



Published in final edited form as:

Support Care Cancer. 2021 October ; 29(10): 5753–5762. doi:10.1007/s00520-021-06113-z.

The financial coping strategies of US cancer patients and survivors

Meredith Doherty¹, Daniel Gardner², Jackie Finik¹

¹Immigrant Health and Cancer Disparities, Memorial Sloan Kettering Cancer Center, 485 Lexington Ave, New York, NY 10017, USA

²Silberman School of Social Work, Hunter College City University of New York, New York, NY 10021, USA

Abstract

Purpose—Coping behaviors may play a mediating role in producing the negative health outcomes observed in financially burdened cancer patients and survivors.

Methods—Exploratory factor and latent class analysis of survey data.

Results—A total of 510 people completed the survey, ages ranged from 25 to over 75 [over half greater than 55 years old (57.8%)]. Most respondents identified as female (64.7%), white (70.8%), or African American (18.6%). A four-factor model of financial coping was revealed: care-altering, lifestyle-altering, self-advocacy, and financial help-seeking. Respondents grouped into three financial coping classes: *low burden/low coping* ($n = 212$), *high self-advocacy* ($n = 143$), and *high burden/high coping* ($n = 155$). African American respondents were at far greater odds than white respondents of being in the *high burden/high coping* class (OR = 5.82, 95% CI 3.01–6.64) or the self-advocacy class (OR = 1.99, 95% CI 1.19–2.80) than the low burden/low coping class. Compared to respondents aged 65 years and older, those 35–44 were more likely in the *high burden/high coping* class (OR = 12.27, 95% CI 7.03–19.87) and the high self-advocacy class (OR = 7.08, 95% CI 5.89–8.28) than the *low burden/low coping* class.

Conclusion—One-third of respondents were in the *high burden/high coping* class. Age and race/ethnicity were significantly associated with class membership. Some coping strategies may compromise health and well-being. Program and policy interventions that reduce the odds that

[✉] Meredith Doherty, Dohertym@mskcc.org.

Author contribution Dr. Doherty conceptualized and wrote 90% of the manuscript, Dr. Gardner assisted in conceptualizing and editing, and Ms. Finik designed, conducted, and wrote up the statistical approach, results, and tables.

Conflict of interest The authors declare no competing interests.

Ethics approval Ethical approval was provided by the Human Research Protection Program (HRPP) of Hunter College, City University of New York determined that this study, a secondary analysis of de-identified survey data, did not meet the requirements for human subjects research and was therefore exempt from IRB review (IRB File #2017-0067).

Consent to participate Under the informed consent terms of the original study, reviewed and approved by the Human Research Protection Program (HRPP) of Hunter College, City University of New York, respondents provided written consent to participate.

Consent for publication Under the informed consent terms of the original study, reviewed and approved by the Human Research Protection Program (HRPP) of Hunter College, City University of New York, participants permitted the researchers to use their responses for the purposes of ongoing research.

Code availability R code used for these analyses is available upon request from the authors.

patients will use strategies that undermine treatment outcomes and increase patient use of protective strategies are needed.

Keywords

Cancer; Financial coping; Financial hardship; Health disparities; Quality of life; Supportive care

Nearly half (42.5%) of the 15 million cancer survivors living in the USA are likely to deplete their entire life's assets within 2 years of diagnosis [1]. Cancer-related financial hardship, caused by high out-of-pocket medical costs and reduced income, is associated with increased pain and symptom burden, depression, treatment nonadherence, and death [2–9]. Although the mechanisms that link financial hardship to poor health outcomes are not fully understood, coping behaviors have been hypothesized as possible mediators [10]. Financial coping behaviors are strategies that cancer patients use to manage the costs of their care, such as: medication underuse and treatment nonadherence, shopping around or asking providers to lower costs, cutting back on non-essential or essential spending, borrowing money or using credit cards, filing for bankruptcy, and missing rent/mortgage and utility payments [11–19].

Folkman and Lazarus describe two modes of coping with stress: emotion-focused and problem-focused [20, 21]. The literature on financial coping in cancer typically focuses on problem-focused strategies and has been broadly clustered into two main strategies: care-altering or lifestyle-altering [19]. Care-altering describes actions taken to reduce the cost of care by delaying or forgoing aspects of treatment, and lifestyle-altering refers to actions directed at other forms of spending [19]. Research on financial coping remains in its early stages, and the field lacks a conceptual framework. In this study, we analyzed secondary survey data from an online study of US cancer patients and survivors to (1) identify distinct problem-focused financial coping strategies, (2) determine if individuals sorted into “coping classes” by employing different combinations of financial coping strategies, and (3) measure the extent to which sociodemographic factors were associated with coping class membership.

Methods

Data collection

Between July and December 2015, 3000 individuals derived from a list of US market research participants were contacted by email to participate in an online survey about cancer-related financial hardship and health insurance. To qualify respondents had to be (1) 25 years of age or older, (2) have a history of cancer (except non-melanoma skin cancer), and (3) have health insurance. Respondents were stratified by geographic region and cancer type to approximate the features of the US population of cancer patients and survivors. Stratification was achieved by using filters in the data collection that automatically screened out participants who represented a geographic region or cancer type once the sample size for each strata had been met. Participants were compensated with the equivalent of \$20 in “green bucks” which could be used to purchase items in certain online stores, and 510 respondents completed a 41-item survey that was developed by researchers and an

advisory panel of patients and national oncology experts to capture the financial concerns of cancer patients and survivors [22]. The survey was designed initially to assess the needs and experiences of US cancer patients and survivors in order to develop supportive programming. The organization that initiated the study was not striving for reproducibility or generalizability, as such it was not qualified as research and did not require IRB approval. The authors sought ethical approval for this secondary analysis from the Human Research Protection Program (HRPP) of Hunter College, City University of New York who determined that this study, a secondary analysis of de-identified survey data, did not meet the requirements for human subjects research and was therefore exempt from IRB review (IRB File #2017–0067). Under the informed consent terms of the original project, respondents permitted the researchers to use their responses for the purposes of ongoing research.

Variables

Financial coping—There were 32 survey items on financial coping that reflected the main categories of coping described in the literature: care-altering and lifestyle-altering. For example, respondents were asked how often (*never, rarely, sometimes, often or always*) they postponed or skipped medical appointments, follow-up testing, or doses of prescribed drugs. They were also asked if they ever declared bankruptcy, borrowed money, cut back on essential or non-essential items, or missed rent, mortgage, or utility payments. For a more complete list of survey items, please see Table 2.

Sociodemographic and health variables—Respondents indicated their current age, race/ethnicity, gender, education, annual household income, and time since diagnosis using mutually exclusive categorical variables. Respondents were asked to report their cancer type, current treatment status as *active, on maintenance treatment, or completed treatment*. Health insurance categories that applied at the time of the survey included: private employer sponsored insurance, marketplace, Medicaid, Medicare only, Medicare with supplemental, VA/Tricare, or other insurance. Respondents were asked about their employment status during treatment: continued working full time, continued working part time, switched from working full time to working part time, stopped working, or N/A I was not working before treatment.

Data analysis

Descriptive statistics summarized cohort characteristics. Categorical variables were summarized using frequencies and percentages, and normally distributed continuous variables were summarized using means and standard deviations. We conducted exploratory factor analysis to reduce data and identify conceptual domains. Next, latent class analysis (LCA) was used to determine the number of latent classes of financial coping using responses from the financial stress and financial coping behavior questionnaire. Models with $k, k + 1 \dots 6$, were tested iteratively until optimal fit was established qualitatively and quantitatively. We assessed model fit using the Akaike information criterion (AIC), Bayesian information criterion (BIC), likelihood ratio test, and entropy. Next chi-square tests with Bonferroni adjustment for multiple testing were used to evaluate associations between demographic and class membership variables. Significant variables were entered into a

multinomial logit model where the categorical dependent variable was class membership, with class 1 (*low burden/low coping*) set as the reference class.

Results

Descriptive analysis

The respondents ($n = 510$) were majority female (65%) and 55 years of age (59%). Twenty percent were in active treatment and 79% had completed their cancer treatment at the time of the survey. Nearly half (48.1%) had a 4-year college degree or more, 70.8% identified as white non-Hispanic, 18.6% identified as African American, and 5.9% identified as Hispanic. Table 1 presents overall characteristics of the sample.

Exploratory factor analysis

The 32 items were highly factorable (Bartlett $p < .001$, KMO = 0.929); principle axis factor analysis (PAF) with orthogonal varimax rotation produced four factors with Eigenvalues over 1.0, accounting for 45%, 29%, 11%, and 8% of variance, respectively. Items with the highest factor loadings were retained for a total of 25 items in the final model. Two of the factors aligned well with existing financial coping categories: care-altering and lifestyle-altering. The other two factors were assigned concept labels from the cancer, health and coping literature: self-advocacy and financial help-seeking. Table 2 presents 25 items matched to concept labels.

Latent class analysis

Based on our model fit criteria, a three-class model was retained (see Table 3 for details). The *low burden/low coping* class ($n = 212$) characterized by low probability (< 0.25) for responding sometimes, often, or always to care-altering items, self-advocacy items, lifestyle-altering items, and financial help-seeking items. The *high self-advocacy* class ($n = 143$) characterized by very low probability (< 0.25) for responding sometimes, often, or always to care-altering items, but moderate to high probability ($> .60$) across key self-advocating items. Lastly, the *high burden/high coping* class ($n = 155$) characterized by moderate to high probability ($> .60$) for responding sometimes, often, or always to all care-altering items (e.g., skipping or postponing filling a prescription) and all self-advocating items, as well as moderate probability ($> .50$) for responding sometimes, often, or always to several key lifestyle-altering and financial help-seeking items. Table 4 presents the conditional probability of items for each class.

Regression

Demographically, the *high burden/high coping* class had the largest proportion of African Americans (34%), people on Medicaid (49%), and part-time or reduced-time workers (20%, 23.9%, respectively), as compared to the other two classes. The multinomial logistic regression used to predict class membership included age, ethnicity/race, insurance type, and treatment type (surgery). After adjusting for confounders, younger (< 65 years) respondents, as compared to those 65–74 years old, were more likely to be part of the *high burden/high coping* class or the *high self-advocacy* class than the *low burden/low coping* class. Specifically, those 25–34 had higher odds of being in the *high burden/high coping* class

(OR = 9.87, 95% CI 8.59–11.14) and higher odds of being in the *high self-advocacy* class (OR = 3.10, 95% CI 2.05–4.16); those 35–44 had greater odds of being in the *high burden/high coping* class (OR = 12.27, 95% CI 7.03–19.87) and greater odds of being in the *high self-advocacy* class (OR = 7.08, 95% CI 5.89–8.28); those 45–54 had higher odds of being in the *high burden/high coping* class (OR = 7.58, 95% CI 6.35–8.81) and those 55–64 had higher odds of being in the *high burden/high coping* class (OR = 4.11, 95% CI 2.91–5.93), as compared to those 65–74 years old. Compared to white respondents, African American (OR = 5.82, 95% CI 3.01–6.64) and Hispanic (OR = 5.60, 95% CI 4.40–6.79) respondents had nearly six times higher odds of belonging to the *high burden/high coping* class than the *low burden/low coping* class. African American respondents were also at increased odds of belonging to the high self-advocacy class than the low burden/low coping group, when compared to white respondents (OR = 1.99, 95% CI 1.19–2.80). Table 5 presents the likelihood of class membership by sociodemographic and health factors.

Discussion

This study aimed to characterize financial coping among a geographically stratified sample of US cancer patients and survivors and to explore the sociodemographic factors associated with variation in coping. Coping behaviors are thought to play a mediating role in producing the negative health outcomes observed in financially burdened cancer patients and survivors [10, 11, 23]. Little is known, in this emerging field, about the full range of financial coping strategies, their determinants, and how they are employed (e.g., in combination, alone, or in sequence). Findings from this study contribute two valuable insights. First, we propose a novel model of financial coping that includes four conceptual domains: care-altering, lifestyle-altering, financial help-seeking, and self-advocacy. This adds two new coping domains to the strategies that are currently established in the cancer financial coping literature (i.e., care-altering and lifestyle-altering) [11–19, 23]. Second, we identified three financial coping typologies (i.e., *low burden/low coping*, *high self-advocacy*, and *high burden/high coping*) that varied significantly by age and race/ethnicity. Together, these findings suggest that financially burdened patients either engage in more self-advocacy or use a combination of all four coping strategies.

Thirty-one percent of respondents were in the *high burden/high coping* class; they employed all four financial coping strategies to manage the costs of their care. Even after accounting for health insurance and treatment type, African American and Hispanic respondents had far greater odds than white respondents of being in the *high burden/high coping* class than in the *low burden/low coping* class. Compared to individuals over 65 years old, everyone under 65 had greater odds of belonging to the *high burden/high coping* class than the *low burden/low coping* class. Twenty-eight percent of respondents mostly employed self-advocacy to manage the costs of their care, meaning they were more likely to estimate out-of-pocket costs before agreeing to treatment or appeal to their health insurance company than to use any of the other coping strategies. Younger respondents had greater odds of engaging in self-advocacy than respondents over 65, and African American respondents had greater odds than white respondents. The remaining 41% of respondents were in the low burden/low coping class, which was composed of a larger proportion of respondents who identified as white.

Over half of the respondents in this study engaged in financial coping, which aligns with past estimates that up to 45% of cancer patients engage in some form of behavioral financial coping [11]. The finding that African American and Hispanic respondents were more likely to engage in high levels of financial coping is consistent with studies that suggest racial minorities are more likely to experience cancer-related financial hardship [12, 24–29] and have difficulties accessing care [30, 31]. Although we did not have significant findings, insurance type has been associated with financial coping in past studies. de Souza and colleagues found that low-income head and neck cancer patients on Medicaid had 42 times higher odds of financial coping than respondents with private health insurance [23]. Younger patients' higher likelihood of experiencing cancer-related financial hardship and engaging in financial coping is well-documented [32–36]. Surprisingly, income did not play a meaningful role in determining group membership, as such, we did not include it in the adjusted models. Although studies have found associations between annual household income and financial hardship, this relationship may not be straightforward [26, 28, 37, 38]. Low-income individuals are more likely to experience cancer-related financial hardship; however, income alone does not protect people from the consequences of high medical costs [39]. Other factors such as insurance type, family size/make-up, out-of-pocket cost of medical and non-medical health needs, and employment should be considered along with income.

Limitations

As with all surveys, recall bias must be considered and cross-sectional data precludes inferences about causality and the sequencing of events. Although it was a stratified national sample, respondents were a self-selected group of online market research participants and therefore not representative of the US cancer patient and survivor population. Filtering software was used to reach a pre-determined sample size for each geographic region and cancer type so that the final sample would be balanced across those variables. We could not determine a precise response rate because we could not access information on the number of eligible respondents who were screened out from those who declined to participate. By including only English-speaking respondents with health insurance and web-access, the study missed out on segments of the American population that are at high-risk of financial hardship [40]. Consequently, the findings could underestimate or distort the relative prevalence of each financial coping strategy in the wider population. The survey also did not collect information on family size, making household income difficult to interpret. This study only examined problem-focused coping and did not attend to affective or emotion-focused coping.

Implications

We found that when patients and survivors are financially stressed, they use a combination of coping strategies that include altering their care, altering their spending, asking for financial assistance, and advocating for themselves with insurers and providers. While coping strategies that undermine patients' adherence to treatment or their quality of life should be prevented, positive strategies could be an important ingredient in the development of an effective clinical response to cancer-related financial hardship. A better understanding of patients' use of positive coping strategies such as self-advocacy and financial help-

seeking could be useful in developing clinical and community health interventions that reinforce or teach these behaviors.

To examine cancer-related financial hardship and financial coping more thoroughly, future studies should include more individuals who are at risk for financial toxicity, including those who do not speak English or have health insurance. Longitudinal studies that use both self-reported and observational data are needed to further characterize the sequence of events and identify pathways in the development of financial hardship and financial coping. Given that up to 73% of cancer patients experience emotional distress related to financial hardship [41], more research should be conducted on emotion-focused coping. Collecting and integrating data on emotion- and problem-focused coping with financial hardship will help to build a more comprehensive model of financial coping and aid in the development of clinical interventions and future research.

Cancer-related financial hardship is a multilevel social problem caused by interactions across the healthcare system [42]. A solution that focuses too heavily on individual-level competencies and behaviors is not only inadequate but also could be excessively burdensome to patients and their caregivers. Compared to cancer patients and survivors in developed countries with universal healthcare systems, people in the USA have higher out-of-pocket costs and experience greater financial stress [43]. A well-constructed universal healthcare system could improve access for underserved patient populations and reduce the financial burden of care. Although the Patient Protection and Affordable Care Act (2010) sought to achieve universal access and reduce the financial burden of care, a recent study suggested that the policy did not make a significant impact on the incidence of medical bankruptcy in the USA [44]. Catalyzed by a growing grassroots movement, US policy makers have been examining the benefits of expanding access to existing public insurance options like Medicare and Medicaid [45, 46]. Although universal healthcare systems produce lower out-of-pockets costs, they do not mitigate the indirect costs of cancer such as income lost due to employment disruption, which disproportionately affects low-income and racial minority cancer patients [47]. There is a renewed interest in understanding the impact of guaranteed income (e.g., universal basic income/negative income tax) on health outcomes, but this research has yet to be conducted with cancer patients [48].

In conclusion, we propose that patients employ four problem-focused coping strategies—care-altering, lifestyle-altering, self-advocacy, and financial help-seeking. People with greater financial burden varied only slightly in their use of coping strategies: those who engage in more self-advocacy and those who engage in all four strategies. Overall, age and race/ethnicity were important indicators of variation in financial burden and coping, as defined by membership in one of the three distinct classes. Further research is needed to understand the role that coping plays in this complex system and develop interventions that reduce financial hardship while maximizing positive coping. Attending to financial burden early and directly is critical to promoting and enhancing well-being among cancer patients and survivors. Ultimately, eliminating cancer-related financial hardship will require a multilevel approach that combines interventions at the policy and program level.

Funding

Postdoctoral Fellowship in Psycho-Oncology [MSKCC Strategy & Innovation]; Cancer Center Support Grant (Population Science Research Program) [P30 CA008748-51, NCI]; American Cancer Society Doctoral Training Grant [129554-DSW-16-071-01-SW, ACS].

Data Availability

The data that support the findings of this study are available from *CancerCare*. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the authors with the permission of Ellen Miller-Sonet (esonet@cancercare.org).

References

- Gilligan AM, Alberts DS, Roe DJ, Skrepnek GH (2018) Death or debt? National estimates of financial toxicity in persons with newly-diagnosed cancer. *Am J Med* 131(10):1187–1199 [PubMed: 29906429]
- Fenn KM, Evans SB, McCorkle R, DiGiovanna MP, Puzstai L, Sanft T et al. (2014) Impact of financial burden of cancer on survivors' quality of life. *J Oncol Pract* 10(5):332–338 [PubMed: 24865220]
- Zafar SY, McNeil RB, Thomas CM, Lathan CS, Ayanian JZ, Provenzale D (2015) Population-based assessment of cancer survivors' financial burden and quality of life: a prospective cohort study. *J Oncol Pract* 11(2):145–150 [PubMed: 25515717]
- Dusetzina SB, Winn AN, Abel GA, Huskamp HA, Keating NL (2014) Cost sharing and adherence to tyrosine kinase inhibitors for patients with chronic myeloid leukemia. *J Clin Oncol* 32(4):306–311 [PubMed: 24366936]
- Neugut AI, Subar M, Wilde ET, Stratton S, Brouse CH, Hillyer GC, Grann VR, Hershman DL (2011) Association between prescription co-payment amount and compliance with adjuvant hormonal therapy in women with early-stage breast cancer. *J Clin Oncol* 29(18):2534–2542 [PubMed: 21606426]
- Lathan CS, Cronin A, Tucker-Seeley R, Zafar SY, Ayanian JZ, Schrag D (2016) Association of financial strain with symptom burden and quality of life for patients with lung or colorectal cancer. *J Clin Oncol* 34(15):1732–1740 [PubMed: 26926678]
- Holland JC, Andersen B, Breitbart WS, Compas B, Dudley MM, Fleishman S et al. (2010) Distress management. *J Natl Compr Cancer Netw* 8(4):448–485
- Meeker CR, Geynisman DM, Egleston BL, Hall MJ, Mechanic KY, Bilusic M, Plimack ER, Martin LP, von Mehren M, Lewis B, Wong YN (2016) Relationships among financial distress, emotional distress, and overall distress in insured patients with cancer. *J Oncol Pract* 12(7):e755–e764 [PubMed: 27328795]
- Ramsey SD, Bansal A, Fedorenko CR, Blough DK, Overstreet KA, Shankaran V, Newcomb P (2016) Financial insolvency as a risk factor for early mortality among patients with cancer. *J Clin Oncol* 34(9):980–986 [PubMed: 26811521]
- Zafar YS (2016) Financial toxicity of cancer care: it's time to intervene. *J Natl Cancer Instit* 108(5):djv370
- Altice CK, Banegas MP, Tucker-Seeley RD, Yabroff KR (2017) Financial hardships experienced by cancer survivors: a systematic review. *JNCI: J Natl Cancer Instit* 109(2):djw205
- Jagsi R, Pottow JA, Griffith KA, Bradley C, Hamilton AS, Graff J et al. (2014) Long-term financial burden of breast cancer: experiences of a diverse cohort of survivors identified through population-based registries. *J Clin Oncol* 32(12):1269–1276 [PubMed: 24663041]
- Bestvina CM, Zullig LL, Rushing C, Chino F, Samsa GP, Altomare I et al. (2014) Patient-oncologist cost communication, financial distress, and medication adherence. *J Oncol Pract* 10(3):162–167 [PubMed: 24839274]

14. Kent EE, Forsythe LP, Yabroff KR, Weaver KE, de Moor JS, Rodriguez JL, Rowland JH (2013) Are survivors who report cancer-related financial problems more likely to forgo or delay medical care? *Cancer* 119(20):3710–3717 [PubMed: 23907958]
15. Zafar SY, Peppercorn JM, Schrag D, Taylor DH, Goetzinger AM, Zhong X, Abernethy AP (2013) The financial toxicity of cancer treatment: a pilot study assessing out-of-pocket expenses and the insured cancer patient's experience. *Oncologist* 18(4):381–390 [PubMed: 23442307]
16. Huntington SF, Weiss BM, Vogl DT, Cohen AD, Garfall AL, Mangan PA, Doshi JA, Stadtmauer EA (2015) Financial toxicity in insured patients with multiple myeloma: a cross-sectional pilot study. *Lancet Haematol* 2(10):e408–e416 [PubMed: 26686042]
17. Irwin B, Kimmick G, Altomare I, Marcom PK, Houck K, Zafar SY, Peppercorn J (2014) Patient experience and attitudes toward addressing the cost of breast cancer care. *Oncologist* 19(11):1135–1140 [PubMed: 25273078]
18. Zullig LL, Peppercorn JM, Schrag D, Taylor DH Jr, Lu Y, Samsa G, ... Zafar SY (2013) Financial distress, use of cost-coping strategies, and adherence to prescription medication among patients with cancer. *J Oncol Pract* 9(6S):60s–63s [PubMed: 29431038]
19. Nipp RD, Zullig LL, Samsa G, Peppercorn JM, Schrag D, Taylor DH Jr, Abernethy AP, Zafar SY (2016) Identifying cancer patients who alter care or lifestyle due to treatment-related financial distress. *Psycho-oncology* 25(6):719–725 [PubMed: 26149817]
20. Lazarus RS, Folkman S (1984) *Stress, appraisal, and coping*. Springer publishing company
21. Folkman S, Lazarus RS (1988) Coping as a mediator of emotion. *J Pers Soc Psychol* 54(3):466–475 [PubMed: 3361419]
22. CancerCare. (2016). *CancerCare patient access and engagement report*. CancerCare.
23. de Souza JA, Kung S, O'Connor J, Yap BJ (2017) Determinants of patient-centered financial stress in patients with locally advanced head and neck cancer. *J Oncol Pract* 13(4):e310–e318 [PubMed: 28195811]
24. Hastert TA, Banegas MP, Hamel LM, Reed AR, Baird T, Beebe-Dimmer JL, Schwartz AG (2019) Race, financial hardship, and limiting care due to cost in a diverse cohort of cancer survivors. *J Cancer Surviv* 13(3):429–437 [PubMed: 31144264]
25. Hershman DL, Tsui J, Wright JD, Coromilas EJ, Tsai WY, Neugut AI (2015) Household net worth, racial disparities, and hormonal therapy adherence among women with early-stage breast cancer. *J Clin Oncol* 33(9):1053–1059 [PubMed: 25691670]
26. Yabroff KR, Dowling EC, Guy GP Jr, Banegas MP, Davidoff A, Han X et al. (2016) Financial hardship associated with cancer in the United States: findings from a population-based sample of adult cancer survivors. *J Clin Oncol* 34(3):259–267 [PubMed: 26644532]
27. Wheeler SB, Spencer JC, Pinheiro LC, Carey LA, Olshan AF, Reeder-Hayes KE (2018) Financial impact of breast cancer in black versus white women. *J Clin Oncol* 36(17):1695–1701 [PubMed: 29668368]
28. Ekwueme DU, Zhao J, Rim SH, de Moor JS, Zheng Z, Khushalani JS, Han X, Kent EE, Yabroff KR (2019) Annual out-of-pocket expenditures and financial hardship among cancer survivors aged 18–64 years—United States, 2011–2016. *Morb Mortal Wkly Rep* 68(22):494–499
29. Murphy CC, Harlan LC, Warren JL, Geiger AM (2015) Race and insurance differences in the receipt of adjuvant chemotherapy among patients with stage III colon cancer. *J Clin Oncol* 33(23):2530–2536 [PubMed: 26150445]
30. Karanth S, Fowler ME, Mao X, Wilson LE, Huang B, Pisu M et al. (2019) Race, socioeconomic status, and health-care access disparities in ovarian cancer treatment and mortality: systematic review and meta-analysis. *JNCI Cancer Spectrum* 3(4):pkz084 [PubMed: 31840133]
31. Krimphove MJ, Cole AP, Fletcher SA, Harmouch SS, Berg S, Lipsitz SR et al. (2019) Evaluation of the contribution of demographics, access to health care, treatment, and tumor characteristics to racial differences in survival of advanced prostate cancer. *Prostate Cancer Prostatic Dis* 22(1):125–136 [PubMed: 30171227]
32. Knight TG, Deal AM, Dusetzina SB, Muss HB, Choi SK, Bensen JT, Williams GR (2018) Financial toxicity in adults with cancer: adverse outcomes and noncompliance. *J Oncol Pract* 14(11):e665–e673

33. Rim SH, Guy GP Jr, Yabroff KR, McGraw KA, Ekwueme DU (2016) The impact of chronic conditions on the economic burden of cancer survivorship: a systematic review. *Exp Rev Pharmacoecon Outcomes Res* 16(5):579–589
34. Weaver KE, Rowland JH, Bellizzi KM, Aziz NM (2010) Forgoing medical care because of cost: assessing disparities in healthcare access among cancer survivors living in the United States. *Cancer* 116(14):3493–3504 [PubMed: 20549763]
35. Banegas MP, Guy GP Jr, de Moor JS, Ekwueme DU, Virgo KS, Kent EE, Nutt S, Zheng Z, Rechis R, Yabroff KR (2016) For working-age cancer survivors, medical debt and bankruptcy create financial hardships. *Health Aff* 35(1):54–61
36. Ramsey S, Blough D, Kirchhoff A, Kreizenbeck K, Fedorenko C, Snell K, Newcomb P, Hollingworth W, Overstreet K (2013) Washington State cancer patients found to be at greater risk for bankruptcy than people without a cancer diagnosis. *Health Aff* 32(6):1143–1152
37. Shankaran V, Jolly S, Blough D, Ramsey SD (2012) Risk factors for financial hardship in patients receiving adjuvant chemotherapy for colon cancer: a population-based exploratory analysis. *J Clin Oncol* 30(14):1608–1614 [PubMed: 22412136]
38. Azzani M, Roslani AC, Su TT (2015) The perceived cancer-related financial hardship among patients and their families: a systematic review. *Support Care Cancer* 23(3):889–898 [PubMed: 25337681]
39. Tucker-Seeley RD, Yabroff KR (2016) Minimizing the “financial toxicity” associated with cancer care: advancing the research agenda. *JNCI: J Natl Cancer Instit* 108(5):djv410
40. Gany FM, Shah SM, Changrani J (2006) New York City’s immigrant minorities: reducing cancer health disparities. *Cancer* 107(S8):2071–2081 [PubMed: 16983657]
41. Gordon LG, Merollini KM, Lowe A, Chan RJ (2017) A systematic review of financial toxicity among cancer survivors: we can’t pay the co-pay. *Patient Patient-Cent Outcomes Res* 10(3):295–309
42. Yabroff KR, Zhao J, Zheng Z, Rai A, Han X (2018) Medical financial hardship among cancer survivors in the United States: what do we know? What do we need to know? *Cancer Epidemiol Prevent Biomark* 27(12):1389–1397
43. Longo CJ, Fitch MI, Banfield L, Hanly P, Yabroff KR, Sharp L (2020) Financial toxicity associated with a cancer diagnosis in publicly funded healthcare countries: a systematic review. *Support Care Cancer* 28:4645–4665. 10.1007/s00520-020-05620-9 [PubMed: 32653957]
44. Himmelstein DU, Lawless RM, Thorne D, Foohey P, & Woolhandler S (2019). Medical bankruptcy: still common despite the Affordable Care Act.
45. Wikelius K, O’Toole A (n.d.) Medicaid buy-in: state of play. Retrieved of August 28, 2019 from <https://unitedstatesofcare.org/wp-content/uploads/2018/12/MBI-Memo.pdf>
46. Johnson M, Kishore S, Berwick DM (2020) Medicare for All: an analysis of key policy issues: a discussion of design issues and options raised by pending Medicare for All legislation and proposals. *Health Aff* 39(1):133–141
47. Blinder VS, Gany FM (2020) Impact of cancer on employment. *J Clin Oncol Off J Am Soc Clin Oncol* 38(4):302–309
48. Gibson M, Hearty W, Craig P (2020) The public health effects of interventions similar to basic income: a scoping review. *Lancet Public Health* 5(3):e165–e176 [PubMed: 32113520]

Table 1

Sample characteristics

	Class 1 "Low Burden/Low Coping" (n = 212)	Class 2 "High Self-Advocacy" (n = 143)	Class 3 "High Burden/High Coping" (n = 155)	Total (n = 510)
Age				
25–34 years	14 (6.6%)	21 (14.7%)	36 (23.2%)	71 (13.9%)
35–44 years	6 (2.8%)	21 (14.7%)	28 (18.1%)	55 (10.8%)
45–54 years	27 (12.7%)	23 (16.1%)	39 (25.2%)	89 (17.5%)
55–64 years	55 (25.9%)	36 (25.2%)	35 (22.6%)	126 (24.7%)
65–74 years	97 (45.8%)	39 (27.3%)	15 (9.7%)	151 (29.6%)
> 75	13 (6.1%)	3 (2.1%)	2 (1.3%)	18 (3.5%)
Sex				
Male	79 (37.3%)	41 (28.7%)	60 (38.7%)	180 (35.3%)
Female	133 (62.7%)	102 (71.3%)	95 (61.3%)	330 (64.7%)
Education				
High school graduate or less	40 (18.9%)	27 (18.9%)	29 (18.7%)	96 (18.8%)
Some college	62 (29.2%)	49 (34.3%)	57 (36.8%)	168 (32.9%)
Bachelor's degree	66 (31.1%)	41 (28.7%)	46 (29.7%)	153 (30.0%)
Master's degree	44 (20.8%)	26 (18.2%)	23 (14.8%)	93 (18.2%)
Ethnicity				
African American	17 (8.0%)	25 (17.5%)	53 (34.2%)	95 (18.6%)
Asian	3 (1.4%)	5 (3.5%)	2 (1.3%)	10 (2.0%)
Hispanic	6 (2.8%)	9 (6.3%)	15 (9.7%)	30 (5.9%)
White non-Hispanic	182 (85.8%)	99 (69.2%)	80 (51.6%)	361 (70.8%)
Multi-racial	4 (1.9%)	3 (2.1%)	3 (1.9%)	10 (2.0%)
Other	0 (0%)	2 (1.4%)	2 (1.3%)	4 (0.8%)
Total household income				
< \$25,000	29 (13.7%)	16 (11.2%)	21 (13.5%)	66 (12.9%)
\$25,000–\$34,999	19 (9.0%)	19 (13.3%)	19 (12.3%)	57 (11.2%)
\$35,000–\$49,999	21 (9.9%)	19 (13.3%)	19 (12.3%)	59 (11.6%)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

	Class 1 “Low Burden/Low Coping” (n = 212)	Class 2 “High Self-Advocacy” (n = 143)	Class 3 “High Burden/High Coping” (n = 155)	Total (n = 510)
\$50,000–\$74,999	44 (20.8%)	31 (21.7%)	30 (19.4%)	105 (20.6%)
\$75,000–\$99,999	40 (18.9%)	23 (16.1%)	23 (14.8%)	86 (16.9%)
\$100,000–\$149,999	35 (16.5%)	20 (14.0%)	26 (16.8%)	81 (15.9%)
> \$150,000	12 (5.7%)	5 (3.5%)	12 (7.7%)	29 (5.7%)
Missing	12 (5.7%)	10 (7.0%)	5 (3.2%)	27 (5.3%)
Health insurance				
Employer sponsored	41 (19.3%)	28 (19.6%)	20 (12.9%)	89 (17.5%)
Medicaid	51 (24.1%)	48 (33.6%)	76 (49.0%)	175 (34.3%)
Medicare	45 (21.2%)	14 (9.8%)	8 (5.2%)	67 (13.1%)
Medicare and supplemental	33 (15.6%)	13 (9.1%)	4 (2.6%)	50 (9.8%)
Other	31 (14.6%)	28 (19.6%)	29 (18.7%)	88 (17.3%)
VA only	3 (1.4%)	1 (0.7%)	9 (5.8%)	13 (2.5%)
Missing	4 (1.9%)	2 (1.4%)	2 (1.3%)	8 (1.6%)
Employment status (at time of cancer treatment)				
Was not working	77 (36.3%)	54 (37.8%)	44 (28.4%)	175 (34.3%)
Continued full time	25 (11.8%)	14 (9.8%)	24 (15.5%)	63 (12.4%)
Continued part time	3 (1.4%)	10 (7.0%)	31 (20.0%)	44 (8.6%)
Switched from full time to part time	32 (15.1%)	30 (21.0%)	37 (23.9%)	99 (19.4%)
Stopped working	75 (35.4%)	35 (24.5%)	19 (12.3%)	129 (25.3%)

Table 2

Financial coping survey items by dimension

	Factor	Factor loading
How often (never, rarely, sometimes, often, or always) did/do you do each of the following in order to reduce your expenses related to your cancer treatment:		
(1) Postpone or skip medical appointments	1	0.84
(2) Postpone or skip follow up testing	1	0.85
(3) Postpone or skip bloodwork	1	0.83
(4) Postpone or skip filling a prescription	1	0.85
(5) Delay or skip complementary treatment	1	0.70
(6) Postpone or skip psychological support	1	0.75
(7) Skip dosage of prescribed drugs	1	0.87
(8) Cut pills in half	1	0.75
(9) Choose a lower cost medication	1	0.82
(10) Order medication from outside US	1	0.68
(11) Estimate cost before going to ER	2	0.75
(12) Estimate cost before agreeing to treatment	2	0.79
(13) Appeal a denial of benefit from you insurance company	2	0.54
(14) Estimate cost before filling a prescription	2	0.84
(15) Find out cost before filling a prescription for side effects/symptoms	2	0.81
(16) Review the explanation of benefits from insurance company	2	0.58
(17) Ask insurance company for help understanding coverage	2	0.64
(18) Find out cost of lab test or scans before agreeing to testing	2	0.81
(19) Applied for co-payment assistance	4	0.51
(20) Applied for financial assistance for non-medical expenses	4	0.56
(21) Applied for financial assistance through provider	4	0.56
Which of the following have you experienced as a result of bills related to your cancer treatment (yes/no):		
(22) I borrowed money from family/friends	3	0.55
(23) I missed rent/mortgage payments	3	0.60
(24) I cut back on groceries, transportation, clothing, tuition	3	0.51
(25) I missed paying bills like heat, electricity, phone	3	0.70

Table 3

Latent class model accuracy and diagnostics

#Clusters	Model	LL ^a	BIC ^b	aBIC ^c	cAIC ^d	VLRT (p) ^e	Entropy
2	Model 2	-8889.83	18,259.72	18,015.31	18,336.72	< .001	0.941
3	Model 3	-8500.22	17,723.62	17,355.42	17,839.62	< .001	0.929
4	Model 4	-8211.29	17,388.92	16,896.92	17,543.92	< .001	0.928
5	Model 5	-8068.23	17,345.94	16,730.16	17,539.94	< .001	0.905
6	Model 6	-7923.79	17,300.21	16,560.63	17,533.21	< .001	0.935

NB:

^a LL, loglikelihood^b BIC, Bayesian information criterion^c aBIC, adjusted Bayesian information criterion^d AIC, Akaike information criterion^e VLRT, Vuong, Lo, Mendel, and Rubin likelihood ratio test

Table 4

Conditional item response probabilities

Item/response (n = 510)	Class 1		Class 2		Class 3	
	“Low Burden/Low Coping”		“High Self-Advocacy”		“High Burden/High Coping”	
	Pr(1)	Pr(2)	Pr(1)	Pr(2)	Pr(1)	Pr(2)
Skip doctor’s appointments	0.9516	0.0484	0.8733	0.1267	0.3207	0.6793
Skip follow-up testing	0.9706	0.0294	0.8972	0.1028	0.2538	0.7462
Skip bloodwork	0.9750	0.0250	0.9584	0.0416	0.2948	0.7052
Skip or postpone filling prescriptions	0.9623	0.0377	0.9003	0.0997	0.1979	0.8021
Skip complementary treatment	0.6615	0.3385	0.5247	0.4753	0.1476	0.8524
Skip psychological counseling	0.6716	0.3284	0.5655	0.4345	0.1482	0.8518
Skip dosages of prescribed medication	0.9545	0.0455	0.9617	0.0383	0.2493	0.7507
Cut pills in half	0.9595	0.0405	0.9314	0.0686	0.2828	0.7172
Asked for financial help from a church	0.9685	0.0315	0.9106	0.0894	0.8224	0.1776
Applied for financial assistance from PAP	0.9469	0.0531	0.8387	0.1613	0.7182	0.2818
Applied for co-pay assistance	0.9179	0.0821	0.6388	0.3612	0.2138	0.7862
Discussed changing to less costly treatment	0.9728	0.0272	0.7110	0.2890	0.1758	0.8242
Chose a lower cost medication	0.9491	0.0509	0.6988	0.3012	0.1551	0.8449
Found out cost before filling prescriptions	0.8739	0.1261	0.1856	0.8144	0.2748	0.7252
Found out cost before filling out prescription for side effects	0.9363	0.0637	0.1678	0.8322	0.2697	0.7303
Reviewed explanation of benefits	0.5430	0.4570	0.1038	0.8962	0.2682	0.7318
Found out cost before a scan	0.9047	0.0953	0.3672	0.6328	0.3951	0.6049
Considered lower cost alt. treatment	0.9728	0.0272	0.6523	0.3477	0.3577	0.6423
Applied for financial assistance for non-medical costs	0.8779	0.1221	0.7329	0.2671	0.2213	0.7787
Ordered medications from non-US sources	0.9514	0.0486	0.8386	0.1614	0.3203	0.6797
Applied for financial assist. from doctor	0.8860	0.1114	0.7296	0.2704	0.2226	0.7774
Applied for financial assist. from hospital	0.9574	0.0426	0.8437	0.1563	0.7571	0.2429
Determined expense before going to ER	0.9519	0.0481	0.4834	0.5166	0.3856	0.6144
Estimated cost before agreeing to treatment	0.9228	0.0772	0.3822	0.6178	0.3182	0.6818
Appealed denial of benefits	0.8663	0.1337	0.5578	0.4422	0.3771	0.6229
Asked insurance company for help understanding your coverage	0.8354	0.1646	0.3039	0.6961	0.3611	0.6389

Item/response (n = 510)	Class 1 “Low Burden/Low Coping”		Class 2 “High Self-Advocacy”		Class 3 “High Burden/High Coping”	
	Pr(1)	Pr(2)	Pr(1)	Pr(2)	Pr(1)	Pr(2)
Consider changing doctors because of cost	1.0000	0.0000	0.8107	0.1893	0.4591	0.5409
Considered bankruptcy	0.9821	0.0179	0.9357	0.0643	0.8516	0.1484
Borrowed from a bank	0.9621	0.0379	0.9172	0.0828	0.8637	0.1363
Cutback on non-essential spending	0.7568	0.2432	0.4245	0.5755	0.5966	0.4034
Borrowed from family/friends	0.9432	0.0568	0.7088	0.2912	0.7193	0.2807
Moved to less expensive home	0.9858	0.0142	0.9359	0.0641	0.8785	0.1215
Missed rent/mortgage payments	0.9921	0.0079	0.8576	0.1424	0.8383	0.1617
Cut back on essential spending	0.8900	0.1100	0.6186	0.3814	0.6621	0.3379
Considered cashing in life insurance	0.7445	0.2555	0.6443	0.3557	0.4394	0.5606
Considered borrowing from pension	0.8067	0.1933	0.7411	0.2589	0.4975	0.5025
Estimated class population shares	0.4173		0.2775		0.3053	

The table displays the probability that a response of sometimes, often, or always to the row item either is [Pr(2)] or is not [Pr(1)] a member of that Class, therefore Pr(2) and Pr(1) sum to 1.0. Pr(2) columns are bolded because they display the probability of membership in that Class

Respondent characteristics associated with class membership (reference class = 1 “Low Burden/Low Coping”)

Table 5

Age	Class 2 (“High Self-Advocacy”) (n = 143)		Class 3 (“High Burden/High Coping”) (n = 155)	
	OR	95% CI	OR	95% CI
25–34 years	3.10**	(2.05, 4.16)	9.87***	(8.59, 11.14)
35–44 years	7.08***	(5.89, 8.28)	12.27***	(7.03, 19.87)
45–54 years	2.15	(0.51, 3.12)	7.58***	(6.35, 8.81)
55–64 years	1.56	(0.64, 2.47)	4.11**	(2.91, 5.93)
65–74 years	ref	ref	ref	ref
> 75	0.60	(0.47, 1.93)	1.16	(0.73, 6.63)
Race/ethnicity				
African American	1.99*	(1.19, 2.80)	5.82***	(3.01, 6.64)
Asian	2.04	(0.37, 3.71)	0.82	(0.04, 3.31)
Hispanic	1.61	(0.41, 2.82)	5.60***	(4.40, 6.79)
White non-Hispanic	ref	ref	ref	ref
Multi-racial	0.94	(0.66, 2.53)	0.64	(0.10, 2.24)
Other ^a	----	----	----	----
Health insurance				
Employer sponsored	0.70	(0.38, 1.77)	0.40	(0.12, 1.99)
Marketplace	2.16	(0.55, 3.78)	1.05	(0.36, 3.11)
Medicaid	0.91	(0.22, 2.05)	1.65	(0.66, 3.23)
Medicare	0.79	(0.10, 1.70)	1.66	(0.36, 2.96)
Medicare and supplemental	ref	ref	ref	ref
Other	1.09	(0.12, 2.06)	0.88	(0.61, 2.38)
VA Tricare only	0.44	(0.21, 2.93)	2.76	(0.63, 4.89)
Treatment type				
Surgery	1.06	(0.54, 1.58)	0.93	(0.38, 2.96)

NB: Variables included in the model based on significant chi-square test with Bonferroni adjustment

Due to limited sample size ($n = 4$), predictions for cases for race/ethnicity category "other" were excluded

$p < .10$
*
 $p < .05$
**
 $p < .01$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript