comorbidities or higher stage of disease or disease burden which may have impacted the disease course, LOS and readmissions.

Conclusions

This study results demonstrate that the SDOH survey implementation at our institution had no direct impact on hospital readmission rates for oncology patients. Furthermore, we found that even after addressing patients' barriers and needs as identified on the SDOH survey, a higher number of Black patients and Medicaid users had higher rates of readmissions compared to their NH White counterparts. Future studies may need to investigate interventions optimizing patients' needs and barriers across various domains of SDOH dedicated specifically to Black patients, Medicaid users, and other high-risk patients both in the inpatient and outpatient settings to reduce hospital readmissions.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://ace.amegroups.com/article/view/10.21037/ace-23-5/rc

Data Sharing Statement: Available at https://ace.amegroups.com/article/view/10.21037/ace-23-5/dss

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was exempt from formal IRB approval by institutional ethics board of Medical College of Wisconsin. Individual consent for this retrospective analysis was waived.

References

1. Whitney RL, Bell JF, Tancredi DJ, et al. Unplanned Hospitalization Among Individuals With Cancer in the Year After Diagnosis. J Oncol Pract 2019;15:e20-9.
2. Tucker-Seeley RD. Social Determinants of Health and Disparities in Cancer Care for Black People in the United States. JCO Oncol Pract 2021;17:261-3.
3. Zumbrunn A, Bachmann N, Bayer-Oglesby L, et al. Social disparities in unplanned 30-day readmission rates after hospital discharge in patients with chronic health conditions: A retrospective cohort study using patient level hospital administrative data linked to the population census in Switzerland. PLoS One 2022;17:e0273342.
4. Kamaraju S, Canales B, Wright T, et al. Patient specific factors associated with inpatient hospital length of stay for solid tumor oncology patients: a retrospective cohort study. Ann Cancer Epidemiol 2022;6:5.
5. Kamaraju T, Atkinson D, Wright T, et al. Leveraging Social Determinants of Health to Reduce Hospital Length of Stay: A Pilot QI Project for Solid Tumor Oncology Patients During the COVID-19 Pandemic. WMJ 2022;121:205-11.
6. Bernheim SM, Parzynski CS, Horwitz L, et al. Accounting

For Patients' Socioeconomic Status Does Not Change Hospital Readmission Rates. Health Aff (Millwood) 2016;35:1461-70.
7. Zettler ME, Feinberg BA, Jeune-Smith Y, et al. Impact of social determinants of health on cancer care: a survey of community oncologists. BMJ Open 2021;11:e049259.
8. Montero AJ, Stevenson J, Guthrie AE, et al. Reducing Unplanned Medical Oncology Readmissions by Improving Outpatient Care Transitions: A Process Improvement Project at the Cleveland Clinic. J Oncol Pract 2016;12:e594-602.
9. North Carolina Department of Health and Human Services. Using Standardized Social Determinants of Health Screening Questions to Identify and Assist Patients with Unmet Health-related Resource Needs in North Carolina. 2018:1-23.
10. O'Gurek DT, Henke C. A Practical Approach to Screening for Social Determinants of Health. Fam Pract Manag 2018;25:7-12.
11. Sulley S, Bayssie M. Social Determinants of Health: An Evaluation of Risk Factors Associated With Inpatient Presentations in the United States. Cureus 2021;13:e13287.
12. Yang X, Yelton B, Chen S, et al. Examining Social Determinants of Health During a Pandemic: Clinical Application of Z Codes Before and During COVID-19. Front Public Health 2022;10:888459.
13. Solomon R, Egorova N, Adelson K, et al. Thirty-Day Readmissions in Patients With Metastatic Cancer: Room for Improvement? J Oncol Pract 2019;15:e410-9.
14. van Walraven C, Wong J, Forster AJ. Influence of neighborhood household income on early death or urgent hospital readmission. J Hosp Med 2013;8:261-6.
15. Rambachan A, Abe-Jones Y, Fernandez A, et al. Racial Disparities in 7-Day Readmissions from an Adult Hospital Medicine Service. J Racial Ethn Health Disparities 2022;9:1500-5.
16. Vizient Clinical Data Base/Resource Manager. Vizient Database. 2021. Available online: https://www.vizientinc.com/our-solutions/clinical-solutions/clinical-data-base
17. Nipp RD, El-Jawahri A, Moran SM, et al. The relationship between physical and psychological symptoms and health care utilization in hospitalized patients with advanced cancer. Cancer 2017;123:4720-7.
18. Salanitro AH, Hovater M, Hearld KR, et al. Symptom burden predicts hospitalization independent of comorbidity in community-dwelling older adults. J Am Geriatr Soc 2012;60:1632-7.
19. Fowler H, Belot A, Ellis L, et al. Comorbidity prevalence among cancer patients: a population-based cohort study of four cancers. BMC Cancer 2020;20:2.
20. Obuobi S, Chua RFM, Besser SA, et al. Social determinants of health and hospital readmissions: can the HOSPITAL risk score be improved by the inclusion of social factors? BMC Health Serv Res 2021;21:5.
21. Cockerham WC, Hamby BW, Oates GR. The Social Determinants of Chronic Disease. Am J Prev Med 2017;52:S5-12.
22. Leppin AL, Gionfriddo MR, Kessler M, et al. Preventing 30-day hospital readmissions: a systematic review and meta-analysis of randomized trials. JAMA Intern Med 2014;174:1095-107.

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