

A Scoping Review of the Physical Health Needs of Family Caregivers of Older Women With Breast Cancer

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Abstract

This scoping review conducted mapping of relevant literature on the physical health needs of family caregivers of older women with breast cancer, gaps analysis, and suggests directions for future academic research. The PRISMA-ScR checklist by Tricco et al. (2018) guided the scoping review. Ten international databases were searched for academic articles published in English between January 2002 and January 2022. The 12,795 discovered articles were reduced to two sources of evidence. Extracted data were mapped out using a charting table. The analysis revealed a dearth of research on the subject of physical health of family caregivers of older women with breast cancer, a lack of detailed description of the physical health needs of family caregivers of older women with breast cancer, a lack of cultural, geographic, and ethnic diversity, a lack of studies on the physical needs/strains experienced by family caregivers aside from physical activity needs, underutilized research methodologies, gender differences that influence physical health needs of family caregivers, development of research tools, and lack of intervention/educational programs on physical health for family caregivers. Future research directions were suggested, and limitations were presented.

Keywords

Breast cancer; family caregiver; older women; scoping review

Introduction

Globally, breast cancer is the leading form of cancer by incidence rate among women (Cao et al., 2021; Sung et al., 2021). Women who possess the BRCA1, BRCA2, ATM, CHECK2, and PALB2 genes are genetically predisposed to breast cancer (Chávarri-Guerra et al., 2021; Lacaze et al., 2021; Stjepanovic et al., 2021). Frail or pre-frail depressed older women show a higher risk of breast cancer than robust older women (Yan et al., 2021). Depressive symptoms including apathy, loneliness, and distress (de Boer et al., 2020), reduced cognitive function (Ahles et al., 2022), reduced personal independence (Brick et al., 2022), as well as fatigue and anxiety (Crouch et al., 2022), are commonly associated with diagnosis and treatment of breast cancer in women. Older women with breast cancer have the added challenges of lack of access and knowledge to utilize online health information after diagnosis (Verma et al., 2022). They also require different healthcare needs than cancer patients from other age groups (Bagayogo et al., 2020) and face low levels of social support (including social activities) (Chambers et al., 2021). These low levels of social support exist despite the assistance provided by the field of geriatric oncology (also known as gero-oncology and oncogeriatrics), which focuses on the treatment, rehabilitation, evaluation, and follow-up of cancer among older patients (Bagayogo et al., 2020). Older women with breast cancer manifest signs of psychological and physical impairment due to impaired body image or alteration in health (Zhang et al., 2021).

Due to the need to ameliorate these negative experiences, caregiving for older women with breast cancer have specific demands (Bagayogo et al., 2020). Family caregivers often face negative psychological impacts of providing such caregiving (Papadakos et al., 2022), alongside the challenges of playing multiple roles in caregiving (Krok-Schoen et al., 2021; Martin et al., 2022). Family caregivers are crucial to patient caregiving (Dijkman et al., 2022) by providing necessary emotional support that is imperative to the healing process of older women with breast cancer (Krietemeyer et al., 2022). All these challenges are experienced simultaneously by family caregivers at the same time as facing the possible declining health of older cancer patients (Ren et al., 2022). Additionally, family caregivers experience a loss of hope and frustration, as well as poor social health characterized by a lack of social activities, a lack of family support, and a lack of personal leisure time. Financially, family caregivers experience a decrease in income, the impact of caregiving on their jobs, and a loss of money (Onyeneho & Ilesanmi, 2021; Sun et al., 2021).

Research also indicates that cancer treatments often add to the negative life experiences of breast cancer patients and their caregivers, given that chemotherapy (including endocrine therapy) increases fatigue among female breast cancer patients (Ahles et al., 2022). Decision-making for cancer treatment adherence, type, and decisions to have surgical intervention negatively affect both patient and family caregivers (Advani et al., 2022; Alatawi et al., 2021; Al-Rashdan et al., 2021). Also, the risk of hospitalization due to chemotherapy use (Valachis et al., 2021) and low but possible risk of chemotherapy toxicity (Pedersini et al., 2020) add to the stress experienced by female breast cancer patients and their caregivers. While surgical intervention may be an option in breast cancer treatment (Jauhari et al., 2021), the decision by older women with breast cancer or their family caregivers to elect for surgical intervention may be deterred by the choice to use adjuvant therapies (Karuturi et al., 2022) along with the age of the patient (Liu et al., 2021; Morgan et al., 2021) – potentially resulting in the caregiving stress experienced by family caregivers (Jansen et al., 2021). Literature has also indicated that family caregivers of older women with breast cancer undergoing treatment experience demoralization, loneliness, and discouragement (Bovero et al., 2022), feel trapped and

overburdened (Spatuzzi et al., 2020), together with anxiety and depression (Celik et al., 2022; Reblin et al., 2016; Unsar et al., 2021). Other research indicates that although family relations may be strengthened through caregiving (La et al., 2021; Thana et al., 2021), these issues may also cause further deterioration of caregivers' health (Thomson et al., 2022).

Rationale and objectives

A systematic review by van der Plas-Krijgsman et al. (2021) found that most breast cancer research focuses on disease-related issues, survival, and toxicity outcomes. Likewise, most research on the health needs of family caregivers of older women with breast cancer has focused on psychological health (Yu et al., 2021), as evidenced by the preceding section of this manuscript. This focus indicates that more research is needed on family caregivers' physical health (Farrington et al., 2020; Papadacos et al., 2022) to address this disparity between studies on their physical and psychological health in academic literature. This form of research would inform relevant stakeholders such as academics in disciplines that include the oncological sciences (medicine, science, epidemiology), oncology medical professionals, social workers, family therapists, counselors, and their affiliates of the physical health needs of family caregivers of older women with breast cancer. Additionally, this research is necessary as physical health needs are often compromised due to family caregivers' constant and consistent care. To that end, by taking both the health and social sciences perspectives, this scoping review is aimed at mapping out, identifying the gaps, and suggesting future research directions on the physical health needs of family caregivers to better inform stakeholders and better comprehend their physical health (Pysklywec et al., 2020).

Scope of the review and definitions

This scoping review focused on the physical health needs of family caregivers of older women with breast cancer. This manuscript used the following population (P), concept (C), and context (C) to guide the research: the population (P) being the family caregivers, the concept (C) being the physical health needs of the family caregivers, and the context (C) being the caregiving provision by family caregivers.

The definition for old age set in conjunction with the World Health Organization (WHO) by Kowal et al. (2001) is 50 in a developing nation and between 60 and 65 in a developed nation; additionally, the authors are also cognizant that based on the work of Orimo et al. (2006) that 65 is an acceptable defining age for an older person. As this scoping review needed to include the relevant academic literature from both developing and developed nations, the authors considered the research site or country where the research (developed or developing nation) was conducted in the screening process to determine if the minimum or mean age of the population focused on in the research matched the focus of the study—meaning that if the research was conducted in a developed nation, the defining age for being an older person was 60 and above, and if the research was conducted in a developing nation the defining age for being an older person was 50 and above.

The authors used the scope of breast cancer to mean all types of breast cancer, including but not limited to hereditary breast cancer, lobular breast cancer, lobular *in situ* breast cancer, malignant neoplasm, and hyperplasia at various stages of diagnosis (Hedenfalk et al., 2001;

Mosca et al., 2010). This study included both older women with breast cancer patients and survivors. Family members consisted of only nuclear family members, i.e., spouses, offspring, children-in-law, and grandchildren. Caregivers outside the nuclear family (neighbors, distant relatives) were not included. Within this scoping review, caregiving explicitly meant long-term care, physical therapy, and daily caregiving activities (Liu et al., 2020).

This scoping review focused on academic articles published between January 2002 and January 2022. This period encapsulates a comprehensive body of academic literature on the studied subject. This encapsulation allows all relevant data to be derived from the extant literature. This scoping review only included academic articles published in academic journals. Grey literature, such as editorials, letters to the editor, opinion pieces, reflective pieces, and annual reports, were excluded. Books and book chapters were also excluded.

Methods

Protocol and registration

No review protocol for this specific topic was registered by the authors who adopted the PRISMA-ScR protocol espoused by Tricco et al. (2018).

Eligibility criteria

The database searches for the literature did not limit the geographic location of the research and included both developed and developing nations. As breast cancer has moved to the forefront of the list of worldwide diseases within the last two decades (Sung et al., 2021), the timeframe of the publication of the articles was between January 2002 and January 2022 to capture the relevant academic literature published in that specific period. The publication language chosen for the database searches was English, the common language among the authors and the language in which most academic literature is prolifically published. The authors included empirical and research studies; however, grey literature was excluded, as were books and book chapters.

Information sources

The scoping review sought information sources in the BioMed Central (BMC), BMJ Journals, Directory of Online Access Journals (DOAJ), Elsevier, EMBASE, Journal of the American Medical Association (JAMA), JSTOR, Nursing and Allied Health Premium, Taylor and Francis Online, and Wiley Online Library databases. These ten databases were selected based on meeting the health and social sciences perspectives taken by this scoping review. The most recent search date on all databases was February 25, 2022.

Search strategy

The keywords used for the database searches were the elderly, senior citizens, the aged, old adult, female, breast cancer, physical health, physical health needs, physical wellness, physical wellbeing, family, nuclear family, spouse, son, daughter, offspring, grandchildren,

caregiver, and carer. Boolean operators were used with these keywords in all the database searches. Table 1 below illustrates the search strategy used for this scoping review.

Table 1: Search strategy

| | |
|----------------------------|--|
| Database | BioMed Central (BMC), BMJ Journals, Directory of Online Access Journals (DOAJ), Elsevier, EMBASE, Journal of the American Medical Association (JAMA), JSTOR, Nursing and Allied Health Premium, Taylor and Francis Online, and Wiley Online Library |
| Other sources | None |
| Key searched terms | <the elderly>, <senior citizens>, <the aged>, <old adult>, <female>, <breast cancer>, <physical health>, <physical health needs>, <physical wellness>, <physical wellbeing>, <family>, <nuclear family>, <spouse>, <son>, <daughter>, <offspring>, <grandchildren>, <caregiver>, <carer> |
| Language | English |
| Location | Globally |
| Duration | January 2002 to January 2022 |
| Types of study | Empirical studies |
| Type of publication | Research articles |
| Exclusion criteria | Editorials, letters, opinion pieces, reflective pieces, annual reports, books, and book chapters |

Selection of sources of evidence

The sources of evidence went through four rounds of exclusion. The first round of exclusion was based on a preliminary scan of the article to determine if the article's contents were within the focus and scope of the research. The second exclusion round was based on duplicated articles in the database searches. The third round of exclusion was based on an assessment of the title and abstract. The fourth round of assessment was based on the full text assessment. More details on the selection of sources of evidence are in the results section of this manuscript.

Data charting process

To limit bias, all authors read each finalized relevant article independently to ascertain relevance to the research. Data charting was done separately by the authors within a stipulated timeframe. Data were extracted using a charting table, and a further explanation of the data charting process is explained in the section on the synthesis of the Results.

Synthesis of results

All data were summarized into the relevant cells in individual charting tables by each research team member. The lead author, who summarized and synthesized the data, collated individual charting tables into one main chart table. Redundant data were removed.

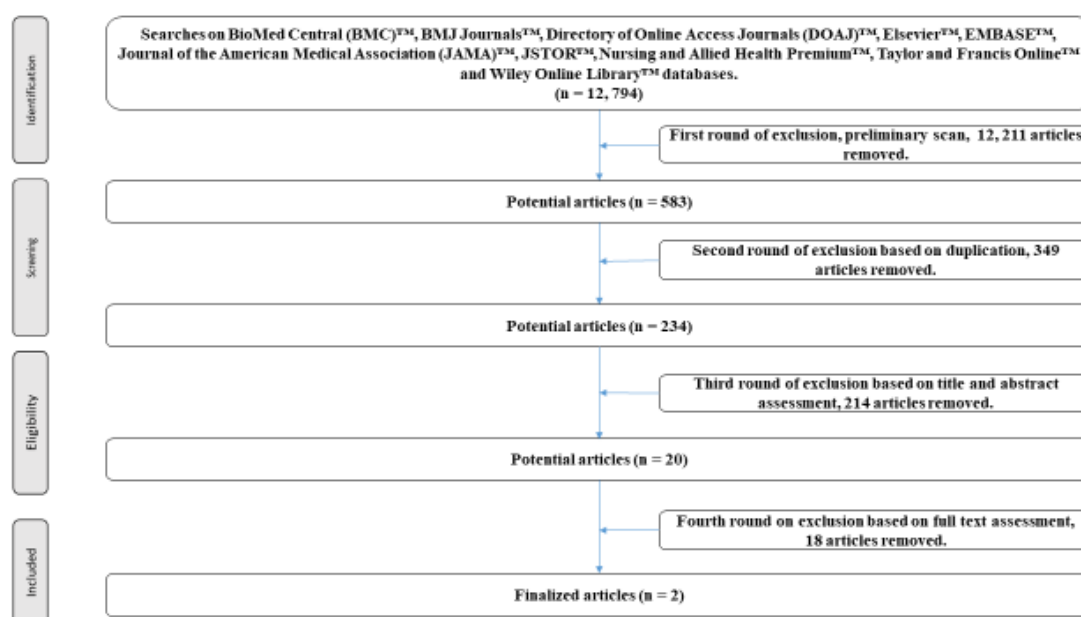
Results

Selection of sources of evidence

As previously stated, the sources of evidence went through four rounds of exclusion. The first round of exclusion was based on a preliminary scan of the article to determine if the article fell within the focus and scope of the research. In this first round, from the initial 12,794 articles found in the database searches, 12,211 articles were removed, leaving a total of 583 articles. The remaining 583 articles underwent a second round of exclusion based on duplication of articles. This second round of exclusion removed 349 articles, leaving 234 articles for the third round of exclusion. These 234 articles underwent a third round of exclusion based on an assessment of the title and abstract. This third exclusion round removed 214 articles, leaving 20 for full text assessment. Articles in the third round of exclusion were removed as caregivers were found to include formal caregivers, and older persons did not meet the age criterion set by pre-set parameters (being below 50 years of age in a developing nation and below 60 in a developed nation), and cancer focused on in the research was not breast cancer.

The fourth round of assessment based on the full text assessment removed 18 articles. These articles were removed as the results of the articles combined breast cancer along with other types of cancer (uterine, colon, and lung) in older persons; the population was a mixture of older men and women but made no distinction between either genders or types of cancer; and upon closer scrutiny, the definition of “elderly” used by the authors of these articles did not refer to older persons but instead to the middle age group of women. Articles were also eliminated as the age of the included older person (minimum or mean) was not clearly stated within the articles. The authors of this manuscript chose to be cautious and not include these articles so that the findings of these articles would not bias the findings of this manuscript. This round of exclusion left two articles as the finalized sources of evidence. All disagreements were managed through discussion and consensus. The process of selecting sources of evidence may be seen in Figure 1.

Figure 1: PRISMA-ScR Flowchart



Characteristics of sources of evidence

The two studies comprising the finalized articles were conducted in the United States ($n = 2$). The study by Haynes-Maslow et al. (2016) focused on the physical challenges faced by older women with breast cancer of African American descent and their family caregivers. This study unveiled the support needs described by this specific segment of society affected by breast cancer. This study also focused on the needs of this group across the cancer continuum. It likewise unveiled the overlap of conditions between patient and caregiver and the impact of cancer on both patient and caregiver. The study by Overcash et al. (2019) focused on determining the predictors of strain among family caregivers of older women with breast cancer. The physical strain aspects focused on in this study include fatigue and physical pain.

The finalized articles used a qualitative approach (Haynes-Maslow et al., 2016) and a quantitative prospective descriptive cross-sectional study (Overcash et al., 2019). Sampling was conducted using purposive sampling with pre-specified criteria targeted at older women with breast cancer and their family caregivers utilizing a variety of media for recruitment; and purposive sampling from an older adult (above 69 years of age) oncology program. Data were collected using focus groups as well as a variety of quantitative research tools. Research tools used were a semi-structured moderator guide, and CGA Instruments were used on older women with breast cancer: Brief Fatigue Inventory (BFI), Geriatric Depression Scale (GDS), fall assessment, Timed Up and Go Test, Mini-Cog, grip strength, numeric pain rating scale, Mini Nutritional Assessment. Family caregivers were given the Modified Caregiver Strain Index (MCSI) instrument to complete.

Research respondents, breast cancer type, and physical health needs of family caregivers

In Haynes-Maslow et al. (2016), respondents were breast cancer survivors and spouses and children of breast cancer survivors. Racially, the study focused on African Americans. The mean age of the older women with breast cancer was 60.4, and the mean age of caregivers was 54. A total of 41 African American adults (37 women and 3 men) participated in five focus groups (22 breast cancer survivors and 19 caregivers). A majority of caregivers and survivors were married (46.3%), had some college education or more (90.3%), and were retired (46.3%). The study conducted by Overcash et al. (2019) had respondents with the following characteristics: older women with breast cancer above 69 years of age ($n = 39$) who were receiving any type of treatment (surgery, endocrine therapy, chemotherapy, radiation therapy), and their family caregivers. These formed 39 dyads in the study.

Although types and forms of breast cancer were not specified in the study by Haynes-Maslow et al. (2016), Overcash et al. (2019) identified five types of breast cancer: infiltrating ductal carcinoma, carcinoma *in situ*, invasive lobular carcinoma, mammary and metaplastic.

Regarding physical health needs, family caregivers experience the physical strain of managing daily household work while maintaining employment and caregiving duties. This inferred fatigue as well as a need for a physical break from the physicality of providing caregiving. Family caregivers also struggled to meet exercise needs while caregiving, though physical functionality on other tasks was not impaired (Haynes-Maslow et al., 2016; Overcash et al., 2019).

Synthesis of results

There exists a significant chasm in research on the physical health needs of the family caregivers of older women with breast cancer. This gap is due mainly to the extant literature focusing on overall caregiving for all types of cancer diagnosed among older persons but not being specific to breast cancer. However, this discontinuity alone cannot be presumed to be a reason for the lack of studies in this area of academia. Other possible reasons for the lack of studies in this specific area of academia, as identified by the authors, are: first, there is a lack of focus on this leading type of cancer; second, there is the assumption that breast cancer is mainly among younger groups of women and therefore, the focus of academic research has been on those age groups and not on older women; third, there is a lack of specialized knowledge on the specialized care needed from family caregivers of older women with breast cancer; fourth, the myriad of possible research methodologies to explore and analyze this area of research has not been utilized maximally; and fifth, the focus of many studies has been on the cancer patient and not their family caregivers. Cumulatively, these possible reasons may be the driving force behind the limited research on the physical health needs of family caregivers of older women with breast cancer.

The information in the preceding paragraph indicates a vast number of possibilities for future research. In broad terms, these research possibilities include sustainability of good physical health of family caregivers due to the long duration of breast cancer and its treatment; and research that moves beyond the domain of a physician/oncologist—specifically the need of other health professionals (physiotherapists, nutritionists, personal trainers, counselors) to address the physical health needs of family caregivers of older women with breast cancer. Also, future research may address the physical health need for rest and sleep of family caregivers (such as how rest and sleep affect the physical health and physical functioning of family caregivers); and the specifics of physical health needs of family caregivers that are derived from socio-economic circumstances (e.g., level of education, type of employment, type of housing).

However, in keeping with the technicalities of a scoping review, this manuscript scaled these broad ideas down into specifics based on synthesizing the data extracted from the finalized articles and then placed them into the charting table. The first gap identified by the authors is the lack of a detailed description of the physical health needs of family caregivers of older women with breast cancer. This gap indicated a need for future studies that are more detailed and focused on the physical health needs of family caregivers. The details of such studies would assist all relevant stakeholders in academia and the health-related professions to better comprehend and manage the physical health needs of family caregivers of older women with breast cancer.

The second gap identified by the authors is the finalized articles have been conducted only within the cultural and geographic confines of the United States. The articles only mentioned the African American culture, and no other cultures were considered. This gap may be addressed by encouraging scholars in other nations and cultural contexts to research the physical health needs of family caregivers of older women with breast cancer. For example, in Asian contexts where filial piety is considered a pillar of family dynamics, scholars may seek out how and why filial piety moderates the physical health challenges and needs of family caregivers. The continent of Africa is also rich in cultural context and nuance in terms of family dynamics—indicating that future studies on the physical health needs of family caregivers conducted within the geographic and cultural contexts of Africa would lend deeper

comprehension of the subject to academics and stakeholders. This, in turn, would lead to better interventions and innovations for meeting the physical health needs of family caregivers.

The third gap identified by the authors is a lack of studies on the physical needs and strains aside from physical activity needs. For example, there were no studies on the physical health needs of rest, nutrition, physical therapy, and physiotherapy to manage the strains caused by providing care to older women with breast cancer. Future studies may address the necessity of sleep, physical relaxation techniques, and nutritional and physiotherapy needs of these family caregivers. Additionally, future research may choose to expand on these topics within the physical healing of family caregivers post full recovery (or death) of older women with breast cancer.

Regarding research methodology, the finalized articles included the general qualitative and quantitative studies methods. The gap is in the use of mixed methodologies for research on the physical health of family caregivers. To address this need, suggestions for future research include using an explanatory sequential mixed methods approach for research on the physical health of family caregivers that will create both breadth and depth of new knowledge. Also, larger sample sizes may be used for future studies in this area of research so that generalizations may be generated; future studies may also choose to focus on using a qualitative research approach to identify physical health issues that are recurrent among family caregivers of older women with breast cancer. It must be noted that these are only a few suggestions considering the myriad of research methodologies that presently exist in both the health-related and social sciences fields.

Additional gaps identified in the synthesis of the results extracted from the finalized articles are a study on the differences between the physical health needs of male and female family caregivers of older women with breast cancer. Future studies to address this gap may focus on exploring these differences and how doctors may manage the differences in these needs, including nurses, physiotherapists, social workers, and counselors. Second, future research may focus on developing tools based on the principles of physiotherapy to further study the physical strain experienced by family caregivers. Third, academics in education, public health, and social work may choose to address the gap in intervention programs for physical health maintenance of family caregivers founded on self-care (exercise, nutrition, rest, and physiotherapy). Future research in this area would allow results to be used for the better physical health of family caregivers of older women with breast cancer and family caregivers of older persons who are ill with debilitating diseases such as stroke. The mapping, analysis, and synthesis of the included sources of evidence are presented in Table 2.

Table 2: Charting Table

| No | Reference | Location of study | Subject | Methodology | Type of breast cancer | Population/family member | Physical health needs | Gap Identified | Future research direction |
|----|--|-------------------|---|---|-----------------------|--|--|---|--|
| 1. | Haynes-Maslow, L., Allicock, M., & Johnson, L.-S. (2016). Cancer support needs for African American breast cancer survivors and caregivers. <i>Journal of Cancer Education, 31</i> (1), 166-171. | United States | The study focuses on the challenges faced by both breast cancer survivors and their family caregivers of African American descent, and unveils the support needs described by this specific segment of society affected by breast cancer. This study focuses on the needs of this group across the cancer | Methodology: Qualitative. Sampling: Purposive sampling with pre-specified criteria targeted at breast cancer survivors and their family caregivers using a variety of media for recruitment. Data collection: Five focus groups were conducted, with each focus group lasting approximately 90 minutes. Prior to the focus group, participants completed a | Unspecified. | Breast cancer survivors, spouses, and children of breast cancer survivors. Racially, the research focused on African Americans. The mean age of respondents was 60.4 years. A total of 41 African American adults (37 women and 3 men) participated in five focus groups. 22 breast cancer survivors and 19 caregivers. Caregivers were 54 years of age on average and comprised mostly of spouses, | Caregivers experienced the physical strain of managing daily household work while maintaining employment and caregiving duties. Inferred fatigue via the need for a break from caregiver roles. | As described by the respondents, the physical health needs are not detailed. This indicates a need for a more detailed study of the physical health needs of older breast cancer survivors. Such studies may take cultural or ethnic perspectives to further elucidate culturally sensitive approaches to meet the physical | Qualitative research is focused on the lived experiences of the caregivers of older women with breast cancer, specifically on their health issues caused by physical strain. This research may be focused on different physical health issues, ailments, and recurring illnesses such as bouts of fatigue caused by caregiving. Potentially there are differences between the physical health needs of male and female caregivers; |

| No | Reference | Location of study | Subject | Methodology | Type of breast cancer | Population/family member | Physical health needs | Gap Identified | Future research direction |
|----|-----------|-------------------|---|--|-----------------------|---|-----------------------|---|--|
| | | | continuum and unveils the overlap of needs between patient and caregiver; and the impact of cancer on both patient and caregiver. | brief demographic questionnaire and provided written informed consent Research tool: Semi-structured moderator guide. Data analysis tool: All focus group discussions were digitally recorded. A general inductive approach was used along with the Atlas.ti version 7.0 software for applied thematic content analysis. | | and children. A majority of caregivers and survivors were married (46.3 %), had some college education or more (90.3 %), and were retired (46.3 %). | | health needs of the caregivers. It may be inferred from the physical strain experienced by the caregivers that physical health needs include physical rest, possible physical therapy for prolonged physical strain, nutrition needs for enhancing energy levels, and exercise instructions. | therefore, future research may focus on the exploration of these differences as well as how these needs may be addressed by doctors, nurses, physiotherapists, and social workers. |

| No | Reference | Location of study | Subject | Methodology | Type of breast cancer | Population/family member | Physical health needs | Gap Identified | Future research direction |
|----|--|-------------------|--|--|--|---|---|--|---|
| 2. | Overcash, J., Fugett, S., Tan, A., Ginther J., & Williams N. (2019). Strain among caregivers of older adults diagnosed with breast cancer. <i>Oncology Nursing Forum</i> 46(6), E185–E201. | United States | The study focuses on determining the predictors of strain among caregivers of older adults diagnosed with breast cancer. The physical strain aspects focused on in this study include fatigue, pain, and nutritional status. | Methodology: Quantitative prospective, descriptive cross-sectional study. Sampling: Purposive sampling from a senior adult (above 69 years of age) oncology program. Data collection: Use of various quantitative research tools. Research tool: CGA Instruments: Brief Fatigue Inventory (BFI), Geriatric Depression Scale (GDS), fall assessment, Timed Up and Go Test, Mini-Cog, grip | Infiltrating ductal carcinoma ($n = 30$); Carcinoma in situ ($n = 4$); Invasive lobular carcinoma ($n = 2$); Mammary ($n = 2$); Metaplastic ($n = 1$). | Women with breast cancer above 69 years of age ($n = 39$) received treatment (surgery, endocrine therapy, chemotherapy, radiation therapy) and their family caregivers. These formed 39 dyads in the study. | Caregivers struggle to meet exercise needs while caregiving, although physical functionality on other tasks was not impaired. | The physical health needs of caregivers are not focused on in detail; only one instrument was used to assess their physical health needs. There is a lack of focus on other physical needs/strains besides physical activity. Lack of focus on specific caregiving strains on the body and nutritional needs of caregivers. As a quantitative study, a | Larger studies so that findings may be generalizable to a larger population. Additionally, mixed methods research should be conducted, and an explanatory sequential mixed methods approach should be implemented, meaning that a following qualitative study can be designed to get more in-depth information on this topic. The focus should also be given to developing physical research tools to study the strain |

| No | Reference | Location of study | Subject | Methodology | Type of breast cancer | Population/family member | Physical health needs | Gap Identified | Future research direction |
|----|-----------|-------------------|---------|---|-----------------------|--------------------------|-----------------------|--|---|
| | | | | <p>strength, numeric pain rating scale, Mini Nutritional Assessment were used on older breast cancer patients. Caregivers were given the Modified Caregiver Strain Index (MCSI) instrument to complete.</p> <p>Data analysis tool: Descriptive statistics, bivariate tests, and a model was used to assess caregiver strain. All statistical tests were two-sided with a significance level of 0.05.</p> | | | | <p>small sample size does not adequately represent the population. One important issue is to generalize the results from the sample to a large population.</p> <p>Methodology gap, only the quantitative approach was adopted in this study. Mixed methods and qualitative research approaches may be taken in future studies.</p> | <p>experienced by caregivers.</p> <p>Additionally, research on educational programs and intervention programs for family caregivers on physical self-care, including exercise, nutrition, rest, and other aspects of physical healthcare (rehabilitation of often used physical movements in healthcare provision).</p> |

Discussion

Summary of evidence

There exists a significant shortage of academic literature explicitly focused on the physical health needs of family caregivers of older women with breast cancer. As the number of cases of breast cancer increases globally, the family caregivers of older women with breast cancer must be given appropriate attention by both academia and relevant stakeholders in the health-related fields. Admittedly, healthcare professionals provide patients with the best quality of care possible. Still, healthcare professionals also need to be cognizant of the physical health needs of the family caregivers who provide care to not inadvertently create segments of the population that fall through the cracks in healthcare systems.

The findings in the finalized articles are somewhat limited in scope due to the small number of articles. However, it is possible to argue that while the extracted data indicates the physical health needs of the family caregivers of older women with breast cancer, the findings are not as expanded as they could be with further research. For example, although the included articles describe the physical strain experienced by family caregivers, the findings do not explore, describe, or analyze the causes of the physical strain, how the strain may be mitigated, or why does exercise not become a priority in the lives of the family caregivers or how does being male or female impact the physical health needs of the family caregivers? This observation indicates a fraction of the breadth and depth of future research needed and possible in this area of academia.

Future research on this specific area of knowledge would be most beneficial to relevant stakeholders in health-related fields. Scholars and their counterparts in the medical field could make the most of this great opportunity through collaborative research that combines research in oncology and therapies with social services related fields to add to the body of literature on this subject. Future research could focus on specific topics such as the physical health needs of non-family caregivers of older women with breast cancer and the differences in physical health needs between non-family caregivers and family caregivers. If such studies are conducted by scholars and their counterparts in the medical field, as suggested earlier in this paragraph, this area of research would benefit older women with breast cancer and their family caregivers, non-family caregivers, and medical professionals. Additionally, as already mentioned in the synthesis section of the results, future research may focus on family caregivers' physical health needs in other geographic and cultural settings. Future research may also use diverse methodologies to study the physical health needs of family caregivers of older women with breast cancer and how gender and other socio-economic variables influence the physical health needs of family caregivers. Other suggestions for future research include research on the physical healing of family caregivers during post-recovery (or death) of older women with breast cancer and the physical health needs of family caregivers of older patients with other diseases.

Limitations

The authors realize that the main limitation faced in this scoping review is the number of finalized articles. The authors recognize that this is attributable to several reasons: first, because the authors chose strict age demographics to determine the older population, several

articles were excluded as these articles had the older person being loosely defined or did not report the minimum or mean age of older women with breast cancer; second, in the instances of some articles non-blood related persons were included as caregivers; third, the study focus was a mix of breast cancer and other types of cancer (i.e., colorectal and lung cancer) that hindered the clarity of results needed; and fourth, the research focus was on the health needs of older women with breast cancer and not the family caregivers. However, by this same limitation, the authors are also confident that because stringent rigor was applied, the results represent the present state of the literature about the physical health needs of family caregivers of older women with breast cancer.

Conclusion

This research faced the limitation of having a small number of included articles. However, this is attributable to the stringent rigor practiced by the authors in selecting the sources of evidence. The results of this study show that family caregivers face physical strain in providing care for older women with breast cancer, and alleviating this physical strain is their primary health need. The results also indicated that there is massive potential for further expansion in this area of research. Scholars and academics may take advantage of this potential to grow and add more knowledge to this study area.

Increasing breast cancer rates and the growing global number of aging persons should strongly urge the relevant stakeholders to be cognizant that there will be more expected care by family caregivers of older women with breast cancer. To meet the physical health needs of these family caregivers, scholars need to address these needs from an academic standpoint to provide empirical foundations from which policies for the healthcare of this population segment may be provided effectively within the framework of health systems. If these research efforts are conducted conscientiously, there is a high likelihood that the physical health needs of family caregivers of older women with breast cancer will be given due time and attention.

Ethical clearance

The study was approved by the Internal Review Board of the Faculty of Social Sciences and Humanities, Mahidol University, Thailand (COA No. 2020/023.2608).

References

- Advani, S., Abraham, L., Buist, D. S. M., Kerlikowske, K., Miglioretti, D. L., Sprague, B. L., Henderson, L. M., Onega, T., Schousboe, J. T., Demb, J., Zhang, D., Walter, L. C., Lee, C. I., Braithwaite, D., O'Meara, E. S., & Breast Cancer Surveillance Consortium. (2022). Breast biopsy patterns and findings among older women undergoing screening mammography: The role of age and comorbidity. *Journal of Geriatric Oncology* 13(2), 161-169. <https://doi.org/10.1016/j.jgo.2021.11.013>
- Ahles, T. A., Schofield, E., Li, Y., Ryan, E., Root, J. C., Patel, S. K., McNeal, K., Gaynor, A., Tan, H., Katheria, V., Vasquez, J., Traina, T., & Hurria, A. (2022). Relationship between cognitive

- functioning and frailty in older breast cancer survivors. *Journal of Geriatric Oncology*, 13(1), 27–32. <https://doi.org/10.1016/j.jgo.2021.07.011>
- Alatawi, Y., Hansen, R. A., Chou, C., Qian, J., Suppiramaniam, V., & Cao, G. (2021). The impact of cognitive impairment on survival and medication adherence among older women with breast cancer. *Breast Cancer*, 28(2), 277–288. <https://doi.org/10.1007/s12282-020-01155-3>
- Al-Rashdan, A., Xu, Y., Quan, M. L., Cao, J. Q., Cheung, W., Bouchard-Fortier, A., Kong, S., & Barbera, L. (2021). Higher-risk breast cancer in women aged 80 and older: Exploring the effect of treatment on survival. *The Breast*, 59, 203–210. <https://doi.org/10.1016/j.breast.2021.07.005>
- Bagayogo, F., Le Berre, M., Ruchon, C., Denis, J. L., Lamothe, L., Vedel, I., & Lapointe, L. (2020). Caring for older cancer patients: A scoping review. *Health Policy*, 124(9), 1008–1016. <https://doi.org/10.1016/j.healthpol.2020.05.002>
- Bovero, A., Vitiello, L. P., Botto, R., Gottardo, F., Cito, A., & Geminiani, G. C. (2022). Demoralization in end-of-life cancer patients' family caregivers: A cross-sectional study. *American Journal of Hospice and Palliative Medicine*, 39(3), 332–339. <https://doi.org/10.1177/10499091211023482>
- Brick, R., Turner, R., Bender, C., Douglas, M., Eilers, R., Ferguson, R., Leland, N., Lyons, K. D., Toto, P., & Skidmore, E. (2022). Impact of non-pharmacological interventions on activity limitations and participation restrictions in older breast cancer survivors: A scoping review. *Journal of Geriatric Oncology*, 13(2), 132–142. <https://doi.org/10.1016/j.jgo.2021.09.010>
- Cao, W., Chen, H. D., Yu, Y. W., Li, N., & Chen, W. Q. (2021). Changing profiles of cancer burden worldwide and in China: A secondary analysis of the global cancer statistics 2020. *Chinese Medical Journal*, 134(7), 783–791. <https://doi.org/10.1097/CM9.0000000000001474>
- Celik, E., Aslan, M. S., Sengul Samanci, N., Karadag, M., Saglam, T., Cakan Celik, Y., Demerci, N. S., & Demirelli, F. H. (2022). The relationship between symptom severity and caregiver burden in cancer patients under palliative care: A cross-sectional study. *Journal of Palliative Care*, 37(1), 48–54. <https://doi.org/10.1177/08258597211045780>
- Chambers, A., Damone, E., Chen, Y. T., Nyrop, K., Deal, A., Muss, H., & Charlot, M. (2021). Social support and outcomes in older adults with lung cancer. *Journal of Geriatric Oncology*, 13(2), 214–219. <https://doi.org/10.1016/j.jgo.2021.09.009>
- Chávarri-Guerra, Y., Marcum, C. A., Hendricks, C. B., Wilbur, D., Cescon, T., Hake, C., Abugattas, J., Rodriguez, Y., Villareal-Garza, C., Yang, K., Cervantes, A., Sand, S., Castillo, D., Herzog, J., Mokhnatkin, J., Sedrak, M. S., Soto-Perez-deCelis, E., & Weitzel, J. N. (2021). Breast cancer associated pathogenic variants among women 61 years and older with triple negative breast cancer. *Journal of Geriatric Oncology*, 12(5), 749–751. <https://doi.org/10.1016/j.jgo.2020.11.008>
- Crouch, A., Champion, V. L., Unverzagt, F. W., Pressler, S. J., Huber, L., Moser, L. R., Cella, D., & Von Ah, D. (2022). Cognitive dysfunction prevalence and associated factors in older breast cancer survivors. *Journal of Geriatric Oncology*, 13(1), 33–39. <https://doi.org/10.1016/j.jgo.2021.07.001>
- de Boer, A. Z., Derks, M. G. M., de Glas, N. A., Bastiaannet, E., Liefers, G. J., Stiggelbout, A. M., van Dijk, M. A., Kroep, J. R., Ropela, A., van den Bos, F., & Portielje, J. E. A. (2020). Metastatic breast cancer in older patients: A longitudinal assessment of geriatric outcomes. *Journal of Geriatric Oncology*, 11(6), 969–975. <https://doi.org/10.1016/j.jgo.2020.04.002>
- Dijkman, B. L., Luttik, M. L., Van der Wal-Huisman, H., Paans, W., & van Leeuwen, B. L. (2022). Factors influencing family involvement in treatment decision-making for older patients with cancer: A scoping review. *Journal of Geriatric Oncology*, 13(4), 391–397. <https://doi.org/10.1016/j.jgo.2021.11.003>
- Farrington, N., Richardson, A., & Bridges, J. (2020). Interventions for older people having cancer treatment: A scoping review. *Journal of Geriatric Oncology*, 11(5), 769–783. <https://doi.org/10.1016/j.jgo.2019.09.015>
- Haynes-Maslow, L., Allicock, M., & Johnson, L.-S. (2016). Cancer support needs for African American breast cancer survivors and caregivers. *Journal of Cancer Education*, 31(1), 166–171. <https://doi.org/10.1007/s13187-015-0832-1>
- Hedenfalk, I., Duggan, D., Chen, Y., Radmacher, M., Bittner, M., Simon, R., Meltzer, P., Gusterson, B., Esteller, M., Raffeld, M., Yakhini, Z., Ben-Dor, A., Dougherty, E., Kononen, J., Bubendorf, L., Fehrl, W., Pittaluga, S., Gruvberger, S., Loman, N., ...Trent, J. (2001). Gene-expression profiles in hereditary breast cancer. *New England Journal of Medicine*, 344(8), 539–548. <https://doi.org/10.1056/NEJM200102223440801>

- Jansen, L., Dauphin, S., De Burghgraeve, T., Schoenmakers, B., Buntinx, F., & van den Akker, M. (2021). Caregiver burden: An increasing problem related to an aging cancer population. *Journal of Health Psychology, 26*(11), 1833–1849. <https://doi.org/10.1177/1359105319893019>
- Jauhari, Y., Gannon, M. R., Dodwell, D., Horgan, K., Clements, K., Medina, J., & Cromwell, D. A. (2021). Surgical decisions in older women with early breast cancer: Patient and disease factors. *British Journal of Surgery, 108*(2), 160–167. <https://doi.org/10.1093/bjs/znaa042>
- Karuturi, M. S., Giordano, S. H., Hoover, D. S., Volk, R. J., & Houston, A. J. (2022). Exploring and supporting older women's chemotherapy decision-making in early-stage breast cancer. *Journal of Geriatric Oncology, 13*(2), 170–175. <https://doi.org/10.1016/j.jgo.2021.11.018>
- Kowal, P. R., Peachey, K., & World Health Organization. (2001). *Information needs for research, policy and action on ageing and elderly: A report of the follow-up meeting to the 2000 Harare MDS Workshop: Indicators for the minimum data set project on ageing: A critical review in sub-Saharan Africa, 21 and 22 June 2001, Dar es Salaam, United Republic of Tanzania*. World Health Organization. <https://apps.who.int/iris/handle/10665/69829>
- Krietemeyer, M., Kemper, C., Clutter, J., & Krok-Schoen, J. L. (2022). The association of social support and income on the nutritional status and physical activity of older female cancer survivors. *Journal of Geriatric Oncology, 13*(3), 334–336. <https://doi.org/10.1016/j.jgo.2021.11.005>
- Krok-Schoen, J. L., Pennell, M. L., Saquib, N., Naughton, M., Zhang, X., Shadyab, A. H., Kroenke, C. H., Bea, J. W., Peterson, L. L., Crane, T., Wactawski-Wende, J., & Paskett, E. D. (2022). Correlates of physical activity among older breast cancer survivors: Findings from the Women's Health Initiative LILAC study. *Journal of Geriatric Oncology, 13*(2), 143–151. <https://doi.org/10.1016/j.jgo.2021.11.012>
- La, I. S., Johantgen, M., Storr, C. L., Zhu, S., Cagle, J. G., & Ross, A. (2021). Caregiver burden and related factors during active cancer treatment: A latent growth curve analysis. *European Journal of Oncology Nursing, 52*, Article 101962. <https://doi.org/10.1016/j.ejon.2021.10.1962>
- Lacaze, P., Bakshi, A., Orchard, S. G., Tiller, J. M., Neumann, J. T., Carr, P. R., Joshi, A. D., Cao, Y., Warner, E. T., Manning, A., Ngyuen-Dumont, T., Southey, M. C., Milne, R. L., Ford, L., Sebra, R., Schadt, E., Gately, L., Gibbs, P., Thompson, B. A., ... McNeil, J. J. (2021). Genomic risk prediction for breast cancer in older women. *Cancers 13*(14), Article 3533. <https://doi.org/10.3390/cancers13143533>
- Liu, X., Zheng, D., Wu, Y., Luo, C., Fan, Y., Zhong, X., & Zheng, H. (2021). Treatment patterns and outcomes in older women with early breast cancer: A population-based cohort study in China. *BMC Cancer, 21*(1), Article 226. <https://doi.org/10.1186/s12885-021-07947-w>
- Liu, Z., Heffernan, C., & Tan, J. (2020). Caregiver burden: A concept analysis. *International Journal of Nursing Sciences, 7*(4), 438–445. <https://doi.org/10.1016/j.ijnss.2020.07.012>
- Martin, C., Burton, M., & Wyld, L. (2022). Caregiver experiences of making treatment decisions for older women with breast cancer and dementia. *Health and Social Care in the Community, 30*(5), e2058–e2068. <https://doi.org/10.1111/hsc.13640>
- Morgan, J. L., Holmes, G., Ward, S., Martin, C., Burton, M., Walters, S. J., Cheung, K. L., Audisio, R. A., Reed, M. W. R., Wyld, L., & Bridging the Age Gap Trial Management Team. (2021). Observational cohort study to determine the degree and causes of variation in the rate of surgery or primary endocrine therapy in older women with operable breast cancer. *European Journal of Surgical Oncology, 47*(2), 261–268. <https://doi.org/10.1016/j.ejso.2020.09.029>
- Mosca, E., Alfieri, R., Merelli, I., Viti, F., Calabria, A., & Milanesi, L. (2010). A multilevel data integration resource for breast cancer study. *BMC Systems Biology, 4*(1), Article 76. <https://doi.org/10.1186/1752-0509-4-76>
- Onyeneho, C. A., & Ilesanmi, R. E. (2021). Burden of care and perceived psycho-social outcomes among family caregivers of patients living with cancer. *Asia-Pacific Journal of Oncology Nursing, 8*(3), 330–336. <https://doi.org/10.4103/2347-5625.308678>
- Orimo, H., Ito, H., Suzuki, T., Araki, A., Hosoi, T., & Sawabe, M. (2006). Reviewing the definition of “elderly.” *Geriatrics & Gerontology International, 6*(3), 149–158. <https://doi.org/10.1111/j.1447-0594.2006.00341.x>
- Overcash, J., Fugett, S., Tan, A., Ginther J., & Williams N. (2019). Strain among caregivers of older adults diagnosed with breast cancer. *Oncology Nursing Forum 46*(6), E185–E201. <https://doi.org/10.1188/19.ONF.E185-E201>

- Papadakos, J., Samoilo, D., Umakanthan, B., Charow, R., Jones, J. M., Matthew, A., Nissim, R., Sayal, A., & Giuliani, M. E. (2022). What are we doing to support informal caregivers? A scoping review of caregiver education programs in cancer care. *Patient Education and Counseling*, *105*(7), 1722–1730. <https://doi.org/10.1016/j.pec.2021.10.012>.
- Pedersini, R., di Mauro, P., Amoroso, V., Parati, M. C., Turla, A., Ghilardi, M., Vassalli, L., Ardine, M., Dalla Volta, A., Monteverdi, S., Borgonovo, K., Ghidhini, A., Cabiddu, M., Simoncini, E. L., Petrelli, F., Berruti, A., & Barni, S. (2020). Efficacy of Eribulin mesylate in older patients with breast cancer: A pooled analysis of clinical trial and real-world data. *Journal of Geriatric Oncology*, *11*(6), 976–981. <https://doi.org/10.1016/j.jgo.2020.03.021>
- Pysklywec, A., Plante, M., Auger, C., Mortenson, W. B., Eales, J., Routhier, F., & Demers, L. (2020). The positive effects of caring for family carers of older adults: A scoping review. *International Journal of Care and Caring*, *4*(3), 349–375. <https://doi.org/10.1332/239788220X15925902138734>
- Reblin, M., Donaldson, G., Ellington, L., Mooney, K., Caserta, M., & Lund, D. (2016). Spouse cancer caregivers' burden and distress at entry to home hospice: The role of relationship quality. *Journal of Social and Personal Relationships*, *33*(5), 666–686. <https://doi.org/10.1177/0265407515588220>
- Ren, L., Tian, X., He, Z., Song, E., & Tang, T. (2022). Cancer-related fatigue in hospitalised patients treated for lymphoma and its burden on family caregivers. *European Journal of Cancer Care*, *31*(1), Article e13547. <https://doi.org/10.1111/ecc.13547>
- Spatuzzi, R., Giuliotti, M. V., Ricciuti, M., Merico, F., Romito, F., Reggiardo, G., Birgolotti, L., Fabbietti, P., Raucii, L., Rosati, G., Bilancia, D., & Vespa, A. (2020). Does family caregiver burden differ between elderly and younger caregivers in supporting dying patients with cancer? An Italian study. *American Journal of Hospice and Palliative Medicine*, *37*(8), 576–581. <https://doi.org/10.1177/1049909119890840>
- Stjepanovic, N., Lubinski, J., Moller, P., Armel, S. R., Foulkes, W. D., Tung, N., Neuhausen, S. L., Kotsopoulos, J., Sun, P., Sun, S., Eisen, A., Narod, S. A., & Hereditary Breast Cancer Clinical Study Group. (2021). Breast cancer risk after age 60 among *BRCA1* and *BRCA2* mutation carriers. *Breast Cancer Research and Treatment*, *187*, 515–523. <https://doi.org/10.1007/s10549-020-06072-9>
- Sun, V., Puts, M., Haase, K., Pilleron, S., Hannan, M., Sattar, S., & Strohschein, F. J. (2021). The role of family caregivers in the care of older adults with cancer. *Seminars in Oncology Nursing*, *37*(6), Article 151232. <https://doi.org/10.1016/j.soncn.2021.151232>
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, *71*(3), 209–249. <https://doi.org/10.3322/caac.21660>
- Thana, K., Sikorskii, A., Lehto, R., Given, C., & Wyatt, G. (2021). Burden and psychological symptoms among caregivers of patients with solid tumor cancers. *European Journal of Oncology Nursing*, *52*, Article 101979. <https://doi.org/10.1016/j.ejon.2021.101979>
- Thomson, M. D., Genderson, M. W., & Siminoff, L. A. (2022). Understanding cancer caregiver burden over time: Dyadic assessments of family cohesion, conflict and communication. *Patient Education and Counseling*, *105*(6), 1545–1551. <https://doi.org/10.1016/j.pec.2021.10.014>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowans, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garrity, C., ... Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, *169*(7), 467–473. <https://doi.org/10.7326/M18-0850>
- Unsar, S., Erol, O., & Ozdemir, O. (2021). Caregiving burden, depression, and anxiety in family caregivers of patients with cancer. *European Journal of Oncology Nursing*, *50*, Article 101882. <https://doi.org/10.1016/j.ejon.2020.101882>
- Valachis, A., Nyström, P., Fredriksson, I., Wennstig, A.-K., & Ahlgren, J. (2021). Treatment patterns, risk for hospitalization and mortality in older patients with triple negative breast cancer. *Journal of Geriatric Oncology*, *12*(2), 212–218. <https://doi.org/10.1016/j.jgo.2020.09.004>
- van der Plas-Krijgsman, W. G., de Boer, A. Z., de Jong, P., Bastiaannet, E., van den Bos, F., Mooijaart, S. P., Lifers, G. J., Portielje, J. E. A., & de Glas, N. A. (2021). Predicting disease-related and patient-

- reported outcomes in older patients with breast cancer - a systematic review. *Journal of Geriatric Oncology*, 12(5), 696–704. <https://doi.org/10.1016/j.jgo.2021.01.008>
- Verma, R., Saldanha, C., Ellis, U., Sattar, S., & Haase, K. R. (2022). eHealth literacy among older adults living with cancer and their caregivers: A scoping review. *Journal of Geriatric Oncology*, 13(5), 555–562. <https://doi.org/10.1016/j.jgo.2021.11.008>
- Yan, C. H., Coleman, C., Nabulsi, N. A., Chiu, B. C. H., Ko, N. Y., Hoskins, K., & Calip, G. S. (2021). Associations between frailty and cancer-specific mortality among older women with breast cancer. *Breast Cancer Research and Treatment*, 189(3), 769–779 <https://doi.org/10.1007/s10549-021-06323-3>
- Yu, W., Chen, J., Sun, S., Liu, P., Ouyang, L., & Hu, J. (2021). The reciprocal associations between caregiver burden, and mental health in primary caregivers of cancer patients: A longitudinal study: Family functioning, caregiver burden, and mental health. *Psycho-Oncology*, 30(6), 892–900. <https://doi.org/10.1002/pon.5667>
- Zhang, X., Pennell, M. L., Bernardo, B. M., Clark, J., Krok-Schoen, J. L., Focht, B. C., Crane, T. E., Shaydyab, A. H., & Paskett, E. D. (2021). Body image, physical activity and psychological health in older female cancer survivors. *Journal of Geriatric Oncology*, 12(7), 1059–1067. <https://doi.org/10.1016/j.jgo.2021.04.007>