

Supportive care interventions for cancer patients in low- and middle-income countries (LMICs): a scoping review

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Abstract

Purpose

In high-income countries (HICs), supportive care is often implemented to assist cancer patients as they seek treatment and beyond. However, in low-and middle-income countries (LMICs), where more than 70% of all cancer-related deaths occur [1], the provision of supportive care has not been assessed. The purpose of this scoping review is to assess the type of supportive care interventions for cancer patients that are being implemented into practice across the cancer care continuum in LMICs.

Methods

We examined published articles reporting on supportive care interventions in LMICs. Following PRISMA guidelines, we performed a systematic search of PubMed, ERIC, CINAHL, and PsychInfo. We limited the scope to original research studies focused on LMICs, studies that implemented any type of supportive care intervention for adult cancer patients, from diagnosis, treatment, and through survivorship.

Results

Thirty-five studies met the criteria for inclusion in the scoping review. The majority were randomized clinical trials (RCT) or used a quasi-experimental design. The highest number of studies (n=23) were implemented in the WHO Eastern-Mediterranean region, followed by South-East Asia (n=6), Africa (n=4) and Western-Pacific Regions (n=2). Most studies focused on women's cancers and included interventions for psychosocial support, symptom management, health literacy/education, and patient navigation.

Conclusions

Although only a small number of interventions are being implemented in these settings, our results suggest that providing different types of supportive services in less-resourced settings, even when health systems are fragmented and fragile, can improve mental health, physical health, and the quality of life (QoL) of cancer patients.

Introduction

Effective cancer care requires the delivery of efficacious treatments as well as appropriate supportive resources to assist patients in making the complex decisions surrounding their diagnosis and treatment. A cancer diagnosis is often accompanied by feelings of fear, anger, frustration, denial, loneliness, stress, anxiety, and depression, which can stem from the lack of knowledge of the illness, poor communication with physicians, financial burdens, and challenges in the areas of transportation and housing. It is critical for a cancer patient to not only understand their diagnosis, treatment plan, and follow up, but to also feel physically, emotionally, and practically supported.

Supportive care has been widely and loosely defined by different organizations and groups over the years, encompassing a wide range in scope of service, patient population, and stage of the disease, and also an evolving nature of definitions to involve cancer survivors, caregivers, and include social determinants of health. Recently, the Multinational Association of Supportive Care in Cancer (MASCC) defined supportive care as the prevention and management of the adverse effects of cancer and its treatment, including the management of physical and psychological symptoms and side effects from diagnosis through treatment to survivorship [2].

Studies in high-income countries (HIC) have shown that providing appropriate supportive care to newly diagnosed cancer patients may help them, and their caregivers manage emotional and psychological symptoms, and address social/cultural or logistical barriers, which in turn may improve treatment compliance and patients' quality of life. Several systematic reviews have assessed and evaluated the supportive care needs that cancer patients experience due to their diagnosis and treatment [3][4]. Some have evaluated specific types of interventions, namely educational interventions or psychotherapeutic interventions such as cognitive behavioral therapy (CBT). Others have evaluated all interventions that target a specific need, a particular outcome, or a specific population or patient group.

However, in low-and middle-income countries (LMICs), where more than 70% of all cancer-related-deaths occur [1], there is a dearth of supportive care interventions and an overall lack of research studies evaluating their effectiveness in these low-resource settings. A recent scoping review of reviews presents the first broad overview of the published studies addressing the supportive care needs of cancer patients during treatment and survivorship during the decade 2009–2019 [4]. This review of 551 studies found that the number of systematic reviews published tripled in the later years for the period reviewed compared to early years, although none evaluated supportive care interventions in LMICs or in settings with fragmented or under-resourced healthcare systems.

For our study, we chose to review supportive care interventions implemented in LMICs during the decade 2011–2021 for two reasons. First, to expand on the evidence provided by Edney's review to assess supportive care interventions that are implemented in LMICs. Second, to complement the evidence provided by other reviews up to 2010-11, pertaining both the unmet supportive care needs of cancer patients [3] and the implementation of supportive care interventions [5].

The purpose of this scoping review is to assess the type of supportive care interventions that are being implemented into practice for cancer patients across the cancer care continuum in LMICs, to qualitatively summarize the reported outcomes, and to call attention to the gaps in meeting the supportive care needs of cancer patients in these less-resourced settings.

Methods

Search Strategy

Keywords were developed by reviewing published works for terms involving cancer, supportive care interventions, and LMICs. To refine search terms for “supportive care,” we used the MASCC definition of supportive care as ‘the prevention and management of the adverse effects of cancer and its treatment’ which includes the management of both the physical and psychological symptoms and side effects from diagnosis, through treatment, survivorship, and end-of-life care [2]. The full list of the search terms and the search strategy can be found in Table S1 in the supplementary documents.

We searched the following databases: PubMed, ERIC, CINAHL, and PsychInfo. The search followed PRISMA guidelines [6] and was restricted to adult cancer patients, articles published on or after 2011, and articles published in English.

Inclusion/Exclusion Criteria

Articles were included in this review if they were original research studies focused on adult cancer patients in LMICs, described the implementation of non-pharmacological supportive care interventions, and reported outcomes of the intervention (process, implementation, or clinical). The review included articles focusing on any cancer type and care setting. Table 1 illustrates the inclusion and exclusion criteria that was applied in the screening process of this review.

Table 1
Inclusion and exclusion criteria.

	Inclusion criteria	Exclusion criteria
Population	18 or older adults Low, low-middle, and middle-income countries	Immigrants/displaced persons Upper-Middle and Upper-income countries People under 18
Intervention	Cancer-focused supportive care intervention reporting outcomes	Pharmacological intervention or studies not reporting an intervention
Type of cancer	All cancers	Non-cancer and benign tumors
Continuum of care	Suspicion of cancer, diagnosis, through survivorship	Community awareness, prevention, and screening
Setting	All (urban, rural, camps)	None
Study design	All study designs	Opinion pieces, commentaries, protocols with no published results, dissertations, news articles
Publications - peer-reviewed	English language	Languages other than English

This review was limited to the diagnosis, treatment, and survivorship phases of the cancer care continuum. We excluded prevention and screening since our focus was on cancer patients rather than in

the population at risk.

Articles were excluded from this review if the supportive care intervention was implemented in upper middle-income to high-income countries, was not directly evaluating a supportive care intervention, was not available in English, or if it included children.

Data extraction and assessment of quality

The initial search retrieved a total of 3,823 articles. After removing the duplicate articles, 3,807 articles were selected to be screened for this review. Three members of the research team participated in a two-phase screening process for each selected article.

First, the research team screened the title and abstract of each article against the inclusion and exclusion criteria, which excluded 3,759 articles. Next, the study team reviewed the full text of the remaining sixty-three articles. Twenty-eight additional articles were excluded in phase two of the screening process because they did not specifically evaluate the interventions. The study team assessed each article included in the review for reporting rigor, sample size, and study design. No articles were excluded from the review based on these criteria.

A total of thirty-five articles were included in this review after the completion of the screening process. Figure 1 shows the PRISMA flow diagram illustrating the process. The following information was extracted from each included article: the study author(s), study type, cancer type, supportive care intervention, phase of the cancer care continuum, location of study, and primary and secondary outcomes.

Results

Thirty-five studies met the criteria for inclusion in the scoping review. The majority were randomized clinical trials (RCT) or used a quasi-experimental design. The highest number of studies were implemented in the WHO Eastern-Mediterranean region (n = 23), followed by South-East Asia (n = 6), Africa (n = 4) and Western-Pacific Regions (n = 2). Table 2 shows the characteristics of the included studies.

Table 2
Study characteristics

Year of publication	2011–2021	35
Countries	Vietnam	5.7% (2)
	Indonesia	8.6% (3)
	India	8.6% (3)
	Pakistan	5.7% (2)
	Cote d'Ivoire	2.9% (1)
	Egypt	2.9% (1)
	Ethiopia	2.9% (1)
	Kenya	2.9% (1)
	Nigeria	2.9% (1)
	Iran	57.1% (20)
WHO Region		
	Eastern-Mediterranean	65.7% (23)
	South-East Asia	17.1% (6)
	Africa	11.4% (4)
	Western-Pacific	5.7% (2)
Type of cancer		
	Non-specific	28.6% (10)
	Breast	40% (14)
	Cervical	2.9% (1)
	Breast & Gynecological	2.9% (1)
	Gynecological	2.9% (1)
	Leukemia	5.7% (2)
	Lymphoma	2.9% (1)
	Esophageal	2.9% (1)
	Colorectal	5.7% (2)
	Gastrointestinal	2.9% (1)
	Oral	2.9% (1)

Year of publication	2011–2021	35
Study type		
	RCT	43% (15)
	Quasi experimental, pre and post, control design	20% (7)
	Quasi experimental, pre and post, NO control	17% (6)
	Quasi experimental, post, control design	8.6% (3)
	Other	11.4% (4)
Phase of the continuum of care		
	Diagnosis	0% (0)
	Treatment	85.7% (30)
	Survivorship	8.6% (3)
	Palliative	5.7% (2)

Types of supportive care.

The types of supportive care interventions reported in the studies often included multiple types of services per study. Psychosocial supportive care was offered in 18 (51%) of the articles that were analyzed and was the most common supportive service. Table 3 depicts the characteristics of the supportive care interventions included in this scoping review.

Table 3
 Characteristics of supportive care interventions

Type of supportive care interventions	
Psychosocial support	16 (45.7)
Spiritual intervention	8.6% (3)
Psychosexual intervention	5.7% (2)
Mindfulness-based art therapy	5.7% (2)
Acupressure	2.9% (1)
Interpersonal psychotherapy	2.9% (1)
Hypnotherapy + CBT	2.9% (1)
Counseling, mind diversion	2.9% (1)
Nurse consultation	5.7% (2)
Uncertainty management program	2.9% (1)
Dignity therapy	5.7% (2)
Peer support	5.7% (2)
Health literacy/education	22.9% (8)
Symptom/ pain management	19.4% (7)
Patient navigation	5.7% (2)
Intervention setting	
Hospital	80% (28)
Home	5.7% (2)

Type of supportive care interventions		
	Community	5.7% (2)
	Mobile	8.6% (3)
	Urban	94.3% (33)
	Rural	5.7% (2)
Duration of the intervention		
	Single session	8.6% (3)
	< 1 month	5.7% (2)
	1–3 months	62.9% (22)
	3–6 months	2.9% (1)
	> 6 months	19.4% (7)
Type of session		
	Patient	82.9% (29)
	Patient Group	5.7% (2)
	Caregiver	2.9% (1)
	Patient & Caregiver/family members	8.6% (3)

The psychosocial interventions were diverse. Spiritual [7][8][9] and psychosexual interventions [10][11], mindfulness [12] and mindfulness-based art therapy [13], acupressure [14], interpersonal psychotherapy [15], hypnotherapy [16], cognitive behavioral therapy (Elyasi et al., 2021), mind diversion [17], nurse consultation [18][19], uncertainty management program [20], dignity therapy [21][22], and peer support (Zaki-Nejad et al., 2020)[24], were implemented alone or combined, to improve quality of life (QOL), mental or sexual functions. In most cases, support was delivered by a healthcare provider (nurse or

therapist) or a researcher. Most frequently, the interventions were directed toward the patient (n = 29), or to a group of patients (group counseling; n = 4), and seldom to the family, partner or caregiver (n = 4).

The majority of the psychosocial interventions reported positive effects on the primary outcomes. Two articles implemented in Indonesia and Iran reported that a 6-week psychosexual intervention for cervical and breast cancer survivors can effectively improve sexual function and quality of sexual life [10][11].

Only two articles reported peer support interventions [23][24]. Both articles were RCTs conducted in Iran. One study showed that a peer support program using telephone or social media to connect peer mentors with patients significantly improved the subjective well-being of colorectal cancer patients [23]. The second compared two support groups from two different hospitals, both exclusively for women with breast cancer. The intervention of regular meetings to discuss the effects of each individual's cancer as a group showed a significant improvement in the quality of life of the participants in each group [24].

Two interventions in Kenya and Iran tested the effect of dignity therapy on the QoL of advanced cancer patients [21][22]. Dignity therapy has been studied to improve distress in patients with incurable diseases. While Weru et al. did not see any effect after one session of dignity therapy implemented in Kenya [21], the study conducted in Iran by Zaki-Neja et al. reported improvement in the quality of life of the intervention group after receiving three sessions [22].

Five articles reported interventions to improve education for patients [25][26][27][28][29], one for caregivers [30], and one for both groups [31]. The education topics varied from basic skills to self-care, cancer information and psychoeducation. All studies reported an increase in the patient's QoL after the intervention.

Additionally, a significant number of studies included in our review focused on non-pharmacological interventions to address common side effects of treatment: cancer-related fatigue (CRF), chemotherapy-induced peripheral neuropathy, and nutrition (n = 7). Five groups reported the effect of physical activity - exercise therapy, aerobic exercise, daily walking, muscle strengthening and yoga - in overall QoL and mobility, CRF, and chemotherapy induced peripheral neuropathy [32][33][34][35][36]. All studies reported improvement in the physical function of cancer patients and their QoL.

Malnutrition, a frequent, debilitating, side effect of cancer, was addressed in two interventions. One study implemented nutritional counseling for gastrointestinal cancer patients which reported an increase in QoL, improved physical function and reduced negative symptoms [37]. In a second study, the implementation of a patient-centered foodservice model increased nutritional intake in cancer patients in a hospital in India [38].

Two studies included in the review reported patient navigation interventions [39][40]. Koffi et al. adapted an ambulatory navigation program for malignant lymphoma patients from Toulouse, France, to Abidjan, Cote d'Ivoire. The study showed that navigation significantly reduced treatment refusal and abandonment, but the extent of the effects of navigation were limited by the cost of treatment, a major

reason for delays in clinical management. Odigie's study reported that the use of mobile phones is feasible and acceptable to improve the follow-up care of cancer patients in a hospital in Zaria, Nigeria.

Types of research studies.

Of the 35 studies, 15 were RCTs, with population sizes ranging from 45 to 140 subjects. Sixteen studies used a quasi-experimental design, either with pre- and post-test and control group (n = 7); pre, post-test and a single intervention group (n = 6); or post-test only with a control group (n = 3).

Types of outcomes measured.

Each intervention included in the review measured multiple outcomes. Although the included articles were reviewed for process, implementation and clinical outcomes, most articles reported only clinical outcomes, with only two studies evaluating process and implementation outcomes [40][39].

Table 4 describes the primary outcomes and the results. The most common outcome measured was quality of life (QoL), followed by anxiety, overall physical and psychological health, depression and stress, and coping capacity. Other, less frequently assessed outcomes were sexual function and well-being, social relationships, spiritual well-being, increased appetite, increased nutritional intake and weight gain, family involvement, self-esteem, cancer-related fatigue, cancer-induced neuropathy, mobility, and treatment abandonment.

Table 4
Description of primary outcomes and results

Author, Country	Intervention	Primary outcome	Results
Afiyanti, Y. [10] Indonesia	Nurse-led psychosexual intervention	Sexual function & wellbeing	Intervention led to positive outcomes including improved sexual function, sexual and personal relationships, self-esteem, and well-being.
Bahrami, M. [18] Iran	Nursing consultation groups with cancer survivors	QoL	Nursing consultation with the presence of cancer survivors did not enhance patients' QoL.
Bayati, M. [27] Iran	Integrated training for cancer patients	Patients' QoL	Integrated training resulted in improved symptoms and enhanced QoL in cancer patients.
Beikmoradi, A. [14] Iran	Acupressure	Anxiety	Acupressure had a statistically significant reduction in anxiety in the experimental group at 5 and 10 days after the intervention. It did not have a significant impact on their covert anxiety.
Belay, W. [15] Ethiopia	Interpersonal Psychotherapy	Anxiety, depression and QoL	Patients in the intervention group showed a significant improvement in anxiety, depression, physical functioning, health-related QoL, insomnia, and fatigue compared to the control group.
Dhawan, S. [34] India	Muscle strengthening and balancing exercises	Chemotherapy-induced peripheral neuropathy pain scores and QoL	Muscle strengthening and balancing exercises are effective in reducing chemotherapy-induced peripheral neuropathy pain and improving QoL among cancer patients.
Ebrahimabadi, M. [19] Iran	Tele-nursing supportive care	Supportive care needs (SCNs)	After the intervention, the mean score of dimensions and total SCNs in the intervention group were significantly less than the control group.
Elyasi, F. [16] Iran	Hypnotherapy and cognitive-behavioral therapy (CBT)	Stress, depression, QoL	Stress, depression, and some domains of QoL, such as physical functioning, body image, sexual functioning, arm symptoms, breast symptoms, future perspective, pain, digestive problems, and functional scale significantly changed in CBT and hypnosis groups. There was no impact on memory and social functioning.
Fatehi, S. [11] Iran	Psychosexual counseling	Sexual function and quality of sexual life	Sexual function scores and sexual quality of life showed significant statistical improvement after the intervention. Sexual satisfaction showed improvement in some subclasses only.

Author, Country	Intervention	Primary outcome	Results
Ghanbari, E. [29] Iran	Mobile app-based psychoeducation and support	Anxiety and self-esteem	The mobile app-based intervention was successful in decreasing anxiety and improving the self-esteem of women with breast cancer.
Gheyasi, F. [33] Iran	Daily walking	Cancer-related fatigue (CRF)	The intervention showed a statistically significant reduction of CRF on the fifth day and tenth day of the intervention.
Ha, XTN. [20] Vietnam	Uncertainty Management Program (UMP)	QoL, physical wellbeing, psychological well-being, body image concerns, and social concerns	The experimental group exhibited low uncertainty before discharge and significantly higher QoL than the control group at 1- and 3-weeks post-mastectomy.
Jafari, N. [7] Iran	Spiritual Therapy	QoL	There was a statistically significant difference in all functional scales of QLQ-C30 after the spiritual therapy intervention.
Jalambadani, Z.[13] Iran	Mindfulness-based art therapy (MBAT)	QoL, physical health, psychological, social relationships.	The MBAT interventions had a statistically significant effect on improving quality of life behaviors.
Koffi, K.G. [39] Ivory Coast	Navigation	Treatment refusal and abandonment	The study showed that patient navigation may reduce refusal and abandonment of treatment.
Kristanti, M.S. [30] Indonesia	Basic Skills Training for caregivers	Patient's QoL	The intervention showed a significant improvement in patients' global health status/QoL, emotional and social functioning, pain, fatigue, dyspnea, insomnia, appetite loss, constipation, and financial hardship of the patients.
Moghaddam Tabrizi, F. [41] Iran	Family-intervention program	Family involvement, optimism, cancer coping, uncertainty reduction, and symptom management	Significant improvement in total cancer coping scores, and in all subscales including individual, positive focus, coping, diversion, planning, and in interpersonal in the intervention group. No significant changes were observed for the control group.

Author, Country	Intervention	Primary outcome	Results
Mohammed, Salwa A. [36] Egypt	Exercise therapy	Mobility and QoL	There was a highly significant difference in patients' level pain intensity, shoulder movement, and functional status of the study group as compared to the control group.
NasiriZiba, F. [31] Iran	Family-centered education	QoL	There was a significant difference between QoL score and spiritual-psychological aspect of scores before and after the intervention in the family-centered group.
Nasution, LA. [8] Indonesia	Spiritual Intervention	Coping and spiritual well-being	There was a statistically significant difference in the average score of coping and spiritual well-being after spiritual intervention between intervention and control groups.
Nguyen, L.T. [37] Vietnam	Nutritional counseling	QoL, physical function and reduction of negative symptoms	Nutritional therapy with high protein was beneficial to the improvement in QoL, physical function, and the reduction of negative symptoms among gastrointestinal cancer patients.
Odigie, V.I. [40] Nigeria	Patient follow-up via mobile phone	Mobile phone for follow-up	86.2% of the patients found the use of mobile phones as convenient/excellent/cheap. They perceived it most valuable (1) to obtain information, (2) to arrange an appointment, and (3) as a 'morale booster.
Pattnaik, S.J. [35] India	Yoga	Stress, coping	Yoga effectively reduced stress and enhanced the coping ability in individuals diagnosed with oral cancer.
Pool, M.K. [28] Iran	Self-care education program	QoL	The intervention group showed a significant improvement in their QoL whereas no improvement was reported in the control group.
Pouy, S. [12] Iran	Mindfulness-based group training	QoL, depression, anxiety, and stress.	After the intervention, the patients in the experimental group reported higher QoL and life expectancy and less severe depression, anxiety, and stress.
Rahimi, M. [23] Iran	Peer Support	Well-being	The intervention improved the subjective well-being of patients with colorectal cancer.

Author, Country	Intervention	Primary outcome	Results
Sajjad, S. [25] Pakistan	Verbal and written patient education, availability of a nurse	QoL	The intervention was effective in improving patients' QoL.
Sankhe, A. [42] India	Spiritual therapy	Spiritual and overall well-being	There was a statistically significant increase in the scores at all the follow-up periods in both the patient and their relative groups.
Sathiaraj, E. [38] India	Patient-centered foodservice	Weight gain and increase in energy and protein intake	A patient-centered foodservice model increases the nutritional intake in oncology patients and improves overall patient satisfaction.
Shahsavari, H. [26] Iran	Nurse-led self-care education program	QoL	Self-care education enhances physical, social, psychological, and spiritual dimensions of QoL of the patients with breast cancer.
Shams, S. [17] Pakistan	Education/counseling, mind diversion	Satisfaction and (improvement) of self-care	Participants reported moderate-to-high self-care behaviors and satisfaction after exposure to supportive care interventions delivered via the patient help group program.
Shobeiri, F. [32] Iran	Aerobic exercise	QoL	Exercise improved all parameters of global QoL in women with breast cancer.
Taleghani, F. [24] Iran	Peer support	QoL	The intervention improved the overall QoL of cancer patients but had different effects in the dimensions of QoL.
Weru, J. [21] Kenya	Dignity therapy	QoL, anxiety, appetite, wellbeing	Dignity therapy showed no statistical effect in overall quality of life.
Zaki-Nejad, M. [22] Iran	Dignity therapy	QoL	Dignity-therapy led to more improvement in the QoL of the intervention group. There was also a significant difference between the two groups in physical functioning, emotional functioning, improvement in nausea and vomiting, insomnia, appetite, and constipation.

Types of cancer.

Our scoping review was not limited to a cancer type. The search results revealed that a significant number of interventions were not directed to a specific type of cancer (n = 10). However, we also noticed that a large number were centered around breast cancer (n = 14).

Discussion

Since the World Cancer Declaration, launched in 2006, called upon government leaders and policymakers around the world to significantly reduce the global cancer burden, promote greater equity in the access to cancer services, and integrate cancer control into the global health and development agenda, significant progress has been made in cancer control globally. Dedicated efforts to develop quality, comprehensive, cancer care currently exist in many LMICs, although they tend to focus on clinical services. Less attention is directed to the development of supportive care services and measuring the impact and value such services might provide for cancer patients and their families in these settings. This scoping review presents supportive care interventions for cancer patients that are being implemented across the cancer care continuum in LMICs and their reported outcomes.

Evidence-based guidelines for supportive care for cancer patients exist, although they are applicable mostly to HIC. Even in these settings, gaps and barriers still exist in the implementation of such programs, in particular in the integration of clinical and supportive care [4].

For LMICs, the Breast Health Global Initiative (BHGI) has published consensus statements focused on supportive and palliative care for patients with breast cancer that are resource-stratified [43]. The recommendations cover physical symptom management, pain control, some psychosocial and spiritual aspects of care and education. However, their focus on clinically related topics does not take into consideration other important health-related issues such as nutrition, safe living conditions, practical needs (childcare, financial constraints), employment or women's rights that take place outside of the healthcare system.

Of the studies included in this review a large number focused on women's cancers and implemented interventions for psychosocial support - including peer support, symptom management, health literacy/education, and patient navigation. During the search process, we found a significant number of articles which described supportive care needs in LMICs. However, there were few actual interventions published.

Notably, peer support interventions, where support is offered to people with cancer by those who have themselves experienced cancer, were rare. Only two peer support programs from Iran were included in the scoping review, despite peer support programs being increasingly recognized as an important component of supportive care for cancer patients.

Additionally, we did not find any interventions aimed at improving social problems or practical needs directly derived from a cancer diagnosis, such as financial toxicity, employment, disability, or stigma of the disease, all of which are highly prevalent in less-resourced settings. This could be related to the fact

that 80% of the interventions included in the review are being implemented at the tertiary care level, and only a few at the community level. This was also noted by Edney et al. who identified a research gap for practical needs [4].

The interventions were described with different degrees of detail about process and implementation in the majority of the thirty-five articles. However, only two studies reported process or implementation outcomes. As health systems become more patient-centered, it may be valuable to use hybrid designs that include a process evaluation and measure implementation outcomes, in addition to the clinical efficacy of the intervention. Implementation science frameworks applied to the design of the interventions would lead to a better understanding of the factors that influence implementation which in turn could define the adaptations that are needed to effectively deliver the intervention in a specific context. The lessons learned from the implementation of these interventions could provide valuable guidance to adapt these established programs into new contexts.

To our knowledge, this is the first scoping review focused on a wide range of cancer supportive care interventions in LMICs. We found similar reviews in the literature that focused specifically on one type of supportive care: support groups [44], and navigation [45], which were extensively reviewed by Edney et al. [4]. However, most included a mix of studies conducted both in high-, middle- and low-income countries; included community awareness and education, and screening interventions; and did not require studies to report outcomes.

The study findings should be interpreted considering several limitations. First, most articles reported positive effects on the primary outcome measured, which could be the result of a publication bias since interventions that fail are less likely to be reported in the literature. Almost all the interventions were randomized trials or quasi-experimental studies implemented in a hospital setting, which could potentially be an additional source of bias since community programs are more difficult to publish in peer reviewed journals or are not able to report (clinical) outcomes data. Additionally, there are undoubtedly more supportive care interventions being employed in LMIC settings, however, due to resource challenges in the areas of manpower and funding, these interventions may not have any research attached to them or their results have not been published.

We only included articles in English published in peer reviewed journals and as such we likely omitted publications about interventions reported in different languages. There was an over representation of articles from Iran, with 20 of the included interventions coming from different hospitals in this country. After a thorough review of the full articles, we did not find a reason to exclude the articles and they are therefore included in the review.

Conclusion

Ensuring that patients and caregivers receive the support they need as they navigate the cancer care pathway and feel supported throughout is crucial to improve cancer outcomes in LMICs. Although only a small number of interventions are being implemented in these settings, the results from this scoping

review suggest that providing different types of supportive services in less-resourced settings, even when health systems are fragmented and fragile, is possible and can improve mental, physical health, and QoL of cancer patients.

Declarations

Authors' contributions: AC and CT developed the concept and design. AC, CM and CT worked in acquisition of data and reviewed the included articles. All authors made substantial analysis and interpretation of data; drafted and revised the article for important intellectual content; and have seen and approved the final version of the manuscript.

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Availability of data and material (data transparency): Search terms can be found in TS1.

Code availability (software application or custom code): Table S1 presents the search terms used.

Ethics approval: Not applicable (not a clinical trial).

Authors' contributions: AC and CT developed the concept and design. AC, CM and CT worked in acquisition of data and reviewed the included articles. All authors made substantial analysis and interpretation of data; drafted and revised the article for important intellectual content; and have seen and approved the final version of the manuscript.

Consent to participate (include appropriate statements): Not applicable (not a clinical trial).

Consent for publication (include appropriate statements): All the coauthors approve the manuscript.

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Figures

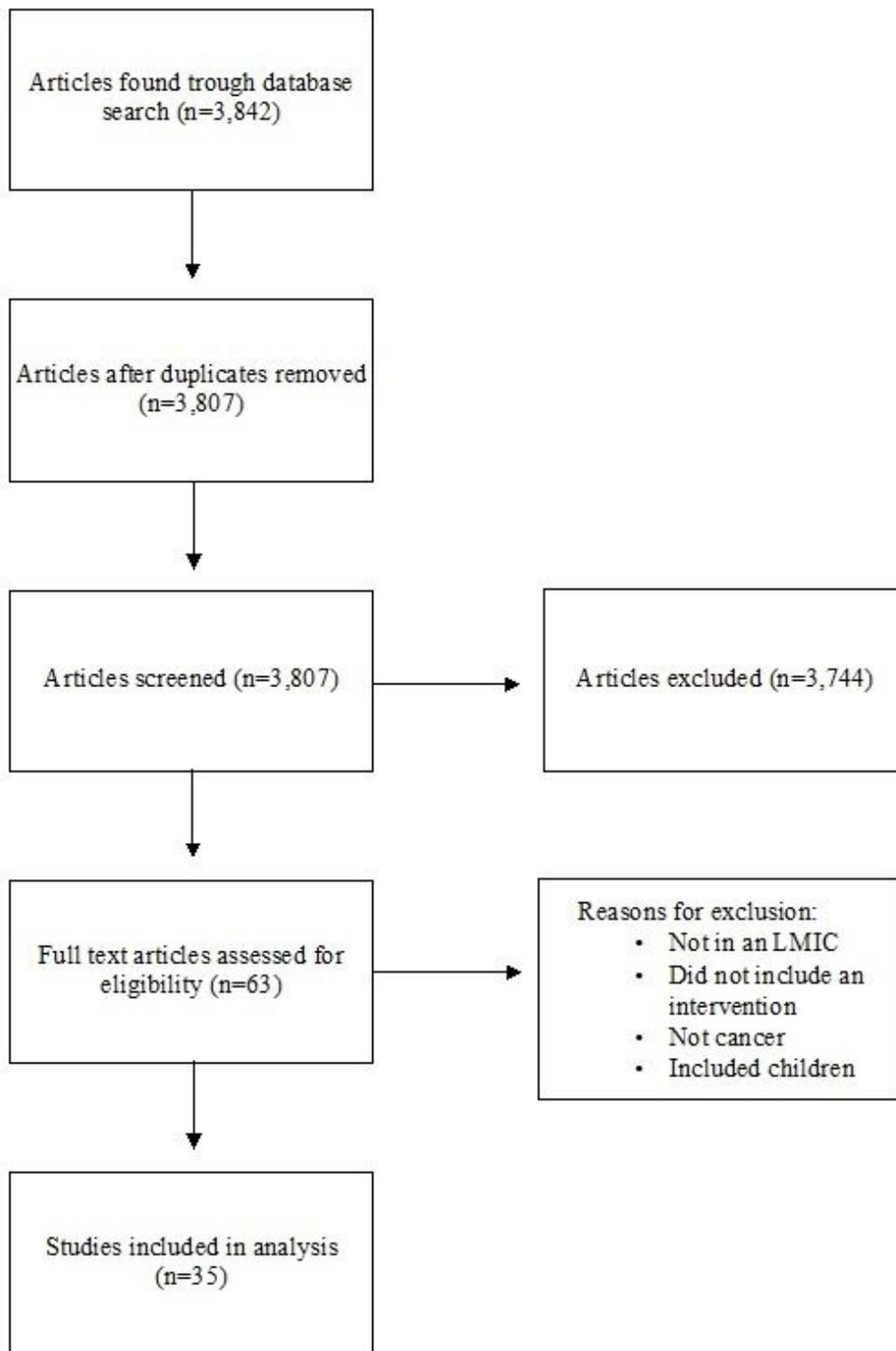


Figure 1

PRISMA diagram

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