Exploring the role of ethnicity on perceptions of cancer and physical health recovery during the first year of survivorship

Youngmee Kim1,2,3, Kelly M Shaffer1, Caio Rocha-Lima2,4, Alexis Milton1 and Charles S Carver1,2,3

Abstract
This study examined the role of ethnicity (Black vs White) in the extent to which patients’ appraisal of the impact of cancer on themselves and their family members relates to their physical health. Colorectal cancer patients provided self-reports for study variables at 2 and 12 months post-diagnosis (N=60). Hierarchical regression analysis revealed that African American patients’ perception of the cancer as disruptive to their family, but not to themselves, related to poorer health recovery, which association was absent among Whites (p < .02). Findings suggest that cancer-related family stress plays a different role between two ethnic groups in elucidating their health recovery during the early survivorship.

Keywords
ethnicity, health recovery, impact on family, perceived cancer-related stress

Recovery of physical functioning, particularly during the first year after cancer diagnosis and treatment, is a primary concern of cancer patients, as they often report compromised levels of physical health compared with people without cancer who are demographically similar (Baker et al., 2003; Keating et al., 2005; Santin et al., 2012). Broadly, three groups of factors have been identified that related to poorer health recovery, defined here as poorer levels of physical functioning reported at the end of curative treatment after taking into consideration physical functioning around the time of diagnosis. Poorer health recovery has been associated with demographic characteristics such as older age, female gender, lower socioeconomic status (Chambers et al., 2012; Jensen et al., 2013; Montazeri et al., 2001; Parker et al., 2003), and ethnic minority status (Kent et al., 2012; Paxton et al., 2012; Siegel et al., 2012). Poorer recovery has also been associated with medical factors such as rectal as opposed to colon cancer among colorectal cancer cases, more advanced cancer diagnosis, and patients’

1University of Miami, USA
2Sylvester Comprehensive Cancer Center, USA
3Center for Advanced Study in the Behavioral Sciences, USA
4University of Miami Miller School of Medicine, USA

Corresponding author:
Youngmee Kim, Department of Psychology, University of Miami, 5665 Ponce de Leon Blvd., Coral Gables, FL 33124-0751, USA.
Email: ykim@miami.edu
dissatisfaction with their health insurance (Chambers et al., 2012; Jensen et al., 2013; Kent et al., 2012; Montazeri et al., 2001; Rief et al., 2011; Santin et al., 2012). Poorer recovery has also been associated with patients’ perception of cancer and its sequelae as being stressful (Chambers et al., 2012; Jensen et al., 2013; Petrie et al., 2007; Sherman et al., 2010; Traeger et al., 2009).

Among these several correlates of poorer health recovery, ethnicity has been suggested as a primary factor (Glanz et al., 2003; Kent et al., 2012; Paxton et al., 2012; Siegel et al., 2012), yet studies report inconsistent findings (Keating et al., 2005; Santin et al., 2012). Some (e.g. Glanz et al., 2003) have found that African Americans are more likely to be diagnosed with advanced cancer, to lack satisfactory insurance coverage, and to report cancer as more burdensome, compared to non-Hispanic Whites (hereafter “Whites”). Others (e.g. Ashing-Giwa et al., 2007; Kagawa-Singer et al., 2010) have failed to replicate these differences. In the latter studies, advanced cancer, lower socioeconomic status, unsatisfactory insurance coverage, and greater cancer-related stress were associated with poorer health recovery regardless of ethnicity. It is unclear, then, whether ethnicity (African American vs White) adds any independent contribution to explaining health recovery once differences in these socio-medical factors are taken into consideration. In the study reported here, we investigated the effect of ethnicity on health recovery from the time of diagnosis to approximately 1 year later, above and beyond effects of these demographic and medical factors.

We also explored the role of patients’ illness-related stress in their health recovery. Existing research has typically examined the extent to which patients perceive their illness as a stressful event (Petrie et al., 2007). However, patients’ stress involves perceptions of burden both to themselves and to their family members (Bowman et al., 2003; Longo et al., 2006). Indeed, ethnic minorities, compared with Whites, are more likely to report concerns about their cancer burdening their family (Gallagher-Thompson et al., 2000; Meyerowitz et al., 1998; Parveen and Morrison, 2012). Thus, we examined whether patients’ perceptions of their cancer being stressful to themselves and, independently, to their families were differentially associated with patients’ health recovery. Finally, we tested whether ethnicity would moderate these associations.

We hypothesized that (a) African American cancer patients would report poorer physical health, compared with White cancer patients; (b) perceiving cancer burdensome to oneself and to one’s family members would both be negatively associated with perceived physical health; and (c) the association between cancer-related stress perception and physical health recovery would be stronger among African American cancer patients, compared with White cancer patients.

Method

Participants and procedure

This study was an observational prospective longitudinal study. Participants were patients diagnosed with colon or rectal cancer within 2 months prior to participating in the study (T1) and were being treated at one of five participating hospitals in Atlanta, GA. Eligibility criteria were being 18 years or older, being able to read and speak English, and residing within 50 miles of the study hospital. A total of 88 patients were enrolled and provided valid information for the study variables by completing a questionnaire at T1 (71% response rate). Of those, 60 completed the questionnaire and provided valid information for the study variables at both T1 and at 12 months post-diagnosis (T2). Patients who provided complete data showed non-significant tendencies to be younger ($p = .10$), have higher income ($p = .09$), have regional rather than localized or distant cancer ($p = .06$), and report better physical health at T1 ($p = .10$). No other variables differed between patients who provided complete data and those who did not ($ps > .24$).

This study was conducted in compliance with the Institutional Review Boards of each of the five hospitals. Eligible patients were typically recruited at the clinic.
signed consent forms and completed surveys documented informed consent to participate. The patients’ time spent completing the survey at each time point was reimbursed with a US$20.00 gift card.

**Measures**

**Demographic and medical characteristics.** Patients’ self-reported age, gender, ethnicity, education, and household income were measured at T1. The extent to which the patients were satisfied with their insurance was measured using a single item (“How satisfied are you with your health insurance coverage?”) at T1. This item was rated on a 5-point Likert-type scale (1 = very dissatisfied; 5 = very satisfied). Patients’ cancer type (colon, rectal, or both) and stage (localized, regional, or distant) were obtained from each hospital’s medical records. Age and satisfaction with insurance were continuous variables; gender, ethnicity, education, and household income were categorical variables with two groups within each variable.

**Cancer-related stress perception.** The extent to which patients felt their cancer had caused stress to themselves and their family over the past 12 months since diagnosis (by T2) was measured by the Appraisal of Cancer Experience Scale (Bowman et al., 2003). This scale assesses Cancer-related Stress Perception to Self (CSP-S) with one item (“Cancer has been a stressful life event”) and Cancer-related Stress Perception to Family (CSP-F) with five items (e.g. “Cancer has distressed my family”). Each item was rated for extent of agreement on a 4-point Likert-type scale (0 = not at all; 3 = very much). For the CSP-F, items were averaged, with higher scores reflecting a greater perceived level of cancer-related stress on one’s family. Both CSP-S and CSP-F were continuous variables. The CSP-F subscale had good internal consistency (α = .81).

**Physical health functioning.** Self-reported levels of physical health were measured using the Medical Outcomes Study 12-Item Short Form Health Survey (MOS SF-12; Ware et al., 1996) at both T1 and T2. The physical health score combines weighted physical functioning, physical role limitation, bodily pain, and general health subscale scores. Normalized physical health composite scores have a mean of 50 and standard deviation of 10 (Ware et al., 1996). Physical health composite scores at both T1 and T2 were continuous variables. The physical health composite score has shown excellent reliability and validity in numerous studies with diverse samples (Montazeri et al., 2011). Higher composite scores reflect better self-reported physical health functioning.

**Results**

**Sample description and ethnic differences**

Demographic and medical information, separated by the two ethnic groups, is presented in Table 1. Participating patients were middle aged, more often male than female, and almost evenly divided between African American and White. The participating patients had averaged greater than high school education and had middle to higher household income. The patients were diagnosed primarily with localized or regional colon cancer. Patients’ perceived cancer-related stress to themselves was rated low to medium and perceived cancer-related stress to the family members was relatively low. These two cancer-related stress perceptions were significantly but not overwhelmingly correlated, $r = .49$, $p < .001$. Patients’ average physical health functioning at both T1 and T2 was below the 25th percentile of the US population norm (Ware et al., 1996).

**Ethnic group differences in study variables**

With our sample size (27 and 33 in the two groups) for two-tailed alpha level at .05 and 80 percent power, an effect size ($d$) greater than .74 or a critical $t$-value of greater than 2.00 would be required to yield a significant difference between the two groups in an outcome (Cohen, 1988). As shown in Table 1, no differences between African American and White groups
were found in studied demographic, medical, and cancer-related stress perception variables.

**Predictors of physical health functioning at 12-month post-diagnosis**

Hierarchical regression modeling was used to relate physical health functioning to predictor variables, in four steps. With our sample size (total of 60), one-tailed alpha level at .05, 80 percent power, and 11 (eight covariates and three main variables) predictors, an effect size ($f^2$) greater than .106 or a critical $t$-value of greater than 1.68 would be required to yield a significant difference between the two groups in an outcome (Cohen, 1988).
As shown in Table 2, self-reported physical health at T1 significantly predicted self-reported physical health at T2 as expected, accounting for 29.7\% of the variance in physical health at T2. In Step 2, demographic and medical factors were added to the equation. Both medical characteristics and satisfaction with insurance significantly predicted physical health at T2. Patients who had both colon and rectal cancers as opposed to those who had either separately had poorer physical health at T2, as did patients whose cancer was more advanced. Patients who were less satisfied with their insurance coverage also reported poorer physical health at T2. This block of variables accounted for an additional 22.1\% of variance.

In Step 3, the proposed main effect variables were added to the equation. Thus, Step 3 tested the effect of ethnicity and cancer-related stress variables on health recovery, above and beyond effects of physical health at T1 and demographic and medical characteristics. The main effect of perception of cancer-related stress to the family (CSP-F) on health recovery was significant. Patients’ perception that their cancer had imposed stress on their family members was independently related to poorer physical health at T2. The main effects of ethnicity and perception of cancer-related stress to patients themselves were not significant. The main effects overall accounted for an additional 6.1\% of variance in physical health at T2.

Finally, two interaction terms were added to the equation in Step 4, testing interaction effects between ethnicity and the two types of cancer-related stress perceptions. A significant interaction emerged between ethnicity and the perception of cancer-related stress to the family, accounting for an additional 7.3\% of variance. Patients’ perception that cancer had imposed greater stress on their family members was related to poorer physical health at T2 among African Americans ($\beta=-.59$, $t(26)=-3.17$, $p=.006$) but not among Whites ($\beta=-.22$, $t(32)=-1.12$, $p=.28$).

**Discussion**

This study examined the role of demographic, medical, and stress perception factors in self-reported health recovery from 2 to 12 months post-diagnosis among colorectal cancer patients. The two ethnic groups (African American and White) were comparable overall in their demographic and medical characteristics. In this study, ethnicity was not a significant predictor of self-reported health recovery during the first year of survivorship beyond effects of other demographic and medical factors. Health recovery was, however, significantly predicted by patients’ cancer stage and lower satisfaction with their insurance coverage. These findings are consistent with the perspective that health disparities are sometimes driven by people’s medical characteristics—such as type and stage of cancer and availability of quality care—rather than the person’s ethnicity per se (Ashing-Giwa et al., 2007; Kagawa-Singer et al., 2010; Keating et al., 2005; Santin et al., 2012). Findings also highlight the importance of access to quality health care (i.e. adequate insurance) to recovery of physical health during the year following the cancer diagnosis and treatment.

Ethnicity did play a role in another finding that pertains to how patients’ cancer-related stress perceptions related to their health recovery. Among African Americans, patients’ perception that their cancer caused burden to their family (though not to themselves) related to less self-reported physical health improvement, in support of our hypothesis, which was based on existing literature (Gallagher-Thompson et al., 2000; Meyerowitz et al., 1998; Parveen and Morrison, 2012). This finding was not attributable to ethnic group differences in cancer-related stress perceptions or to socioeconomic status. Given the limited variables under study here, we can only speculate about mechanisms driving this differential effect. One possibly contributing psychosocial factor is familism, the expectation that extended family will be involved in caring for relatives who are ill. This is frequently cited as an important cultural
factor among minorities (Sabogal et al., 1987). Yet, minority patients’ stress from perceiving that their cancer imposes psychological and financial burden on their family caregivers may compromise patients’ health recovery. Further investigation of sources of patients’ perceptions of family burden from their cancer, including increased conflict among family members and the prompting of fatalistic views of one’s self and family members, may be fruitful in advancing our knowledge about ethnic differences in the association of perceived stress and patients’ health recovery.

**Limitations and directions for future studies**

All psychosocial variables were self-reported and therefore may be affected by social desirability reactions. Also, only basic demographic and medical characteristics were examined, the sample size was small, and the effect sizes were small to modest. Future research should investigate other factors that may affect patients’ perceived cancer-related stress, such as other major life events, daily hassles, and developmental place in the life course, and testing potential mediational effects of cancer-related stress perception on cancer patients’ health recovery. Additionally, African Americans were the only minority group assessed and all participants lived in a metropolitan area. This investigation is also limited to the first year since the diagnosis, so it will also be important to examine other phases of cancer survivorship.

**Conclusion**

This study contributes to the cancer survivorship literature by providing the first evidence that
patients’ stress related to perceived burden on their family plays a different role in predicting their health recovery among African American cancer patients. Findings suggest psychosocial intervention targeting patients’ overly negative views about the impact of their cancer on their family may particularly benefit African American patients during their recovery from cancer.

Acknowledgements

The authors extend their appreciation to Tekla Evans and Chiew Kwei Kaw for their efforts in data management, and all the families who participated in this investigation. The first author dedicates this research to the memory of Heekyoung Kim.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded by the American Cancer Society National Home Office, intramural research. Writing this manuscript was supported by ACS RSG Grant (121909-RSG-12-042-01-CPPB) and the Sylvester Comprehensive Cancer Center, Miami, FL.

References


Paxton RJ, Phillips KL, Jones LA, et al. (2012) Associations among physical activity, body...


