

SYSTEMATIC REVIEW

Knowledge, Attitudes, and Practices in Pain Management Among Older Adults Living with Cancer: A Systematic Review

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ABSTRACT

Introduction: Cancer has become one of the leading global causes of death, with both its incidence and mortality rates expected to rise significantly by 2030. Notably, over 60% of cancer patients are aged 50 years or older. Despite advancements in medical technology, cancer pain management remains insufficient, largely due to gaps in knowledge and pervasive negative attitudes toward pain management among healthcare providers, patients, and caregivers. Existing research has primarily focused on healthcare professionals, while systematic studies investigating the knowledge, attitudes, and practices (KAP) of elderly cancer patients regarding pain management remain limited. Addressing these factors is essential for overcoming barriers to effective pain management, enhancing self-management skills, and ultimately improving the quality of life for this population. **Methods:** This systematic review followed the PRISMA guidelines and involved a comprehensive literature search across databases including PubMed, Medline, Google Scholar, ScienceDirect, CINAHL, and PsycINFO, using relevant keywords. **Results:** Twenty-two studies met the inclusion criteria and were assessed across three dimensions: knowledge, attitudes, and practices regarding cancer pain management in older adults. **Conclusions:** The findings reveal that knowledge gaps and negative attitudes significantly hinder effective pain management practices among older adults with cancer. Future efforts should prioritize patient education through systematic and accessible approaches to address these attitudes, while promoting the development of individualized pain management plans that incorporate cultural and belief considerations to optimize outcomes. **Registration:** PROSPERO International prospective register of systematic reviews, ID: CRD42024595514

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INTRODUCTION

Cancer has emerged as a major global public health challenge, exacerbated by the aging populations in numerous countries, resulting in a significant increase in newly diagnosed cancer cases worldwide(1). Projections suggest that by 2030, the global cancer burden will reach approximately 21.4 million new cases annually (2), with most of this increase occurring in low- and middle-income countries(2-4). Presently, around 60% of cancer diagnoses occur in individuals

aged 50 years or older (5). Cancer-related pain is widespread and severe within this patient population, particularly among those undergoing active treatment (6). Pain not only impairs physical function but also induces substantial psychological distress, significantly impacting the quality of life of both patients and their caregivers (7-10).

The incidence of cancer-related pain remains notably high worldwide, with studies indicating that more than half of cancer patients experience pain during treatment, and up to 70% of those with advanced cancer suffer from moderate to severe pain (11). Despite notable advances in medical care, including the widespread implementation of the World Health Organization (WHO) analgesic ladder and the common use of

opioid analgesics as primary treatment (12), cancer pain management continues to be inadequate for many patients. Factors such as cross-cultural differences, knowledge gaps, and inefficiencies in healthcare systems often result in insufficient pain assessment and treatment for older adults with cancer(13-22).

Pain management for elderly cancer patients globally faces numerous challenges. Cultural differences, inequitable distribution of medical resources, and inconsistent pain management standards contribute to suboptimal outcomes(13-22). While there is considerable research on healthcare providers' knowledge and attitudes toward cancer pain management, there is a lack of systematic investigations focusing on the knowledge, attitudes, and practices (KAP) of elderly cancer patients in diverse cultural contexts. Understanding how elderly cancer patients perceive and manage pain across different cultural settings is essential for developing effective interventions.

This systematic review aims to examine the knowledge, attitudes, and practices related to pain management among elderly cancer patients in a multi-country context. By synthesizing existing research across various countries and regions, this review seeks to identify cross-cultural barriers, cultural influences, and practical challenges in pain management. The insights gained will help develop culturally sensitive interventions, improve pain management outcomes, foster better communication between patients and healthcare providers, and ultimately enhance the global quality of life for elderly cancer patients.

METHODOLOGY

Study Design

This study was conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The study followed five major steps: identifying a clear research question, conducting a systematic search of electronic databases for relevant studies, defining criteria for article inclusion and selection, extracting data, and analyzing and reporting the findings. The primary research question guiding this review was: "What are the pain management knowledge, attitudes, and practices of older adults living with cancer?"

Search Strategy

We systematically conducted a literature search across six databases: PubMed, Medline, Google Scholar, ScienceDirect, CINAHL, and PsycINFO. Additionally, manual searches of relevant journals and related

materials were performed. The search terms included combinations of 'cancer pain management' with 'knowledge,' 'attitudes,' or 'practices,' and were focused on elderly cancer patients. The search strategy was limited to publications from 2000 to 2024. The selection of the period from 2000 to 2024 for the literature search is grounded in several important considerations. Firstly, this period marks a significant phase in the evolution of cancer pain management, during which the World Health Organization (WHO) updated its guidelines and extensively promoted the three-step analgesic ladder, thereby establishing the contemporary framework for managing cancer-related pain. Secondly, the assessment tools utilized in this review, such as the Brief Pain Inventory (BPI) and the Pain Management Index (PMI), underwent further development and became widely implemented, thereby enhancing the comparability across studies. Lastly, research published post-2000 generally adhered to more rigorous study designs and statistical methodologies, thereby improving the robustness and validity of the evidence. Furthermore, reference lists of the identified studies were also scrutinized for potential eligible studies.

Eligibility Criteria

The study population consists of elderly patients aged 50 years and older who have experienced cancer-related pain. For studies that included participants from multiple age groups but provided age-stratified data, we extracted and analyzed data exclusively from participants aged 50 years and older, or we included studies in which the median or mean age of participants was ≥ 50 years. Eligible studies must specifically examine pain management knowledge, attitudes, and practices within this population, encompassing, but not limited to, patients' perceptions of pain management, the use of pain management strategies, and adherence to pain treatment. Studies were excluded if they involved non-cancer patients, lacked specification of patient age and cancer-related pain, did not address pain management knowledge, attitudes, and practices, or focused exclusively on other health issues (e.g., depression, anxiety) without considering pain management. We also excluded studies with unavailable full texts, those with unclear or inappropriate methodologies, commentaries, editorials, and studies published in languages other than English.

Screening and Selection of Studies

All titles and abstracts of articles were screened to assess their relevance to the research questions. Next, the selected articles underwent a more detailed review to confirm their inclusion. The study selection process is presented in a PRISMA flow diagram (Figure 1).

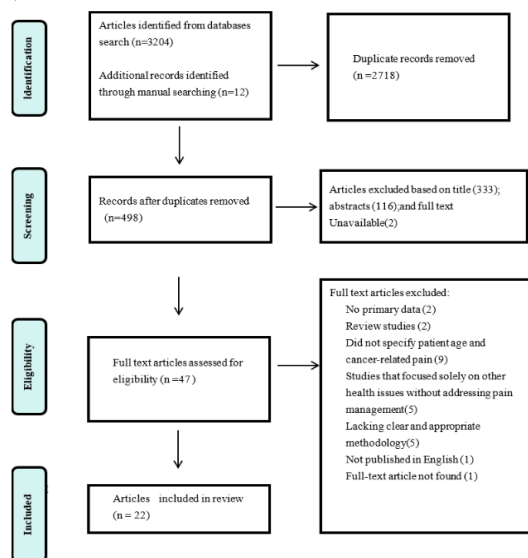


Figure 1: PRISMA flow chart showing studies screening and selection process

Appraisal for Quality and Risk Bias

Two independent researchers assessed the quality of all included studies used the revised Newcastle-Ottawa Scale (NOS) to assess risk of bias. Originally designed for case-control and cohort studies, the revised scale is also widely applied to evaluate cross-sectional studies. We adopted the modification proposed by Wells et al. (2013)(23), which focuses on key evaluation criteria for cross-sectional studies, including sample representativeness, sample size adequacy, and statistical method appropriateness. Disagreements were resolved by consensus, and the results are presented in Table I.

Data Extraction and Analysis

Two independent reviewers extracted data from the studies that met the inclusion criteria. In cases of conflicting opinions, the research team reached a consensus. The variables extracted from the included studies encompassed the following domains: study authors, year of publication, country, title, research

Table I. Results of the quality and risk bias of the included studies

Study (first author)	Study design	Selection				Comparability		Outcome	
		Representativeness of the sample	Sample size	Non-respondents	Ascertainment of exposure	Based on design and analysis	Assessment of outcome	Statistical	
Ali et al. (2024) [24]	Cross sectional	*	*	*	**		*	*	
Atiyyat et al. (2018) [25]	Cross sectional	*	*		**	*	*	*	
Akiyama et al. (2012) [26]	Cross sectional	*	*	*	**	**	*	*	
Bennett et al. (2009) [27]	Cross sectional	*	*		**		*	*	
Baker et al. (2014) [28]	Cross sectional	*	*	*	**	*	*	*	
Bağcıvan et al. (2009) [29]	Cross sectional	*	*		**		*	*	
Czerw et al. (2021) [30]	Cross sectional	*	*	*	**		*	*	
Closs et al. (2009) [31]	Cross sectional	*	*		**		*	*	
Cohen et al. (2005) [32]	Cross sectional	*			*		*		
Eleiwah et al. (2024) [33]	Cross sectional	*	*	*	**		*	*	
Kong et al. (2022) [34]	Cross sectional	*	*		**	*	*	*	
Kim et al. (2015) [15]	Cross sectional	*	*	*	**	**	*	*	
Kwekkeboom et al. (2021) [35]	Cross sectional	*	*	*	**	*	*	*	
Lin et al. (2000) [36]	Cross sectional	*	*		**		*	*	
Lou and Shang (2017) [37]	Cross sectional	*	*	*	**	*	*	*	
Ma et al. (2020) [38]	Cross sectional	*	*		**	*	*	*	
Mercadante et al. (2021) [39]	Cross sectional	*	*		**		*	*	
McDarby et al. (2017) [40]	Cross sectional	*			*		*	*	
Polański et al. (2024) [41]	Cross sectional	*	*	*	**	*	*	*	
Saifan et al. (2015) [42]	Cross sectional	*	*	*	**		*	*	
Zeng et al. (2020) [43]	Cross sectional	*	*		**	*	*	*	
Zhao et al. (2023) [44]	Cross sectional	*	*		**	*	*	*	

Note:

Selection (Up to 5 stars): Representativeness of the sample (1 star), Sample Size (1 star), Non-respondents (1 star), Ascertainment of exposure (2 stars)

Comparability (Up to 2 stars): Based on design and analysis

Outcome (Up to 3 stars): Assessment of outcome (2 stars), Statistical (1 star)

design, study aim, participants, measurement instruments, type of cancer, and key findings (Table II). We conducted a descriptive analysis of the generated

data and summarized the findings into domains using relevant themes, such as knowledge, attitudes, and practices.

Table II Characteristics of included studies

Author(s) year/ country of publica- tion	Study design	Participants (total number, Median age,	Measurement/Instru- ment	Type of cancer	Key finding	Domains
Ali et al., (2024) ^[24] , Oman	A cross-sectional survey-based study A quantitative approach.	Total :n=68 Gender :(Male=21,Female=47) Age ≥60=4 Inclusion criteria :They were Omani, 18 years or older, aware of their cancer diagnosis, had experienced cancer-related pain, were or currently taking oral analgesics, and could read and write. Exclusion criteria :Cancer patients who were admitted to the intensive care unit (ICU) or those on pain management after a surgical procedure	Demographic and Disease-Related Information Questionnaires; Barriers Questionnaire II-12 (BQII-12) (12 Items); Patient Pain Questionnaire (PPQ) (16 Items)	Breast cancer;Oral, nasopharyngeal,esophageal,-gastrointestinal cancers;Kidney,ureter,bladder, ovarian cervical and uterine cancers ;Lung cancer;Liver, pancreatic, and lymphoma, Other	The mean score on the Barriers Questionnaire (BQ) was 2.52 (SD 0.84), reflecting a moderate level of perceived barriers to pain management. The data revealed significant concerns, with older patients showing reluctance to use analgesics due to fears of symptom masking, and female patients expressing heightened worries about developing drug tolerance.	Attitudes
Atiyyat et al., (2018) ^[25] , Jordan	A cross-sectional study A quantitative approach	Total :n=150 Gender :(Male=92, Female=58) Age : a range from 19.0 to 74.5 years. Inclusion criteria : a) age 18 years and older, b) ability to read and write Arabic, c) receiving treatment at the regional comprehensive cancer center in Jordan, and d) had experienced cancer-related pain in the past week.	The Barriers Questionnaire-II (BQ-II) The Brief Pain Inventory (BPI)	Not mentioned	The mean (SD) BQ-II total score was 2.3 (0.8) on a scale of 0–5, where higher scores denote greater perceived barriers. Notably, older patients exhibited significantly higher scores, particularly in concerns regarding harmful effects and communication barriers.	Attitude
Akiyama et al., (2012) ^[26] , Japan	A cross-sectional study A quantitative approach	Total :n=833 Gender :(Male=473, Female=360) Age :67.0±11.0 Inclusion criteria : (1) adult cancer patients with a primary tumor site in the lung, esophagus, stomach, colon, rectum, pancreas, liver, biliary system, kidney, prostate, bladder, breast, ovary, or uterus; (2) presence of metastatic or recurrent cancer; (3) outpatient visits to the hospital between April and June 2008; and (4) disclosure of malignancy Exclusion criteria : (1) incapacity of the patient to complete the questionnaire (dementia, cognitive failure, or psychiatric illness), (2) severe emotional distress of the patient as determined by the principal treating physician, (3) poor physical condition unable to complete the questionnaire, and (4) language difficulty or visual loss.	Data were collected on: (1) knowledge about opioids, beliefs about palliative care, and concerns about homecare; (2) sense of security; (3) pain intensity; and (4) patient perceived quality of palliative care. The questionnaire (available from the authors) was constructed based on an extensive literature review, expert consensus among the authors, and a previous study	Not mentioned	Knowledge about opioids was assessed using two questions: “Opioids can relieve most pain caused by cancer” and “Opioids are addictive and/or shorten life.” It was found that 28% of older patients believed opioids are addictive and/or shorten life. Furthermore, patients who agreed that “opioids can relieve most pain caused by cancer” reported significantly higher levels of security regarding their pain management.	Knowledge attitude
Bennett et al., (2009) ^[27] , UK	a descriptive observational study A quantitative approach.	Total :90 Older people (n=58);Younger people (n=32) Gender :Older people (Male=38,Female=20);Younger people (Male=15,Female=1) Age :Older people (81±4.25);Younger people (52±6.8) Inclusion criteria : cancer patients experiencing moderate to severe pain who reside at home and have recently been referred to specialist palliative care services in Leeds	Brief Pain Inventory [BPI]; Hospital Anxiety and Depression Scale [HADS]; Self complete Leeds Assessment of Neuropathic Symptoms and Signs [S-LANSS]) information on self-rated health state (Euro Qol thermometer) barriers to pain reporting and use of analgesics (Barriers Questionnaire [BQ])	Lung;Prostate;Upper gastrointestinal;Colorectal;Breast; Genitourinary	Over 27% of the Older people reported deliberately missing scheduled doses(P) , citing reasons such as concerns about side effects, forgetfulness, or perceiving their pain as manageable without analgesics(A).	Practices Attitude

CONTINUE

Table II Characteristics of included studies (cont.)

Author(s) year/ country of publication	Study design	Participants (total number, Median age,	Measurement/Instrument	Type of cancer	Key finding	Domains
Baker et al., (2014) ^[28] , USA	A prospective cross-sectional study A quantitative approach.	Total :n=150 Gender :((Male=64,Female=86) Inclusion criteria :The study included patients aged 55 years or older who self-identified as Black/African American or White/Caucasian, reported a cancer pain severity score of 4 or higher on the Brief Pain Inventory (BPI), and were capable of providing informed consent.	Patient Pain Questionnaire (PPQ); Brief Pain Inventory (BPI); American Pain Society's Patient Outcome Questionnaire (APS-POQ); Chronic Pain Self-Efficacy Scale; Seven-item trust summary scale of the Primary Care Assessment Survey (PCAS);	Breast;hematological;lung;and other	Knowledge deficits, misconceptions about pain self-management , and challenges in implementing pain management strategies undermine the effectiveness of both pharmacological and non-pharmacological interventions in cancer patients.	Knowledge Attitude
Bağcıvan et al., (2009) ^[29] , Turkey	A cross-sectional study A quantitative approach	Total :n=170 Gender :(Male=63, Female=107) Age :52.87±15.03 Inclusion criteria : 1) diagnosis of cancer; 2) age 18 years or older; 3) ability to read and write Turkish; 4) willingness to participate; 5) mentally able to communicate; and 6) having been, or still using an analgesic for cancer-related pain	Demographic and Medical Characteristics Barriers Questionnaire (BQ-II) Pain Management Index(PMI)	breast cancer; gastrointestinal system-related cancer types;lung cancer.	It was found that older patients have beliefs that may be barriers to optimal pain management, mostly in relation to addiction , and to a small extent, physical side effects. It was ascertained that male, unmarried patients, patients with cancer who also have another chronic disease, patients whose "average pain" intensity is more than 5 for the past 24 hours, and patients who use an inadequate analgesic have more beliefs that may be barriers to optimal pain management.	Attitude Practice
Czerw et al., (2021) ^[30] , Poland	A cross-sectional study A quantitative approach	Total :n=481 Gender :(Female=481) Age :56.66±12.87 Inclusion criteria : Patients who at least one month earlier had ended active oncological treatment and remained under outpatient control at the Oncology Center-Maria Skłodowska Curie Institute in Warsaw	The Beliefs about Pain Control Questionnaire (BPC-Q);The Pain Coping-Strategies Questionnaire (CSQ);Approval Illness Scale (AIS);-Mental Adjustment to Cancer(Mini-MAC);	ovarian cancer,endometrial cancer and breast cancer	In the CSQ test, the highest scores were observed for the coping strategy of praying/hoping, with significant variation across cancer location and socio-economic variables. The mean acceptance score on the AIS was M = 27.48 (SD = 7.68). On the Mini-Mac scale, patients demonstrated the highest scores in the domain of fighting spirit (M = 22.94, SD = 3.62).	Practice
Closs et al., (2009) ^[31] , UK	a descriptive observational study A quantitative approach.	Total :90 Older people (n=58);Younger people (n=32) Gender :Older people (Male=38,Female=20);Younger people (Male=15,Female=1) Age : Older people (81±4.25);Younger people (52±6.8) Inclusion criteria :cancer patients with at least moderate intensity pain ; living at home that were newly referred to specialist palliative care services in Leeds.	Barriers Questionnaire (BQ);Brief Pain Inventory (BPI);Hospital Anxiety and Depression scale(HAD);self rated health state, using the EuroQol 'thermometer'	Lung;Prostate;Upper gastrointestinal;Colorectal;Breast; Genitourinary	Both groups identified beliefs about analgesic use as the primary barrier to effective pain management. However, older patients reported that concerns about analgesic use and challenges in communicating with medical staff were significantly more critical barriers compared to younger patients . Overall, factors such as communication with medical staff and fatalistic attitudes were considered less significant than medication-related barriers	Attitude
Cohen et al., (2005) ^[32] , USA	Descriptive cross-sectional methods A quantitative approach.	Total :39 Israelis Gender :(Male=19,Female=20) Inclusion criteria :(1) were 65 years and older, (2) were identified by the head nurses working in the departments as experiencing a degree of self-reported cancer related pain, and (3) spoke Hebrew.	Brief Pain Inventory (BPI); Patient Pain Questionnaire Knowledge Subscale (PPQK); Patient Medical History Questionnaire (PMHQ) Part 1 (Patient Section) and Part 2 (Health Professional Section); Demographic Data Questionnaire (DDQ).	Lung;Breast;Prostate; Colon and other	A significant portion of the sample (56.7%) reported experiencing severe worst pain, with a similarly high percentage (56.4%) exhibiting negative pain management outcomes. Additionally, over half of the participants (54.55%) demonstrated inadequate knowledge and attitudes toward pain and its management .	Knowledge Attitude

CONTINUE

Table II Characteristics of included studies (cont.)

Author(s) year/ country of publica- tion	Study design	Participants (total number, Median age,	Measurement/Instru- ment	Type of cancer	Key finding	Domains
Eleiwah et al., (2024) ^[33] , Jordan	A cross-sectional study A quantitative approach	Total :n=200 (Cancer patients=100) Gender :(Male=93, Female=107) Age :(50.9±13.4) Inclusion criteria : (1) they had to be at least 18 years old, (2) able to read, write, and comprehend Arabic, (3) and have had the disease for at least one month before the data collection period. Exclusion criteria : (1) treatment for COVID-19 (2) had a chronic Condition in addition to cancer, (3) were unconscious, (4) or were in the maternity hospital were excluded from the study	The socio-demographic characteristics Questionnaire; The Barriers Questionnaire II (Arabic version)	Leukemia; Breast cancer; Pancreatic cancer; Liver cancer; Colon cancer; Rectal cancer; Lung cancer; and other	The overall mean score related to the ABQ-II was (M = 2.89, SD = 0.55). Among patients with cancer, the harmful effects of medications (M = 3.45, SD = 0.78) had the highest mean scores or highest perceived barrier—as the most significant barriers to effective pain management, while fatalism had the lowest mean scores among (M = 2.12, SD = 0.79), with an overall mean score for the ABQ-II was (M = 2.87, SD = 0.52).	Attitude
Kong et al., (2022) ^[34] , China	A cross-sectional study A quantitative approach	Total :n=81 Gender :(Male=50, Female=31) Age :59.48±12.70 Inclusion criteria : (1) aged > 18 years; (2) with a cancer diagnosis; (3) with an overall pain score of 2 or higher on the Brief Pain Inventory (BPI); and (4) hospitalized patients in the oncology units. Exclusion criteria : Patients with cognitive impairment whose scores were <24 on the Mini-Mental State Examination (MMSE) assessment were excluded.	BPI; The Pain Management Inventory (PMI); The Pain Self-Efficacy Questionnaire (PSEQ); A demographic and clinical form to collect participants' demographic data	Liver cancer; lung cancer; colon cancer; gastric cancer; breast cancer; ovarian cancer; rectal Cancer; lymph cancer; and other cancers	The most commonly used methods of pain management included adjusting activity intensity to avoid fatigue, using distraction techniques, and massaging the sore area. The most effective methods to manage pain included taking analgesics prescribed by doctor, taking over-the-counter analgesics, and massaging the sore area	Practice
Kim et al., (2015) ^[15] , Korea	A cross-sectional survey-based study A quantitative approach.	Total :n=1190; Gender :(Male=385, Female=805) Age :(53±17) Inclusion criteria : Patients aged ≥18 years with a documented history of cancer pain in the preceding month were randomly contacted through patients' associations, doctor referrals, hospital intercepts, online panels, patient referrals, door-to-door recruitment, or phone book recruitment Exclusion criteria : Patients who were employees or related to employees of any health-care, pharmaceutical, advertising or market research companies, or those involved in any other pain management studies	The questionnaires for the physician and patient surveys were developed by a steering committee of 16 pain management specialists, representing most of the participating countries. The questions for patients were focused on demographic data, screening for pain and pain assessment, perceived doctors' attitudes toward pain, effect of pain on QoL and activities of daily living (including employment), and treatment of pain.	Not mentioned	The primary barriers identified were patients' fear of addiction (67.2%) and adverse events (65.0%), reluctance to report pain (52.5%)(P) , excessive regulations (48.0%), and hesitance to prescribe opioids (42.8%) . Additionally, opioid use was confirmed in only 53.2% (286/538) of patients who recalled their medication.	Attitude Practice
Kwekkeboom et al., (2021) ^[35] , USA	A cross-sectional study A quantitative approach	Total :n=157 Gender :(Male=86, Female=71) Age : Their mean age was 61.89 years (SD =11.49, range 24-89) Inclusion criteria : patients had to be 18 years of age or older, have active recurrent or metastatic cancer, be able to speak and read English at or above a fifth grade level, and be capable of completing the questionnaire on their own. Exclusion criteria : Patients who had surgery within the past 30 days and those who did not manage their own pain medications were excluded.	Self-report questionnaire; The Barriers Questionnaire II; Brief Pain Inventory (BPI) The Pain Management Index (PMI)	Lung, Gastrointestinal, Genitourinary, Breast, Melanoma and others	The total BQ-II score (N 5 157) was M (mean) = 1.83 (SD =0.77). Subscale scores, from highest to lowest, were harmful effects M 5=2.50 (0.98), physiologic effects M = 2.17 (SD =0.97), fatalism M =1.11 (0.83), and communication M= 0.89 (0.98) More than half (n=56, 58%) demonstrated adequate use of analgesics for the level of pain severity experienced.	Attitude Practice

CONTINUE

Table II Characteristics of included studies (cont.)

Author(s) year/ country of publica- tion	Study design	Participants (total number, Median age,	Measurement/Instru- ment	Type of cancer	Key finding	Domains
Lin, (2000) ^[36] , China	A cross-sec- tional study A quan- titative approach	Total :n=159 Gender :(Male=79, Female=80) Age :(57.09±13.53) Inclusion criteria: (a) be over the age of 18, (b) have been given a diag- nosis of cancer, (c)have experienced pain in the last 24 h, (d) have received analgesics for pain, and (e) be able to communicate in Chinese. Exclusion criteria: Patients were cognitively impaired or had language difficulties.	Barriers Question- naire-Taiwan form, the Brief Pain Inven- tory-Chinese version, the ECOG performance status scale, and a demographic and medication ques- tionnaire.	breast,lung ,colorectal,oral, gastric, liver , cervical,naso- pharyngeal , lymphoma, brain,pros- tate,pancreatic, and various other types .	Patient concerns were related to their hesitancy to take anal- gesics and, similarly, caregiver concerns were related to their hesitancy to administer analge- sics. Most importantly, patient and caregiver concerns had an impact on how the patients’ pain was managed: patients and their family caregivers with higher levels of concerns used inadequate an- algesics as compared to patients using adequate analgesics;	Attitude Practice
Lou and Shang, (2017) ^[37] , China	A de- scriptive, cross-sec- tional study A quan- titative approach.	Total :n=363 Gender :(Male=190,Female=173) Age (≥60, n=146) Inclusion criteria: 1) a cancer diagnosis at least one month before the study; 2) awareness of their disease diagnosis; 3) experiencing cancer-related pain and currently taking oral analgesics at home or according to doctors’ advice, such as non-steroid anti-inflammatory drug, weak opioid analgesics, or strong opioid analgesics; 4) the ability to read and understand the questionnaires; and 5) aged 18 years or older. Exclusion criteria : 1) surgery patients; or 2) an inability to complete the ques- tionnaire survey because of illness or treatment.	Demographic and Disease-Related Infor- mation Questionnaires; Pain Management Barriers Question- naire-Taiwan Form (BQT);Pain Knowledge Questionnaire The Family Pain Ques- tionnaire (FPQ)	Lung cancer;Oral, nasopharyn- geal,esophageal and gastro- intestinalcan- cers ;Breast cancer;Liver and pancreatic cancers and Lymphoma;Kid- ney, ureter, bladder, ovarian and uterine cancers	The overall attitude toward pain management among cancer patients aged 60 and older is suboptimal, particularly in the dimensions of “tolerance” (3.83±0.96), “as-needed use of analgesics” (3.73±1.01), and “addiction” (3.44±1.05). Fur- thermore, the pain knowledge of these patients is generally inadequate, with a mean score of 44.22±16.29 (out of 100), especially regarding the ap- propriate timing and dosage of analgesic administration.	Knowl- edge Attitude
Ma et al., (2020) ^[38] , China	A cross-sec- tional study A quan- titative approach	Total :n=146 Age :(<60,n=87;60–74,n=52;≥75,n=7) Inclusion criteria: Patients who were 18 years or older re- ceiving opioids for more than 72 h because of cancer pain and who were pathologically diagnosed with malig- nant tumours were recruited. All participants had normal ability to read and write Chi- nese and volunteered to participate in this study. Exclusion criteria : Those who were suffering from other life-threatening dis- eases, severe mental disease or cog- nitive disorders were un- able to participate in this study. Addi- tionally, patients with postoperative pain were also excluded.	The Barriers Questionnaire-Chinese (BQ-C). Umerical Rating Scale, NRS	Gastrointestinal cancer, Lung cancer, Gy- naecologic cancer, Head and neck cancer and other	The highest mean scores for patient-related attitudinal bar- riers to pain management were observed in “tolerance” (2.85 ± 2.14) and “addiction” (2.52 ± 2.10). The mean score for “pain endurance” was lower, at (1.97 ± 2.16)(A). Additionally, 73.3% of older participants adhered to their prescribed analgesic regimens consistently.(P)	Attitude Practice
Mercadant et al., (2021) ^[39] , Italy	A cross-sec- tional study A quan- titative approach	Total :n=113 Gender :(Male=59, Female=54) Age :(68.0±13.0) Inclusion criteria: Patients were eligible if they were at least 18 years of age, had a diagnosis of cancer, and had been receiving chronic opioid therapy for background pain for at least 7 days. Exclusion criteria: Incapacity to complete the ques- tionnaires for any reason, relevant cognitive failure, or a Karnofsky status of ≤20. Informed consent was obtained from all subjects prior to study partic- ipation	The Brief Pain Invento- ry (BPI), Edmonton Symptom Assessment Scale (ESAS), Memorial Delirium Assessment Scale (MDAS), Barriers Ques- tionnaire II (BQ-II), Medication Ad- herence Rating Scale (MARS), and Hospital Anxiety and Depression Scale (HADS) were the measurement instruments used.	Colorectal; Urogenital; Lung and breast	At univariate analysis, BQ-II scores were associated with the following MARS items: “some- times if you feel worse when you take the med- ication, do you stop taking it?” (P = 0.016), “I feel weird, like a ‘zombie’ on medication” (P = 0.021), and “Medication makes me feel tired and sluggish” (P = 0.009) Negative side-effects and attitudes to psychotropic medi- cation globally prevailed (“I feel weird, like a ‘zombie’ on medi- cation” and “Medication makes me feel tired and sluggish”, 17.3% and 42.3%, respectively) on other items.	Attitude Practice

CONTINUE

Table II Characteristics of included studies (cont.)

Author(s) year/ country of publica- tion	Study design	Participants (total number, Median age,	Measurement/Instru- ment	Type of cancer	Key finding	Domains
McDarby etal., (2017) ^[40] , Ireland	A cross-sec- tional study A quan- titative approach	Total :n=49 Gender :(Male=21, Female=28) Age :range: 35-85 Inclusion criteria : Age greater than 18 years, a malig- nant diagnosis, a life expectancy of greater than one month and the capacity to provide informed consent	Barriers Questionnaire II (BQII) Pain Management Index (PMI)	Gastrointestinal cancer; Breast cancer;Lung can- cer;Gynaecolog- ical cancer;Hae- matological Cancer;Melano- ma cancer; Prostate cancer;- Renal cancer	Older cancer patients, especial- ly those aged 70 and above, often exhibit higher levels of fatalistic beliefs regarding pain, viewing it as an unavoidable aspect of their condition. Such attitudes may hinder their willingness to accept pain man- agement treatments. Further- more, elderly patients frequently express concerns about the risk of addiction to analgesic medications. Although research indicates that cancer patients are at a relatively low risk of substance dependence, these misconceptions can still present significant obstacles to effective pain management.	Attitude
Polański et al., (2024) ^[41] , Poland	A cross-sec- tional study A quan- titative approach	Total :n=257 Gender :(Male=142, Female=115) Age :63.0±9.0 Inclusion Criteria : Age ≥ 18 years ;Histopathologically confirmed diagno- sis of lung cancer;Ability to complete the questionnaires independently Exclusion Criteria : Lack of voluntary and informed con- sent to participate; Inability to complete the questionnaires independently; Severe pain unrelated to the primary disease; Presence of other severe chronic conditions that could affect health perception (e.g., another malignancy, severe heart failure, severe COPD, asthma, hemodynamic instability); Cognitive impairment indicative of dementia	Initial Nutrition Assess- ment Questionnaire; Visual Analog Scale;- Beliefs about Pain Con- trol;Coping Strategies Questionnaire	lung cancer	most patients perceived their ability to manage pain as either a matter of chance or predom- inantly under the control of healthcare providers. Regarding pain management strategies, lung cancer patients most commonly employed methods such as prayer or hope, increased behavioral activity, and distraction. Patients regard- ed the effectiveness of their ability to control pain and to reduce pain as equivalent. Patients reported that less frequent use of negative pain coping strategies, coupled with more frequent use of positive pain control strategies, was associated with a greater perception of pain reduction (p < 0.001).	Attitude Practice
Saifan et al., (2015) ^[42] , Jordan	A cross-sec- tional study A quan- titative approach	Total :n=300 Gender :(Male=161, Female=139) Age :(51-60,n=102;Older than 70,n=8) Inclusion criteria : (i) being Jordanian and older than 18 years, (ii) having a con- firmed cancer diagnosis, (iii) having experienced pain, and (iv) hav- ing received analgesics in the previous 24 hours.	(i) a self-report ques- tionnaire to collect demographic data, including age, gender, marital sta- tus, and education; (ii) the A-BPI; and (iii) the ABQ-II.	Not mentioned	Four major barriers to pain control were highlighted: fears related to addiction, side effects, communication concerns, and fatalistic belief	Attitude
Zeng et al., (2020) ^[43] , China	A de- scriptive cross-sec- tional study A quan- titative approach	Total :n=246 Gender :(Male=167, Female=79) Age :(51.5±11.7) Inclusion criteria : (1) cancer diagnosis, (2) age 18 years and older, (3) ability to read and write Chinese, (4) presence of pain for at least two weeks, (5) current usage of analgesics, and (6) knowledge of the diagnosis Exclusion criteria : (1) a history of cognitive impairment in medical records and (2) an inability to participate in the study because of illness or treatment.	the Barriers Questionnaire-Chinese (BQ-C), the Morisky Medication Adherence Scale (MMAS), the Pain Man- agement Index (PMI), and a demographic and disease character- istic questionnaire	Lung, Gastro- intestinal, Na- sopharyn- geal, Breast and other	The highest mean score was observed in the subscale assess- ing concerns about analgesic tolerance. Among these con- cerns, the items related to liver harm (97.6%) and kidney harm (97.2%) were the most prev- alent. Additionally, 41.9% of patients (103 individuals) were using insufficient analgesics. Patients diagnosed with cancer for over a year reported higher mean scores for concerns about side effects. The three attitudinal barriers to pain management with the highest scores were: "Tolerance" (2.75±1.58), "Dis- traction" (2.70±1.31), and "Dis- ease progression" (2.69±1.23).	Attitude

CONTINUE

Table II Characteristics of included studies (cont.)

Author(s) year/ country of publica- tion	Study design	Participants (total number, Median age,	Measurement/Instru- ment	Type of cancer	Key finding	Domains
Zhao et al., (2023) ^[44] , China	A cross-sec- tional study A quan- titative approach	Total: n=141 Gender: (Male=71, Female=70) Age: 54.50±15.50 Inclusion criteria: (1) were diagnosed with cancer; (2) were diagnosed of pain related to cancer or cancer therapy; (3) had a life expectan- cy of ≥ 3 months; (4) had clear consciousness, self-cognition, and expression ability; (5) were provid- ed written informed consent and completed questionnaires. Exclusion criteria: Patients who were illiterate, had severe cognitive impairment, and had acute or chronic pain caused by non-cancer factors were excluded.	(1) the numerical rating scale (NRS);(2) the ID- Pain;,(3) the Morisky Medication Adherence Scale-Chi- nese validated version (MMAS-C);(4) the Belief about Medicines Question- naire (BMQ) – Specific; and (5) the Hospital Anxiety and Depression Scale (HADS).	Primary tumor site: Bone; Lung;Soft tissue ;Colorec- tal;Breast;Gul- let;Stomach;Liv- er;Pancreat- ic;Uterus;Kid- ney;Myeloma;- Prostate;Gall- bladder;and thers	Of the 141 patients, 83 (58.9%) adhered to analgesic regimens, while 58 (41.1%) did not. Uni- variate analysis revealed that ad- herence was significantly associ- ated with several factors: pain duration exceeding 3 months, recent pain episodes within the last 24 hours, presence of side effects, timely acquisition of analgesics, neuropathic pain, self-adjustment or discontinua- tion of analgesics, anxiety and depression, and beliefs about medications.	Practice

RESULTS

This review encompasses 22 studies (Fig.1) conducted across 11 countries, with sample sizes ranging from 49 to 1,190 and a wide age distribution among participants(15, 24-44). Although some of the original studies included participants aged 18 years and older, we strictly adhered to our predefined criteria by analyzing only those studies in which the median or mean age of participants was ≥50 years. This methodology ensured that all data included in the analysis were consistent with our research focus on the elderly population. The included articles comprised of studies drawn across twelve countries: China, Jordan, USA, UK, Italy, Poland, Turkey, Japan, Korea, Israel, and Ireland(15, 24-44). The qualities of the included studies were generally good. The studies included in this review involved patients from various countries and regions, with sample sizes ranging from 49 to 1,190, encompassing different age groups, particularly focusing on older adult(15, 24-44). The sex ratio varied among the studies, but overall, male patients were slightly more prevalent. The inclusion criteria generally required a cancer diagnosis, moderate to severe pain, and the ability to complete a questionnaire or provide informed consent. Most studies also required participants to comprehend and respond to the survey (24, 25, 28). While some studies imposed a lower age limit, the majority focused on patients over 50 years of age. These demographic differences may have influenced the outcomes related to pain management knowledge, attitudes, and practices, offering a multidimensional perspective for analysis in this review.

The assessment tools used in this review to evaluate the knowledge, attitudes, and practices of older adults with cancer pain are diverse, covering various dimensions such as pain intensity, psychological status, medication adherence, and cognitive impairment. Commonly employed tools include the Brief Pain Inventory (BPI) (25, 28, 31, 32, 34-36, 39) and Pain Management Index (PMI) (29, 34, 40, 43) for measuring pain intensity; the Hospital Anxiety and Depression Scale (HADS)(27, 31, 39, 44) for assessing anxiety and depression; and the Barriers Questionnaire (BQ) (27, 31) and its variants (e.g., BQ-II, BQ-C, BQT) for evaluating patient perceptions of barriers to pain management(24, 25, 29, 35-40, 42, 43). Additionally, the Pain Self-Efficacy Questionnaire (PSEQ) measures patient self-efficacy in managing pain(34), and the Morisky Medication Adherence Scale (MMAS) assesses adherence to medications(43, 44). Furthermore, culturally specific instruments, such as the Pain Management Barriers Questionnaire-Taiwan Form and the Beliefs about Pain Control Questionnaire (BPCQ), provide targeted assessments(30, 36, 37). These tools offer comprehensive measures for the systematic analysis of pain management knowledge, attitudes, and practices in older adults living with cancer. Cancer sites included the lungs in the respiratory system; the mouth, nasopharynx, esophagus, stomach, colorectum, liver, and pancreas in the digestive system; the prostate, kidneys, ureters, bladder, ovaries, cervix, and uterus in the genitourinary system; the mammary glands; lymphomas and leukemias in the hematological system; melanomas of the skin; tumors associated with bones and soft tissues; and cancers of the brain and other components of the central nervous system. All studies assessed three (3) main domains which were knowledge,

attitude and practice (15, 24-44).

In the knowledge domain, Elderly cancer patients experiencing pain exhibit inadequate knowledge levels (mean score: 44.22 ± 16.29 out of 100), specifically concerning optimal timing and appropriate dosage of analgesic medications(37). This lack of knowledge directly impairs patients' ability to effectively manage pain, hindering their use of both pharmacologic and nonpharmacologic strategies.

In the attitude domain, patients generally held negative attitudes toward pain management, as demonstrated by prevalent concerns about addiction(15, 26, 29, 33, 40), tolerance(24, 38, 43), and disease progression(43). Elderly patients, in particular, expressed stronger concerns about communication barriers(25, 31), medication side effects (27, 31, 39)and opioid tolerance and addiction(26, 37). Additionally, factors such as religious fatalism (30, 40, 41)and a high tolerance for pain contributed to patients' reluctance to report pain(15, 27) or accept appropriate medication(29, 36, 43).

In the practical domain, patients' actions were closely linked to their knowledge and attitudes. Although 73.3% of patients adhered to their prescribed analgesic regimen(38), more than 27% intentionally omitted medication due to concerns about side effects(27, 31), forgetfulness, or the belief that pain could be tolerated without pharmacologic intervention. Nonpharmacologic management practices, such as prayer(30, 41), activity restriction(34, 41), while practiced by some, were insufficient substitutes for medication, resulting in inadequate pain control for many patients(29, 36, 43).

Older adult cancer patients' pain management knowledge, attitudes, and practices are influenced by various factors, including age, gender, education level, economic status, and duration of illness. Cognitive decline, concerns about medication side effects, and communication barriers with healthcare professionals often contribute to higher pain management challenges in this age group. Additionally, insufficient knowledge and negative attitudes can exacerbate poor medication adherence and suboptimal pain management. For instance, fear of opioid addiction may reduce adherence to prescribed medications, leading to ineffective pain control. Moreover, negative attitudes might prompt patients to adopt passive or maladaptive coping strategies, rather than actively seeking medical assistance.

DISCUSSION

Knowledge of Cancer Pain Management in Older Adults

The analysis of 22 studies included in this review consistently demonstrates significant gaps in elderly cancer patients' knowledge of pain management.

Studies such as Lou and Shang (2017) (37)and Ali et al.(2024) (24)demonstrate that misconceptions about opioid use are pervasive, with many elderly individuals incorrectly believing that opioids are addictive or that increasing pain necessarily signals cancer progression. This fear directly impedes the use of effective pain management strategies, resulting in inadequate symptom management. According to the Knowledge-Attitude-Practice (KAP) theory, knowledge deficits are foundational in shaping patients' attitudes and subsequent practices. In the reviewed studies, these gaps were commonly linked to inadequate patient education, with a focus on clinical cancer treatment rather than on providing comprehensive education on pain management. This aligns with our findings, where misconceptions among patients regarding the risks of addiction and tolerance prevent them from adhering to prescribed pain management regimens. Moreover, cultural factors play a significant role in influencing these knowledge gaps. In their study, Silbermann and Hassan (2011) (45)identified that in many Middle Eastern countries, opioids are culturally linked to death, further intensifying fears surrounding their use. This cultural framing exacerbates the knowledge gap, especially in regions where religious and societal beliefs play a strong role in healthcare decisions. In contrast, Western studies like Jacobsen et al. (2009) (46)focus more on the lack of tailored educational interventions and highlight the need for healthcare providers to correct misconceptions about opioid safety and addiction. These findings suggest that addressing the knowledge gap in elderly cancer patients requires a multifaceted approach. Healthcare providers must prioritize patient-centered educational interventions that are culturally sensitive, addressing not only the medical aspects of pain management but also the socio-cultural and religious beliefs that shape patients' understanding of opioids. This would lead to more informed decision-making and better adherence to pain management protocols.

Attitudes Toward Cancer Pain Management in Older Adults

Adverse attitudes toward opioid use are a recurrent theme in the studies reviewed, with many older patients exhibiting concerns about addiction and side effects. For instance, Atiyyat et al. (2018) (25) and Bennett et al. (2009) (27) found that elderly cancer patients in Jordan and the UK, respectively, exhibited significant resistance to opioid use, primarily motivated by fears of addiction and adverse effects. The KAP theory suggests that these attitudes stem from patients' insufficient knowledge, which fosters misconceptions about opioid safety and addiction. In regions with strong religious or cultural influences, such as the Middle East, resistance to opioid use is further reinforced by societal norms, as discussed by Silbermann and Hassan (2011)(45). Their research found that in Islamic communities, opioids are often viewed as a precursor to death, intensifying the

reluctance to use pain medication. Similarly, Lovering (2006) (47) highlighted how cultural attitudes toward pain in many societies can shape patients' willingness to engage in effective pain management practices. In contrast, studies from Western contexts, such as those reviewed by Jacobsen et al. (2009) (46), emphasize that while opioid fear is prevalent, it is more closely related to a lack of understanding of modern pain management techniques than to religious or cultural beliefs. This highlights the global nature of opioid stigma, but also the necessity of tailoring interventions to address the specific cultural and societal contexts in which patients are situated. Addressing these adverse attitudes requires healthcare providers to engage in culturally sensitive communication, acknowledging patients' fears and beliefs while informing them about the importance of opioids in improving quality of life. Empowering patients with knowledge can help reshape these adverse attitudes and enhance their willingness to use opioid-based therapies for effective pain control.

Practices of Cancer Pain Management in Older Adults

Ineffective pain management practices were commonly observed among the elderly patients in the studies reviewed. As reported by Bennett et al. (2009) (27) and Closs et al. (2009) (31), a significant portion of older patients skipped or reduced their opioid doses due to concerns about addiction or side effects. These practices are strongly influenced by the knowledge and attitudes discussed earlier. According to the KAP theory, inadequate knowledge and adverse attitudes contribute to suboptimal pain management behaviors, such as medication non-adherence or excessive reliance on non-pharmacological strategies. Lovering (2006) (47) emphasized that cultural attitudes significantly influence pain management behaviors, with many patients opting for traditional methods over prescribed medications. In comparison, Western studies like those reviewed by Jacobsen et al. (2009) (46) suggest that while patients are similarly concerned about opioid use, there is a stronger emphasis on the need for better communication between healthcare providers and patients to promote adherence to prescribed opioid regimens. This difference underscores the importance of addressing the medical as well as the cultural aspects of pain management. To improve pain management practices among elderly cancer patients, healthcare professionals must integrate comprehensive education about both pharmacological and non-pharmacological methods, ensuring patients' understanding of the complementary roles these strategies play. Moreover, involving caregivers in educational interventions is crucial, as they often influence patients' adherence to pain management protocols. In particular, caregivers need to be educated on the importance of consistent opioid use and the limitations of relying solely on non-pharmacological methods.

Recommendations

Based on the Knowledge-Attitude-Practice (KAP) model, this study demonstrates how significant knowledge deficits and negative attitudes toward pain management influence practical choices among older adults living with cancer. The findings not only confirm the presence of knowledge gaps, particularly misconceptions regarding opioid use and pain pathophysiology, but also elucidate how these deficits translate into suboptimal pain management practices. Future research should further investigate the mechanisms underlying the KAP model in pain management, with a focus on the pathways of influence in older cancer patients. Specifically, longitudinal studies could examine how knowledge acquisition and attitude shift progressively impact patients' practice choices, as well as the mediating or moderating effects of cultural beliefs, social support, and psychological factors. Additionally, interdisciplinary research combining neuroscience and practice psychology is anticipated to uncover the neural mechanisms behind the acceptance of pain management knowledge and attitude changes in elderly patients, thereby providing a theoretical foundation for developing more effective educational and intervention strategies.

In clinical practice, pain management interventions based on the KAP model should prioritize improving knowledge deficits, correcting negative attitudes, and fostering positive pain management practices in older cancer patients. First, individualized education plans should be developed to address specific knowledge gaps, using simple, clear, and accessible materials to correct common misconceptions, particularly concerning opioid use and pain progression. Second, clinical interventions should consider patients' cultural backgrounds and belief systems, helping them overcome excessive concerns about drug dependence and resistance, while enhancing their confidence in effective pain management through psychological counseling, social support, and doctor-patient communication. Finally, a nursing model incorporating the KAP framework should be implemented, with knowledge transfer as the foundation, belief reinforcement as the motivation, and practice change as the goal. This approach aims to encourage patients to actively report pain, adhere to prescribed medications, and appropriately use nonpharmacological therapies in their daily lives. Future clinical trials should validate the efficacy of such interventions and explore their effective implementation in resource-limited settings to improve pain management outcomes for older cancer patients globally.

Limitation

In this systematic review, we analyzed 22 articles published between 2000 and 2024 to examine

knowledge, attitudes, and practices related to cancer pain management in older adults. However, several limitations must be acknowledged. First, the review included only studies published in English, which may have introduced language bias and excluded significant findings reported in other languages. Additionally, the exclusion of unpublished and gray literature may have led to the omission of relevant studies, thereby limiting the generalizability and representativeness of the results. This study utilized a cross-sectional design. During the literature search and selection process, however, we faced a significant challenge: the limited number of high-quality studies focusing specifically on older adults with cancer pain (aged ≥ 50). To ensure both methodological rigor and comprehensive evidence, we implemented a clear analytical strategy: for studies that included participants from multiple age groups but provided age-stratified data, we extracted and analyzed data from the elderly subgroup (≥ 50 years). For studies lacking age-stratified data, we included only those where the median or mean age of participants was ≥ 50 years. This heterogeneity may have compromised the generalizability and precision of findings specific to the elderly population, thus weakening the relevance of the conclusions. Furthermore, the analyses of mixed populations might have resulted in less precise characterizations of cancer pain management practices and attitudes in older adults, due to age-related differences in pain perception and management. Moreover, significant differences in the geographic and economic contexts of the included studies—spanning both high- and low-income countries—could have influenced knowledge, attitudes, and practices regarding cancer pain management. Consequently, the findings of this review may not be universally applicable, particularly in resource-limited settings. Finally, the included studies may have exhibited publication bias, with a tendency to report negative outcomes. This bias could have skewed the assessment of cancer pain management practices. Additionally, variations in data collection and analysis methods across studies may have affected the comparability and comprehensiveness of the results. In summary, while this review provides valuable insights into the knowledge, attitudes, and practices associated with cancer pain management in older adults, the aforementioned limitations should be carefully considered when interpreting the findings to avoid overgeneralization and to inform future research directions.

CONCLUSION

This study systematically reviewed the current status of pain management knowledge, attitudes, and practices among older adults patients, revealing significant knowledge deficits, negative attitudes, and their profound impact on cancer pain management practices. Future efforts should focus on enhancing patient education, systematically improving knowledge

structures, adjusting negative attitudes, and developing individualized pain management programs tailored to the practical characteristics of older cancer patients. These efforts must also consider the importance of cultural and faith backgrounds in improving pain management outcomes. We also recommend that future research adopt more stringent age criteria to strengthen the scientific rigor of conclusions in this field.

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