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Implications for patient-provider communication and health self-efficacy among cancer survivors with multiple chronic conditions: results from the Health Information National Trends Survey

Jessica D. Austin[1], **Michael C. Robertson**[2,3], **L. Aubree Shay**[4], **Bijal A. Balasubramanian**[5,6]

[1]Department of Health Promotion Behavioral Science, UTHealth School of Public Health in Dallas, Harry Hines Blvd, Dallas, TX 75390, USA

[2]Center for Energy Balance, Department of Behavioral Science, MD Anderson Cancer Center, Cancer Prevention Building, Unit 1330, 1155 Pressler St, Houston, TX 77030, USA

[3]Department of Health Promotion & Behavioral Sciences, UTHealth School of Public Health in Houston, 1200 Pressler Street, Houston, TX 77030, USA

[4]Department of Health Promotion Behavioral Science, UTHealth School of Public Health in San Antonio, 7411 John Smith Drive, Suite 1100, San Antonio, TX 78229, USA

[5]Department of Epidemiology, Human Genetics, & Environmental Sciences, UTHealth School of Public Health in Dallas, 6011 Harry Hines Blvd, Dallas, TX 75390, USA

[6]Harold C. Simmons Comprehensive Cancer Center, UT Southwestern Medical Center, Dallas, TX 75390, USA

Abstract

Purpose —Cancer survivors with multiple chronic conditions experience significant challenges managing their health. The six core functions of patient-centered communication (PCC)—fostering healing relationships, exchanging information, responding to emotions, managing uncertainty, making decisions, and enabling patient self-management—represent a central component to facilitating a survivor's confidence to manage their health that has not been investigated in cancer survivors with multiple chronic conditions.

Method—Nationally representative data across two iterations of the Health Information National Trends Survey (HINTS) were merged with combined replicate weights using the jackknife replication method. Adjusted linear regression examined the association between PCC and health self-efficacy in a sample of breast, colorectal, and prostate cancer survivors and by multiple chronic conditions.

Jessica D. Austin, Jessica.D.Austin@uth.tmc.edu.

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Ethical approval This article does not contain any studies with human participants performed by any of the authors.

Results—53.9% reported that providers did not always respond to their emotions and 48.9% reported that they could not always rely on their providers to help them manage uncertainty. In the adjusted linear regression models, there was a significant positive association between PCC and health self-efficacy ($\beta = 0.2$, $p = 0.01$) for the entire sample. However, the association between PCC and health self-efficacy was attenuated in cancer survivors with multiple chronic conditions ($\beta = 0.1$, $p = 0.53$).

Conclusion—PCC alone is not enough to improve a cancer survivor's confidence in their ability to manage their health in the presence of multiple chronic conditions.

Implications for Cancer Survivors—Cancer survivors with multiple chronic conditions need ongoing support, in addition to PCC, that render them prepared to manage their health after cancer.

Keywords

Cancer survivorship; Multiple chronic conditions; Patient-provider communication; Self-efficacy

Introduction

Cancer survivors with multiple chronic conditions in addition to cancer face significant demands in managing their illnesses following active treatment and have the added burden of managing multiple providers in a fragmented, siloed healthcare system [1–4]. Nearly 70% of all cancer survivors have multiple chronic conditions [5–7]. This is associated with an elevated risk of poor health outcomes, cancer recurrence, the development of additional chronic conditions, chronic morbidity, and premature mortality [4, 5, 8]. As the focus of cancer care and control efforts shifts towards more personalized and long-term approaches, empowering cancer survivors to assume a more active role in their own healthcare is becoming an increasingly essential component of cancer survivorship [9, 10].

In 2006, the Institute of Medicine's report *From Cancer Patient to Cancer Survivor: Lost in Transition* identified the period following the completion of active treatment (chemotherapy, radiation, surgery) as frequently rife with complexities and uncertainties in care experienced by patients [4]. This is especially true for cancer survivors with multiple chronic conditions. Self-management in cancer survivorship involves managing consequences of cancer and its treatment, understanding how and when to seek support, recognizing and reporting signs and symptoms, and adhering to lifestyle and clinical recommendations that promote survival [11]. Central to survivors' success in self-management is health self-efficacy, or their confidence in their ability to manage their health and healthcare following cancer and its treatment [12, 13]. Indeed, health self-efficacy has been associated with emotional well-being, coping, and adherence to lifestyle, surveillance, and follow-up behaviors in cancer survivorship [9, 11, 14].

Effective patient-centered communication (PCC) is an antecedent to self-management and contributes directly and indirectly to important patient outcomes including a positive association to self-efficacy [15–20]. Several recent studies have shown that PCC following active treatment is suboptimal, with gaps in communication most problematic among cancer survivors with multiple chronic conditions [17, 21, 22]. The National Cancer Institute (NCI) monograph *Patient-Centered Communication in Cancer Care* recognized the importance of communication in cancer care and outlines six core functions essential for meeting the complex needs of cancer survivors: (1) Fostering healing relationships; (2) Exchanging information; (3) Responding to emotions; (4) Managing uncertainty; (5) Making decisions; and (6) Enabling patient self-management [13]. Effective communication between patients and providers has been shown to significantly increase a patients' participation in their own healthcare, which can positively impact quality and health outcomes [19, 20]. Despite the growing awareness of the importance of PCC and health self-efficacy in cancer survivorship, few studies have made an attempt to delineate whether cancer survivors with multiple chronic conditions experience differences in PCC and health self-efficacy compared with cancer survivors without multiple chronic conditions following active treatment due to conceptual and methodological challenges.

While a number of thoughtful conceptual frameworks and models of PCC exist, few account for the complexities of PCC on diverse outcomes experienced by cancer survivors or consider the impact of patient attributes, such as the presence of multiple chronic conditions on the communication exchange. Building upon models and frameworks, Lafata et al. proposed a conceptual framework depicting these complexities [23]. The Patient-Clinician Communication Model posits that patient attributes, such as the presence of multiple chronic conditions, are antecedent to the communication exchange and that the communication exchange itself can directly lead to improved health outcomes. Yet, in most cases, the communication exchange likely affects health outcomes indirectly through intermediate affective-cognitive outcomes, such as health self-efficacy, and behavioral outcomes [16, 23]. Few studies have examined these proposed mechanisms and relationships between PCC and health self-efficacy in cancer survivors with multiple chronic conditions due to methodological challenges and limited assessment of a survivor's communication experiences following the completion of active treatment [24].

Despite advancements in the measurement of PCC in cancer care, no single measure is designed with psycho-metric rigor for reliable assessment of PCC in cancer survivors following active treatment, nor is designed to capture the complexity of the communication exchange that cancer survivors with multiple chronic conditions may face due to a lack of coordination or communication between providers. Reliable and valid measures are needed covering issues salient to cancer survivors that can be tailored to different survivor attributes and include key outcomes of PCC, such as health self-efficacy [25, 26]. Street et al. compiled a set of core PCC survey items based on previous work funded by the NCI that healthcare providers and organizations can use to measure specific elements of PCC core functions of particular interest to their organization, patient population, or phases of cancer care [24, 27]. Previous studies have linked these standalone items to quality of care and health outcomes but these items collectively have not been psychometrically tested in cancer survivor populations. Recent efforts have examined the psychometric properties of a long and short form PCC measure designed for use in surveillance activities, intervention research, and for quality improvement initiatives in cancer care [26]. Although the measure demonstrates strong reliability and constructs validity, it was only tested among English-speaking colorectal cancer patients from a single site limiting its generalizability and use in cancer survivors with multiple chronic conditions. National surveys provide an opportunity to explore snapshots of some aspects of PCC and its impact on health self-efficacy for a sample of cancer survivors with multiple chronic conditions.

While cancer survivors with multiple chronic conditions tend to have frequent and intensive contact with the healthcare system, it is unclear to what degree this at-risk population faces challenges managing their health and communicating with providers, both critical to high-quality survivorship care [28, 29]. To address this critical need, we used nationally representative data of breast, colorectal, and prostate cancer survivors pooled across two iterations of the Health Information National Trends Survey (HINTS) to analyze: (1) the differences in PCC and health-self efficacy in a sample of cancer survivors with and without multiple chronic conditions; and (2) if the relationship between PCC and health self-efficacy varies by the presence of multiple chronic conditions. We hypothesized that cancer survivors with multiple chronic conditions will report lower levels of PCC and health self-efficacy compared with cancer survivors without multiple chronic conditions and that the strength of the relationship between PCC and health self-efficacy will decrease in cancer survivors with multiple chronic conditions. Findings from this study will fill an important gap in existing research on PCC and health self-efficacy among cancer survivors and have implications for improving the delivery of cancer care for cancer survivors with multiple chronic conditions.

Methods

Survey design and sample

3The Health Information National Trends Survey (HINTS) is a single-mode, mailed, nationally representative, cross-sectional probability survey funded by the NCI. Available in English and Spanish, HINTS is designed to assess current access to and use of information about cancer across the cancer care continuum (e.g., cancer prevention, early detection, diagnosis, treatment, and survivorship) [30]. We combined data from two iterations of HINTS that included PCC and health self-efficacy questions: HINTS 4, Cycle 4 (fielded August–November, 2014, response rate 34.4%) and HINTS 5, Cycle 1 (fielded January–May, 2017, response rate 32.4%). Information on the two-stage stratified sampling design and other methodological details are described on the HINTS website (https://hints.cancer.gov/ data/survey-instruments.aspx). For this analysis, we restricted the sample to those who reported a personal history of breast, prostate, or colorectal cancer, and excluded those who indicated that they were still in active treatment—defined as still receiving chemotherapy, radiation, and/or surgery for their cancer—to align with the post-treatment phase of cancer survivorship [4]. These three cancer types were chosen because they are the most common cancers in the US and because the prevalence of chronic conditions and the probability of dying from other causes have been shown to vary by these cancer types [7].

Survey items

Sociodemographic information including gender, age, education, race, and income were included in the analysis as variables that have the potential to affect PCC, health self-efficacy, and their association. We also assessed clinical- and cancer-related information.

Respondents were asked to indicate yes/ no to having a usual source of healthcare: “Not including psychiatrists health professionals, is there a particular doctor, nurse, or other health professional that you see most often?” A dichotomous-derived variable for health insurance status was also included. Respondents also indicated how frequently they had seen a doctor, nurse, or other healthcare professional in the prior 12 months. As described in the sampling strategy, survivors also indicated the type of cancer they had and how long ago they received their last cancer treatment.

Finally, respondents were asked to indicate yes/no to ever being told if they had each of the following conditions: diabetes or high blood sugar, hypertension or high blood pressure, a heart condition, chronic lung disease, or arthritis or rheumatism. A binary variable was created to measure whether or not the cancer survivor had multiple chronic conditions, defined as having two or more chronic conditions in addition to cancer [1]. We consider the presence of multiple chronic conditions to be a proxy for greater illness burden and did not control for perceived health status since this variable is considered an outcome of PCC and health self-efficacy [23, 31].

Predictor variable—Previous iterations of HINTS, including the HINTS 4, Cycle 4, were comprised of six items representing the six core functions of PCC. However, the item corresponding to the core function fostering healing relationships was not included in the HINTS 5, Cycle 1 iteration. To address this limitation, the research team first examined the items around the communication exchange that were consistent across both iterations. Survivors were asked about their communication experiences during the prior 12 months with doctors, nurses, or other health professionals. These items were grounded in the PCC framework originally proposed by Epstein and Street, corresponding to the core functions of PCC and overlapping concepts that impact the communication exchange, such as spending enough time [32]. The team compared these items with survey items representing the core functions of PCC within the literature and, through discussion, reached consensus on items that best represented each of the six core functions [24, 26, 33]. To ensure that the new items adequately represent PCC, the team performed a Cronbach’s alpha using the HINTS 4, Cycle 4 sample. Results indicated strong reliability of the new items ($\alpha = 0.93$) similar to the initial set of items ($\alpha = 0.92$). Table 1 details the survey items for each core function included in the current analysis and the items representing the core function from previous iterations. For the current analysis, we used “Give you a chance to ask all the health related questions you had?” to represent fostering healing relationships and “Explain things in a way you could understand?” to represent exchanging information.

Response options were always, usually, sometimes or never. Following previous approaches, items were reversed score prior to analysis and an overall mean PCC score was created using a linear transformation into a 0–100 scale, where higher scores indicate higher levels of PCC [34, 35]. For descriptive purposes, responses for each function were dichotomized as always vs. usually/sometimes/never, with the latter considered suboptimal communication for each function. This approach is consistent with previous studies of patient experiences of care [34, 35].

Outcome variable—Survivors were asked to rate their confidence in their ability to take care of their health. Response options were completely confident, very confident, somewhat confident, a little confident, and not confident at all. Consistent with previous item use, items were reversed scored and a continuous health self-efficacy mean score was created using a linear transformation into a 0–100 scale [31]. The linear transformation allows for comparison between PCC and health self-efficacy since the underlying Likert-type responses are on different scales. Higher scores indicate greater levels of self-efficacy to manage health.

Data analysis

All analyses were performed using SAS 9.4 (SAS Institute Inc., Cary, NC, USA). The two HINTS datasets were merged into a stacked dataset which included a variable to indicate iteration. HINTS-supplied survey weights using jackknife variance estimation techniques were used in inferential analyses to account for the complex HINTS sampling design and to calculate nationally representative estimates [36]. We handled missing data using a pairwise deletion method [37]. Although pairwise deletion may reduce statistical power and increase the risk of bias, the level of missing data was extremely low (< 10%) and there was no systematic difference between the complete and incomplete cases [38]. Chi-square was used to assess the differences in sociodemographic-, clinical-, and cancer-related information stratified by multiple chronic conditions. Survey-weighted linear regression models were used to evaluate the association between health self-efficacy and PCC, both for the entire sample and stratified by multiple chronic conditions. All models adjusted for gender, age, race/ethnicity, education, income, health insurance status, usual source of healthcare, number of visits to healthcare provider during the prior 12 months, time since diagnosis, and cancer type.

Results

Sociodemographic-, clinical-, and cancer-related characteristics of the sample are summarized in Table 2. These characteristics are representative of the US population of breast, prostate, and colorectal cancer survivors. The majority were non-Hispanic White (78.8%), had some college education or more (64.4%), had an income less than $75,000 (64.6%), and had a usual source of care (87.0%). A little over a third of respondents indicated that they saw a healthcare provider five or more times during the prior 12 months (37.3%). Approximately 51% of the population reported having multiple chronic conditions; high blood pressure or hypertension(63.4%) was the most prevalent chronic disease. Finally, over two-thirds of the sample were survivors greater than 10 years from diagnosis.

Table 3 presents the mean health self-efficacy score and mean PCC score, as well as the percent suboptimal for each PCC core function for all breast, colorectal, and prostate cancer survivors and by multiple chronic conditions [34]. Cancer survivors with one or more chronic conditions reported lower levels of health self-efficacy and PCC compared with the entire sample of cancer survivors and those reporting one or no chronic conditions. Considerable proportions reported suboptimal communication on each of the core functions across all groups, most notably responding to emotions and managing uncertainty.

Specifically, 53.9% of all breast, colorectal, and prostate cancer survivors, 52.0% of survivors with one or no chronic conditions, and 58.4% of survivors with one or more chronic conditions reported that providers did not always respond to their emotions. All groups also reported suboptimal communication around providers helping them with feelings of uncertainty around health or healthcare. Nearly half of cancer survivors with one or more chronic conditions reported that providers did not involve them in decisions as much as they wanted, compared with 38.6% of all cancer survivors and 32.0% of survivors with one or no chronic conditions.

Table 4 summarizes sociodemographic-, clinical-, and cancer-related characteristics by multiple chronic conditions. Having multiple chronic conditions was associated with being male, older age, having lower income, a lower level of education, and a greater number of visits with a healthcare provider over the last 12 months. Although not statistically significant, colorectal cancer survivors reported a higher burden of chronic conditions.

Table 5 summarizes the results of the linear regression models examining the association of PCC with health self-efficacy for all breast, colorectal, and prostate cancer survivors (model 1) and by multiple chronic conditions (model 2), adjusting for potentially confounding variables. Results from model 1 show a significant positive association between PCC and health self-efficacy ($\beta = 0.2$, $p = 0.01$) for the entire sample of cancer survivors. This can be interpreted that for every one unit increase in PCC, there is a 0.2 increase in health self-efficacy. These findings are consistent with those reporting one or no chronic conditions in addition to cancer in the stratified analysis ($\beta = 0.3$, $p = 0.04$), in that for every one unit increase in PCC, there is a 0.3 increase in health self-efficacy. However, the association between PCC and health self-efficacy is attenuated in cancer survivors with multiple chronic conditions ($\beta = 0.1$, $p = 0.53$).

A recent analysis of trends in PCC found that survivors 10 or more years since diagnosis are still experiencing suboptimal communication suggesting that they are lost beyond the initial transition [35]. Given that the majority of the sample were survivors 10 years or more from diagnosis, we performed a subanalysis examining the relationship between PCC and health self-efficacy by multiple chronic conditions in a subset of survivors within the first 10 years of their diagnosis. Table 6 summarizes the results of the linear regression model, adjusting for potentially confounding variables. Findings from the subanalysis are consistent with the initial model (model 2), in that cancer survivors reporting one or no chronic conditions in addition to cancer show a significant positive association between PCC and health self-efficacy ($\beta = 0.4$, $p = 0.04$) that is attenuated in survivors reporting multiple chronic conditions ($\beta = 0.2$, $p = 0.21$).

Discussion

To our knowledge, these analyses are the first attempt to understand PCC and health self-efficacy in a representative sample of breast, colorectal, and prostate cancer survivors stratified by the multiple chronic conditions. Our conceptual framework for the present study came from Lafata et al. and findings support existing literature that the quality of PCC in cancer survivorship continues to be suboptimal with gaps in the communication quality most notable among survivors with multiple chronic conditions [5, 28, 39]. For our analysis, we considered having two or more chronic conditions to be a proxy for higher illness burden and did not control for perceived health status since perceived health status is considered a health outcome of both PCC and health self-efficacy that may impact subsequent communication exchanges [23]. Future longitudinal studies are needed to understand the impact of perceived health status on subsequent communication exchanges and health self-efficacy.

Overall, we found a significant positive association between PCC and health self-efficacy in the entire sample of breast, colorectal, and prostate cancer survivors and in the subset reporting one or no chronic conditions. This finding supports existing literature suggesting that there is a strong direct positive association between PCC and health self-efficacy [16, 19, 31] but it is unclear how clinically significant PCC is to improving health self-efficacy given small changes in health self-efficacy for every one-unit improvement in PCC. Although cancer survivors with multiple chronic conditions more frequently report having a regular provider and have more healthcare visits, this did not translate to higher levels of PCC, health self-efficacy, or a stronger association between PCC and health-self efficacy compared with cancer survivors without multiple chronic conditions. This finding may be explained by the amount of time since diagnosis with the majority of analytic sample being greater than 10 years from their cancer diagnosis. Only one-third of long-term cancer survivors continue to seek care from oncologists after 5 years of survival [40] and survivors report concerns about seeing their primary care provider for cancer-related follow-up due to a lack of knowledge, limited involvement in initial cancer care, and a lack of care continuity [41]. We performed a subanalysis examining the relationships between PCC and health self-efficacy by multiple chronic conditions in a subset of survivors less than 10 years from diagnosis and found similar results. These findings suggest that PCC alone may not be enough to impact a cancer survivor’s confidence in their ability to manage their health in the presence of multiple chronic conditions.

The management of chronic conditions often entails a greater degree of patient self-management, supported by PCC with several providers including oncology, primary care, and specialty providers [5, 32, 42]. Similar to previous literature, we found that our sample of breast, colorectal, and prostate cancer survivors rated their overall communication experience with providers positively [35]. However, there were significant proportions of survivors reporting suboptimal communication, notably in responding to emotions and managing uncertainty. These findings are consistent with existing literature that has shown that providers often fail to address psychosocial concerns due to disagreement between providers about who should be responsible for survivors’ psychosocial needs [43, 44]. Managing uncertainty is another challenge for survivors worried about risk of recurrence and long-term survival [2]. Cancer survivors may also feel abandoned by the healthcare system following active treatment, resulting in uncertainty about care moving forward [45]. In addition, nearly 50% of cancer survivors with multiple chronic conditions reported that the provider did not involve them in decisions as much as they wanted. This is especially problematic given that our findings show that cancer survivors with multiple chronic conditions are more likely to be male, of low socioeconomic status, and of older age and that these patient attributes have been shown to impact both the communication exchange itself and associated with poor patient outcomes [46, 47].

Our findings represent a significant contribution to the literature because they address the presence of multiple chronic conditions in three prevalent cancer survivor types and the impact on PCC and health self-efficacy, both critical to achieving positive health outcomes. However, there are a number of notable limitations. Given the cross-sectional nature of these results, no causal argument can be made. The HINTS sample of cancer survivors also represents a heterogeneous group of breast, colorectal, and prostate cancer survivors. Due to small sample sizes, we were unable to perform additional analyses by cancer type but did control for this in our regression analyses. In addition, all information is self-report lending itself to recall bias and social desirability which may bias results away from the null if over-reporting occurs. The HINTS also focuses on the most common chronic conditions in the entire population which may not be comprehensive for all cancer survivors. Our measure of health self-efficacy was derived from a single item and was broadly applicable to one’s overall health without reference to any specific behavior. Self-efficacy is a general trait that is likely to change based on the task to be self-managed and is subject to change over time. It is unclear if the single item of self-efficacy might apply to specific health self-management tasks, especially for those with multiple conditions.

The PCC items utilized in this study may not comprehensively capture the complexity of the six core functions of PCC in cancer survivorship. This limitation may explain null findings between PCC and health self-efficacy when stratifying by multiple chronic conditions. The HINTS items used for the overall PCC score and representing the six core functions differ from previous uses of HINTS items since the HINTS 5, Cycle 1 iteration did not have the item that previously represented fostering healing relationships. To overcome this limitation, the research team reviewed items across both iterations that aligned with items identified in the literature and consistent with recommendations for a systematic approach to measuring patient-centered communication. The team calculated a Cronbach’s alpha comparing the initial set of six HINTS PCC items used in previous studies with the revised set PCC items in HINTS 4, Cycle 4 respondents. Results indicated strong reliability of the new items ($\alpha = 0.93$) similar to the initial set of items ($\alpha = 0.92$). The PCC items also do not specify whether survivors are reporting communication and the care experience with oncologists or other types of healthcare providers. In addition, this study is limited by a lack of data on provider characteristics such as length of relationship with a provider, important for establishing trust and rapport. Despite these limitations, our results provide an overall perception of PCC in cancer survivorship and the findings are useful for surveillance purposes and hypothesis generation.

Conclusion

Our findings emphasize the need for coordinated, comprehensive care for survivors and strategies to integrate primary care into long-term survivorship care [48, 49]. As the cancer survivor population ages and survival rates improve, cancer survivors will continue to experience significant challenges communicating with their providers and managing cancer-related issues and overall health, critical for quality of life and overall survival. The seminal

Institute of Medicine's report From *Cancer Patient to Cancer Survivor: Lost in Transition* recommended that cancer care providers develop and deliver to survivors' and their primary care providers survivor-ship care plans (SCPs) to facilitate communication and care coordination among survivors, cancer care providers, and primary care providers resulting in improved health outcomes [4]. Findings from observational studies have demonstrated positive outcomes of SCPs including improved patient-provider communication [50, 51] and increased confidence in one's ability to manage care [52]. Yet, SCP implementation has not been widespread across health systems and few studies consider the perspectives of vulnerable cancer survivor populations that carry a disproportionate burden of cancer, its long-term effects, and chronic disease burden [53–55].

Our results emphasize the need for future studies of how to provide cancer survivors with multiple chronic conditions with ongoing support well beyond the completion of active treatment and how to facilitate PCC that more effectively engages survivors in their health and healthcare. This will require an understanding of what survivors feel is important to render them prepared to manage their health and navigate their care in ways consistent with their needs and preferences.

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References

1. Lee SJC, et al. Achieving coordinated care for patients with complex cases of cancer: a multiteam system approach. J Oncol Pract. 2016;12(11):1029–38. [PubMed: 27577621]
2. Mayer DK, Nasso SF, Earp JA. Defining cancer survivors, their needs, and perspectives on survivorship health care in the USA. Lancet Oncol. 2017;18(1):e11–8. [PubMed: 28049573]
3. Hoekstra RA, Heins MJ, Korevaar JC. Health care needs of cancer survivors in general practice: a systematic review. BMC Fam Pract. 2014;15(1):94. [PubMed: 24885266]
4. Hewitt M, Greenfield S, Stovall E. From cancer patient to cancer survivor: lost in transition. Committee on cancer survivorship: improving care and quality of life, institute of medicine and national research council. Washington, DC: The National Academies Press; 2006.
5. Sarfati D, Koczwara B, Jackson C. The impact of comorbidity on cancer and its treatment. CA Cancer J Clin. 2016;66(4):337–50. [PubMed: 26891458]
6. Hudson SV, et al. Cancer Survivors and the patient-centered medical home. Transl Behav Med. 2012;2(3):322–31. [PubMed: 23606921]
7. Cho H, et al. Assessing non-cancer-related health status of US cancer patients: other-cause survival and comorbidity prevalence. Am J Epidemiol. 2013;178(3):339–49. [PubMed: 23825168]
8. American Cancer Society. Cancer facts & figures 2018. Atlanta: American Cancer Society; 2018.
9. McCorkle R, et al. Self-management: enabling and empowering patients living with cancer as a chronic illness. CA Cancer J Clin. 2011;61(1):50–62. [PubMed: 21205833]
10. McCabe MS, et al. American Society of Clinical Oncology statement: achieving high-quality cancer survivorship care. J Clin Oncol. 2013;31(5):631–40. [PubMed: 23295805]

11. Foster C, et al. Cancer survivors' self-efficacy to self-manage in the year following primary treatment. J Cancer Surviv. 2015;9(1):11–9. [PubMed: 25028218]
12. Bodenheimer T, et al. Patient self-management of chronic disease in primary care. JAMA. 2002;288(19):2469–75. [PubMed: 12435261]
13. Bandura A Social foundations of thought and action: A social cognitive theory Social foundations of thought and action: A social cognitive theory. 1986, Englewood Cliffs, NJ, US: Prentice-Hall, Inc.
14. Stacey FG, et al. A systematic review and meta-analysis of social cognitive theory-based physical activity and/or nutrition behavior change interventions for cancer survivors. J Cancer Surviv. 2015;9(2):305–38. [PubMed: 25432633]
15. Epstein RM, et al. Why the nation needs a policy push on patient-centered health care. Health Aff. 2010;29(8):1489–95.
16. Street RL, et al. How does communication heal? Pathways linking clinician–patient communication to health outcomes. Patient Educ Couns. 2009;74(3):295–301. [PubMed: 19150199]
17. Thorne SE, Stajduhar KI. Patient perceptions of communications on the threshold of cancer survivorship: implications for provider responses. J Cancer Surviv. 2012;6(2):229–37. [PubMed: 22431035]
18. Fogarty LA, et al. Can 40 seconds of compassion reduce patient anxiety? J Clin Oncol. 1999;17(1): 371. [PubMed: 10458256]
19. Jenerette CM, Mayer DK. Patient-provider communication: the rise of patient engagement. In: Semin Oncol Nurs, 2016 32(2): p. 134–43; 2016.
20. Levit L, et al. Patient-centered communication and shared decision making, in delivering high-quality cancer care: charting a new course for a system in crisis. National Academies Press (US); 2013.
21. Economou D, Reb A. Communication concerns when transitioning to cancer survivorship care. Semin Oncol Nurs. 2017;33(5):526–35. [PubMed: 29107527]
22. Thorne S, et al. Changing communication needs and preferences across the cancer care trajectory: insights from the patient perspective. Support Care Cancer. 2014;22(4):1009–15. [PubMed: 24287506]
23. Lafata JE, Shay LA, Winship JM. Understanding the influences and impact of patient-clinician communication in cancer care. Health Expect. 2017;20(6):1385–92. [PubMed: 28636108]
24. Street RL Jr, Mazor KM, Arora NK. Assessing patient-centered communication in cancer care: measures for surveillance of communication outcomes. J Oncol Pract. 2016;12(12):1198–202. [PubMed: 27650836]
25. Sepucha KR, Fowler FJ Jr, Mulley AG Jr. Policy support for patient-centered care: the need for measurable improvements in decision quality. Health Aff (Millwood). 2004;Suppl Variation: Var54–62.
26. Reeve BB, et al. Psychometric evaluation and design of patient-centered communication measures for cancer care settings. Patient Educ Couns. 2017;100(7):1322–8. [PubMed: 28214167]
27. Mazor KM, et al. Assessing patients' experiences with communication across the cancer care continuum. Patient Educ Couns. 2016;99(8):1343–8. [PubMed: 26979476]
28. Zulman DM, et al. Quality of care for patients with multiple chronic conditions: the role of comorbidity interrelatedness. J Gen Intern Med. 2014;29(3):529–37. [PubMed: 24081443]
29. Ganz PA. Institute of Medicine report on delivery of high-quality cancer care. J Oncol Pract. 2014;10(3):193–5. [PubMed: 24839280]
30. Nelson D, et al. The Health Information National Trends Survey (HINTS): development, design, and dissemination. J Health Commun. 2004;9(5):443–60. [PubMed: 15513791]
31. Rutten LJF, et al. Health self-efficacy among populations with multiple chronic conditions: the value of patient-centered communication. Adv Ther. 2016;33(8):1440–51. [PubMed: 27357639]
32. Epstein RM, Street RL. Patient-centered communication in cancer care: promoting healing and reducing suffering, National Cancer Institute, US Department of Health and Human Services, NIH Publication No. 07–6225 Bethesda, MD, 2007.

33. McCormack LA, et al. Measuring patient-centered communication in cancer care: a literature review and the development of a systematic approach. Soc Sci Med. 2011;72(7):1085–95. [PubMed: 21376443]
34. Arora NK, et al. Assessment of quality of cancer-related follow-up care from the cancer survivor’s perspective. J Clin Oncol. 2011;29(10):1280–9. [PubMed: 21357781]
35. Blanch-Hartigan D, et al. Trends in cancer survivors’ experience of patient-centered communication: results from the Health Information National Trends Survey (HINTS). J Cancer Surviv. 2016;10(6):1067–77. [PubMed: 27193357]
36. Moser RP, et al. Integrative analytic methods using population-level cross-sectional data. National Institutes of Health: Bethesda; 2013.
37. Statistical Analysis With Missing Data. Vol. 45 2012 364–365; 2003.
38. Langkamp DL, Lehman A, Lemeshow S. Techniques for handling missing data in secondary analyses of large surveys. Acad Pediatr. 2010;10(3):205–10. [PubMed: 20338836]
39. Maly RC, et al. Quality of life over 5 years after a breast cancer diagnosis among low-income women: effects of race/ethnicity and patient-physician communication. Cancer. 2015;121(6):916–26. [PubMed: 25411008]
40. Pollack LA, et al. Care of long-term cancer survivors. Cancer. 2009;115(22):5284–95. [PubMed: 19685532]
41. Hudson SV, et al. Adult cancer survivors discuss follow-up in primary care: ‘not what I want, but maybe what I need’. Ann Fam Med. 2012;10(5):418–27. [PubMed: 22966105]
42. Grady PA, Gough LL. Self-management: a comprehensive approach to management of chronic conditions. Am J Public Health. 2014;104(8):e25–31. [PubMed: 24922170]
43. Forsythe LP, et al. Who provides psychosocial follow-up care for post-treatment cancer survivors? A survey of medical oncologists and primary care physicians. J Clin Oncol. 2012;30(23):2897–905. [PubMed: 22778322]
44. Institute of Medicine Committee on Psychosocial Services to Cancer Patients/Families in a Community, S. The National Academies Collection: reports funded by National Institutes of Health, in cancer care for the whole patient: meeting psychosocial health needs. In: Adler NE, Page AEK, editors. National Academies Press (US) Washington (DC): National Academy of Sciences; 2008.
45. Koch L, et al. Fear of recurrence in long-term breast cancer survivors-still an issue. Results on prevalence, determinants, and the association with quality of life and depression from the cancer survivorship–a multi-regional population-based study. Psychooncology. 2014;23(5):547–54. [PubMed: 24293081]
46. Schieber AC, et al. Do gender differences affect the doctor-patient interaction during consultations in general practice? Results from the INTERMEDE study. Fam Pract. 2014;31(6):706–13. [PubMed: 25214508]
47. Thornton RL, et al. Patient-physician social concordance, medical visit communication and patients’ perceptions of health care quality. Patient Educ Couns. 2011;85(3):e201–8. [PubMed: 21840150]
48. Hudson SV, et al. Identifying key questions to advance research and practice in cancer survivorship follow-up care: a report from the ASPO Survivorship Interest Group. Cancer Epidemiology Biomarkers & Prevention. 2009;18(7):2152–4.
49. Grunfeld E, Earle CC. The interface between primary and oncology specialty care: treatment through survivorship. J Natl Cancer Inst Monogr. 2010;2010(40):25–30. [PubMed: 20386051]
50. Blinder VS, et al. Patient perspectives on breast cancer treatment plan and summary documents in community oncology care: a pilot program. Cancer. 2013;119(1):164–72. [PubMed: 23197335]
51. Hill-Kayser CE, et al. High level use and satisfaction with internet-based breast cancer survivorship care plans. Breast J. 2012;18(1): 97–9. [PubMed: 22098063]
52. Casillas J, et al. How confident are young adult cancer survivors in managing their survivorship care? A report from the LIVESTRONG™ Survivorship Center of Excellence Network. J Cancer Surviv. 2011;5(4):371–81. [PubMed: 22042661]
53. Salz T, et al. Survivorship care plans in research and practice. CA Cancer J Clin. 2012;62(2):101–17. [PubMed: 22241452]

54. Mayer DK, et al. Summing it up: an integrative review of studies of cancer survivorship care plans (2006–2013). Cancer. 2015;121(7): 978–96. [PubMed: 25252164]
55. Jacobsen PB, et al. Systematic review of the impact of cancer survivorship care plans on health outcomes and health care delivery. J Clin Oncol. 2018;36(20):2088–100. [PubMed: 29775389]

Table 1

HINTS survey items representing PCC and the six core functions for the current analysis compared with previous iterations

PCC core function	Survey item from previous iterations	Survey item for current analysis
Fostering healing relationships	During the past 12 months, how often did you feel you could rely on your doctors, nurses, or other healthcare professionals to take care of your healthcare needs?	Give you a chance to ask all the health-related questions you had?
Responding to emotions	Give the attention you needed to your feelings and emotions?	Give the attention you needed to your feelings and emotions?
Making decisions	Involve you in decisions about your healthcare as much as you wanted?	Involve you in decisions about your healthcare as much as you wanted?
Enabling self--management	Make sure you understood the things you needed to do to take care of your health?	Make sure you understood the things you needed to do to take care of your health?
Exchanging information	Give you a chance to ask all the health-related questions you had?	Explain things in a way you could understand?
Managing uncertainty	Help you deal with feelings of uncertainty about your health or healthcare?	Help you deal with feelings of uncertainty about your health or healthcare?

Table 2

Sample size and weighted population estimates of sociodemographic-, clinical-, and cancer-related characteristics for breast, colorectal, and prostate cancer survivors

	N	Weighted % of US population[a]
Gender		
Female	157	65.5
Male	97	34.5
Age group		
18–49	9	3.5
50–64	73	36.5
65–74	94	30.9
75+	72	29.2
Education		
Less than high school	18	9.4
High school graduate	62	26.2
Some college	66	26.2
College graduate or more	103	38.2
Race/ethnicity		
Non-Hispanic White	153	78.8
Non-Hispanic Black	37	11.3
Hispanic	21	5.1
Non-Hispanic other	14	4.8
Income		
Less than $20,000	49	20.3
$20,000 to < $35,000	42	15.9
$35,000 to < $50,000	31	10.2
$50,000 to < $75,000	36	18.4
$75,000 or more	65	35.1
Health insurance status		
Yes	237	95.2
No	12	4.8
Regular healthcare provider		
Yes	212	87.0
No	36	13.0
Number of healthcare visits		
1–2	65	31.3
3–4	76	31.4
5+	85	37.3
Time since Dx		
Less than 1 year	25	11.5
2–5 years	59	23.3
6–10 years	60	23.5

	N	**Weighted % of US population**[a]
11+years	102	41.7
Cancer type		
Breast only	137	15.0
Prostate only	83	7.9
Colorectal only	36	4.0
Multiple chronic conditions		
Yes	130	51.0
No	117	49.0
Diabetes		
Yes	85	32.3
No	163	67.6
High blood pressure or hypertension		
Yes	161	63.4
No	89	36.2
Heart disease		
Yes	31	12.2
No	218	87.8
Lung disease		
Yes	41	16.5
No	209	83.5
Arthritis		
Yes	121	45.4
No	129	54.6

[a] Sample and replicate weights were applied to account for the complex survey design and to ensure estimates are representative of the US population. Some values may not equal 100

Table 3

Health self-efficacy and patient-centered communication in breast, colorectal, and prostate cancer survivors and by multiple chronic conditions

	All cancer survivors	**Multiple chronic conditions**	
		Yes	**No**
	Mean (SE)	Mean (SE)	
Health self-efficacy[a]	69.0 (2.0)	65.1 (3.0)	72.3 (2.9)
PCC[a]	78.8 (2.3)	76.7 (3.5)	80.0 (2.8)
Six specific functions[a]	*N* (% suboptimal[b])	*N* (% suboptimal[b])	
Fostering healing relationships	71 (31.3)	36 (33.2)	34 (30.4)
Responding to emotions	115 (53.9)	61 (58.4)	52 (52.0)
Making decisions	89 (38.6)	50 (47.3)	39 (32.0)
Enabling self-management	75 (31.7)	40 (36.3)	34 (28.1)
Exchanging information	78 (32.3)	42 (39.3)	34 (26.2)
Managing uncertainty	110 (48.9)	54 (46.9)	55 (52.8)

SE, standard error

[a] Sample and replicate weights were applied to account for the complex survey design and to ensure estimates are representative of the US population

[b] Response options were always, usually, sometimes, and never. Suboptimal communication defined as responses of usually/sometimes/never

Table 4

Socio-demographic-, clinical-, and cancer-related characteristics by cancer survivors with multiple chronic conditions

Respondent characteristics	**Multiple chronic conditions**		**Chi-square *p* value**[a]
	No (weighted %)	**Yes (weighted %)**	
Gender			0.04
Female	55.5	44.5	
Male	39.1	60.9	
Age group			0.01
18–49	76.3	23.7	
50–64	62.5	37.5	
65–74	42.0	58.0	
75+	32.3	67.7	
Education			<0.01
Less than high school	5.2	94.8	
High school graduate	38.9	61.1	
Some college	60.5	39.5	
College graduate or more	58.5	41.5	
Race			0.16
NH White	52.9	47.1	
NH Black	26.3	73.7	
Hispanic	59.7	40.3	
NH other	44.0	56.0	
Income			<0.01
Less than $20,000	19.3	80.7	
$20,000 to < $35,000	24.4	75.6	
$35,000 to < $50,000	52.1	47.9	
$50,000 to < $75,000	78.0	22.0	
$75,000 or more	59.9	40.1	
Health insurance status			
Yes	50.0	50.0	0.23
No	30.0	72.0	

Respondent characteristics	**Multiple chronic conditions**		**Chi-square *p* value**[a]
	No (weighted %)	**Yes (weighted %)**	
Regular healthcare provider			0.14
Yes	46.5	53.5	
No	66.0	34.0	
Number of healthcare visits			0.01
1–2	70.2	29.8	
3–4	40.8	59.2	
5+	37.6	62.4	
Time since Dx			0.94
Less than 1 year	47.8	52.2	
2–5 years	52.1	47.9	
6–10 years	43.8	56.2	
11+years	48.5	51.5	
Cancer type			0.4
Breast only	53.7	46.3	
Prostate only	50.2	49.8	
Colorectal only	39.2	60.8	

Table 5

Multivariable linear regression models examining independent associations of patient-centered communication with health self-efficacy for all breast, colorectal, and prostate cancer survivors and by multiple chronic conditions

	N	***B***	**SE**	***p* value**
Model 1: All cancer survivors[a, b]	161	0.2	0.1	0.01
Model 2: Cancer survivor with multiple chronic conditions[a]				
No	79	0.3	0.1	0.04
Yes	82	0.1	0.1	0.48

SE, standard error

[a] Adjusted for gender, age, race/ethnicity, education, income, health insurance status, usual source of healthcare, number of visits to healthcare provider during the prior 12 months, time since diagnosis, and cancer type

[b] Adjusted for multiple chronic conditions

Table 6

Multivariable linear regression models examining independent associations of patient-centered communication with health self-efficacy for breast, colorectal, and prostate cancer survivors less than 10 years from diagnosis by multiple chronic conditions

	N	***B***	**SE**	***p* value**
Cancer survivor with multiple chronic conditions[a]				
No	50	0.4	0.2	0.04
Yes	53	0.2	0.1	0.21

SE, standard error

[a] Adjusted for gender, age, race/ethnicity, education, income, health insurance status, usual source of healthcare, number of visits to healthcare provider during the prior 12 months, and cancer type