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ARE NURSING INTERVENTIONS EFFECTIVE TO IMPROVE QUALITY OF LIFE IN CANCER SURVIVORS? A SYSTEMATIC REVIEW

--Manuscript Draft--

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Abstract:	<p>Background: Cancer survivors (CSs) have needs that can negatively impact their quality of life (QoL). Oncology nurses play a key role in providing comprehensive care in cancer survivorship, although little is known about their impact on health outcomes.</p> <p>Objective: The aim of this review was to determine the effectiveness of nursing interventions to improve QoL and satisfaction with care of CSs.</p> <p>Methods: Systematic review. PubMed, CINAHL, PsycINFO and Cochrane databases were searched for experimental studies. The JBI Checklist for Randomized Controlled Trials was used to verify the quality of the studies. Prospero's reference: 148294.</p> <p>Results: Of the eight clinical trials eligible for inclusion, five demonstrated that interventions conducted by nurses improved the overall QoL or some of its domains in CSs. The included studies focused on short-term survival, no studies in long-term cancer survivors being identified. Two studies assessed satisfaction with care of survivors, obtaining positive results.</p> <p>Conclusions: Nursing interventions seem to improve QoL of short-term CCs. However, because of low number of studies identified, findings of this systematic review should be interpreted with caution.</p> <p>Implications for practice: Further studies are necessary to strengthen the implementation of effective nursing intervention in cancer practice. Besides, research should be conducted with long-term cancer survivors as there is lack of data on this</p>

specific stage of cancer.

June 18th, 2020.

To Prof. Pamela S. Hinds

Editor-in-Chief, CANCER NURSING: An International Journal for Cancer Care

We are resubmitting our revised manuscript ID CN-D-20-00214 entitled: “**ARE NURSING INTERVENTIONS EFFECTIVE TO IMPROVE QUALITY OF LIFE IN CANCER SURVIVORS? A SYSTEMATIC REVIEW**”.

We are sincerely thankful for the opportunity to publish our manuscript in Cancer Nursing. We also thank the reviewer for the careful reading and suggestions, which have been very helpful in improving the manuscript.

All comments have been considered to improve the quality of this article; we present replies to each of them separately (below). The changes are highlighted in red in the main text.

All co-authors have agreed to the resubmission with these revisions.

Our very best,

The authors.

LIST OF RESPONSES TO THE REVIEWERS' COMMENTS

Reviewer's Comments	Authors' Revisions
A. Significance of topic - The authors have provided a meaningful synthesis.	Thank you for the comment
B. Appropriateness to CANCER NURSING - Appropriate.	
C. Author's demonstration of authority - Good systematic review.	
D. Clarity/writing style - Organized and clear.	
E. Organization of material - Control is needed over referential numbers example 3-4 are connected.	Thank you for the comment. We have deleted reference 4.
F. Usefulness for practitioners - Useful.	Thank you for the comment
G. Clarity of objectives - The authors have chosen not to include C in PICO without describing and this must be done. In addition, inclusion criteria are clinical trials, so C is needed,	Following this suggestion, the authors have included the PICO strategy and they have specified in page 3 of the main document and in Table 1 that their comparison was "usual care".
H. Conceptual/theoretical framework - The QoL theory seemed to have been used to guide the study, although that was never clearly stated.	Thank you for this observation. In this review, we understood QoL as a major nursing outcome (NOC [2000]) and have now clearly stated it in page 4. Moreover, the mentioned theory could have been an appropriate theoretical framework.
I. Operationalization of variables - ok	Thank you
J. Sample/sample selection - It is not clear whether the reviewed studies had ethical approval or reasoning and this is needed.	Thank you for your comment. We understand how important an ethical approval is for clinical trials and all the studies in this review had one, which has now been stated in the selection criteria of the articles in page 5.
K. Methodology - The authors have chosen not to include C in PICO without describing and this must be done. In addition, inclusion criteria are clinical trials, so C is needed. Completely absence of method discussion	The authors now explicitly state that their comparison was "usual care" and hope this clarifies the methodology used for the review. The method used for selecting articles has been explained further in page 6.

<p>with selection, etc. and this is a part in the chosen method.</p>	
<p>L. Data analysis - - It does not mention how the articles were quality-reviewed, what criteria were used and with what reference. The authors have to comment quality of the selected articles.</p>	<p>We have added the following explanation in page 6:</p> <p>The JBI Checklist for Randomized Controlled Trials (Joanna Briggs Institute, 2017) was used to critically appraise the quality of the selected articles and their results are displayed in Table 2. This changed the order of tables 2 and 3.</p>
<p>M. Conclusions/implications for practice - With a broader search, the result have become more improving QoL of CSs.</p>	<p>We do agree with the reviewer's comment. In fact, in our paper this was identified as a limitation in page 15.</p> <p>It may be that including the review of grey literature as well as other databases would have allowed the identification of new articles and stronger conclusion. However, we included the main databases of interest in the subject of study and also included four languages to expand the identification of articles.</p>

Dr Pamela S. Hinds
Editor, Cancer Nursing

10th of May 2020

Dear Professor Hinds,

We are pleased to submit the manuscript entitled **“Are nursing interventions effective to improve quality of life in cancer survivors? A systematic review”** for consideration for publication in the Journal of Cancer Nursing.

This article aims to summarize the most recent and reliable nursing interventions in cancer survivorship in order to serve as a reference for future guidelines. Successfully navigating the survivorship care of cancer survivors and their family is a complex task that requires interdisciplinary collaboration. This article contributes to knowledge from an interdisciplinary perspective about cancer survivorship care globally.

This is because in addition to understanding that the end of active treatment does not equal the end of care needs, it goes on in the understanding of survivorship care as a chronic experience that should be addressed as such. Survivorship care has become a common and relevant topic among the cancer professionals and, therefore, it is important to consider and evaluate the outcomes that professionals, particularly cancer nurses are achieving through their unique interventions.

We confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere. Besides, particular attention has been taken to ensure that the submitted manuscript, including the graphics, have exactly adhered to the journal style in all respects. Also, in the editing of the paper we had the support of the American Journal Experts (AJE) for the English translation (please, find attached an editing certificate by AJE, Ref. 5CEF-AABD-FF88-5F80-1DBP). Furthermore, this review is registered at the International prospective register of systematic reviews. Prospero's provisional reference number 148294.

Thank you for considering this manuscript for publication in Cancer Nursing.

Yours sincerely,

The authors

Title page

Complete manuscript title:

Are nursing interventions effective to improve quality of life in cancer survivors? A systematic review

Bylines:

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Authorship

Criteria	Author Initials
Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data.	IRM, VLRS, CGV
Involved in drafting the manuscript or revising it critically for important intellectual content.	IRM, LA, MDO, NER, VLRS, CGV

<p>Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.</p>	<p>IRM, LA, MDO, NER, VLRS, CGV</p>
<p>Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.</p>	<p>IRM, LA, MDO, NER, VLRS, CGV</p>

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Moreover, the main author acknowledges the financial support received from Santander Group Bank and the Basque Government to complete her Master's degree in Advanced Practice and Nursing Management of the University of Navarra which was the catalyst of this review.

Conflict of Interest Statement

The authors declare no conflict of interest.

Funding Statement

This study received funding for translation services from the Department of Community Nursing and Maternal & Child Health Care of the School of Nursing of the University of Navarra.

Background: Cancer survivors (CSs) have needs that can negatively impact their quality of life (QoL). Oncology nurses play a key role in providing comprehensive care in cancer survivorship, although little is known about their impact on health outcomes.

Objective: ~~The aim of this review was to~~ determine the effectiveness of nursing interventions to improve QoL and satisfaction with care of CSs.

Methods: Systematic review. PubMed, CINAHL, PsycINFO and Cochrane databases were searched for experimental studies. The JBI Checklist for Randomized Controlled Trials was used to verify the quality of the studies. Prospero's reference: 148294.

Results: Of the eight clinical trials eligible for inclusion, five demonstrated that interventions conducted by nurses improved the overall QoL or some of its domains in CSs. The included studies focused on short-term survival, ~~;~~ no studies in long-term cancer survivors ~~being~~ were identified. Two studies assessed satisfaction with care of survivors, obtaining positive results.

Conclusions: Nursing interventions seem to improve QoL of short-term **CCs**. However, because of low number of studies identified, findings of this systematic review should be interpreted with caution.

Implications for practice: Further studies are necessary to strengthen the implementation of effective nursing intervention in cancer practice. ~~Besides,~~ ~~r~~Research should particularly be conducted with long-term cancer survivors as there is lack of data on this specific stage of cancer.

Commented [CN1]: ? Please spell out this acronym.

Key words: cancer survivor, survivorship, quality of life, satisfaction with care, nursing intervention, systematic review.

INTRODUCTION

Cancer is one of the main causes of morbidity and the leading cause of mortality worldwide ¹. As life expectancy continues to increase, the incidence of cancer also increases: worldwide, in 2012, there were 14 million new diagnoses; in 2018, the number increased to 18.1 million, and it is expected to reach 29.5 million by 2040 ^{2,3}.

Survival increases at the same time that incidence increases. Efforts to promote early diagnosis and new treatments have made it possible for an increasing number of people to complete their treatments every day ³. In 2012, there were 32.6 million survivors worldwide, and it is expected that in 2026, the number of survivors will grows exponentially, reaching 20.3 million in the United States ^{3,4}.

With the increase in the number of survivors, there has been a parallel increase in the demand for care to meet their needs, which were reflected for the first time in the revolutionary report "*From Cancer Patient to Cancer Survivor: Lost in Transition*" published in 2006 by the American Institute of Medicine (IOM) ⁵. This report raised awareness of the medical, functional, and psychosocial consequences of cancer and the need to implement Survivorship Care Plans (SCP) for survivors and families. By cancer survivor (CS), organizations such as the National Comprehensive Cancer Network (NCCN), referred to those who have been diagnosed with cancer, from the time of their diagnosis to the final stage of life ⁶. ~~However, m~~More recently, cancer survivorship tends to focus on the differentiated phase of cancer care that happens once active treatment has been completed ⁷. In line with the IOM's concept of cancer survival as a specific stage of the cancer trajectory ⁵ and other researchers ⁸, the present study considers survivors as those who have completed active treatment for cancer and ~~they~~ are in the extended survivorship (from the end of treatment to 1 to 5 years), ~~or~~ permanent survivorship or long-term

survival (≥ 5 years after the end of active treatment and in clinical remission). Precisely, it is in the extended and long-term survival phases of cancer that a lack of coordination and care towards survivors and their families have been identified ⁵. ~~However, s~~Survivors may experience health problems beyond the end of cancer treatment, such as late effects (toxicities that occur months or even years after the end of treatment) and long-term effects (complications derived from the treatments that appear during treatment and continue even after treatment is completed, i.e., persistent effects). ~~That is what t~~The IOM ~~supported report indicated~~ the need to develop specific survivorship care (SCPs), taking into account the treatments the survivors would have received, future risks, and personal and family needs ⁵. Therefore, surviving cancer is considered a chronic illness that requires a global health action ⁹⁻¹¹.

Within the comprehensive and integrated approach of cancer care, nurses, as part of the multidisciplinary team in oncology and primary health care, play a key role in caring for cancer survivors and their families ¹², even leading SCP autonomously ¹³⁻¹⁵. ~~Therefore, a~~As in other chronic diseases, nurses can be key professionals in meeting not only the physical needs of cancer survivors ^{16,17} but also the psychosocial and family impact of cancer ^{18,19}.

Taking into account the novelty of follow-up in survival and the existing indications that support greater patient satisfaction with nurse-led follow-up ^{13,20,21}, the aim of this review was to determine the effectiveness of nursing interventions to improve QoL and satisfaction with care among CSs.

METHODOLOGY

Type of review

A systematic literature review was conducted as this type of review is considered the most appropriate to confirm or refute whether or not current practice is based on rigorous evidence^{22,23}. In this review, the aim was to determine whether nursing interventions were effective ~~to in~~ ~~improve-improving~~ QoL and satisfaction with care among CSs. ~~Therefore, the methodology used in the present study was justified following overall indications for systematic reviews²³.~~

Research question

What is the impact of nursing interventions on QoL of cancer survivors and their satisfaction with nursing care in cancer survivorship?

Search strategy

This review followed the criteria of the PRISMA statement²⁴. A search was conducted in *PubMed*, *Cinahl*, *PsycINFO* and *Cochrane databases* from January to March 2019. These databases were selected as they were considered one of the most relevant in the field of nursing science. *MeSH* terms “cancer survivors”, “nursing interventions” and “Quality of life” and synonymous were used and were combined using Boolean operators (Table 1) following the PICO structure (population, intervention, comparison and outcome), where comparison was usual care.

In this review, the term nursing intervention referred to any act or treatment implemented by a nurse, based on their knowledge and clinical judgement, to carry out their plan of care to improve the health outcomes of the patient^{25,26}. In addition, QoL was understood as a multidimensional concept that encompasses several subcategories or domains (physical, emotional and social/family well-being)²⁷ or the scope of positive perception of current life conditions and a major nursing outcome to include in any nursing care plan²⁸. Patient

satisfaction or satisfaction with care was considered “the degree to which an individual regards the health care service or product manner in which it is delivered by the provider to be useful, effective, or beneficial”²⁹ as well as a major indicator of quality care³⁰. Finally, in this review we ~~referred to defined~~ effectiveness of intervention to be the degree to which nursing interventions were successful in producing a positive impact in the QoL of survivors and satisfaction with nursing care during survivorship.

To verify potential gaps in the identification of relevant articles in the selected databases, a random selection of five high-impact journals that address the study topic was performed and a complemented search was conducted in the following journals: *European Journal of Cancer Care*, *European Journal of Oncology Nursing*, *Journal of Cancer Survivorship*, *Cancer Nursing* and *Quality of Life Research*. Besides, the snowballing technique was used to select more articles when appropriate.

The established limits were as follows:

- Publication date: 2009-2019.
- Languages: English, French, German and Spanish.

Selection criteria

The following inclusion criteria were established to ensure rigor and fit to the proposed aim:

- Clinical trials of nursing interventions with the QoL and/or satisfaction with the care of adult CSs as variables and comparing their outcomes to usual care. We chose clinical trials because they are studies that are used to assess effectiveness of interventions, ~~objective of this review.~~

- Trials whose interventions were aimed at improving some of the dimensions of QoL as primary outcome of the trials:

- Nursing interventions to improve the management of delayed physical effects, such as lymphoedema, 'chemo-brain' or cognitive deficit, fatigue, pain, urinary or digestive dysfunction, infertility, premature menopause, relapse or secondary cancer, cardiac disturbances, changes in immunity, respiratory disorders, osteoporosis and renal impairment.
- Nursing interventions to improve the management of delayed psychological effects, including anxiety, depression, or fear of relapse.
- Nursing interventions to improve social and family well-being or family coexistence in cancer survival.

- Clinical trials that, after being critically appraised by the Joanna Briggs Institute (JBI) Checklist for Randomized Controlled Trials ³¹ were considered appropriate for inclusion.

~~Therefore, and based on the established aim and inclusion criteria, the following~~ exclusion criteria were ~~determined~~:

- Nursing interventions for oncology patients in active treatment.
- Clinical trials that were not considered appropriate for inclusion after being critically evaluated through the JBI Checklist for Randomized Controlled Trials.
- Clinical trials that did not state having an ethical approval for their development.
- Secondary studies, as recommended by some authors for systematic reviews ³².
- Studies directed at paediatric patients or patients under 18 years of age.

- Studies whose interventions were based on pharmacological treatments.
- Studies not led by nurses or in which a nurse did not perform the main intervention.
- Studies that did not have the impact of interventions on QoL or satisfaction with care as a variable.
- Grey literature.

~~Following the above mentioned predefined criteria,~~ Two authors (IRM & CGV) were responsible for assessing the eligibility of the articles. As shown in the PRISMA Flowchart ([see the Figure](#)), 431 articles were identified through database searching and 11 more were identified through other sources. After automatically removing the duplicated articles by using a reference manager (Mendeley), 353 articles remained. The authors excluded 227 articles after carefully going through their titles and abstracts, and finally, 126 full-text articles were assessed for eligibility. The reasons why each of the 118 studies were excluded are displayed in the [Figure 4](#).

Data extraction and quality assessment

Data from included full-texts articles were extracted in a structured extraction word sheet, which was developed ad hoc by the authors and included the following categories: characteristics of the interventions, sample characteristics and dimensions of the quality of life and satisfaction outcomes. This stage was developed by the first author and presented for discussion to the senior author who previously had reviewed the extraction results independently. In the second stage, two authors (IRM & VLRS) independently assessed the quality of the studies through the JBI Checklist for Randomized Controlled Trials ³¹, ~~which~~ (results are displayed in [Table 2](#)) and added to the data extraction form before ~~the inclusion into~~ the analysis to reduce the risk of bias.

~~Finally, a~~All authors agreed on the final inclusion of papers according to the extracted data and the quality of the selected articles.

Protocol registration

This review is registered at the International Prospective Register of Systematic Reviews.

Prospero's provisional reference number is [148294](#).

RESULTS

Applying the proposed search strategy and following the PRISMA flowchart, a total of eight clinical studies were included in the final review (Figure, Table 3). It is noteworthy that four were directed towards breast CSs, two towards gynaecological CSs, one towards prostate CSs and one towards colorectal CSs. Additionally, the articles came from ~~the following countries:~~ Denmark, South Korea, United Kingdom, Australia, the Netherlands, and Iran.

The studies included in this review used different scales that were validated in their environment. Some of the most commonly used scales were the European Organisation for Research and Treatment of Cancer - Quality of Life of Cancer Patients (EORTC QLQ-C30) and the Functional Assessment of Cancer Therapy - Breast/General (FACT-B/G). In addition, all the studies included sub-scales that assessed specific domains of QoL, such as overall QoL, physical well-being, emotional well-being, and social and family well-being. Satisfaction with the care received was only measured in two of the studies. All the variables that each article evaluated can be found in Table 4. ~~Moreover, the r~~Results were classified according to the specific or overall QoL domains they improved (Table 5), the interventions that measured satisfaction and ~~these~~ interventions that were not effective. Those interventions that achieved statistically significant improvements were considered effective.

Effective interventions to improve the overall quality of life

Among the interventions that were shown to be effective in improving overall quality of life, ~~we found was~~ the psycho-educational intervention carried out by Park et al.³³ in South Korea with breast CSs. The intervention was performed in adult women who had completed treatment in the 4 weeks prior to the start of the intervention, which consisted of face-to-face education with the help of a participant notebook, telephone coaching sessions and small group meetings (five-eight women). The intervention was carried out for 12 weeks, and the values of the variables (QoL measured by the FACT-B and physical and psychological symptoms measured by the Memorial Symptom Assessment Scale – Short Form (MSAS-SF)) were collected at the beginning and end of the intervention and at three months after the intervention. The intervention group obtained the best values for total QoL at three months ($p = .002$, 95% CI).

Another intervention that ~~obtained satisfactory results for the~~ achieved improvement of overall QoL was conducted in Iran, also with breast CSs³⁴. The study used the EORTC QLQ-C30 Quality of Life Questionnaire. The intervention consisted of 90-minute sessions of talk and support in groups of seven-nine CSs for 12 weeks. The sessions, led by a breast cancer specialist nurse, were unstructured, but the moderator guided the discussions to relevant issues such as information needs, fear of relapse and the definition of objectives. In addition, the moderator made sure to maintain the participation of all attendees. After the intervention, the results for overall QoL significantly improved ($p = .002$, 95% CI).

Commented [CN1]: Time point of measuring this?

Effective interventions to improve physical well-being

Three studies were found^{34–36} that described actions that achieved positive results for improving the physical well-being of participants.

The first of the interventions was carried out in South Korea with female survivors of ovarian cancer with total remission of the disease for between 6 months and 3 years³⁵. The study used the FACT-G scale translated into Korean. The longitudinal intervention was multidisciplinary, though nurse-led, and consisted of 40-minute sessions of group education, 20-minute group self-help sessions, and education for performing physical exercise and relaxation at home. The intervention showed improvement in physical well-being in the intervention group at 8 weeks ($p = .049$)³⁵.

In the study by Olesen et al.³⁶ developed in Denmark, survivors of gynaecological cancer who participated in the intervention attended two to four sessions with a nurse for three months. The number of sessions was determined between the patient and the nurse, and the following topics were addressed: assessment of future challenges; definition and prioritization of problems, education on the symptoms of relapse, systematic solutions to problems, and strategies for long-term problem solving. Nine months after the intervention, the researchers collected the data using the QLQ-CS scale for CSs, and found that physical well-being improved compared to the control group ($p = .006$, 95% CI)³⁶.

The study by Tabrizi et al.³⁴ with breast CSs, which was described in the previous section, did not demonstrate significant improvements in the sub-domain of physical functioning ($p = .331$, 95% CI), ~~although it showed~~ It did find improvements in the sub-domain of fatigue ($p = .046$, 95% CI), which is strongly related to physical well-being and which is included within physical well-being in other scales³⁴.

Effective interventions to improve emotional well-being

Once again, the study of Tabrizi et al.³⁴ obtained positive results for QoL in this sub-domain ($p = .0047$, 95% CI). Additionally, the multidisciplinary intervention of Hwang et al.³⁵ was shown to be effective for improving the emotional well-being of its participants ($p = .001$)³⁵.

Another nurse-led intervention carried out for 12 weeks in South Korea aimed at making healthy changes in habits, such as diet and exercise, for breast CSs; this intervention achieved promising results for improving emotional well-being, as measured by the EORTC QLQ-C39 questionnaire ($p = .004$)³⁷. Finally, with the psycho-educational intervention proposed by Park et al.³³, positive results were obtained for improving the participants' emotional well-being ($p < .01$, 95% CI).

Effective interventions to improve social and family well-being

The interventions that managed to achieve statistically significant results in terms of the social/family domain of the survivors was an intervention performed in the support and expression groups ($p = .024$, 95% CI)³⁴ and the Korean multidisciplinary intervention ($p = .004$)³⁵.

Studies that evaluated satisfaction with care

A study conducted in Australia³⁸ that presented a package of care called *SurvivorCare* included as a variable the satisfaction with the care received by patients in both the control and intervention groups. The participants in both groups were satisfied with the care they received, but those who participated in the intervention group tended to improve more and to use "satisfied" or "very satisfied" more often in the questionnaire, although differences were not statistically significant.

The second study that mentioned participants' level of satisfaction was that of Kimman et al.³⁹. This group obtained high levels of satisfaction in both telephone follow-ups and face-to-face modalities. These results are explained in more detail in another article⁴⁰.

Interventions that did not demonstrate significant improvements of the quality of life

Of the eight studies that were selected and ~~analysed~~analyzed, three did not obtain statistically significant results for any of the variables studied in this review. Watson et al.⁴¹, in the United Kingdom, recently created a nurse-led psycho-educational programme to improve the self-management of frequent complications in survivors of prostate cancer (*PROSPECTIV*). As a measurement instrument, they used the Expanded Prostate Cancer Index Composite (EPIC-26) questionnaire to assess QoL in patients with prostate conditions. Although in this study no statistically significant differences were found between the intervention group and the control group, the latter more often resorted to specialized consultations, while the former turned to their primary care ~~centre~~center as a first option⁴¹.

~~On the other hand,~~ In the Netherlands, Kimman et al.³⁹ designed a study in which breast CSs who had completed treatment during the 6 weeks prior to study randomization were assigned to one of the four groups developed. In this study, the EORTC QLQ-C30 instrument was used to evaluate QoL. The study found no significant differences in routine follow-up versus telephone follow-up between patients who received educational group programming (EGP) and those who did not. It should be noted that this was the only study in which the partners of survivors were included in one of the interventions³⁹.

The third study that did not have statistically significant results in relation to QoL and its subscales was performed in Australia by Jefford et al.³⁸. To evaluate the QoL of the participants,

they used the EORTC QLQ-C30 questionnaire. Although the intervention did not obtain statistically significant results, the baseline QoL of the participants was already ~~good~~high³⁸.

DISCUSSION

The variability of the primary pathologies, the different survival times for which the interventions were carried out, the diversity of instruments used to assess their effectiveness, and the scarcity of articles and their limited convenience samples make interpretation of the results ~~extremely~~ difficult. Despite this, the results obtained in this review coincide with the existing global tendency to respond to the physical, emotional and social/family needs derived from different treatments and from the diagnosis itself in this sector of the population, which is dramatically increasing. It is relevant that the majority of the studies obtained their most positive results for the improvement of physical well-being, possibly because historically, this is the area with which most health professionals have been accustomed to working. Additionally, the studies included in this review were conducted in various countries in Europe, Asia, America, and Oceania and highlight the importance of the role of nursing care for CSs.

~~It should be noted that n~~None of the interventions had a negative effect on the QoL of participants. In addition, even in the cases in which no statistically significant difference was found, the trends evaluated in the intervention groups showed an improvement in QoL, while in the control groups, the results remained very similar or, for some QoL parameters, even got worse^{33,37-39,41}. Although the objectivized trend tends towards improvement, it is necessary to consider the methodological limitations of the studies that, therefore, affect the transferability and acceptability of their results.

~~On the other hand, if~~ it is interesting that the two interventions that demonstrated a statistically significant effect on the overall QoL of cancer survivors used educational and group expression sessions^{33,34}, ~~increasing relevance and~~ supporting the relevance and use of this type of intervention. However, ~~it must be considered that~~ both interventions were performed in breast CSs in Asia, which may affect the applicability and transferability of the results to patients with other characteristics and from other health, social and cultural contexts.

Another recurring intervention in the analysed studies was telephone follow-up by nurses^{33,38,39}. The results of this intervention were mixed as there were no significant results except in the study by Park et al.³³. Even so, each of the studies complemented the telephone follow-up with other types of materials or interventions, so it is not feasible to assess the telephone intervention in isolation. What the results do show is that telephone follow-up does not worsen the health outcomes of its recipients and that it may be a viable alternative for improving the cost-effectiveness and accessibility of the system, which coincides with the findings of other studies^{40,42}. Despite this, it must be taken into account that telephone follow-up will not be appropriate in all cases and that if it is not carried out by personnel with specialized training, it can have a negative impact on the nurse-patient relationship⁴³⁻⁴⁵.

Only the intervention developed in the United Kingdom was performed in the primary care setting, and despite not showing significant effectiveness, patients in the intervention group visited their health ~~centre-center~~ more frequently for the management of possible late effects. Participants assigned to the control group received routine follow-up by their specialist and, for possible late effects, also accessed more specialized services⁴¹. These results suggest that follow-up with primary care is feasible and could improve cost-effectiveness and accessibility for patients who do not live near ~~centres-centers~~ with specialists.

~~In addition, t~~The instruments used to measure the QoL of the participants, although validated in oncological patients and in the different environments in which the research ~~is was~~ conducted, are not exclusive to survivorship, except for the Quality of Life Cancer Survivor (QLQ-CS) scale used by Olesen. et al.³⁶; consequently, some of the participants' greatest concerns may not be properly reflected in the phenomenon studied or the effectiveness of interventions. Meneses and Benz⁴⁶ ~~spoke of addressed~~ the impact of these instruments in the evaluation of the results of the survivors, ~~and~~ they collected and ~~analysed analyzed~~ instruments that had been specifically created and validated to evaluate the QoL of CSs.

Likewise, it is essential to highlight the absence of interventions aimed at the social dimension of the survivors when it has been shown that families also have specific needs⁴⁷. Only the intervention by Kimman et al.³⁹ included the partners of the participants in the educational group sessions, but ~~it did not measure~~ how the intervention affected the family members ~~was not measured~~. ~~Therefore, it is~~We recommended that future research involve family members to ~~have generate~~ evidence of the impact of interventions when the family is seen as the unit of care.

Another of the findings that stand out in this review is that none of the selected articles address long-term CSs; instead, they focus exclusively on the most immediate survival phase, at the end of treatment. The group of long-term survivors also have needs that can vary from those of other patients and often go unaddressed^{47,48}. ~~Further w~~Work as to how nursing interventions can help families manage the long-term survival needs to be undertaken.

Likewise, none of the ~~analysed analyzed~~ articles referred to the workplace impact of survival. In addition, articles from the European context came from three specific countries (Denmark, the Netherlands and the United Kingdom), ~~which makes us wonder~~raising the question of whether

survival is being addressed equally in Europe or whether, on the contrary, it is treated as a priority issue in only some environments.

Finally, it should be highlighted that all authors noted the importance of ensuring that nurses who carried out the interventions were broadly trained in the field of oncology and were experts in dealing with patients and detecting needs. This finding contrasts with the fact that none of the ~~analysed~~-analyzed articles employed advanced practice nurses in their interventions, although a recent systematic review showed that more experienced nurses improve satisfaction of care, QoL and cost-effectiveness in the area of cancer survival ⁴⁹. Regarding this nursing profile, no study was found from the United States, where advanced practice nursing is more developed and where the focus on survival first occurred.

STRENGTHS AND LIMITATIONS

This review performed a comprehensive search in the main health and nursing databases and snowballing of list of references including various languages (English, French, German and Spanish) which may have contributed to the diversity of origins among the identified articles, in contrast to searches that are limited to English. However, we did not include publications from grey literature, so, it is possible that some studies may have been missed.

Few articles were included in the review, and these articles had obvious methodological limitations, despite the efforts made by the research team to ensure methodological rigor. The number of articles may have been limited by the identification of studies published exclusively on nursing interventions because they use to be systematically included in the multidisciplinary SCPs, which is why they may have been excluded in this review. Another major limitation of the review is that the variable "satisfaction with care" was not present in all studies. This may be

because, for this review, primary quantitative articles were chosen, and if the qualitative results were presented in another article, they did not meet the inclusion criteria of this review ~~and were therefore excluded. Therefore,~~†The lack of sufficient studies and the methodological limitations make the representability of the results to be weak.

CONCLUSIONS

The synthesis of evidence in this review provides new knowledge around the different nursing interventions used to ~~improving~~ improve quality of life and satisfaction with care of cancer survivors. Despite the weakness of results to ~~generalising~~ generalizing findings across health settings, some of the interventions have proven to be effective in improving QoL of CSs and satisfaction with care, although they do not fully respond to the specific needs that CSs may experience as a result of the end of treatments and living beyond cancer. Consequently, we recommend those interventions that are based on psychoeducational, educational and/or support groups, as these have achieved the best outcomes in this review. Other interventions, such as telematic approaches, need to be developed further.

In addition, this review highlights the need to rethink and refine interventions, include more types of cancers, promote the use of tools specifically created to measure QoL in survival and take long-term survivors into consideration. Finally, it would be very interesting if these interventions were carried out by nurses with advanced roles in the community itself. Such practices would likely allow CSs, including their families, to benefit from better accessibility to health services, considering the environment in which they live, including their workplace.

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FIGURES

FIGURE: PRISMA Flowchart of the Selection Process of the Articles

TABLES

TABLE 1: Search Strategy with Mesh Terms and their Combination

TABLE 2: Summary of the Articles Included in the Review

TABLE 3: JBI Critical Appraisal Checklist for Randomized Controlled Trials

TABLE 4: Articles Reviewed and the Variables they Evaluated

TABLE 5: Effective Interventions for Each Quality of Life Sub-Scale

TABLE 1: Search Strategy with Mesh Terms and their Combination

Population	AND	Intervention	AND	Comparison	AND	Outcome
Long-term cancer survivor* OR Cancer survivors OR Cancer post-treatment OR Cancer posttreatment		Nursing care OR Nurs* intervention OR Cancer nurs* OR Oncology Nursing OR Nurse-led OR Nurse specialist OR Advanced practice Nurs* OR Primary care nurs* OR Cancer follow-up		(usual care)		Quality of Life OR QoL OR Health related quality of life OR HRQOL OR Patient satisfaction

TABLE 2: JBI Critical Appraisal Checklist for Randomized Controlled Trials

	1. Randomization	2. Concealed allocation	3. Similar groups at baseline	4. Participants blind to assignment	5. Those delivering treatment blind	6. Outcomes assessors blind	7. Groups treated identically	8. Follow up completed / differences analyzed	9. Analyzed by intention to treat	10. Outcomes measured in the same way	11. Outcomes measured in a reliable way	12. Appropriate statistical analysis	13. Appropriate RCT design and deviations accounted for
(Olesen et al., 2016) Denmark	Yes	Yes	Yes	No	NA	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Park et al., 2012) South Korea	Yes	Yes	Yes	No	NA	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Watson et al., 2018) United Kingdom	Yes	Yes	Yes	No	NA	Unclear	Yes	Yes	No	Yes	Yes	Yes	Yes
(Jefford et al., 2016) Australia	Yes	Yes	Yes	No	NA	Unclear	Yes	Yes	No	Yes	Yes	Yes	Yes
(Kimman et al., 2011) The Netherlands	Yes	Yes	Yes	No	NA	Unclear	Yes	Yes	No	Yes	Yes	Yes	Yes
(Hwang et al., 2016) South Korea	No	No	Yes	No	NA	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Kim et al., 2011) South Korea	Yes	Unclear	Yes	No	NA	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Tabrizi et al., 2016) Iran	Yes	Yes	Yes	Yes	NA	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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TABLE 3: Summary of the Articles Included in the Review

Author/s, year (country)	Intervention	Sample	Quality of life outcomes	JBIC Score	Checklist
(Olesen et al., 2016) (Denmark)	<p>Person-centred-centred intervention based on empowerment: Guided self-reporting for gynaecological cancer (GSD-GYN-C). Consisted of 2-4 nurse-led conversations during a period of 3 months.</p> <p>The nurse, together with the patient, determined how many conversations were to be carried out.</p>	<p>165 women older than 18 years who came for a review after diagnosis of gynaecological cancer without chemotherapy-radiotherapy treatment or signs of disease.</p> <p>80 intervention group, 85 control group.</p>	<p>Self-administered questionnaire before intervention and at 9 months after the intervention:</p> <p>QoL (QOL-CS):</p> <ul style="list-style-type: none"> - Not adjusted for baseline values: significant for total QoL ($p = .02$, 95% CI) and for the physical well-being sub-scale ($p = .01$, 95% CI). - Adjusted for baseline values: significant only for the physical well-being subscale ($p = .006$, 95% CI). 	10/13	
(Park et al., 2012) (South Korea)	<p>Twelve-week psycho-educational intervention that consisted of face-to-face education using a participant notebook, health coaching via telephone and monthly small-group sessions (5-8 women).</p>	<p>48 women between 18-70 years who were breast CSs and had completed active treatment during the 4 weeks prior to recruitment.</p> <p>25 intervention group, 23 control group.</p>	<p>Self-administered questionnaire before and after the intervention and at 3 months post-intervention:</p> <ul style="list-style-type: none"> - QoL (FACT-B): Significant for overall QoL ($p = .02$, 95% CI) and the emotional well-being sub-scale ($p = <.01$, 95% CI) at 3 months after the intervention. <p><i>Although the results for the other sub-scales were not significant, there was a tendency toward improvement in the intervention group, while the values worsened over time in the control group.</i></p>	10/13	
(Watson et al., 2018) (United Kingdom)	<p>Psycho-educational intervention with a focus on self-management based on the social cognitive theory of Bandura. The intervention consisted of 4 domains: understanding the context of the treatment of prostate cancer; identifying unmet needs; activation of self-management and behavior; and cognitive restructuring.</p> <p>The first contact was face-to-face, and the rest of the sessions were established according to individual needs. The last</p>	<p>83 adult prostate CSs who had completed active treatment and had stable prostate-specific antigen values.</p> <p>42 intervention group, 41 control group.</p>	<p>Self-administered questionnaires at start of intervention and at 9 months:</p> <ul style="list-style-type: none"> - QoL (EPIC-26, SCNS-SF34 and HADS): no statistically significant differences between the two groups were observed. The study was a pilot, so it did not have the best power to measure significance. 	9/13	

	contact was a phone call at 6 months.			
(Jefford et al., 2016) (Australia)	Innovative intervention in supportive care (SurvivorCare) consisting of 4 components: information package; face-to-face session with a nurse at the end of treatment; customized survivor care plan; and nurse-led telephone follow-up.	221 <u>colorectal cancer</u> survivors over 18 years who had completed active treatment. 110 intervention group, 111 control group.	Self-administered questionnaires at start, 8 weeks and 6 months: - QoL (QLQ-C30 and QLQ-CR29): There were no statistically significant results, although in general, the baseline QoL of the participants was already good. Even so, the intervention group reported greater satisfaction with many aspects of care, suggesting that the intervention had relevant aspects.	9/13
(Kimman et al., 2011) (Netherlands)	Different interventions in 4 groups: 1. Regular follow-up visits at 3, 6, 9, 12 and 18 months. 2. Nurse-led telephone follow-up, control by mammography at 12 months and telephone interviews by a breast cancer nurse during the routine follow-up months. 3. Regular intervention for group 1 + educational group program me (EGP), for which the patient could be accompanied by a partner. 4. Intervention group 2 treatment + EGP.	320 <u>breast cancer</u> survivors who had completed treatment during the 6 weeks prior to randomization. 79 control group (1), 85 telephone intervention group (2), 79 routine intervention group + EGP, 77 telephone intervention group + EGP.	Self-administered questionnaire at 12 months after randomization: - QoL (EORT QLQ-C30): There were no significant differences between routine follow-up and telephone follow-up by nursing staff, nor between patients who received the EGP and those who did not. There were also no significant differences from those who received the telephone follow-up combined with the EGP.	9/13
(Hwang et al., 2016) (South Korea)	A nurse-led multidisciplinary intervention consisting of an exhaustive 8-week care program me in which group education, participation in a self-help group, physical exercises at home, and relaxation therapy were carried out.	40 patients older than 18 years who were surviving <u>ovarian cancer</u> and had been in complete remission for between 6 months and 3 years. 20 intervention group, 20 control group. Assignment adjusted according to age and	Self-administered questionnaire before and at the end of the intervention: - QoL (FACT-G): The intervention group showed improvement on the physical ($p = .003$), social/family ($p = .004$), emotional ($p = .001$) and functional ($p = .002$) well-being sub-scales,	8/13

initial stage.

whereas in the control group, all except for functional well-being decreased, demonstrating a significant difference between the two groups.

(Kim et al., 2011) (South Korea)	Based on the transtheoretical model of change by Prochaska & DiClemente (1983), a nurse-led 12-week intervention of diet and exercise adjusted to each patient's phase of preparation for.	45 female survivors of <u>breast cancer</u> who were excluded from active treatment. 23 intervention group, 22 control group.	Self-administered questionnaire before and at the end of the intervention: - QoL (EORTC QLQ-C30): only the difference in the emotional well-being sub-scale was significant ($p = .004$). Although the rest of the sub-scales did not show statistically significant differences, they did show a tendency towards improvement in the intervention group.	9/13
(Tabrizi et al., 2016) (Iran)	Groups (7-9 survivors) participated in unstructured talking and support, with 90-minute sessions for 12 weeks.	81 <u>breast cancer</u> survivors, diagnosed for 4-18 months, completed chemotherapy treatment and had no evidence of disease. 41 intervention group, 40 control group. Randomization stratified by type of diagnosis, involvement of axillary nodes, age >50 or <50 and oestrogen receptor status.	Pre- and post-intervention questionnaires: - QoL (EORTC QLQ-C30): significant results for total QoL ($p = .002$, CI 95%), emotional well-being sub-scale ($p = .047$, CI 95%), social functioning sub-scale ($p = .024$, CI 95%), fatigue sub-scale ($p = .046$, CI 95%) and future outlook sub-scale ($p = .031$, CI 95%).	11/13

Abbreviations : CI, Confidence Interval ; CS, Cancer Survivor ; EGP, Educational Group Programme ; EORTC, European Organisation for Research and Treatment of Cancer ; EPIC-26, Expanded Prostate Cancer Index Composite ; FACT-B, Functional Assessment of Cancer Therapy – Breast ; FACT-G, Functional Assessment of Cancer Therapy – General ; GSD-GYN-C, Guided Self-Determination tailored to Gynecologic Cancer ; HADS, Hospital Anxiety and Depression Scale ; QLQ-C30, Quality of Life of Cancer Patients ; QLQ-CR29, Quality of Life of Colorectal Cancer Patients ; QoL, Quality of Life ; and SCNS-SF34, Supportive Care Needs Survey – Short Form.

TABLE 4: Articles Reviewed and the Variables they Evaluated

	Quality of Life	Mental health, depression, anxiety and loneliness	Physical activity, muscle strength, cardiovascular function and fatigue	Hope and motivation	Quality of diet	Immune response	Unmet needs	Perceptions of care	Symptoms and impact of cancer	Self-sufficiency for care
(Olesen et al., 2016) Denmark	X	X						X	X	X
(Park et al., 2012) South Korea	X								X	
(Watson et al., 2018) United Kingdom	X	X					X			
(Jefford et al., 2016) Australia	X	X					X	X		
(Kimman et al., 2011) The Netherlands	X	X								
(Hwang et al., 2016) South Korea	X		X			X				
(Kim et al., 2011) South Korea	X	X	X	X	X					
(Tabrizi et al., 2016) Iran	X	X		X						

TABLE 5: Effective Interventions for Each Quality of Life Sub-Scale

Author/s, year Type of intervention	Quality of Life	Physical well-being	Emotional well-being	Social well-being
(Olesen et al., 2016) Nursing sessions: empowerment		X		
(Park et al., 2012) Psychoeducational support: staff and groups	X	X	X	
(Watson et al., 2018) Psychoeducational: personal and telephone contact				
(Jefford et al., 2016) Multidimensional: personal, plan of care and telephone contact				X
(Kimman et al., 2011) Telephone follow-up and/or EGP				
(Hwang et al., 2016) Educational group programme and exercises	X	X		
(Kim et al., 2011) Session on diet and exercise		X		
(Tabrizi et al., 2016) Support groups and talking	X	X	X	

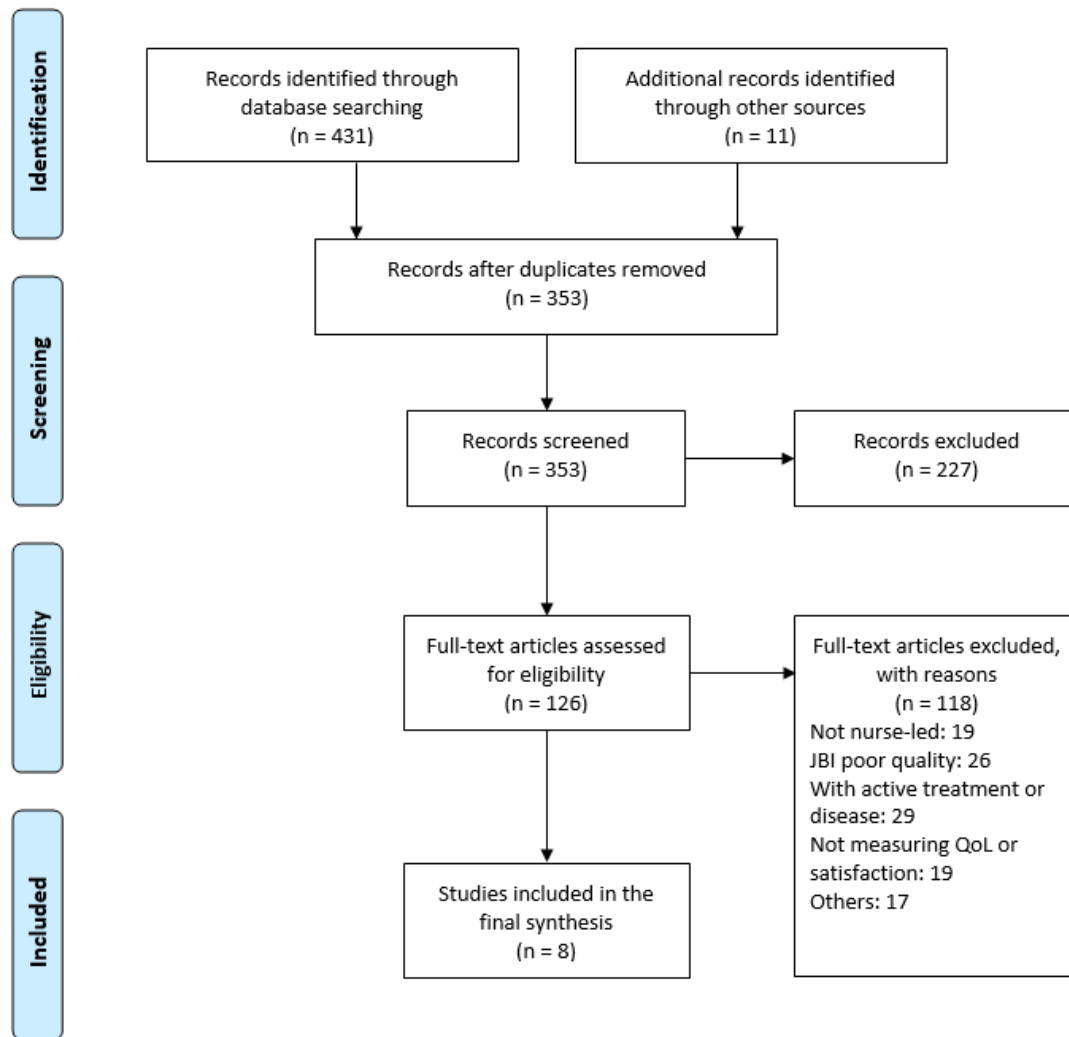


FIGURE: PRISMA flowchart of the selection process of the articles