Low-Income Cancer Survivors’ Use of Health-Promoting Behaviors

Martha Meraviglia, Alexa Stuifbergen, Sherry Morgan, Dawn Parsons

Cancer survivors are at high risk for cancer recurrence, secondary cancer, or other illnesses, such as heart disease, diabetes, osteoporosis, or functional disabilities (American Society of Clinical Oncology, 2014). For low-income cancer survivors, the burden of cancer is significantly greater; an analysis of matched data from the SEER Program and the U.S. National Longitudinal Mortality Study found significant disparities in cancer burden for persons with low income, including increased incidence of cancer and late-stage diagnosis (Clegg et al., 2009). Unfortunately, persons with limited financial resources are also more likely to exhibit unhealthy behaviors, such as physical inactivity, poor nutrition, and overweight (Schoenborn, Adams, & Peregoy, 2013).

The American Cancer Society (ACS) outlined health-promoting (HP) behavior recommendations regarding physical activity and exercise for cancer survivors (Rock et al., 2012). Recommendations include engaging in at least 150 minutes of moderate-to-strenuous or 60 minutes of strenuous physical activity per week and including strength-training exercises at least 2 days per week. The ACS also outlined goals for dietary intake during and after cancer treatment, which include high intake of fruits, vegetables, and whole grains; consumption of a low-fat diet; maintenance of energy levels; prevention of unwanted weight loss or gain; and moderate intake of vitamin and mineral supplements.

Adopting HP behaviors is extremely important for low-income cancer survivors. Because their risk of poor outcomes exceeds that of other survivors, these behaviors can enhance their general health, reduce the occurrence of secondary disabilities such as osteoporosis, and reduce the risk for secondary cancer (Rock et al., 2012). In this article, a randomized controlled study conducted to obtain baseline data concerning HP behaviors of low-income cancer survivors and their self-efficacy for engaging in HP behaviors is reported. The purpose was to determine the feasibility of an HP intervention for low-income cancer survivors that would improve their self-efficacy, increase their use of HP behaviors, and improve their health.

This cross-sectional correlation study examined use of health-promoting (HP) behaviors and self-efficacy for engaging in HP behaviors. Participants reported higher HP behavior scores for health responsibility, interpersonal relationships, and spiritual growth, and lower scores for physical activity/exercise, nutrition, and stress management. Low physical activity, stress management, and nutrition scores suggest nurses can implement strategies that encourage use of these HP behaviors and enhance self-efficacy.

Literature Review

The literature was reviewed to identify the HP behaviors of cancer survivors, reported benefits, and if low-income survivors were examined. Because limited research was found on the topics of interest, the search was expanded to include literature for 1998-2013 by searching CINAHL, PsycINFO, and PubMed using the search terms of cancer survivors, low-income, and health-promoting behaviors. The majority of cancer health-promotion research has focused on prevention, early detection, and health maintenance through management of symptoms. Health-promotion interventions that focus on vulnerable populations, such as those with low

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income, have not been studied widely (Rowland et al., 2013).

Differences exist in cancer survivors' use of HP behaviors even when income is not considered. Recent population-based studies found only a small percentage of cancer survivors engage in HP behaviors at all. For instance, Blanchard, Courneya, and Stein (2008) examined the prevalence of healthy nutrition, physical activity, and quality of life (QOL) in cancer survivors from the ACS Study of Cancer Survivors. Over 9,000 survivors with six different types of cancer participated in the cross-sectional survey. Authors reported only 17% of survivors had healthy diets and 38% were physically active. Additionally, physically active survivors reported higher QOL; adopting several HP behaviors was associated with even higher QOL.

In another national study, Bellizzi, Rowland, Jeffery, and McNeel (2005) reported similar findings. They examined 7,384 cancer survivors' responses on the National Health Interview Survey, comparing their HP behaviors to noncancer participants' behaviors. Few cancer survivors reported meeting recommendations for physical activity: 38% of young survivors, 33% of mid-age survivors, and 25% of older survivors. In comparison to the noncancer participants, survivors engaged in fewer HP behaviors, putting them at increased risk for recurrence or co-morbidities.

Hawkins and co-authors (2010) examined behavior changes in 7,903 cancer survivors at 3, 6, and 10 years after their cancer diagnosis. Participants were from the ACS Study of Cancer Survivors, a cross-sectional survey that asked if they increased, stayed the same, or reduced 15 behaviors. These cancer survivors reported increasing their use of several HP behaviors: get regular check-ups (49%), eat healthy foods (40%), and try to lose weight (35%). A small percentage of survivors increased their use of exercise (28%) and stress management activities (30%), and spent more time with family and friends (25.7%). Authors conducted regression analysis to identify predictors of behavior changes; they found predictors for using positive behaviors were younger age, more education, greater time from diagnosis, and having more faith and meaning in life.

Several health-promotion interventions for cancer survivors have been reported in the literature. Campbell and co-authors (2009) conducted a case-control study examining interventions to increase healthy nutrition and physical activity. They compared two health communication interventions, tailored print material and telephone motivational interviewing, to increased use of HP behaviors. The sample of 825 older colorectal cancer survivors was randomized to four groups. Cancer survivors who received the combined intervention (two types of health communication) had significantly more consumption of fruits and vegetables. Authors did not find significant improvement for physical activity in any of the four intervention groups.

Mosher and co-authors (2013) reported findings from the FRESH START intervention in which 543 breast and prostate cancer survivors received either standard or tailored print material on diet and physical activity. The tailored material emphasized healthy nutrition through consumption of more fruits and vegetables and less fat, as well as increased physical activity. Authors reported the intervention significantly improved participants' self-efficacy for changing behaviors and increased their healthy diet and physical activity when compared to the control group.

Emerging evidence indicates health promotion improves QOL for cancer survivors. Many researchers have examined different types of HP behaviors, but few have addressed multiple HP behaviors or low-income cancer survivors' use of HP behaviors (Blanchard et al., 2008; Demark-Wahnefried, Aziz, Rowland, & Pinto, 2005). In addition, most health-promotion research has focused on women with breast cancer (Rowland, 2013). Thus, additional research is needed to examine the influence of health-promotion interventions on low-income cancer survivors.

Conceptual Framework

The conceptual framework for this study was derived from Stuifbergen's (2005) explanatory model for health promotion in chronic conditions. The model incorporates concepts from Pender's model of health promotion and self-efficacy theory (Bandura, 1997; Pender, Murdough, & Parsons, 2010). In the explanatory model, HP behaviors are influenced by perceived resources, barriers, and self-efficacy for engaging in HP behaviors. The model, which has been tested in people with multiple sclerosis, post-polio syndrome, and fibromyalgia syndrome, provides support for development of knowledge and skills to reduce barriers and enhance resources for increased participation in HP behaviors (Stuifbergen, 2005).

Methods

Procedures

Participants were recruited directly from among low-income cancer survivors receiving health care at an urban cancer center in central Texas; the center serves 200 low-income, newly diagnosed patients each year in addition to providing follow-up oncology care to over 400 cancer survivors. Following University of Texas and Seton Healthcare System institutional review board approval, several methods were used for subject recruitment, including the distribution of study fliers throughout the clinic and infusion room and referrals from oncology nurses. To be eligible, participants had to be adults over age 18, English- or Spanish-speaking, and diagnosed with Stage I-III cancer for at least 6 months. After giving informed consent, participants completed a study questionnaire assessing personal and cancer characteristics, HP behaviors, and self-efficacy for engaging in HP behaviors.
Measures

The study questionnaire consisted of a set of instruments in a bound booklet with enlarged print size and spacing to enhance readability. The research nurse offered to read the questionnaire aloud if a participant had difficulty reading.

*Personal and cancer characteristics.* Characteristics of participants were collected using investigator-generated measures, the Background Information Sheet (BIS) and the Characteristics of Cancer questionnaire (CC). The BIS is a nine-item instrument that assesses personal characteristics of age, race, education in years, marital status, religion, satisfaction with income, economics of daily living, and employment status. The CC instrument addresses type and stage of cancer, stage of cancer, and length of time since diagnosis. Both measures have been used previously by the researcher to assess participant characteristics of survivors of lung and breast cancer (Meraviglia, 2006).

*Health-promoting behaviors.* Health-promoting behaviors were assessed with the Health Promoting Lifestyle Profile-II (HPLP-II), a 52-item 4-point scale that assesses the frequency with which individuals report engaging in activities directed toward increasing their level of health and well-being (Walker, Sechrist, & Pender, 1995). The instrument comprises six subscales: Health Responsibility, Physical Activity, Nutrition, Stress Management, Interpersonal Relationships, and Spiritual Growth. Responses are scaled from 1 (never) to 4 (routinely), with possible total scale scores ranging from 52 to 208 and subscale scores ranging from 8 to 32 (8 items) or 9 to 36 (9 items). Higher scores indicate more frequent practice of HP behaviors. Internal consistency was 0.93 for the total scale, and ranged from 0.73 to 0.85 for the subscales.

*Self-efficacy for HP behaviors.* Participants’ ability for engaging in HP behaviors was assessed with the Self-Rated Abilities for Health Practices scale (SRAHP; Becker, Stuifbergen, Oh, & Hall, 1993). This scale assesses an individual’s beliefs about his or her ability to perform the HP behaviors of responsible health practices, physical activity, nutrition, and psychological well-being. Respondents were asked to rate how well they perform 28 health behaviors on a 5-point scale (0 not at all to 4 completely). Ratings on the items were summed to yield a total score ranging from 0 to 112 and four subscale scores ranging from 0 to 28. Higher scores indicate greater self-confidence for engaging in HP behaviors. Evidence from previous research supports the discriminant, concurrent, and predictive validity of the SRAHP (Becker et al., 1993). In this study, the instrument had an acceptable internal consistency of 0.92 for the total scale and ranged from 0.80 to 0.93 for the subscales.

Data Analysis

Data analyses were conducted using SPSS v18 (IBM, Chicago, IL). Missing data were minimal, and after analysis, estimated values using regression were imputed for missing data. Descriptive statistics (frequency distributions and percentages) were calculated for personal and cancer characteristics. Means, standard deviations, and ranges were calculated for the HPLP-II subscale scores and total score as well as for the self-efficacy subscale scores and total score. Relationships among variables were assessed with Pearson bivariate correlations. All analyses were interpreted using an alpha less than 0.05 as the significance level. Internal consistency reliability was determined for the instruments, with Cronbach’s alpha of 0.70 or above considered acceptable.

Results

Fifty-one low-income cancer survivors receiving care at the cancer center agreed to participate in this study. Their demographic information is presented in Table 1. Length of time since being diagnosed ranged from 6 months to 10 years (M=2.23), with 37% (n=19) of the participants being within the first year. As would be expected in short-term cancer survivors, the majority were receiving treatment: either chemotherapy (53%, n=27) or radiation therapy (12%, n=6).

Health-Promoting Behaviors

Health-promoting behaviors were assessed by total scores on the HPLP-II as well as subscale scores on health responsibility, physical activity, nutrition, stress management, interpersonal relationships, and spiritual growth (see Table 2). The six subscales had unequal numbers of items, so the item subscale scores were averaged (subscales mean score divided by the number of items) for comparison. Participants scored highest on health responsibility, interpersonal relationships, and spiritual growth, and lowest on physical activity, nutrition, and stress management.

Examination of responses on individual subscale items showed most participants did not meet current ACS (Rock et al., 2012) recommendations for physical activity or nutrition. Only 13% (n=7) reported having a planned exercise program, 19% (n=10) engaged in leisure-time physical activities, 32% (n=16) reported regular light to moderate exercise, and only 15% (n=8) engaged in vigorous exercise. With respect to nutrition, 60% (n=31) reported eating a high-fat and high-sugar diet, and 42% (n=22) were not eating enough fruits or vegetables.

Of the participants engaged in important HP behaviors for cancer survivors, such as reporting unusual signs or symptoms to their health professionals (80%, n=41), questioning health professionals in order to understand instructions (70%, n=36), and inspecting their bodies monthly for physical changes (76%, n=39). Regarding spiritual growth behaviors, 75% (n=38) said they believed life has purpose, 69% (n=35) looked forward to the future, 82% (n=42) were aware of what is important in life, and 75% (n=38) felt connected with a force greater than themselves.

Self-Efficacy for HP Behaviors

Participants’ confidence in their abilities to perform HP behaviors was assessed for responsible health...
practices, physical activity, nutrition, and psychological well-being (see Table 2). Participants scored highest on responsible health practices (M=23.41), nutrition (M=19.24), and psychological well-being (M=18.74). The lowest score was on physical activity (M=14.52).

### Relationships among Study Variables

Several significant relationships (p<0.05) were found among participant demographics, HP behaviors, and self-efficacy for health behaviors. Interestingly, age was related significantly only to HPLP-II stress management (r=0.32). Education was related positively to the HPLP-II total (r=0.41) and the HPLP-II subscales for health responsibility (r=0.31), nutrition (r=0.38), interpersonal relationships (r=0.37), spiritual growth (r=0.30), and physical activity (r=0.29). Education was related significantly to the SRAHP total (r=0.42) and to SRAHP subscales for nutrition (r=0.47) and psychological well-being (r=0.30). As might be expected, SRAHP subscale scores were correlated moderately with HPLP-II subscale scores (see Table 3). Strongest relationships were between SRAHP responsible health practices and HPLP-II health responsibility (r=0.63), SRAHP psychological well-being and HPLP-II interpersonal relationships (r=0.64), and SRAHP psychological well-being and HPLP-II spiritual growth (r=0.62).

### Discussion

This study provides important information on HP behaviors and self-efficacy for engaging in HP behaviors from baseline data obtained in order to determine the feasibility of a health-promotion intervention for ethnically diverse low-income cancer survivors. The majority of study participants were women, divorced or single, on disability leave, or unemployed. Most reported they were dissatisfied with their incomes and their incomes did not meet their living needs. The majority of these cancer survivors had breast cancer, colorectal cancer, or sarcoma at Stage II or Stage III, with an average time since diagnosis of 2.23 years. Surprisingly, over a third of participants reported not knowing the stage of their cancer or did not respond to this question, a result quite different from other research findings in which survivors have been very knowledgeable about their type of cancer but few knew the stage of their cancer (Santoso, Engle, Schaffer, & Wan, 2006).

Results provide new evidence confirming relationships between self-confidence about performing HP behaviors and reported use of HP behaviors. Campbell and co-authors (2009) found self-efficacy was associ-
ated with increased consumption of fruits and vegetables in healthy adults and colorectal cancer survivors. Likewise, in an intervention study designed to increase healthy eating and physical activity in cancer survivors, higher levels of self-efficacy predicted increased use of HP behaviors (Mosher et al., 2013).

The present study's low-income cancer survivors did not meet ACS recommendations for physical activity and nutrition (Rock et al., 2012). Only a small percentage (13%, n=7) reported having a planned exercise program with few engaging in leisure-time physical activities. Additionally, over half (60%, n=31) reported eating a high-fat and high-sugar diet without sufficient fruits and vegetables. These findings suggest low-income survivors do not participate in physical activity or exercise, or make healthy changes in their diets. In contrast, Blanchard and co-authors (2008) reported 38% of cancer survivors were physically active and 17% had healthy diets. Hawkins and colleagues (2010) reported 28% began exercising after being diagnosed with cancer and over 40% changed their diets to include more fruits and vegetables.

To their credit, most participants reported important HP behaviors for cancer survivors, including self-monitoring their disease by reporting unusual signs and symptoms as well as inspecting their bodies monthly for physical changes. In contrast, only 32% of rural cancer survivors in another study reported self-monitoring (e.g., checking for cancer symptoms and writing questions to ask their health care providers) (Hermansen-Kobulnicky, 2009).

In terms of spiritual growth behaviors, most participants indicated a belief that life has purpose, felt connected with a force greater than themselves, and were aware of what is important in life. These data suggest low-income survivors in this study already had an inner spiritual resource, something consistently found to have a positive influence on cancer survivors' adaptation, coping, and psychological well-being (Hawkins et al., 2010; Meraviglia, 2006).

Significant relationships were found among study variables. For example, education was related positively to most HP behaviors; thus the more education a participant

### TABLE 2.
**Total and Subscale Scores for Health-Promoting Behaviors and Self-Efficacy (N=51)**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
<th>Average</th>
<th>Score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPLP-II Total</td>
<td>133.58</td>
<td>21.33</td>
<td>81-181</td>
<td>2.57</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Health responsibility</td>
<td>24.06</td>
<td>4.76</td>
<td>13-32</td>
<td>2.67</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td>14.60</td>
<td>4.83</td>
<td>8-31</td>
<td>1.82</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>21.69</td>
<td>4.83</td>
<td>12-31</td>
<td>2.41</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Stress management</td>
<td>20.06</td>
<td>4.21</td>
<td>12-30</td>
<td>2.51</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Interpersonal relations</td>
<td>26.80</td>
<td>4.94</td>
<td>12-35</td>
<td>2.97</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Spiritual growth</td>
<td>26.38</td>
<td>5.96</td>
<td>13-36</td>
<td>2.93</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>SRAHP Total</td>
<td>75.93</td>
<td>16.75</td>
<td>32-103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsible health</td>
<td>23.41</td>
<td>4.12</td>
<td>9-28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td>14.53</td>
<td>7.47</td>
<td>0-28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>19.24</td>
<td>5.66</td>
<td>6-28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>18.75</td>
<td>5.52</td>
<td>7-28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HPLP-II = Health Promotion Lifestyle Profile II; SRAHP = Self-Rated Abilities for Health Practices

### TABLE 3.
**Relationships Among Health-Promoting Behaviors and Self-Efficacy**

<table>
<thead>
<tr>
<th>Scale</th>
<th>SRAHP Total</th>
<th>Responsible Health</th>
<th>Physical Activity</th>
<th>Nutrition</th>
<th>Psychological</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPLP-II Total</td>
<td>0.534*</td>
<td>0.461*</td>
<td>0.186</td>
<td>0.408*</td>
<td>0.597**</td>
</tr>
<tr>
<td>Health responsibility</td>
<td>0.280</td>
<td>0.626**</td>
<td>-0.128</td>
<td>0.211</td>
<td>0.346*</td>
</tr>
<tr>
<td>Physical activity</td>
<td>0.315*</td>
<td>-0.081</td>
<td>0.495**</td>
<td>0.238</td>
<td>0.078</td>
</tr>
<tr>
<td>Nutrition</td>
<td>0.451*</td>
<td>0.329*</td>
<td>0.219</td>
<td>0.499**</td>
<td>0.304*</td>
</tr>
<tr>
<td>Stress management</td>
<td>0.390*</td>
<td>0.311*</td>
<td>0.084</td>
<td>0.258</td>
<td>0.569**</td>
</tr>
<tr>
<td>Interpersonal relations</td>
<td>0.436*</td>
<td>0.471**</td>
<td>0.011</td>
<td>0.306</td>
<td>0.640**</td>
</tr>
<tr>
<td>Spiritual growth</td>
<td>0.428*</td>
<td>0.336*</td>
<td>0.119</td>
<td>0.257</td>
<td>0.617**</td>
</tr>
</tbody>
</table>

*p<0.05, two-tailed

*p<0.01, two-tailed

HPLP-II = Health Promotion Lifestyle Profile-II; SRAHP = Self-Rated Abilities for Health Practices
had received, the more he or she engaged in HP behaviors. Hawkins and colleagues (2010) similarly found participants with more education reported engaging in more HP behaviors.

**Nursing Implications**

Findings of the current study have implications for nursing practice. The low frequency of nutritional and physical activity behaviors implies this is an important area in which nurses can have an impact by teaching cancer survivors about healthy eating and exercising as well as emphasizing benefits of changing these HP behaviors. An HP intervention is warranted to examine the effects of changes in HP behaviors on overall health and QOL. The association between self-efficacy and HP behaviors supports nurse implementation of strategies to enhance self-efficacy for engaging in HP behaviors, such as providing feedback on the use of stress management, verbally validating survivors’ efforts to achieve desired HP behavior change, and creating written or verbal contracts with patients to participate in HP behavior change (Bandura, 1997; Stuifbergen, 2005).

**Future Research**

Additional research is needed to examine the use of HP behaviors and feasibility of interventions after primary cancer treatment is finished. Alfano and Rowland (2006) indicated survivors are unprepared to deal with the multifaceted problems that can occur after completion of treatment, and instead may benefit from information and programs on cancer survivorship issues during and after treatment. The time of treatment may not be the most teachable moment as cancer survivors seem then to be focused on self-care for symptom management and surveillance of disease progression. Introducing the need to adopt HP behaviors during treatment might cause more distress at a time of extreme uncertainty.

**Limitations**

Because findings are based on self-reported accounts of HP behaviors, they are subject to recall bias and social desirability bias. These potential biases are accepted as weaknesses and must be considered in interpreting the results. In addition, data are cross-sectional and do not permit analysis of changes in HP behaviors and self-efficacy over time. Finally, the risk for inflation of Type 1 error exists due to the small sample size and multiple statistical tests. Despite these limitations, the study provides important information about previously unexamined use of HP behaviors by low-income cancer survivors.

**Conclusion**

Findings from this study indicate low-income cancer survivors engage less in HP behaviors (especially physical activity, nutrition, stress management) than other survivors. Thus nurses should implement strategies to improve patients’ self-efficacy for engaging in these HP behaviors as well as their use of these HP behaviors. More research is needed in a larger group of low-income survivors to examine predictors of HP behaviors and explore long-term influence of adopting a healthy lifestyle on health outcomes.

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