The Centers for Disease Control and Prevention (CDC, 2011) estimated that more than 11.7 million cancer survivors are living in the United States today. About 64% of adults with cancer today will be alive five years after their diagnosis, and about 75% of those who had childhood cancer will be alive after 10 years (National Cancer Institute, 2009). Although that is encouraging, long-term cancer survivors, compared with the general population, are at increased risk for developing several chronic physiologic and psychological problems secondary to their cancer treatment (Eakin et al., 2006). Many cancer survivors suffer from cancer-related fatigue, diabetes, osteoporosis, obesity, cardiovascular disease, chronic pain, impaired immune function, and poor quality of life (QOL) (Schmitz et al., 2005).

Studies have identified physical activity as a nonpharmacologic intervention to help alleviate some of the chronic conditions that cancer survivors may develop during their lifetime (Schmitz et al., 2005; Warburton, Nicol, & Bredin, 2006). For example, physical activity such as low-intensity aerobic walking or cycling can result in significant improvement in cancer-related fatigue, emotional distress, and overall QOL (Courneyea, 2003). Visovsky and Dvorak (2005) found that physical activity plays a significant role in decreasing blood pressure, as well as shortening the duration of neutropenia, thrombocytopenia, and pain.

Less than 20% of adult cancer survivors participate in physical activity and, as a result of such inactivity, cancer survivors are at increased risk for developing chronic diseases. Studies have linked social support as a predictor of physical activity participation in healthy adults. The primary goal of this systematic review is to examine the relationship between social support and physical activity engagement in adult cancer survivors and determine whether additional research is needed in this area. Several databases were searched and articles were systematically extracted according to the inclusion and exclusion criteria. That search yielded 69 articles, 22 of which were identified and included in this review. Fifty percent of the studies showed a significant relationship between social support and physical activity engagement; however, 59% of the participants were breast cancer survivors. The findings suggest that additional research is needed to develop social support strategies that will increase physical activity engagement in adult survivors of cancers other than breast cancer.

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The American Cancer Society (n.d.) has recommended that cancer survivors participate in at least 30 minutes of moderate physical activity that is safe, effective, and enjoyable at least five times a week. However, evidence reveals that less than 20% of adult cancer survivors are meeting the recommended physical activity guidelines, which may increase risk of developing a chronic illness, secondary cancer, or disease recurrence (Branchard, Courneyea, & Stein, 2008; Hamer, Stamatakis, & Saxton, 2009).

Social support has been identified as a positive determinant of physical activity in healthy adults and people with other chronic diseases (Anderson-Bill, Winett, & Wojcik, 2011; McNell, Wyrwich, Brownson, Clark, & Kreuter, 2006; Molloy, Dixon, Hamer, & Sniehotta, 2010; Peterson, Yates, & Hertzog, 2008; Ravenek & Schneider, 2009; Wilcox et al., 2009). Although extensive research exists on the topic of social support and physical activity, little is known regarding the role of social support as a facilitator of physical activity engagement in adult cancer survivors. Therefore, the primary goal of this review is to examine social support interventions that have been successful in motivating adult cancer survivors to engage in physical activity.

Social support is behavior that assists individuals in achieving desired goals and outcomes (Duncan, Duncan, & Strycker, 2005). Several types of social support exist, including social networks (e.g., friends, family, coworkers, neighbors, healthcare professionals). Social support includes emotional support, tangible support, informational support, and appraisal support. These types of social support may help and encourage people to be physically active.
professionals), emotional (e.g., expressions of comfort and caring), instrumental (e.g., provision of tangible aid, goods, or services), informational (e.g., provision of advice and guidance), appraisal (e.g., affirmation from statements or actions), belonging (e.g., shared social activities), and environmental support (e.g., community, neighborhood) (Schaffer, 2009; Uchino, 2004). In addition, perceived quality and availability of support determines the actual benefit of social support to cancer survivors (Cohen, Underwood, & Gottlieb, 2000). Social support may be perceived as helpful or a source of stress or conflict (Uchino, 2004). Conversely, a lack of social support or support given at the wrong time may result in negative consequences or unhealthy behavior (Cohen et al., 2000).

**Literature Review**

**Methods**

The articles reviewed were identified through a search of the literature using the databases CINAHL®, PubMed, Social Science Citation Index, PsycINFO, and Dissertations and Theses using the key phrases “social support,” “physical activity,” and “cancer survivor.” In addition, the reference lists of all retrieved articles were evaluated for additional studies that might fit the inclusion criteria. The search was restricted to human studies published in English, and it yielded 69 articles published from 1987–2011, representing a variety of disciplines, including nursing, psychology, social science, and kinesiology.

The primary inclusion criterion was identification of quantitative studies that measured social support and physical activity variables in adult cancer survivors (aged 18 years or older). Quantitative studies that assessed physical activity as an interventional, outcome, or mediator variable were included. Studies that contained social support measurements were included.

The primary exclusion criteria were qualitative studies that examined social support and studies that evaluated social support as a facilitator of physical activity in children or adolescent cancer survivors. Studies that measured social support as a variable in chronic diseases other than cancer were excluded. A thorough examination of the articles resulted in exclusion of 47 articles, leaving 22 articles for the review. Nineteen of the published studies were conducted in the United States; the remaining three studies were done in Australia, Taiwan, and Canada.

Information from selected articles can be found in Table 1 (correlational, descriptive, and observational studies) and Table 2 (interventional, including randomized, controlled trials [RCTs]; quasiexperimental; pre-experimental one-group; and pre-post study). Table 3 lists the social support instruments used in studies included in this review.

**Sample Description**

The majority of studies included in the literature review used a convenience sample of adult cancer survivors. Only seven of the 22 studies were interventional studies, and four of those were RCTs (Bloom, Stewart, D’Onofrio, Luce, & Banks, 2008; Carmack-Taylor et al., 2006; Emery, Yang, Frierson, Peterson, & Suh, 2009; Rogers et al., 2011); one was quasiexperimental (Sherman, Heard, & Cavanagh, 2010); one was a pre-post design (Stolley, Sharp, Oh, & Schiffer, 2009); and one was a pre-experimental study (James et al., 2006). The remaining 15 studies used correlational and other designs (Alfano et al., 2009; Coups et al., 2009; Harper et al., 2007; Hsu, 2005; Love & Sabiston, 2011; Mandelblatt et al., 2011; McDonnell, 2006; Pinto, Trunzo, Reiss, & Shiu, 2002; Rogers, Courneya, et al., 2008; Rogers, Markwell, Verhulst, McAuley, & Courneya, 2009; Rogers, McAuley, Courneya, & Verhulst, 2008; Saquib et al., 2011; Servaes, Verhagen, & Bleijenberg, 2002; Sherman et al., 2010; Steginga, Lynch, Hawkes, Dunn, & Aitken, 2009; Stephenson, Bebb, Reimer, & Culos-Reed, 2009).

The sample size in the studies ranged from 23–2,967 participants. The majority of the studies were conducted in a community setting, and 13 were based on a theoretical framework. All of the studies examined multiple variables that interacted with social support and physical activity in adult cancer survivors. The demographics of the adult cancer survivors are included in the literature review. The median age range of the sample population within the review is 28–73 years old. In the studies that reported gender and race or ethnicity, the majority of the sample identified as Caucasian or White women. Two studies evaluated a specific race or ethnic group, Taiwanese and African-Americans (Hsu, 2005; Stolley et al., 2009). Sixty-three percent of the sample included in this review were breast cancer survivors who had completed surgery, chemotherapy, or radiation treatment.

**Results**

Sixty-eight percent of this literature consists of correlational, descriptive, and observational studies that evaluated the relationships among social support, physical activity, and other variables, such as breast cancer events or mortality, chronic fatigue, and QOL in adult cancer survivors. The remaining 32% of the literature consists of interventional studies examining the effects of social support and physical activity engagement. All of the studies reviewed used standardized social support instruments that have proven reliability and validity in cancer survivors or similar populations.

**Correlational, Descriptive, and Observational Studies**

Seven of the 15 correlational, descriptive, and observational studies identified social support as a potential correlate of physical activity in adult cancer survivors (Coups et al., 2009; Harper et al., 2007; Hsu, 2005; McDonnell, 2006; Rogers, Courneya, et al., 2008; Rogers, McAuley, et al., 2008; Rogers et al., 2009). All seven studies identified physical activity as a dependent variable and social support as the independent variable. Four of the seven studies found that source of social support and perception of received support significantly predicted cancer survivors’ exercise frequency and participation (Harper et al., 2007; Hsu, 2005; Rogers, McAuley, et al., 2008; Rogers et al., 2009). In contrast, Coups et al. (2009) reported that neither social support nor any perceived environmental factors were associated with moderate or strenuous physical activity among lung cancer survivors. Similarly, McDonnell (2006) and Rogers, Courneya, et al. (2008) found no significant relationship with physical activity levels and social support.
TABLE 1. Literature Review of Correlational, Descriptive, and Observational Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Design and Purpose</th>
<th>Sample</th>
<th>Variables</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Alfano et al., 2009</td>
<td>Cross-sectional, descriptive study in a community setting</td>
<td>245 long-term breast cancer survivors who were, on average, 12.4 (SD = 1.8) years since diagnosis</td>
<td>Independent: Health behaviors (e.g., exercise, diet)</td>
<td>Increased exercise behavior was related to lower fatigue.</td>
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<td>To investigate the prevalence and clustering of self-reported changes in diet and exercise and how these changes related to ongoing cancer-related symptoms, social support, and stressful life events among long-term breast cancer survivors</td>
<td>X age: 61.9 years (SD = 9.9)</td>
<td>Dependent: Cancer-related symptoms, social support, and stressful life events</td>
<td>No association between diet and other cancer symptoms</td>
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<td>Race: 93% White, 7% other</td>
<td>Strengths: use of Internet to conduct research</td>
<td>Survivors who reported increasing the amount they exercised after their breast cancer diagnosis reported greater social support than survivors who reported decreasing or maintaining their prediagnosis level of exercise (78.9 versus 73.1 [adjusted mean social support scores], respectively; p = 0.06)</td>
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<td>Weaknesses: cross-sectional design, homogeneity of sample, self-reported diet and exercise changes using a nonvalidated scale, lack of knowledge of precancer health behaviors</td>
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<td><strong>Strengths:</strong> large sample</td>
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<tr>
<td>Coupes et al., 2009</td>
<td>Cross-sectional, descriptive study using social cognitive theory in a community setting</td>
<td>175 survivors of early-stage non-small cell lung cancer who were 1–6 years postsurgical treatment; 30% had a high school education or less</td>
<td>Independent: Medical condition, self-efficacy, outcome expectations, social support, and environmental support</td>
<td>Participants reported an average of 77.7 minutes of moderate to strenuous weekly activity. About 5% reported engaging in leisurely walking at least three times per week. Less leisurely walking was reported by older individuals (p = 0.001), those with lower education levels (p &lt; 0.001), and those with more comorbidities (p = 0.104). Physical activity was lower for participants treated with chemotherapy, radiotherapy, or surgery (p = 0.084). Social support and perceived environmental factors were not associated with moderate to strenuous physical activity. Social support from friends was associated with leisurely walking. Self-efficacy was associated with physical activity. Outcome expectations were associated with physical activity. Weaknesses: Cross-sectional design did not permit testing of causal relationships; sample was mostly White, non-Hispanic, well-educated individuals, limiting generalization. <strong>Strengths:</strong> large sample; understudied cancer survivor group</td>
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<tr>
<td>Harper et al., 2007</td>
<td>Cross-sectional, observational study using social cognitive theory in a community setting</td>
<td>216 cancer survivors (33% breast, 17% lung, 10% thyroid, 9% lymphoma, 6% colorectal, 6% ovarian, 3% prostate, 2% melanoma, and 15% other); 81% were women, and 93% were Caucasian</td>
<td>Independent: Optimism, social support, social constraints, cancer-specific distress, stressor response, and social desirability</td>
<td>Optimism (β = 0.04), social support (β = 0.02), and avoidance symptoms (β = 0.03) were related to composite measure of increased exercise frequency and improved diet. Demographic and clinical variables were unrelated to positive behavioral change. Weaknesses: cross-sectional design limits causal relationships; biased recall; sample was mostly female, married, and well educated, limiting generalization; heterogeneous sample, limiting translation of results to individual cancer types; recruitment only via Internet, limiting access to study <strong>Strengths:</strong> use of Internet to conduct research</td>
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<td>To investigate the extent of positive change in four psychosocial behaviors and two physical health behaviors; the role of psychosocial predictors in positive behavior change after cancer diagnosis and treatment; and the possible influence of social desirability in reports of positive psychosocial and behavior change</td>
<td>X time since diagnosis: 3.1 years</td>
<td>Dependent: Physical behaviors (diet and physical activity) and psychosocial behaviors (reflect on life priorities; spend quality time with family and friends; engage in charitable or volunteer activities; and engage in religious or spiritual activities)</td>
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### TABLE 1. Literature Review of Correlational, Descriptive, and Observational Studies (Continued)

<table>
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<tr>
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<tbody>
<tr>
<td>Hsu, 2005</td>
<td>Prospective longitudinal repeated-measures design using social cognitive theory in Taiwan To assess the factors that influence exercise behavior among breast cancer survivors and to demonstrate cross-culture applicability of the instruments</td>
<td>196 women with stage 0–III breast cancer Age range: 23–74 years X age: 47.63 years (SD = 9.91)</td>
<td><strong>Independent:</strong> Cancer-related fatigue, physical health, mental health, social support, exercise barriers, outcome expectancy, and self-efficacy</td>
<td>Exercise frequency was significantly predicted by age ($\beta = 0.72$), education ($\beta = 0.74$), exercise history ($\beta = 0.52$), social support for exercise ($\beta = 0.26$), and exercise self-efficacy ($\beta = 0.37$). Exercise outcome expectancy did not predict exercise frequency ($p = 0.288$).</td>
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<td><strong>Dependent:</strong> Physical activity</td>
<td><strong>Weaknesses:</strong> Study used convenience sampling, which may not be representative of the Taiwanese breast cancer population; the majority of the sample was married, highly educated, and middle class, which limits generalization; self-reported exercise behavior may be biased.</td>
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<td><strong>Strengths:</strong> Low attrition rate (2.6%); unstudied population</td>
<td><strong>Strengths:</strong> Low attrition rate (2.6%); unstudied population</td>
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<td>Love &amp; Sabiston, 2011</td>
<td>Cross-sectional study in a community setting To explore social support and enduring distress as predictors of psychological growth; the moderating role of physical activity also was examined.</td>
<td>64 young adult cancer survivors (73% female, 48% single) Cancer type: breast (17%), Hodgkin (14%), acute lymphoblastic leukemia (9%), cervical (6%), testicular (6%), and thyroid (6%) X age: 28.83 years Race: 88% Caucasian</td>
<td><strong>Independent:</strong> Social support and enduring stress <strong>Dependent:</strong> Psychological growth <strong>Moderator:</strong> Physical activity</td>
<td>Stress ($\beta = -0.04$) and social support ($\beta = 0.46$) were significant predictors of psychological growth. Physical activity and social support interaction accounted for about 13% of the variance ($\beta = -0.52$), suggesting a strong positive correlation between social support and psychological growth in inactive individuals and a much weaker correlation for active individuals. <strong>Weaknesses:</strong> Self-selected sample limits generalization; small sample size limits inferences. <strong>Strengths:</strong> Variety of cancer survivors</td>
</tr>
<tr>
<td>Mandelblatt et al., 2011</td>
<td>Prospective cohort study in a community setting To assess the effects of lifestyle factors on breast cancer recurrence and mortality</td>
<td>2,279 women with invasive, nonmetastatic breast cancer X age: 59.7 years Race: 73% White, 12% Asian-Pacific Islander, 9% Hispanic, 7% Black</td>
<td><strong>Independent:</strong> Physical activity <strong>Dependent:</strong> Quality of life and social support</td>
<td>Physical activity was associated with all quality of life subscales except emotional well-being (all $p &lt; 0.01$). Quality of life was higher for women in the highest quartile of moderate and vigorous activity compared to women in the lowest quartile ($p &lt; 0.001$). White breast cancer survivors reported higher levels of physical activity and better quality of life compared to racial minority breast cancer survivors. Physical activity was associated with social support ($p \leq 0.001$) <strong>Weaknesses:</strong> Physical activity and quality of life were measured at the same time, so causality cannot be determined; self-reported physical activity levels; convenient sample limits generalizability. <strong>Strengths:</strong> Large and racially diverse sample; used validated measures of quality of life and physical activity</td>
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<tr>
<td>McDonnell, 2006</td>
<td>Cross-sectional study using social ecological framework in a community setting To examine correlates of physical activity among breast cancer survivors from a multilevel perspective that assessed correlates at the intrapersonal, interpersonal, institutional, and community levels of influence</td>
<td>50 breast cancer survivors X age: 55.62 years (SD = 9.61) X time since diagnosis: 40.54 months (SD = 16.24)</td>
<td><strong>Independent:</strong> Task self-efficacy, barrier self-efficacy, social support, health care climate, environmental factors, and physiologic indicators <strong>Dependent:</strong> Physical activity</td>
<td>Barrier self-efficacy was a significant correlate of total energy expenditure ($r = 0.29, p = 0.043$), and daily energy expenditure ($r = 0.316, p = 0.029$). Social support from family and friends and the healthcare climate had no significant relationship with physical activity levels. <strong>Weaknesses:</strong> Self-selection of sample may lead to bias; small sample limits subgroup comparison. <strong>Strengths:</strong> Prospective design provides insight into current physical activity levels of breast cancer survivors.</td>
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<th>Findings</th>
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| Pinto et al., 2002 | Observational, longitudinal (3-, 6-, 9-, and 12-month follow-up) study To examine the trend of exercise participation among early-stage breast cancer survivors and investigate the effects of exercise on mood, quality of life, and cancer-related symptoms | 69 breast cancer survivors
- X age: 57.5 years
- X time since diagnosis: 8 months | Independent: Physical activity Dependent: Depression, social support, active coping, cancer-related symptoms, quality of life, coping, and mood | Participation in vigorous-intensity exercise increased with greater time since diagnosis ($p \leq 0.01$), greater confidant support ($p \leq 0.01$), living with a spouse or partner ($p < 0.01$), and higher baseline depression ($p = 0.01$). No predictor variables for moderate-intensity exercise were identified. |
| Rogers, Courneya, et al., 2008 | Cross-sectional study using Social Cognitive Theory in an academic outpatient clinic To determine physical activity correlates and barriers among patients with head and neck cancer | 59 survivors of head and neck cancer; 83% men and 92% White
- X age: 58 years (SD = 12.8)
- X months since diagnosis: 18.6 (SD = 51.9) | Independent: Self-efficacy, barriers, social support, role model, depression, and symptoms Dependent: Physical activity | Strongest bivariate correlates of physical activity included enjoyment, symptom index, alcohol use, task self-efficacy, perceived barriers, and comorbidity. No significant association among physical activity and social support Weaknesses: cross-sectional study limits causation; not population-based, which limits generalizability; small sample size Strengths: first study to examine physical activity in patients with head and neck cancer; high response rate (91%) minimized selection bias |
| Rogers et al., 2009 | Cross-sectional study using the Ecologic Model in a rural community setting To determine the exercise preferences of rural breast cancer survivors and to identify the major determinants of these preferences | 483 rural breast cancer survivors
- Race: 96% White
- X education: 13 years (SD = 2.5)
- X months since diagnosis: 39 (SD = 21.5) | Independent: Self-efficacy, task self-efficacy, perceived exercise barriers, enjoyment, social support, fatigue, and depression Dependent: Physical activity | 19% of survivors reported more than 150 minutes of moderate to vigorous physical activity per week. More than half were open to various counseling options. Most popular options were counseling after treatment (36%), face-to-face (47%), and from an exercise specialist (40%). Preferred home-based (63%), unsupervised (47%), moderate-intensity exercise (65%) that was primarily walking Higher social support with exercising with friends or family Weaknesses: Sample was mostly White with higher education and income, which may limit generalization; low response rate; sampling bias; cross-sectional design limits causation Strengths: understudied rural population |
| Rogers, McAuley, et al., 2008 | Cross-sectional, descriptive study using social cognitive theory in a community setting To determine physical activity self-efficacy correlates in breast cancer survivors | 192 breast cancer survivors
- Race: 98% White
- X age: 64 years (SD = 11.5)
- X months since breast cancer diagnosis: 62.5 (SD = 25.9) | Independent: Perceived barriers, enjoyment, social support, and fatigue Dependent: Self-efficacy and physical activity | Structural equation analyses demonstrated significant and direct associations for perceived physical activity barriers ($\beta = -0.29$), fatigue ($\beta = -0.24$), social support ($\beta = 0.12$), enjoyment ($\beta = 0.12$), and prediagnosis physical activity ($\beta = 0.11$) with perceived barriers and self-efficacy. Survivors with more social support reported less fatigue, fewer barriers, and more enjoyment from physical activity and were more efficacious with overcoming barriers to physical activity. Weaknesses: Cross-sectional design and mainly Caucasian sample limits causation and generalizability. Strengths: first study to report fatigue as a source of self-efficacy; unique assessment of differences in efficacy correlates for barriers-related versus task-related confidence |

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TABLE 1. Literature Review of Correlational, Descriptive, and Observational Studies (Continued)

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| Saquib et al., 2011 | Cross-sectional survey in a community setting To assess whether health-related quality of life and other psychosocial variables predict time to additional breast cancer events or all-cause mortality in breast cancer survivors | 2,967 breast cancer survivors | **Independent:** Quality of life, social support, and physical activity  
**Dependent:** Breast cancer event | Poor physical health was associated with decreased time to additional breast cancer events and all-cause mortality ($p = 0.005$ and $0.004$ respectively). Greater hostility predicted additional breast cancer events ($p = 0.03$). None of the other psychosocial variables predicted either outcome. |
| Servaes et al., 2002 | Cross-sectional study in a comprehensive cancer center To investigate complaints of fatigue after treatment for breast cancer | 150 breast cancer survivors who completed treatment 6–70 months prior  
**X age:** 45.9 years  
**Control group:** 78 women with a history of cancer ($X$ age = 48.1 years) | **Independent:** Psychological well-being, functional impairment, sleep disturbance, physical activity, social support and social functioning, and neuropsychological functioning  
**Dependent:** Chronic fatigue | Severely fatigued survivors scored more problematic on psychological well-being, functional impairment, sleep disturbance, physical activity, social support, and neuropsychological and social functioning. Severely fatigued survivors reported less physical activity and social functioning, more negative interactions, and a higher discrepancy between the amount of social support received and the desired amount of social support compared to control group. |
| Steginga et al., 2009 | Prospective study at 6 and 24 months postdiagnosis in Queensland, Australia To investigate the role of medical, sociodemographic, psychosocial, and lifestyle variables in the overall and domain-specific quality-of-life outcomes of patients with colorectal cancer | 1,822 survivors of colorectal cancer  
(60% men)  
**X age:** 65 years | **Independent:** Fatigue, fecal control, body mass index, physical activity, dispositional optimism, and social support  
**Dependent:** Quality of life | Poorer social support and problems with fecal control were linked to lower levels of social well-being. Advanced stage of disease negatively influenced physical and functional adjustment. Higher body mass index, lack of insurance, and multiple comorbidities were associated with poor quality of life. |
| Stephenson et al., 2009 | Cross-sectional survey in a cancer center in Calgary, Canada To assess diet and physical activity level behavior in colorectal cancer survivors receiving systemic chemotherapy, and to examine potential associations between these behaviors and quality of life | 67 colorectal cancer survivors receiving systemic chemotherapy  
(52% men, 91% Caucasian)  
**X age:** 60.4 years  
**X time since cancer diagnosis:** 13.9 months ($SD = 14.1$) | **Independent:** Physical activity behavior, diet behavior, and social support  
**Dependent:** Quality of life | 58% were meeting national dietary guidelines, 26% were meeting national physical activity guidelines, and 17% were meeting both (17%). Body mass index, age, and social provisions have stronger correlations with perceived quality of life than do the lifestyle behaviors. Neither behavior was significantly associated with quality of life or perceived social support. |

Weaknesses: small sample limits generalization; self-report format may influence reports of behavior; cross-sectional design  
Strengths: first study to look at behavior and quality of life in colorectal cancer survivors receiving chemotherapy |
from family and friends in breast cancer survivors or head and neck cancer survivors, respectively.

Three of the 15 correlational, descriptive, and observational studies identified physical activity as the independent variable, with social support as the dependent variable (Alfano et al., 2009; Mandelblatt et al., 2011; Pinto et al., 2002). Each of those studies showed increased physical activity participation in breast cancer survivors who reported having higher multilevel or functional social support.

Four studies identified physical activity and social support as independent variables, with the dependent variable being breast cancer events or mortality, chronic fatigue, or QOL (Saquib et al., 2011; Seraes et al., 2002; Steginga et al., 2009; Stephenson et al., 2009). For example, Saquib et al. (2011) found poor physical health was associated with higher body mass index, lower physical activity, lower alcohol consumption, and more insomnia in breast cancer survivors; however, no significant association was observed with social support. Seraes et al. (2002) evaluated chronic fatigue in breast cancer survivors and found severely fatigued participants scored lower on psychological well-being, functional impairment, sleep disturbance, physical activity, social support, and neuropsychological and social functioning compared to breast cancer survivors who reported nonsevere fatigue. Steginga et al. (2009) found that poor social support and fecal control were linked to poor QOL in colorectal cancer survivors; however, no significant association existed with physical activity. Similarly, Stephenson et al. (2009) found that diet and physical activity levels were not significantly associated with QOL or perceived social support in colorectal cancer survivors receiving chemotherapy.

One study identified physical activity as a moderator variable between social support and post-traumatic growth in young adult (aged 20–39 years) cancer survivors. Inactive young adult cancer survivors reported lower levels of social support and lower levels of post-traumatic growth (Love & Sabiston, 2011).

In brief, 47% of the correlational, descriptive, and observational studies identified a positive relationship between social support and physical activity in adult cancer survivors, 40% showed no significant association between the two variables, and 13% showed a negative association between social support and physical activity. Ten studies had a sample size that ranged from 150–2,967; however, five studies had a sample size that ranged from 50–69. Smaller sample sizes tend to produce less accurate estimates than larger samples (Polit & Hungler, 1991). Seven of the studies used a conceptual framework to guide the study (Coups et al., 2009; Harper et al., 2007; Hsu, 2005; McDonnell, 2006; Rogers, Courneya, et al., 2008; Rogers et al., 2009; Rogers, McAuley, et al., 2008).

Interventional Studies

Seven interventional studies evaluated social support and physical activity engagement (Bloom et al., 2008; Carmack-Taylor et al., 2006; Emery et al., 2009; James et al., 2006; Rogers et al., 2011; Sherman et al., 2010; Stolley et al., 2009). Four studies were RCTs (Bloom et al., 2008; Carmack-Taylor et al., 2006; Emery et al., 2009; Rogers et al., 2011), one was quasi-experimental (Sherman et al., 2010), one was a pre-post design (Stolley et al., 2009), and one was a pre-experimental study (James et al., 2006).

All seven studies reported a relationship between social support and physical activity engagement; however, results varied depending on the participant’s gender, age, cancer diagnosis, stage of disease, and type of intervention. For example, 162 Australian postsurgical breast cancer survivors who participated in a mixed-modality, eight-week group exercise and information support program reported increased satisfaction with social support at follow-up compared to the control group (Sherman et al., 2010). Similar results of increased satisfaction with social support for physical activity and fruit and vegetable intake were found in colorectal cancer survivors and the comparison group who participated in a health promotion program consisting of tailored print messages and telephone-based motivational interviewing (James et al., 2006).

In addition, Stolley et al. (2009) reported that social support and physical activity improved significantly between the baseline and postintervention interviews of African American breast cancer survivors who participated in a culturally tailored weight-loss program. Notably, African American breast cancer survivors reported that discouragement by friends increased significantly during the six-month Moving Forward intervention. Bloom et al. (2008) examined young breast cancer survivors participating in three six-hour workshops during a three-month period to determine whether the intervention would improve knowledge of breast cancer, lifestyle habits, and communication with family. Young breast cancer survivors (aged 23–50 years) in the intervention group reported an increase in their amount of physical activity and social support; however, no significant dietary changes occurred.

Rogers et al. (2011) found a significant increase in objective physical activity engagement after the intervention; however, they found little to no change in self-efficacy, social support, fear of exercise, exercise partner, or role models in breast cancer survivors participating in an individualized exercise program that included supervised exercise sessions, group sessions, and individual face-to-face counseling. Conversely, Carmack-Taylor et al. (2006) reported no significant improvements in QOL or social support at six or 12 months in prostate cancer survivors who participated in a group-based lifestyle physical activity program.

Emery et al. (2009) reported that breast cancer survivors experienced poor physical health, depressive symptoms, and lower emotional health-related QOL with less physical activity. In addition, family social support increased as physical activity declined near the end of the five-year longitudinal study.

On the whole, four of the seven interventional studies showed a positive outcome with social support and physical activity engagement in adult cancer survivors. However, three studies did not demonstrate any significant improvements in physical activity engagement or social support after completing a specific intervention. One study did not include a comparison or control group, which limited the causative relationship between social support and physical activity engagement (Stolley et al., 2009).

Measurements of Social Support

Several measurements were used in this review to assess social support in cancer survivors (Berkman & Syme, 1979; Broadhead, Gehlbach, de Gruy, & Kaplan, 1988; Cohen, Mermelstein,
Design and Purpose

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TABLE 2. Literature Review of Interventional Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Design and Purpose</th>
<th>Sample</th>
<th>Variables</th>
<th>Findings</th>
</tr>
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<tbody>
<tr>
<td>Bloom et al., 2008</td>
<td>Randomized, controlled trials with a pretest/post-test design using a social support framework where survivors were assigned to an intervention or control group and conducted in a community setting. To test a hypothesis that women in the intervention group would show greater improvement than controls with respect to (a) knowledge of breast cancer, its treatment, and long-term health concerns; (b) lifestyle habits; and (c) communication with family and physicians.</td>
<td>404 breast cancer survivors who were five years from diagnosis and cancer-free. X age: 42% were younger than 45 years at diagnosis. Race: 76% Euro-American, 10% Asian, 7% Latina, and 5% African American.</td>
<td>Intervention: Three educational workshops that focused on information, diet and exercise, communication, and emotional support. Outcome: Breast cancer information, physical activity, diet, patient-physician communication, communication with family, and social support.</td>
<td>At post-test, women in the intervention group, on average, had greater knowledge regarding breast cancer, its treatment, and their own future health (p = 0.015) and were more likely to report an increased amount of physical activity (p = 0.036), but not significant dietary changes, than those in the control group. Social support was related to increased self-report of physical activity. Weaknesses: Some participants did not attend the workshops as agreed; lack of consistency in speakers for all workshops; some participants were enrolled in the WHEL study, which might alter diet and physical activity results. Strengths: randomized, controlled trial design; large sample size.</td>
</tr>
<tr>
<td>Carmack-Taylor et al., 2006</td>
<td>A three-conditioned randomized, controlled trial using social cognitive theory and the Transtheoretical Model in an urban cancer center. To evaluate the efficacy of a six-month, group-based lifestyle physical activity program for patients with prostate cancer compared to a group-based educational support program and a standard of care program (no group).</td>
<td>134 prostate cancer survivors receiving continuous androgen ablation. Lifestyle program: n = 46. Educational support program: n = 51. Standard care: n = 37. Median age: 69.2 years. Race: 73% White, 20% Black, 7% other.</td>
<td>Intervention: Consisted of participants attending small group meetings for six months; both programs included an orientation session, 16 weekly sessions, and four biweekly sessions, each lasting 1.5 hours. The first hour of the lifestyle program focused on increasing physical activity. The first hour of the educational support program provided facilitated discussion. The last half hour of both programs involved either a facilitated discussion or an expert speaker covering topics such as sexuality, treatment side effects, or diet. Standard of care participants did not attend group support meetings, but received mailings of educational material and information about community resources. Outcome: Quality of life, body mass index, endurance, social support, physical activity, process of change, decisional balance, and self-efficacy.</td>
<td>No statistically significant differences on any quality-of-life measures, measures of body composition or endurance at 6 or 12 months, or in physical activity or energy expenditure. No significant improvements in social support for any of the groups at 6 or 12 months. Weaknesses: self-report physical activity measures, which may alter study outcome; age of participants varied from 44.8–89 years, which may alter study outcome. Strengths: randomized, controlled design, which improves causation; use of validated instruments.</td>
</tr>
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</table>

BEAT Cancer—Better Exercise Adherence after Treatment for Cancer; WHEL—Women’s Healthy Eating and Living
### TABLE 2. Literature Review of Interventional Studies (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Design and Purpose</th>
<th>Sample</th>
<th>Variables</th>
<th>Findings</th>
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</thead>
</table>
| Emery et al., 2009     | Five-year longitudinal follow-up study in a community setting where participants were randomized to one of two study arms: intervention with assessment or assessment only To estimate the five-year trajectory of physical activity among women with breast cancer, and to evaluate biopsychosocial variables measured soon after breast cancer diagnosis | 277 patients from a regional setting with stage II or III breast cancer  
X age: 50.9 years (SD = 10.8)  
Race: 90% Caucasian | Intervention with assessment: Psychoeducational group sessions for 18 weeks (90 minutes per week), followed by eight additional sessions at monthly intervals. Sessions covered topics such as stress reduction, social support, communication skills, and physical activity. Psychological and behavioral assessments were conducted at baseline, four months, and every six months during the next four years for a total of 12 assessments during the five-year study.  
Assessment only: Same assessments as intervention group, but no intervention  
Outcome: Physical activity, health status and symptoms, health-related quality of life, depression symptoms, social support | A curvilinear pattern of change in physical activity was evident over the five years of follow-up (p = 0.002). Physical activity increased gradually during the first 18 months, then declined steadily over the subsequent 42 months. Higher family support was associated with slower decline in physical activity in the latter 42 months.  
Weaknesses: Intervention may have influenced physical activity and other outcomes; homogeneous sample, which limits generalization  
Strengths: Large sample size with repeated assessments of physical activity over five years; no prior study examined physical activity among breast cancer survivors in a longitudinal study over five years |
| James et al., 2006     | A 2 x 2 factorial intervention design using social cognitive theory in a community setting to test two methods of communicating and promoting health behavior change To examine health behaviors and their association with social cognitive theory constructs among colorectal survivors and comparable non–colorectal-affected participants | 825 participants (304 colorectal cancer survivors and 521 non–colorectal-affected participants); 48% were women and 36% were African American  
X age: 67 years (SD = 10.04) | Intervention: Consisted of tailored print messages and telephone-based motivational interviewing. A preintervention survey was conducted at baseline, with follow-up at six and 12 months.  
Outcome: Fruit and vegetable intake, physical activity, self-efficacy, social support, perceived barriers, knowledge | Behaviors were comparable between groups, but survivors perceived more social support for behaviors (p < 0.05).  
Weaknesses: Cross-sectional design does not allow for assessing causal or temporal relationships; self-selected sample may be more motivated and healthier; self-report measures may lead to biases.  
Strengths: Diversity of sample and comparison group |
| Rogers et al., 2011    | A two-arm randomized, controlled trial using social cognitive theory in a small urban Midwest setting To determine the effect of a three-month BEAT Cancer intervention of specific social cognitive theory constructs compared to usual care | 41 breast cancer survivors (21 in intervention arm; 20 in usual-care arm)  
Median age: 53 years  
Race: 93% White | Intervention: BEAT Cancer intervention included 12 individual supervised exercise sessions, six discussion group sessions, and three individual face-to-face counseling sessions administered over a three-month period. Usual-care group participants were given American Cancer Society pamphlets and downloaded Web site information related to physical activity after a cancer diagnosis.  
Outcome: Physical activity, self-efficacy, barrier interference, social support, outcome expectations, and fear of exercise | Little to no change for task self-efficacy, friend social support, importance of positive outcomes, fear of exercise, exercise partner, and role models  
Intervention group reported lower barriers interference and greater physical activity enjoyment. Barrier interference significantly (p = 0.004) mediated the intervention effect of physical activity three months postintervention. Post-enjoyment was not a significant mediator.  
Weaknesses: Small sample size; sample mainly White, limiting generalization  
Strengths: Randomized, controlled design provided necessary causal and temporal relationships; objective physical activity measure |

BEAT Cancer—Better Exercise Adherence after Treatment for Cancer; WHEL—Women’s Healthy Eating and Living

(Continued on the next page)
TABLE 2. Literature Review of Interventional Studies (Continued)

<table>
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<tr>
<th>Study</th>
<th>Design and Purpose</th>
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<th>Findings</th>
</tr>
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<tbody>
<tr>
<td>Sherman et al., 2010</td>
<td>A two (group) by two (time point) quasieperimental study using social cognitive theory with a structured group exercise and support program as the treatment condition, and the waitlist control, conducted in a community setting in Australia. To evaluate the short-term impact of YWCA Encore, a mixed-modality group exercise and information support program for breast cancer survivors.</td>
<td>162 breast cancer survivors (116 women allocated to the Encore program and 46 women allocated to the waitlist group). <strong>Median age:</strong> Encore group = 57.7 years; waitlist group = 54.3 years. <strong>Country of origin:</strong> 78% from Australia.</td>
<td><strong>Intervention:</strong> Encore; lasted eight weeks with two-hour sessions held once per week. <strong>Outcome:</strong> Quality of life, functional ability and energy levels, psychological distress, social support, and health-related beliefs.</td>
<td>Functional ability scores rated by Encore participants at the time of completion were significantly higher than at the time of program entry (p = 0.0005). Self-reported energy levels increased significantly from the time of study entry to completion (p = 0.0005). Significant enhancements at follow-up for quality of life and social support with the Encore group compared to control. <strong>Weaknesses:</strong> self-report questionnaires, which may have bias; amount of physical activity was not measured; study was conducted over a short time frame, which may have affected outcomes; study lacked randomization. <strong>Strengths:</strong> Comparison groups improve causation; group and information discussion may increase quality of life and social support benefits to participants.</td>
</tr>
<tr>
<td>Stolley et al., 2009</td>
<td>One-group pretest/post-test design using social cognitive theory and the Health Belief Model in an urban university setting. To assess the feasibility and impact of Moving Forward, a culturally tailored weight-loss program for African American breast cancer survivors.</td>
<td>23 African American breast cancer survivors. <strong>X age:</strong> 51.4 years (SD = 8.9). <strong>Education and Income:</strong> Most participants had some college experience and made more than $75,000 per year.</td>
<td><strong>Intervention:</strong> Six-month intervention that included two weekly classes. The first class included two hours of education on knowledge, attitudes, barriers, and facilitators related to changes in diet, exercise, and weight. The last 60 minutes involved an exercise class; the second weekly class was an exercise class. <strong>Outcome:</strong> Dietary patterns, physical activity, social support, quality of life, and height and weight.</td>
<td>After the intervention, significant differences in weight, body mass index, dietary fat intake, vegetable consumption, vigorous physical activity, and social support were increased significantly. No significant differences were noted in quality of life. <strong>Weaknesses:</strong> small sample size; lack of comparison group; participants were self-selected, thus possible biased sample; self-report, subject to recall bias. <strong>Strengths:</strong> first study to examine a weight-loss program for this population.</td>
</tr>
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</table>

BEAT Cancer—Better Exercise Adherence after Treatment for Cancer; WHEL—Women’s Healthy Eating and Living

measurement. In addition, all measurements of social support included in this review were previously tested in adult cancer survivors, healthy adults, and people with other chronic diseases.

**Discussion**

The primary goal of this review was to examine past social support interventions to determine which strategies have been successful in motivating adult cancer survivors to engage in physical activity. Review findings suggest that studies using a conceptual framework such as social cognitive theory or the social ecological model to guide the research appear to show a significant relationship between social support and physical activity in adult cancer survivors, which is consistent with other research studies (Matthews et al., 2007; Rabin, Pinto, & Frierson, 2006).

In addition, multiple-level social support is associated with physical activity frequency and participation in most cancer survivors. That is consistent with research that found multi-level support to be significantly associated with physical activity and dietary behaviors among Latinos with multiple chronic diseases (Bull, Eakin, Reeves, & Kimberly, 2005). Conversely, previous research posits that cancer survivors experience more negative interactions with social support because of poor coping and psychological distress (Manne & Glassman, 2000). Only one study in this review addressed the negative interactions of social support and found that severely fatigued patients with breast cancer reported more negative interactions and a higher discrepancy between the received and desired amounts of social support received (Servaes et al., 2002).
### TABLE 3. Social Support Instruments

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Items Measured</th>
<th>Sample</th>
<th>Instrument Design, Validity, Reliability, Number of Items, and Sample</th>
<th>Study Used in Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOS Social Support Survey (Sherbourne &amp; Stewart, 1991)</td>
<td>Emotional, informational, affectionate, tangible, and positive social intervention</td>
<td>Breast cancer survivors</td>
<td>20-item, Likert-type scale ranging from 1 (none of the time) to 5 (all of the time)</td>
<td>Alfano et al., 2009</td>
</tr>
<tr>
<td>Berkman-Syme Social Network Index (Berkman &amp; Syme, 1979)</td>
<td>Frequency of social contacts (marital status, contact with friends and family, and church and group membership)</td>
<td>Breast cancer survivors</td>
<td>4 items (domains); index score is based on quality and number of networks; final network score is reported as four levels; higher levels indicate stronger social network</td>
<td>Bloom et al., 2008</td>
</tr>
<tr>
<td>Interpersonal Support Evaluation List (Cohen et al., 1985)</td>
<td>Tangible, appraisal, belonging, and self-esteem</td>
<td>Prostate cancer survivors</td>
<td>16-item, four-point scale ranging from 0 (definitely false) to 3 (definitely true)</td>
<td>Carmack-Taylor et al., 2006</td>
</tr>
<tr>
<td>Social Support for Exercise Scale (Sallis et al., 1987)</td>
<td>Family and friend support</td>
<td>Survivors of early-stage non-small cell lung cancer</td>
<td>13-item, five-point ranking system ranging from 1 (none) to 5 (very often)</td>
<td>Coups et al., 2009</td>
</tr>
<tr>
<td>Environmental Support for Physical Activity Questionnaire (SIP 4-99 Research Group, 2002)</td>
<td>Neighborhood characteristics, barriers to physical activity, social issues, and access</td>
<td>Survivors of early-stage non-small cell lung cancer</td>
<td>6 out of 26 items Neighborhood: Likert-type scale, with the least value indicating stronger endorsement Community: Three-point scale—whether they used, did not use, or did not have the environmental support for physical activity</td>
<td>Coups et al., 2009</td>
</tr>
<tr>
<td>Perceived Social Support From Family and Friends (Procidano &amp; Heller, 1983)</td>
<td>Network of family and friends</td>
<td>Breast cancer survivors</td>
<td>20 items per scale; items are rated “yes” or “no;” score ranges from 0–20 for each of the two scales.</td>
<td>Emery et al., 2009</td>
</tr>
<tr>
<td>Duke-UNC Functional Social Support Questionnaire (Broadhead et al., 1988)</td>
<td>Functional support</td>
<td>Survivors of various cancers</td>
<td>8-item, five-point Likert-type scale ranging from 1 (as much as I would like) to 5 (much less than I would like); possible scores range from 8–40, with higher scores reflecting more perceived functional support.</td>
<td>Harper et al., 2007</td>
</tr>
<tr>
<td>Social Provision Scale for Exercise (Cutrona &amp; Russell, 1987)</td>
<td>Reliable alliance, attachment, guidance, nurturance, social integration, and reassurance of worth</td>
<td>Breast cancer survivors in Taiwan</td>
<td>24-item, four-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree) to show the extent to which their social relationship currently supplies each of the provisions; possible scores ranged from 24 (low support) to 96 (high support).</td>
<td>Hsu, 2005</td>
</tr>
<tr>
<td>Perceived Social Support (Kelsey et al., 2000)</td>
<td>Physical activity and fruit or vegetable intake</td>
<td>Colon cancer survivors</td>
<td>Four-item Likert-type scale, where response ranges from not at all to a lot</td>
<td>James et al., 2006</td>
</tr>
<tr>
<td>Social Provisions Scale (Cutrona &amp; Russell, 1987)</td>
<td>Attachment, social integration, reassurance of worth, reliable alliance</td>
<td>Young adult cancer survivors</td>
<td>24-item, four-point rating scale ranging from 1 (strongly disagree) to 4 (strongly agree)</td>
<td>Love &amp; Sabiston, 2011</td>
</tr>
<tr>
<td>MOS Social Support Survey (Sherbourne &amp; Stewart, 1991)</td>
<td>Emotional, informational, tangible, social interaction, and affectionate</td>
<td>Breast cancer survivors</td>
<td>19-item, Likert-type scale ranging from 1 (none of the time) to 5 (all of the time)</td>
<td>Mandelblatt et al., 2011</td>
</tr>
<tr>
<td>Social Support and Exercise Survey (Sallis et al., 1987)</td>
<td>Support received from family and friends for physical activity</td>
<td>Breast cancer survivors</td>
<td>13-item, five-point ranking system ranging from 1 (none) to 5 (very often)</td>
<td>McDonnell, 2006</td>
</tr>
<tr>
<td>MOS—Medical Outcomes Study; SSL—Social Support List; UNC—University of North Carolina</td>
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(Continued on the next page)
Half of the studies in this review showed a significant relationship between social support and physical activity engagement; however, 59% of those participants were breast cancer survivors, which may limit generalizability to survivors with other types of cancers. Additional research is needed to develop social support strategies that will increase physical activity engagement in adult cancer survivors other than those diagnosed with breast cancer.

Finally, the results of this review suggest that social support is more valuable to female cancer survivors than their male counterparts; however, that may be, in part, because the majority of participants in this review was female. None of the...
studies included in this review evaluated gender as a moderator variable, although women are generally the providers of social support. That may put them more at risk for lacking their own support to engage in healthy behaviors such as physical activity (Cohen et al., 2000).

Limitations

Several limitations were identified in this review, which may limit the conclusions that can be drawn from the analysis. The review was limited by the small number of studies available that met the inclusion criteria. Most of the intervention studies were of a short duration and consisted mainly of highly educated female breast cancer survivors, as well as colorectal and prostate cancer survivors—48% of prostate cancer survivors had college degrees, 73% of colorectal cancer survivors had at least a high school degree, and about 54% of the colorectal cancer survivors were male—making it difficult to generalize the findings of this review to other cancer types. Other cancer survivor groups remain unstudied. Fifteen studies included in this review used a cross-sectional, descriptive, or observational study design, which makes drawing conclusions regarding causal relationships among the tested variables difficult. For example, the participants’ ages in the cross-sectional studies ranged from 28–64 years, which may alter the results of this review, because the individual’s life stage may change the duration and direction of social support.

Nursing Implications and Future Research

Physical inactivity is associated with poorer physical health and poorer QOL in cancer survivors; therefore, oncology nurses and other members of the healthcare team need to develop and encourage social support strategies to increase physical activity engagement in adult cancer survivors. More research is needed to understand the effects of group, individual, functional, informational, emotional, or negative social support on physical activity participation in cancer survivors. How do gender, sociocultural differences, personality differences, pre-cancer diagnosis physical activity behavior, cancer diagnosis, stage of disease, physical health, mental health, and treatment modalities mediate the relationship of social support and physical activity engagement in cancer survivors?

Conclusion

Drawing conclusions from this small literature review is difficult because many factors influenced the outcome of the studies that were reviewed. The specific variables that were tested—the age and gender of the participants, the type of social support, and the study design—all had an impact on the outcome of the studies. Some of the studies lacked detailed information on methodology, interventions, and follow-up. Based on the limited number of articles available for this review, more research is needed to examine the relationship between social support and physical activity engagement in adult cancer survivors.

Implications for Practice

- Less than 20% of adult cancer survivors are meeting the recommended physical activity guidelines, which may increase their risk of developing a chronic disease, secondary cancer, or disease recurrence.
- Nurses and other healthcare providers should develop social support strategies that will encourage physical activity engagement in cancer survivors.
- More research is needed to assess social support and physical activity engagement in underserved cancer survivors (e.g., minorities, rural dwellers, older adults).

References


Cohen et al., 2000.}

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References


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