Original Article

Development of a nurse navigation program for cancer pain

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ABSTRACT

Objective: Cancer pain significantly impacts the overall quality of life of cancer patients, necessitating proactive management. The manifestations of cancer pain vary individually and require tailored interventions to address each patient's unique characteristics. Therefore, this study aims to develop a nurse navigation program for cancer pain (NNP-CP) tailored to the needs of cancer patients requiring pain control, aiming to establish evidence-based clinical nursing practices and promote effective cancer pain management.

Methods: This study is a methodological research into developing a pain management program led by nurses for cancer patients requiring pain control, based on a professional navigation framework. The development of the program relied on three out of the five stages of the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model.

Results: A literature review was conducted to select the content and rationale to be included in the intervention program. Publications within the last 10 years in English or Korean were identified and screened based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) 2020 literature selection flow, 17 articles were included. Standardized information regarding cancer pain control was based on the 7th edition of 'Cancer Pain Management Guidelines'. The initial draft of the pain management intervention program was developed by organizing and structuring the derived content based on the professional navigation framework. Subsequently, the final intervention program was confirmed through the review by six clinical experts specializing in cancer pain.

Conclusions: Cancer pain is a significant factor that profoundly influences the quality of life and survival duration of cancer patients. While appropriate management methods offer the prospect of control, insufficient intervention is the current reality. Through the pain management intervention program based on the expert navigation framework that promotes continuity of care and empowers the recipients, this study anticipates not only pain reduction in cancer patients but also an enhancement in their quality of life.

Introduction

Cancer pain is a common symptom experienced by some 66.4% of advanced cancer patients,[1] significantly impacting their quality of life, treatment adherence, and survival rates.[2] However, one-third of cancer patients still do not receive adequate pain control.[1]

Recognizing the imperative for effective cancer pain management and coping, various institutions have disseminated clinical guidelines pertaining to this domain.[3–6] However, the methods of utilizing and implementing these guidelines vary among medical establishments, with a noted deficiency in prioritizing and recognizing the importance of pain

management in clinical settings. Consequently, there are challenges in actively addressing pain due to a lack of awareness. Pain management predominantly relies on sporadic counseling sessions, primarily focused on explaining analgesics or procedures and their associated side-effects.[7,8]

Upon reviewing nursing interventions and meta-analysis studies attempted to control cancer pain, it has been observed that interventions tailored to the individual pain patterns of cancer patients, based on continuous engagement to induce and reinforce pain control adherence, are effective in managing cancer pain. However, consistent criteria and methods for effective pain-related interventions, intervention frequency,

etc., were not clearly established, and there were limitations in applying them in clinical settings.[9–12]

Professional navigation program is structured into domains of facilitating continuity of care, encompassing concepts of information, management, and relational continuity, and promoting empowerment, encompassing concepts of self-management, active coping, and support care. Each concept is applied by connecting detailed intervention contents, known as timely medical accessibility and sufficient information provision during treatment, thereby enhancing satisfaction with the treatment experience.[13,14] This differs from conventional standardized education methods, as it involves structured interventions such as information and adjustment, tailored patient education and emotional support, and integration of scattered information.[15] Particularly, nurses as providers of navigation programs possess clinical expertise, communication skills, and problem-solving abilities, along with educational proficiency and a high understanding of the healthcare system. They offer advantages in ensuring accessibility to treatment, identifying the needs of recipients, securing resources, and coordinating medical services.[16,17]

Nurse navigation programs in cancer care have been reported to offer several benefits. Throughout the cancer journey, nurse navigation programs have shown positive effects on individuals at risk of or diagnosed with cancer, such as shortened diagnosis and treatment times, increased knowledge for patients and caregivers, improved treatment adherence, and enhanced quality of life.[18] Nurses providing navigation programs are found to prioritize holistic nursing care and support for patients in all dimensions, focusing on preventive, therapeutic, or rehabilitative nursing during cancer treatment.[19] Additionally, nurse navigation programs in clinical settings have aided patients and families in overcoming healthcare system barriers by offering individualized support and facilitating timely access to information-based decision-making and high-quality healthcare and psychosocial therapies at all stages of the cancer treatment journey.[20] Moreover, applying navigation programs for symptom management in patients undergoing cancer treatment has been shown to improve quality of life and reduce the severity of symptoms such as mucositis, dysphagia, and oral pain.[21] Based on the findings observed abroad, research into the development of a nurse navigation program for cancer patients within the domestic medical context in Korea has shown promising results. For instance, a navigation program designed for newly diagnosed gastric cancer patients demonstrated a reduction in anxiety symptoms.[15] Similarly, a navigation program aimed at patients undergoing colorectal cancer surgery showed effectiveness in reducing uncertainty and increasing resilience post-surgery.[22] Additionally, a comprehensive health function enhancement was observed among patients with invasive bladder cancer undergoing radical cystectomy, leading to a decrease in unplanned readmissions.[23]

In this study, we aim to develop a nurse-led pain management navigation program targeting cancer patients requiring pain control for continuous and individualized tailored cancer pain management. This initiative seeks to establish clinical nursing practice evidence for the clinical application of cancer pain control interventions and to promote effective cancer pain control in cancer patients.

Methods

This study is a methodological research aimed at developing a pain management program for cancer patients in need of pain control based on the professional navigation framework. To develop a systematic intervention program, the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional design model was employed, consisting of five stages: analysis, design, development, implementation, and evaluation.[24] Within this model, the program was developed based on the first three stages: The analysis stage, which involves identifying and analyzing relevant factors and necessary content; the design stage, which involves planning for media, objectives, and other related matters based on the results of the analysis process; and the development stage, which involves developing a draft based on the previous stages and validating it for feasibility. The specific activities performed in each stage in this study are depicted in Fig. 1.

Development of NNP-CP: analysis

A review of domestic and international literature was conducted to select the content and basis for inclusion in the navigation intervention program for pain management in cancer patients. The ultimate goal of this study is to develop a pain management navigation intervention program for cancer patients in need of pain control. This program aims to serve as evidence in clinical nursing practice while simultaneously striving to enhance pain relief, improve quality of life for cancer patients, elevate self-efficacy, and satisfaction with pain management. Following the National Evidence-based Health care Collaborating Agency (NECA) systematic review guidelines,[25] research questions were formulated, and search terms were selected based on existing systematic literature reviews. The literature search focused on identifying the application and effectiveness of nurse-led interventions for pain control and management in individuals requiring cancer pain control, excluding interventional pain treatments such as pain-relieving therapies, radiation therapy, and surgery. The selected search terms included 'Cancer pain', 'Patient navigation', 'Coaching', 'Education', 'Pain management/nursing', 'Patient satisfaction', 'Self-efficacy', 'Quality of Life', 'Pain relief', 'Pain measurement', and 'Barrier'. Various search engines such as PubMed, EMBASE, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library, and Research Information Sharing Service (RISS) were employed, and search strategies were constructed based on the selected search terms using controlled vocabulary (MeSH, Emtree, CINAHL Subject Headings) and limited to documents published in English or Korean after 2013. Identified literature was screened and selected based on the PRISMA 2020 literature selection flow (Fig. 2).[26]

The retrieved documents from various search engines were as follows: 481 from PubMed, 4197 from EMBASE, 228 from CINAHL, 651 from Cochrane Library, and 202 from RISS. After removing duplicate references using the EndNote21 citation manager, a total of 5127 articles were identified. Through title and abstract review, 5060 articles were excluded, which included information on surgical procedures, treatments, medications, case reports, interventions not applicable or
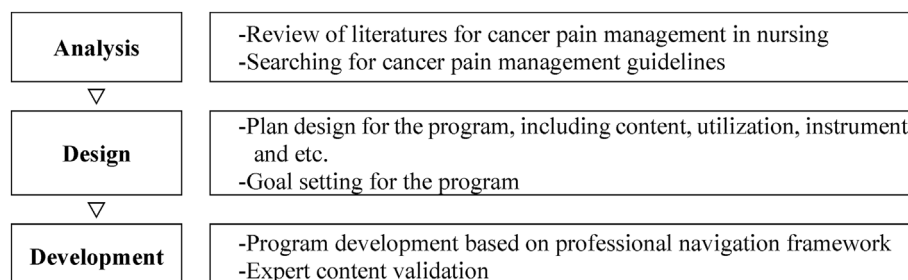

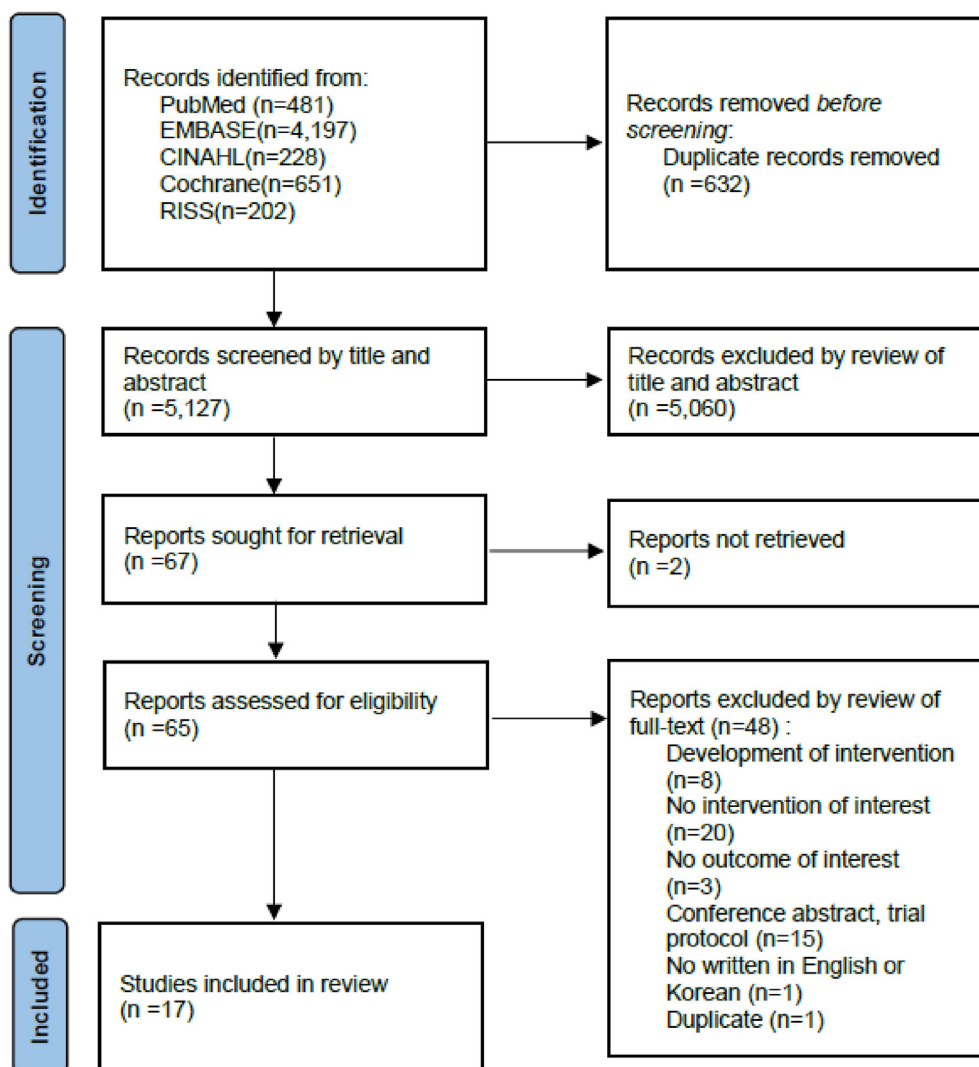| Analysis | -Review of literatures for cancer pain management in nursing
-Searching for cancer pain management guidelines |
| Design | -Plan design for the program, including content, utilization, instrument and etc.
-Goal setting for the program |
| Development | -Program development based on professional navigation framework
-Expert content validation |

Fig. 1. Flow of program development.

Fig. 2. Study selection via databases based on PRISMA 2020 flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-analyses.

impractical in medical clinical settings, educational studies for physicians or nurses, knowledge and attitude studies, among others related to tumor treatment. Additionally, two articles that were inaccessible were removed. Further review excluded 48 articles involving ongoing interventions under development, medical staff educational interventions, intervention research protocol development, pain medication dosing adjustments, conference abstracts, etc. Ultimately, 17 articles were included in the review.

Standardized information on cancer pain control was based on the 7th edition of the 'Guidelines for Cancer Pain Management for Medical Professionals Treating Cancer Patients' published by the Ministry of Health and Welfare in 2023. This guideline reflects the latest insights and domestic clinical realities derived from domestic and international treatment guidelines, literature reviews, and expert opinions, serving as a reference for program development.

Development of NNP-CP: design

Based on the literature review from the analysis, an overall design was established for the intervention and related aspects. The objective of the intervention program developed in this study was set to enhance pain relief and improve the quality of life for cancer patients in need of pain control. The aim was also to increase patients' self-efficacy and satisfaction with pain management. Various strategies were identified concerning the effective means of delivering the intervention, including suitable mediums, application locations, timing, and frequency.

Development of NNP-CP: development

Development of intervention based on professional navigation framework

The pain management intervention program was developed by aligning the components of intervention, application timing, and medium, identified through the previous analysis and design phases, with the professional navigation framework (Table 1).[14]

The professional navigation framework is an initiated healthcare delivery model aimed at overcoming difficulties experienced by cancer patients, such as fragmented medical services, delays, lack of information and coordination, and insufficient guidelines. It aims to provide timely information about the disease, treatment, and available resources, facilitating better communication between healthcare providers and recipients, along with emotional support. By focusing on the recipients and considering their expectations through the intervention, the framework sets a patient-centered approach to healthcare, aiming to eliminate barriers to treatment, improve outcomes for recipients, and enhance overall healthcare quality. The framework's structure encompasses concepts of informational, managerial, and relational continuity, as well as active coping, self-management, and supportive care, aiming to enhance the continuity of care and empower the recipients.

Table 1
Professional navigation framework.[14]

Dimension	Concepts/process and function
1. Facilitating continuity of care	**Informational continuity** - Having access to, and understanding, a high level of information on the patients with cancer and their care - Providing timely and tailored information and advice to the interdisciplinary team(s) and patients with cancer (patient-centered information) - Working closely with the interdisciplinary team(s) to improve continuity of the information and knowledge of family and patients' needs and changes - Using communication tools and strategies to increase continuity of information **Management continuity** - Conducting comprehensive screening and needs and resources assessment (initial and ongoing) - Matching unmet needs with services, resources available, and support systems within the cancer care organization and the community - Identifying lack of resources, finding temporary solutions, and reporting the system gaps - Mapping continuum of care, explaining treatment and care plans, minimizing uncertainty (patient orientation), and decreasing barriers to cancer care adherence - Referring to and communicating with hospital and community teams - Doing prompt liaison - Facilitating coordination and organization of medical and psychosocial care (using care pathways) - Contributing to the elaboration and application of the interdisciplinary care plan and nursing care plan - Contributing to interprofessional collaboration (hospital and community settings) **Relational continuity** - Initiating and maintaining an ongoing relationship with the patient with cancer - Being easily accessible through the cancer continuum - Mapping on the cancer trajectory how the professional navigator is involved and until when - Being part of an oncology team - Being trusted by health providers and team members
2. Promoting patient empowerment	**Active coping** - Assisting the patient and family to actively obtain information, support, and referral they needed - Enhancing or reinforcing the patient's and family's senses of autonomy (self-care) and self-determination through education and support to maintain their sense of control and quality of life - Enhancing recognition of the patient's and family's inner resources - Reinforcing active coping - Facilitating problem solving - Facilitating decision making - Setting and prioritizing goals **Self-management** - Assessing and monitoring symptoms - Providing or facilitating symptom management - Assisting and reinforcing the patient in adjusting to and managing his or her altered health state and symptoms proactively, not reactively, through timely and tailored information and self-care instructions - Reinforcing self-care behaviors - Assisting in following individualized treatment and care plans - Supporting the patient and family in decision making and cancer transition (palliative care) - Supporting the patient and family on how to negotiate care (advocacy role) - Optimizing self-care capabilities and skills - Educating, modeling, and coaching to facilitate the patient's, family's, and team members' behavioral changes toward patient-centered care (hospital and community resources) **Supportive care** - Providing access to supportive care through screening, assessment, direct care and intervention, and referral - Screening for distress and conducting comprehensive supportive care needs and resources assessment - Identifying unmet supportive care needs - Educating on distress and distress management - Assessing available support and reinforcing it - Supporting patient and family to mobilize their own resources and to explore new ones - Providing transitional support - Identifying policies or structural barriers limiting access to supportive care and suggesting ways to address it - Assisting and facilitating the development of community and healthcare resources (leadership) - Referring (mobilizing resources and services within the cancer care organization and the community to address unmet supportive care needs)

Expert content validation

To ensure the content validity of the developed cancer patient pain management navigation program, an expert review of the draft intervention program was conducted. A panel of six clinical experts specializing in cancer patients' pain control evaluated the draft. The panel consisted of one hematologic oncologist, one anesthesiologist specializing in pain medicine, one hospice specialist nurse, and three oncology specialist nurses. Each expert rated the intervention content on a Likert scale from 'Not at all appropriate' (1 point) to 'Highly appropriate' (4 points). Items that received a rating of 3–4 points, indicating an 80% or higher consensus among experts (Content Validity Index [CVI] $\geq$ 0.80), were identified as significant aspects.[27]

Results

Development of NNP-CP: analysis

The review of the intervention content of the included literature is presented in Table 2. The interventions studied commonly included individualized 1:1 education, lasting between a minimum of 15 minutes to a maximum of 60 minutes. The main content of the education encompassed guidance on cancer and cancer-related pain, the impact of pain, pain assessment, factors hindering pain control, guidance on analgesics and managing their side-effects, general information on non-pharmacological pain management methods, followed by follow-ups

Table 2
Summary of intervention of the results of the included literatures.

No.	Author (year)*	Study design	Participants	Intervention — Contents	Intervention — Intensity	Outcome variables	Results
1	Aliasgharpour et al. (2018)	RCT	98 (Exp. 49/ Con. 49)	Pain management training	3 weeks (6 sessions +20-minute education)	Pain severity with VAS	Effective
2	Aparna et al. (2021)	RCT	100 (Exp. 50/ Con. 50)	Standardized educational intervention	4 weeks (15-minute interaction +2 follow-ups every 2 weeks)	Analgesic knowledge and compliance, barrier to compliance	Effective in analgesic knowledge and compliance
3	Chen et al. (2019)	Nonequivalent control group post-test-only design	125 (Exp. 65/ Con. 60)	Evidence based nursing (psychological + cognitive + behavioral intervention)	1 month	Pain intensity with NRS, depression, anxiety, QoL, adverse event rate, nursing satisfaction	Effective
4	Duzova and Can (2021)	RCT	88 (Exp. 47/ Con. 41)	Nursing navigation program	7 weeks (30-minute visual training + daily counseling + weekly follow-up)	CTCAEs toxicity criteria, QoL	Effective in QoL, mucositis, dysphagia, oral pain, weight loss
5	Jahn et al. (2014)	RCT	207 (Exp. 102/Con. 105)	Self -care improvement through oncology nursing (SCION)-PAIN program	From hospitalization to 2–3 days after discharge (30-minute basic session + follow-up session from the day after basic session, every 3 days)	Pain intensity, barriers to pain management, pain coping, medication adherence, QoL	Effective in barriers to pain management, medication adherence
6	Kim et al. (2013)	RCT	108 (Exp. 54/ Con. 54)	Standardized pain education	1 week (30-minutes education + telemonitoring by phone everyday)	Pain, distress, anxiety, depression, QoL, performance status	Effective in pain, anxiety, depression, QoL, performance status
7	Koh et al. (2018)	One-group pre-test-posttest design	176	Individual cancer pain education	Education for 30 minutes using educational booklets	Pain, QoL, breakthrough pain control, misconceptions about cancer pain and opioid use	Effective in pain, QoL, breakthrough pain control, misconceptions of opioid pain medication.
8	Liu et al. (2021)	Nonequivalent control group design	187 (Exp. 102/ Con. 85)	Primary nursing	Individual nursing plans and procedures formulated for each patient and telephone visit once a week (twice a week with pain score ≥ 3)	Pain relief, anxiety, depression, self-efficacy, self-care ability, medication compliance, sleep, QoL, nursing satisfaction	Effective
9	Musavi et al. (2021)	RCT	75 (Exp. 40/ Con. 35)	Pain self-management education	From hospitalization to 3 months after discharge Face to face along with feedback during the hospitalization and weekly telephone follow-ups 1 month after discharge, and then every 2 weeks for 2 months	Pain, QoL	Effective
10	Obaid et al. (2022)	Nonequivalent control group pre-test-posttest design	134 (Exp. 68/ Con. 66)	Remote-based monitoring and education program	2 weeks (3 educational 15~20-minute sessions by telephone on 3rd, 7th, 14th day)	Pain, patient-related barriers, pain medication adherence	Effective
11	Oldenmenger et al. (2016)	RCT	54 (Exp. 28/ Con. 26)	Pain consult and patient pain education	8 weeks (60-minutes session in 1st visit + weekly monitoring and reviewing patients by phone)	Adherence to analgesics	Effective
12	Williams et al. (2015)	RCT	149 (Exp. 75/ Con. 74)	Pain treatment protocol and an education program	3 months (initial 35-minute consultation + weekly follow-up 15-minute sessions by phone or visit)	Pain, pain management index, QoL, patient satisfaction, anxiety, depression	Effective in pain management, satisfaction
13	Woo et al. (2019)	RCT	288 (Exp. 144/Con. 144)	Early palliative care and automated symptom monitoring	Until BPI worst pain score was ≤ 3 Daily coaching by telephone or during regularly scheduled outpatient care	BPI, depression	Effective in pain (Participants with BPI worst pain score ≤ 3)
14	Chun et al. (2013)	Non-equivalent control group design	56 (Exp. 28/ Con. 28)	Pain management education	Individual education 30 min	Knowledge, concern, attitude about pain management	Effective in knowledge about pain management
15	Shin et al. (2013)	Non-equivalent control group design	62 (Exp. 31/ Con. 31)	Periodic reminding intervention	4 weeks (individual education by tailored image-combined medication instructions + daily reminding text message + weekly telephone calls)	Medication adherence, self-efficacy, pain	Effective
16	Kim et al. (2020)	RCT	47 (Exp. 25/ Con. 22)	Tailored education and coaching program	3~4 weeks (40-minute tailored education + 20-minute coaching by phone till NRS 1–3)	Pain, daily living impairment, barriers on pain management, self-efficacy, pain management satisfaction	Effective in pain, pain management satisfaction
17	Kim et al. (2017)	RCT	62 (Exp. 31/ Con. 31)	Individual education of cancer pain management	30 minutes (one time)	Perception, attitudes	Effective

*All references in Appendix.

Con., control group; Exp., experimental group; NRS, Numerical Rating Scale; QoL, Quality of Life; RCT, Randomized controlled trial; VAS, Visual Analogue Scale; CTCAEs, Common Terminology Criteria for Adverse Events; BPI, Brief pain inventory.

regarding pain control and analgesic medication history in subsequent interventions. Nearly all interventions, post-education on pain, provided pamphlets containing information on self-created cancer pain and educational content based on pain management guidelines. The individuals delivering the interventions were all nurses, including research nurses, specialized nurses, those with training in pain control or palliative care, or a specialized nursing team assembled for interventions. The duration of interventions varied from single-session education to up to 3 months, sometimes decided based on the severity of the patient's pain. Variables used to assess the intervention's effects included pain intensity, pain-related knowledge, interference, self-efficacy in pain management, quality of life, adherence to analgesic medications, and satisfaction with pain control, among which some or all variables' effects were confirmed in most interventions. The period between the first and second intervention in studies conducting additional interventions ranged from a minimum of 1 day to a maximum of 14 days, and the frequency varied from daily to weekly. The time taken for additional interventions also differed among interventions, using methods like telephone or in-person sessions.

According to cancer pain management guidelines, pain control is an essential element in caring for cancer patients that affects their quality of life and survival. It aims to facilitate appropriate analgesic use, maintaining daily activities, minimizing side-effects, and reducing inappropriate drug use due to pain. The guidelines recommend conducting comprehensive pain assessments for all patients experiencing pain, individualizing pain management plans based on the disease's progression and treatment goals for each patient, periodically evaluating the effectiveness of pain treatment, its side-effects, and compliance, using pain assessment tools, reporting changes in pain patterns using pain diaries, pain management education including expectations about pain control, and psychological and social support.

In conclusion, for effective pain control through interventions, education tailored to individual characteristics of patients regarding pain management is crucial. Comprehensive pain assessment, setting pain control goals, personalized pain management plans, providing educational materials or pain diaries, and delivering interventions within varying time frames, depending on the nature of interventions and the characteristics and responses of the recipients, were identified as necessary. Although there was no consistent evidence for the duration and frequency until additional interventions were administered, pain intensity evaluations based on current pain, pain in the last 24 hours, and pain in the last week as per cancer pain management guidelines suggest that educational sessions for intervention should start within 1–2 days and include the one-week point for additional intervention. It was observed that at least a week-long intervention period was necessary. Regular evaluations of pain management-related side-effects and compliance with each intervention, including psychological and social support, should be incorporated. Trained professionals in cancer, cancer-related pain, and management should conduct interventions, possessing skills in communication, coordination, among other duties. The primary outcome of pain control interventions focuses on reducing pain intensity, while secondary outcomes include effects such as appropriate analgesic use, improved quality of life, and maintaining daily activities.

Development of NNP-CP: design

Through this study, the aim of the developed intervention program is to alleviate pain for cancer patients in need of pain management. This endeavor seeks to enhance the quality of life for cancer patients and promote an increase in self-efficacy and satisfaction regarding the management of their pain. The effects of the intervention program will be verified through changes in these specific variables. Based on a literature review, the content that should be included in the intervention program and the applicable intervention methods in a clinical environment were selected as follows.

- The intervention commences from the point at which pain control is deemed necessary for cancer patients. It starts with nurse-led face-to-face education and counseling interventions in a dedicated space to conduct personalized pain assessments and establish intervention plans.
- Comprehensive pain assessments of the subjects are conducted to set intervention plans and goals. This involves educating them on the use of assessment tools for pain evaluation, considering the condition of the disease, cancer-related pain, the necessity of pain control, and recording pain patterns using pain diaries.
- After education, educational materials regarding cancer-related pain and a pain and analgesic intake diary are provided, based on guidelines for managing cancer-related pain.
- When prescribing analgesics, guidance regarding their usage is given along with an assessment of current medication and ongoing treatment, to establish an analgesic intake plan. Consistent communication among the medical team is encouraged for adherence to the analgesic intake plan.
- Evaluation of pain patterns, adherence to the pain control plan, assessment, and adjustment of analgesic intake for potential side-effects, and additional interventions including emotional support are implemented using methods such as phone calls or face-to-face interactions.
- Additional interventions are scheduled for 2 days and 7 days after the initial education.
- Active methods are employed to encourage communication between the medical team and patients regarding pain control.
- The primary executors of the intervention possess a high understanding of overall oncology and significant clinical experience in pain control for cancer patients, conducted by specialized nurses.
- Counseling is provided to address inquiries regarding pain management.

Development of NNP-CP: development

Development based on professional navigation framework

The pain management navigation program for cancer patients was formulated by arranging and structuring the identified elements from the analysis and design phases within a professional navigation framework to develop an initial draft (Table 3). Aligning with the components of the professional navigation framework, the necessary intervention program content was organized. To incorporate the elements of continuity in the navigation framework and include criteria for pain intensity assessment, the intervention was structured into four sessions on Days 1, 3, 7, and 14, ensuring that all framework-based elements were included for each session. The primary executor of the intervention is an oncology specialized nurse, enabling management response for tumor-related issues, pain management, treatment adjustments, and facilitating interprofessional information sharing. To maintain consistency in content and uphold a trustworthy relationship, a designated nurse responsible for the intervention continuously provides comprehensive intervention. Apart from intervention timings, guidance was provided on how to seek counseling promptly in case of inquiries, ensuring timely assistance. Emergency procedures were included to facilitate immediate movement without waiting for counseling in urgent situations. Securing continuity in management and relationships ensured checking medication levels and adjusted hospital visits for prescription in case of medication shortages, preventing disruption in pain management due to inadequate medication. Supporting effective methods for pain reduction throughout the intervention and planning and implementing efficient strategies to identify and manage situations triggering or exacerbating pain towards the latter stages, aimed to adapt to daily life and enhance coping mechanisms and self-management.

Expert content validation

To ensure the content validity of the developed pain management navigation program for cancer patients, an expert validation of the

Table 3
Pain management navigation program for cancer patient with pain.

Session	Concepts of professional navigation framework						Contents of intervention
	Continuity			Empowerment			
	Informational continuity	Management continuity	Relational continuity	Active coping	Self-management	Supportive care	
#1 on Day1			○				Assignment of nurse for intervention
	○	○					Comprehensive pain assessment (Pain history, presence of breakthrough pain, response to pain treatments, symptoms related to pain apart from cancer, current status of cancer and its treatments, co-existing conditions and chronic pain history before cancer diagnosis, psychosocial evaluation, current medication profile, physical examination, test results)
		○				○	Assessment of support system (Primary caregiver, place of residence, assistive devices, available medical resources)
	○	○	○	○	○		Establishment of pain control goals and plans
	○	○		○	○		Cancer pain education (Understanding the disease and pain, necessity of pain management, methods of pain assessment, pain management plans, impact of pain on daily life, guidance on painkillers and their side-effects)
	○	○		○	○	○	Provision of pain education materials and guidance on pain diary documentation
	○	○		○	○	○	Instructions for emergency room visits if necessary
		○	○	○	○	○	Guidance on additional intervention plans and contact information
	○	○	○				Sharing of information among medical professionals regarding pain medication plans
#2 on Day3		○	○				Assessment of pain in the past 24 hours (maximum, minimum, average), identification of breakthrough pain and its patterns
	○	○	○		○		Verification of analgesic intake history and pain control level
	○	○	○		○		Assessment and adjustment of analgesic side effects
		○	○	○	○		Confirmation and adjustment of adherence with analgesic medications
				○	○	○	Reinforcement of pain control adherence and psychological support
	○	○		○	○	○	Identification and provision of effective methods for pain reduction
		○		○	○	○	Enhancement of pain diary and assessment tool utilization
	○	○				○	Addressing queries related to pain control
#3 on Day7		○	○				Assessment of pain in the last week (maximum, minimum, average), identification of breakthrough pain and its patterns
	○	○	○		○		Verification of analgesic intake history and pain control level
		○	○				Management of remaining analgesics and adjustment of hospital schedules for additional prescriptions
	○	○	○		○		Assessment and adjustment of analgesic side effects
		○	○	○	○		Confirmation and adjustment of adherence with analgesic medications
	○	○		○	○	○	Identification and provision of effective methods for pain reduction
						○	Provision of psychological and social support
	○	○				○	Addressing queries related to pain control
#4 on Day14		○	○				Assessment of pain in the last week (maximum, minimum, average), identification of breakthrough pain and its patterns
	○	○	○		○		Verification of analgesic intake history and pain control level
	○	○	○				Confirmation of new occurrences of pain and re-evaluation
	○	○	○	○	○	○	Identification and provision of effective methods for pain reduction
	○	○	○	○	○	○	Identification and planning of situations triggering or increasing pain
						○	Provision of psychological and social support
		○	○				Review of current analgesic intake and management of remaining medication
	○	○	○				Sharing of information among medical professionals regarding analgesic intake and plans
	○	○				○	Addressing queries related to pain control

preliminary intervention program content was conducted. A total of six experts participated in the content validity verification: one specialist in hematologic oncology, one specialist in anesthesiology and pain medicine, one hospice specialized nurse, and three oncology specialized nurses. Each item's CVI was calculated, ranging from a minimum of 0.83 to a maximum of 1.00. It was confirmed that all items in the intervention program content exceeded the significant CVI value of 0.80, indicating unanimous support from the experts for each item in the intervention program content.

Discussion

This study aimed to develop a nurse-led intervention program based on a professional navigation framework for cancer patients requiring pain control, intending to facilitate effective pain management and provide a foundation for evidence-based clinical practices in oncology pain intervention nursing. While clinical guidelines for managing cancer-related pain have been presented by numerous domestic and international institutions, their practical application in clinical settings has been limited. This study attempted to apply guidelines for managing cancer-related pain in clinical practice and sought continuous, proactive nursing intervention strategies and the development of roles for specialized nurses, which holds significance.

Educating cancer patients requiring pain control, as recommended in preceding intervention studies related to cancer pain management guidelines, is deemed essential. Such education not only contributes to pain reduction but can significantly impact the overall quality of life and survival period for cancer patients. However, due to the nature of persistent assessment needs, pain control plan adherence confirmation, and the characteristics of cancer-related pain, one-time education might not ensure the efficacy and long-term effects of the intervention.[28] Therefore, interventions should encompass ongoing assessment, education, counseling, identification of educational needs, and information provision.

The professional navigation framework developed through this study embodies elements of information, management, and continuity in relationships, suggesting its potential effectiveness in the management of persistent cancer pain requiring continuous intervention. It is anticipated that this framework, which also includes elements of self-management, coping mechanisms, and support, will promote the implementation of pain management plans acquired through education and facilitate the consistent maintenance of pain control. Self-management in cancer pain control refers to the management of physical and psychological consequences resulting from pain, pain medication intake, and cancer-related pain while living with these challenges.[29] Optimal self-management resources encourage reporting pain experiences, support communication with healthcare providers, and facilitate coordination between services to overcome established barriers in cancer pain control.[30]

The repetitive assessments conducted by nurses included in the developed intervention program are seen as an active means for healthcare professionals to understand and report cancer patients' symptoms, thereby benefitting the effective implementation of pain control and self-management in cancer patients.

The developed cancer patient pain management navigation intervention program was designed to be primarily executed by nurses, especially those with specialized expertise in oncology. Insufficient education for healthcare providers is a major and persistent barrier to safe and effective pain management,[31] leading to inadequate knowledge, negative attitudes, and subpar pain management practices.[32] Nurses play a pivotal role in assessing and evaluating patients' pain based on trust and are crucial healthcare providers in reducing barriers. Nurses' perception and knowledge of cancer pain impact pain control interventions,[33] and specialized education can enhance nurses' knowledge and attitudes toward pain management.[34] Therefore, it is believed that professional development through nurse education programs on pain management, including tailored approaches to meet individual patient needs, is essential. Particularly, oncology specialized nurses exhibit a close association between cancer pain and the course of tumors and treatments. Thus, they can provide counseling not only for pain management but also for symptoms related to tumors or treatments, serving as educators, coordinators, advocates, and providers of ongoing support.[35] Considering these roles, utilizing specialized oncology nurses in intervention methods might be worthwhile.

The necessity of cancer pain control has been acknowledged through various domestic and international literature. Numerous studies on interventions for pain control, including guideline development, have been conducted. However, despite these efforts, cancer pain control within clinical settings remains inadequate. Even research-supported clinical guidelines that are anticipated to be effective are challenging to implement. Among the reasons contributing to the inadequate management of cancer pain is the medical staff's indifference and lower prioritization of pain within clinical practice.[7,32] There is a recognized need for healthcare providers to reassess their perceptions of cancer pain and emphasize the necessity for regular assessments. Simultaneously, there appears to be a need for institutional support, possibly through health insurance policies, to facilitate effective implementation of pain-related education and counseling practices, promoting the application of effective interventions.

Limitations

This study is limited to the development of a draft intervention for cancer patients in need of pain control, thus its practical application is restricted. Therefore, it is necessary to conduct additional pilot studies to describe specific intervention methods tailored to the context of clinical practice and to supplement the intervention. Furthermore, experimental studies are needed to confirm the effectiveness of intervention application. Additionally, contents of this study does not include education for nurses providing the intervention. Education for oncology specialized nurses is required to ensure effective implementation and outcomes of the intervention.

Conclusions

Cancer-related pain significantly influences the quality of life and survival period of cancer patients. However, the current reality reflects insufficient intervention regarding its management. Cancer pain manifests diversely based on factors such as etiology, temporal aspects, psychosocial issues, underlying conditions, necessitating personalized intervention plans, continual assessments, and the promotion of self-management for pain management. Through the development of a pain management intervention program based on professional navigation, aiming to enhance continuity of care and empower the recipients, it is anticipated that cancer patients may experience reduced pain, improved quality of life, enhanced self-efficacy, and satisfaction in pain management.

The intervention program developed through this study could potentially lead not only to improvements in pain control and patient satisfaction among cancer patients but also facilitate the establishment of new nursing practice guidelines and foster professional development among nurses. Furthermore, considering the recent emergence and proven efficacy of various application and internet-based intervention programs, there is an expectation that implementing the developed program through this study onto such platforms could expand its practical and effective use within clinical practice.

Ethics statement

Not required

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CRediT authorship contribution statement

Study conception and design acquisition: M. Yoo, M. Jang, S. Kang, & E. Suh. Data collection and analysis: M. Yoo, & E. Suh. Drafting and critical revision of the manuscript: M. Yoo, M. Jang, S. Kang, & E. Suh. All authors had full access to all the data in the study, and the corresponding author had final responsibility for the decision to submit for publication. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of generative AI and AI-assisted technologies in the writing process

No AI tools or services were used during the preparation of this work.

Appendix A.   Supplementary material

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