

การพัฒนาโปรแกรมการส่งเสริมสมรรถนะแห่งตนเพื่อการจัดการความปวด ในผู้ป่วยมะเร็ง: การศึกษานำร่อง

เจีย ทวีล พย.บ.* นุชบา สมใจวงศ์ ปส.ค.**

อศาวลัย พันธุ์พานิชย์ ปส.ค.*** สี่ฝาง เซิง ปส.ค.****

บทคัดย่อ

การศึกษาเพื่อการพัฒนาโปรแกรมส่งเสริมสมรรถนะแห่งตนในการจัดการความปวดของผู้ป่วยมะเร็ง มีขั้นตอนการพัฒนาโปรแกรมส่งเสริมสมรรถนะแห่งตนในการจัดการความปวดของผู้ป่วยมะเร็ง 3 ขั้นตอน คือ 1) ขั้นตอนทบทวนวรรณกรรม 2) การพัฒนาโปรแกรมตามทฤษฎีสมรรถนะแห่งตน และ 3) การประเมินคุณภาพ ความเป็นไปได้ และการยอมรับได้ของโปรแกรม โดยคุณภาพของโปรแกรมประเมินความตรงตามเนื้อหาโดยผู้ทรงคุณวุฒิ 5 ท่าน การยอมรับได้ของโปรแกรม ประเมินจากอัตราการคงอยู่ในโปรแกรม และ ความเป็นไปได้ของโปรแกรม โดยเปรียบเทียบผลลัพธ์ก่อนและหลังเข้าร่วมโปรแกรมของผู้ป่วยมะเร็งที่มีความปวด จำนวน 10 ราย โดยใช้การทดสอบทีแบบคู่ และการทดสอบวิลคอกซ์ ผลการวิจัยพบว่า ค่าดัชนีความตรงของเนื้อหาของโปรแกรมเท่ากับ .98 อัตราการคงอยู่ในโปรแกรมเป็น ร้อยละ 100 ผู้เข้าร่วมโปรแกรมมีระดับความปวดลดลง ($Z = -2.68, p < .01$) และมีคะแนนของสมรรถนะแห่งตนในการจัดการความปวดเพิ่มมากขึ้น ($t = -5.78, p < .01$) จะเห็นได้ว่าการพัฒนาโปรแกรมส่งเสริมการรับรู้สมรรถนะแห่งตนในการจัดการความปวดของผู้ป่วยมะเร็งมีคุณภาพ ความเป็นไปได้ และเป็นที่ยอมรับเพียงพอ ควรมีการศึกษาวิจัยเพิ่มเติมเพื่อยืนยันผลของโปรแกรมนี้น ในโดยใช้กลุ่มตัวอย่างที่มีขนาดใหญ่ขึ้น

คำสำคัญ: การจัดการความปวด ความปวดที่เกี่ยวข้องกับมะเร็ง ผู้ป่วยมะเร็ง สมรรถนะแห่งตน

วันรับบทความ 23 เมษายน 2566 วันแก้ไขบทความ 31 พฤษภาคม 2566 วันตอบรับบทความ 6 มิถุนายน 2566

*นักศึกษาในหลักสูตรพยาบาลศาสตรมหาบัณฑิตนานาชาติ คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น

**ผู้ช่วยศาสตราจารย์ สาขาวิชาการพยาบาลผู้ใหญ่ คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น ผู้จัดทำบทความต้นฉบับ
อีเมล bussom@kku.ac.th

***ผู้ช่วยศาสตราจารย์ สาขาวิชาการพยาบาลผู้สูงอายุ คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น

****คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยแพทยศาสตร์โยวเจียง ประเทศจีน

Development of a self-efficacy promoting program for pain management in patients with cancer: A pilot study

Jia Liu B.N.S.* Busaba Somjaivong Ph.D.**

Ladawan Panpanit Ph.D.*** LiFang Zhang Ph.D.****

Abstract

This article presents the process for the development of a self-efficacy promoting program on pain management among patients with cancer. It consisted of three steps: 1) literature review step, 2) developing a program based on self-efficacy theory, and 3) assessment of program quality, feasibility, and acceptability. The program quality was assessed by verification of the content validity index (CVI) by five experts. The acceptability of the program was determined in terms of retention rate in the program. The feasibility of the program was tested by comparing the outcomes before and after participating in the program among 10 cancer patients with pain using paired t-test and Wilcoxon Rank Sum Test. Findings revealed CVI of the program was .98. Retention rate in the program was 100%. Participants had decreased pain levels ($Z=-2.68$, $p<.01$) and improved pain self-efficacy scores ($t=-5.78$, $p<.01$). Therefore, the development of a self-efficacy promoting program on pain management among patients with cancer had sufficient quality, feasibility, and acceptability. Further research is needed to evaluate the outcome of this program using larger sample size.

keywords: pain management; cancer-related pain; cancer patients; self-efficacy

Received 23 April 2023 Revised 31 May 2023 Accepted 6 June 2023

*A student of the Master of Nursing Science Program in International, Faculty of Nursing, Khon Kaen University

**Assistant professor, Adult Nursing Division, Faculty of Nursing, Khon Kaen University Corresponding author,
E-mail: bussom@kku.ac.th

***Assistant professor, Gerontological Nursing Division, Faculty of Nursing, Khon Kaen University

****Dean of Faculty of Nursing, Youjiang Medical University for Nationalities, China

Background

Cancer has a high incidence worldwide. It is estimated to have 19.3 million new cancer cases in 2020, according to the Global Cancer Watch Network (GLOBOCAN)¹. In China, cancer is by far the most common cause of death. There will be 4,568,754 new cancer cases diagnosed and 3,002,899 cancer deaths expected². Cancer has serious physical, psychological, social, and spiritual impacts on patients. It causes patients to experience several symptoms such as pain, dyspnea, difficulty sleeping, anxious, fatigue, and medication side effects^{3,4}.

One of the most common symptoms of cancer patients is cancer-related pain. It was reported that more than 70 % of cancer patients suffering pain. In addition, cancer-related pain has been inadequately controlled in up to 40 –50% of cancer patients who felt moderate-to-severe pain, despite the availability of effective medications^{5,6}. Cancer-related pain can cause physical and mental health problems. It reduces patients' ability to perform daily activities, with a significant impact on the quality of life of patients and their families. Unrelieved pain can also lead to feelings of loneliness and depression, further undermining the quality of life^{6,7}. Current guidelines for adult cancer-related pain management from the National Comprehensive Cancer Network (NCCN) consider severe uncontrolled pain to be a medical emergency that requires immediate evaluation and treatment⁸. The NCCN guidelines for adult cancer indicate that people need to optimize pain outcomes across five dimensions, including pain relief, psychosocial functioning, minimizing adverse events, avoiding abnormal drug use, and the relationship between pain and mood^{4,8}.

According to the literature review, cancer

patients who experience pain must have a strong belief in their ability to monitor and control pain to change their pain experience or improve their functioning despite pain^{9,10}. Self-efficacy theory (SET) was first mentioned by Bandura in 1977, and mainly refers to the influence of the psychological process on behavioral change. People's self-efficacy can be enhanced in four ways, including direct mastery experience, vicarious experience, verbal persuasion and emotional arousal¹¹. Bandura demonstrated that self-efficacy is a key component of symptom self-management and is essential for the implementation of necessary behaviors. Self-efficacy can increase people's belief, which motivate people's action, and influence outcomes¹².

SET was also applied to pain management in cancer patients, it was associated with time to diagnosis, ability to deal with frustration, and pain severity¹³. Patients with low levels of self-efficacy for cancer pain may be at risk for higher levels of pain because there is a significant inverse relationship between cancer pain self-efficacy and cancer pain severity. Improving self-efficacy promotes pain outcomes and quality of life¹⁴. Several studies have shown that the implementation of a self-efficacy intervention on patients can significantly optimize experimental results. Cancer pain patients with high self-efficacy had better pain self-management, thus achieving lower pain levels and higher quality of life¹⁴⁻¹⁶.

A pre-survey among eight patients with cancer pain at the Affiliated Hospital of Youjiang Medical University for Nationality found that four patients (50%) still have pain after taking medicine. Six patients (75%) do not take any non-pharmacological therapies to relieve pain. In addition,

patients do not have the confidence to control pain. Assessing patients' Pain Self-Efficacy Questionnaire (PSEQ) measurements, patients had an average self-efficacy score of 20 (on a scale of 0–60) indicating they had a low level of self-efficacy to perform pain management. Moreover, there is no intervention based on SET to improve cancer patients' self-efficacy in pain management. Nurses do not teach nonpharmacological pain management, do not empower patients to manage pain alone or provide vicarious experiences for patients to learn. To fill this gap in the existing body of knowledge, the researcher was interested in developing a self-efficacy promoting program to improve cancer patients' self-efficacy and reducing pain. This article is part of a research study on the effects of a self-efficacy promoting program on pain management among patients with cancer. It presents the process for the development of a self-efficacy promoting program on pain management among patients with cancer.

Research Objective

1. To develop a self-efficacy promoting program to promote self-efficacy and reduce pain for cancer patients with pain
2. To test the quality, feasibility, and acceptability of the self-efficacy promoting program in cancer patients with pain.

Conceptual Framework

Self-efficacy theory was used as a framework to study the effects of the program on self-efficacy and pain management among cancer patients. According to Bandura, self-efficacy relates to a person's confidence that with enough effort,

he or she can perform specific tasks. Individuals with high self-efficacy feel that they can carry out the action required to attain the objective, and that this conduct will result in the intended outcome. People with poor self-efficacy, on the other hand, believe that they cannot complete the task. Self-efficacy is the belief in people's ability to act as the agent, which controls people's thoughts and actions and controls the environmental conditions in which people live. Personal efficacy expectations are based on four basic sources of knowledge. Performance accomplishments come from personal experience and have the greatest influence on self-efficacy. Other sources of effective information include vicarious experience of others' success through hard work, verbal persuasion that has a positive impact on self-efficacy, and physiological arousal that determines one's own anxiety level and vulnerability to stress¹¹.

Literature suggested that the ability to monitor and control pain, was necessary for cancer patients who suffer pain, to change their pain experience or improve their ability to function despite their pain^{9,10}. According to this theory, the researcher developed the self-efficacy promoting program according to the four sources of self-efficacy. The first source was performance accomplishments. Patient's direct mastery experiences were promoted through the following measures: 1) A pain management manual was used to explain cancer-related pain to patients; including classification, evaluation, pharmacological and non-pharmacological treatment, and related side effects of cancer pain medications. 2) The researcher taught and facilitated patients in relation to non-pharmacological pain management. 3) Problems

and difficulties in pain management encountered by patients were analyzed to enhance their confidence. The achievement was encouraged for those who had good pain management. The second source was a vicarious experience, the researcher showed the patient a video of an oncology patient sharing his/her success in managing pain and some examples from the internet. The third source was verbal persuasion, the researcher used face-to-face communication between medical staff and patients, to persuade them to maintain good behaviors. The last source of self-efficacy theory was emotional arousal, which was a state of heightened physiological activity^{17,18}. The researcher encouraged the patient's family to give psychological support to the patient. The research's conceptual framework was illustrated in Figure 1.

Method

This study consisted of three phases: a literature review phase; a program development phase based on self-efficacy theory; and a program quality, feasibility, and acceptability evaluation phase.

1. The literature review phase

The researcher reviewed the literature on the promotion of self-efficacy and pain management. The researcher found many papers that study interventions to increase self-efficacy. These articles were about the same pain problem in the same population^{9,13,16}. Self-efficacy theory

has been widely used in nursing research and achieved good outcomes^{19,20}. In chronic diseases, self-efficacy research has focused on self-management of symptoms associated with chronic disorders, such as pain, and indicates that self-efficacy has been linked to pain management outcome behaviors²¹. Self-efficacy plays an important mediating role in cancer pain management. It can increase patients' confidence in dealing with disease and pain, as well as reduce patients' anxiety and fear^{13,22}. A study conducted by Xu and Shi showed that self-efficacy intervention for cancer pain patients can improve their self-efficacy and relieve their pain level²³. This program was implemented in 15 days because a randomized controlled trial of self-efficacy in lung cancer patients with pain showed that 15 days of self-efficacy intervention could significantly improve patients' self-efficacy and quality of life²⁴.

2. The phase of program development based on self-efficacy theory

The program development activities based on the conceptual framework are as follows (Table 1)

2.1 Performance accomplishments

The researcher developed a pain management manual for cancer patients. Details of the manual included definition cancer-related pain^{25,26}, pain classification^{27,28}, impacts of pain⁴, pain evaluation^{28,29}, pain management^{30,31}, and medication side effects⁴.

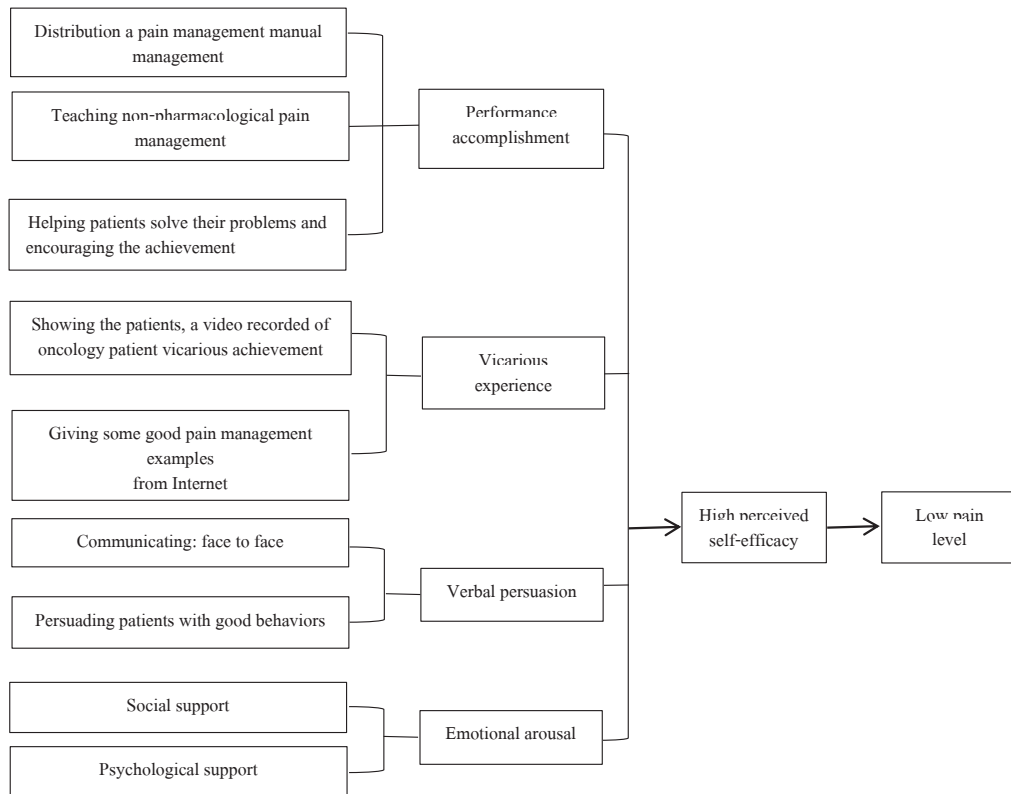


Figure 1: Conceptual framework of this Study

In addition, the researcher taught patients non-pharmacological pain management and facilitated them to perform it for 20 minutes in 15 days³⁰. In case of any problem arose, the researcher analyzed the problems and encouraged patients' achievement³². Patients also were provided instruction to complete a pain diary¹⁶.

2.2 Vicarious experiences

The researcher showed patients a video to demonstrate good pain management and gave some examples from the Internet^{20,33}

2.3 Verbal persuasion

The researcher used face-to-face communication to persuade patients³⁴.

2.4 Emotional arousal

The researcher encouraged the patient's family and friends to give psychological support to patients^{35,36}

Table 1 A self-efficacy promoting program in cancer pain patients

Time	Activities	Minutes
Day 1	Meeting and Pretest <ul style="list-style-type: none"> – meet participants in the hospital at 10:00. – collect data on demographic information, PSEQ, and pain level using NRS Performance accomplishments <ul style="list-style-type: none"> – provide the patient with a pain management manual – help patients to participate and choose non-pharmacological pain management for 20 minutes per day – instruct patients to complete a pain diary – analyze causes of problems and difficulties encountered by patients to enhance their confidence in pain management. Vicarious experience <ul style="list-style-type: none"> – show the patient a video of an oncology patient sharing their success in managing pain – demonstrate some successful examples of pain control online for the patient. 	40
Day 2	Verbal persuasion <ul style="list-style-type: none"> – use face-to-face communication between medical staff and patients Emotional arousal <ul style="list-style-type: none"> – provide psychological care to the patient and encourage family members to actively participate in the patient's pain management. Performance accomplishments <ul style="list-style-type: none"> – ask whether patients perform non-pharmacological or record diary as recommended, they will get encouragement when they complete it – follow the patient's pain score from the oncology pain assessment form 	30
Day 3-5	<ul style="list-style-type: none"> – monitor patients' non-pharmacological management every day at the hospital – ask the patients whether they have a problem with pain management. If patients have a problem, the researcher will solve the problem together with them. – make sure that every patient can record pain levels correctly – follow the patient's pain score from the oncology pain assessment form (from 11 am on the previous day to 11 am on the current day) and pain diary. 	25
Day 6-14	<ul style="list-style-type: none"> – monitor patients' non-pharmacological management and record patient's pain level according to their pain diary every day by telephone – ask the patients if they have a problem with pain management. If patients have a problem, the researcher will assist them to solve the problem. 	5
Day 15	<ul style="list-style-type: none"> – record patient's pain level according to their pain diary – complete the PSEQ 	10

3. The phase of program quality, feasibility, and acceptability evaluation

3.1 Verification of the program was done by five experts: two lecturers, two clinical specialist nurses, and one oncology physician (two experts are lecturers, one was from the Faculty of Nursing, Khon Kaen University, Thailand and one was from Youjiang Medical University for Nationality, China. Both of them are knowledgeable in the oncological area. One expert was a head nurse of the oncology department at the Affiliated Hospital of Youjiang Medical University for Nationality in China. She was a clinical specialist nurse and had been working for 30 years in the field of the oncology department. Another expert was a deputy head nurse and clinical specialist nurse at the Affiliated Hospital of Youjiang Medical University for Nationality in China. She had been working for 13 years in the field of oncology department. The last expert was a doctor of the oncology department at the Affiliated Hospital of Youjiang Medical University for Nationality in China. He was an experienced doctor and had been working for 10 years in the field of oncology department). The program was revised according to the expert's suggestion. The experts determined whether the content, mode, activities, and tools of the program were fully appropriate. The language used applicability, clarity and consistency was checked. The consistency of the program and the conceptual frameworks was also examined.

3.2 After the program had been quality checked, it was then tested for cancer patients in order to conduct feasibility and acceptability tests. This study was a pilot study with the following inclusion criteria: 1) were 18 years old or over; 2) had been diagnosed with cancer; 3) were aware of their cancer

diagnosis; 4) had pain score ≥ 4 on a scale of 0–10; 5) were able to write, read, and speak Chinese; 6) were willing to participate in the study; 7) had no history of disease affecting cognitive, such as dementia or mental disorders (according to patient's medical records); 8) had no condition precluding participation in this study, such as body temperature > 38.5 , respiration > 24 beats/min, pulse > 110 beats/min, blood pressure $> 160/110$ mmHg), severe fatigue, difficulty breathing, and confusion.

This study was conducted at Affiliated Hospital of Youjiang Medical University for Nationality in Baise City, Guangxi Province, China. It used a consecutive sampling method. Researcher selected 10 cancer patients with pain who meet the inclusion criteria. This study was approved by the Ethical Committee of Human Research, Khon Kaen University, Thailand (HE 652153, 09 Sep 2022) and Affiliated Hospital of Youjiang Medical University for Nationality for legal acceptance and human subject protection (YYFY-LL-2022-46).

Research instruments

Instrument used to measure self-efficacy of cancer patients was the Pain Self-efficacy Questionnaire (PSEQ), which consists of 10 items. Each item was rated on a scale of 7, with 0 being completely insecure and 6 being completely confident. The total score is calculated by adding up the scores for each of the 10 items, with a maximum possible score of 60 points. The higher the score, the stronger the self-efficacy. The simple Chinese version of PSEQ is tested in mainland China and the validity of it ranges from .69–.88, and reliability of PSEQ is .95³⁷. The reliability of PSEQ in this study was .96 as tested by alpha Cronbach. The Numeric Rating

Scale (NRS) was used to rate pain on a scale of 0 to 10, with 0 representing no pain and 10 indicating the worst pain. Three levels of pain are mild pain (1–3), moderate pain (4–6), and severe pain (7–10)³⁸. NRS is widely acceptable to assess pain in the world, it is the simplest and convenient method.

Data analysis

Evaluating the feasibility of the project by comparing the pain self-efficacy score and pain score before and after participating in the program among 10 participants using Statistical Package of Social Science (SPSS). All the data was tested normality, using the Shapiro–Wilk test. The results showed that pain self-efficacy score was normal distribution, and pain score was abnormal distribution. The comparison of pain self-efficacy score was then analyzed using paired t-test; and comparison of pain score was analyzed using Wilcoxon Rank Sum Test.

Results

Findings of the study were provided in relation to program development results, as well as the quality, feasibility and acceptability of the program. The developed self-efficacy promoting program included four aspects: performance accomplishment,

vicarious experience, verbal persuasion and emotional arousal.

The quality of the program was evaluated in terms of content validity index (CVI) by five experts. According to Almanasreh and colleagues, an acceptable I-CVI (item content validity index) of more than .78 and an average CVI of more than .90 are required. The CVI is based on 5 expert judgments of each item's content relevance or representativeness, usually on 4-point Likert scales ranging from 1 (not relevant or representative) to 4 (extremely relevant or representative)³⁹. The content validity of the demographic questionnaire and the self-efficacy promoting program on pain management were .90 and .98, respectively. The feasibility of self-efficacy promoting program on pain management was .99. The content validity and feasibility of this project had been certified by five experts. Implementation in patients was further confirmed.

2. Program acceptability and feasibility

An acceptance assessment of the project found that ten participants were involved in all program activities until its completion. The retention, therefore, was 100%. Two program outcomes were self-efficacy and pain levels as shown in Tables 2 and 3

Table 2 Comparison of the mean pain self-efficacy score using paired t-test

Time	n	\bar{X}	S.D.	95 % CI of \bar{d}	t	df	p-value
Pretest	10	24.30	5.33	-14.89 to -6.51	-5.78	9	< .01
Posttest	10	35.00	5.01				

\bar{X} =mean; S.D.=standard deviation; \bar{d} =mean difference; CI=confident interval

Table 3 Comparison of the mean pain score by using Wilcoxon Rank Sum Test

Time	n	Mean Ranks	Sun of ranks	z	p-value
Positive ranks	8	5.50	44	-2.68	< .01
Negative ranks	1	1.00	1		
Ties	1				

Positive ranks = posttest > pretest, negative ranks = posttest < pretest, ties = posttest = pretest

Discussion

This self-efficacy promoting program in cancer pain patients had four components (performance accomplishment, vicarious experience, verbal persuasion and emotional arousal). The project's quality, feasibility and acceptability were evaluated and achieved good results.

Cancer patients with pain who participated in this developed project had better understanding of cancer pain. Based on the principle of self-efficacy theory, through the manual and pain diary, patients could actively participate in pain control and gained subjective experience of pain. Moreover, through videos and persuasion by medical staff, they could obtain indirect experience of pain and improved their confidence in pain management. In addition, emotional support helped them express their feelings, leading to feeling taken care for by their families, and improving their confidence in coping with the disease. After 15 days of the program, the study found that the self-efficacy promotion program significantly enhanced patients' confidence in pain management, thereby improving their pain levels.

Self-efficacy promoting program are procedures that allow patients to gain more experience and support, which can be used to improve patients' self-efficacy and reduce their symptoms. The

developed self-efficacy promoting program can be applied for cancer pain patients to help them relieve pain and enhance quality of life. The program used a manual, according to the literature review, and pain diary to improve patients' performance accomplishment^{16,31}. The study sample applied available and low cost non-pharmacological pain treatments, such as music and yoga. This is consistent with non-pharmacological pain management in many studies^{40,41}. The duration of the non-pharmacological treatments was approximately once a day for 20 minutes, and patients do it for 15 days which was also mentioned in the study of Behzadmehr and college³⁰. The study sample gained vicarious experiences of successful pain management from others via video. In addition, a study conducted by Novy and Aigner also found that patients can get more confidence in pain management with other people's persuasion and family support³⁵.

This study describes the self-efficacy promoting program for cancer pain patients, which was validated by a panel of 5 experts in the field of expertise and the CVI was 0.98. The program was found to be highly effective, receiving high marks for each item of the program. It could improve the patient's confidence in coping with pain and reduce the patient's pain level. The program is valid and

feasible enough to apply to cancer patients who are troubled by pain. When people have knowledge and understand cancer pain, they can clearly express their own pain and actively participate in recording their own pain, contributing to good experience in cancer pain management. Successful cancer pain management can make patients gain higher self-confidence, enabling them to maintain health and balance, both physically and mentally^{42,43}.

The self-efficacy promoting program had been developed using concise and systematic process and revised according to expert advice for further completion of the program. The program had sufficient quality, feasibility, and acceptability; which can assist cancer pain patients to achieve pain relief and promote self-efficacy.

Recommendation

This program was developed as part of research on the effects of a self-efficacy promoting program on pain management among patients with cancer. The program should be applied for cancer patients with pain in similar contexts. Further studies should be conducted, using larger sample size and multiple measurements.

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA* 2021;71(3):209-49.
2. Cao W, Chen HD, Yu YW, Li N, Chen WQ. Changing profiles of cancer burden worldwide and in China: A secondary analysis of the global cancer statistics 2020. *Chin Med J* 2021;134(7):783-91.
3. Kroker L, Dubois C, Münstedt K, Büntzel J, Keinki C, Hübner J. A pilot study of side effects of cancer therapies and their impact on satisfaction with life. *Cancer Investigation* 2019;37(4-5):216-26.
4. Swarm RA, Paice JA, Angheliescu DL, Are M, Bruce JY, Buga S, et al. Adult cancer pain, version 3.2019, NCCN clinical practice guidelines in oncology. *JNCCN* 2019; 17(8):977-1007.
5. Koller A, Miaskowski C, De Geest S, Opitz O, Spichiger E. A systematic evaluation of content, structure, and efficacy of interventions to improve patients' self-management of cancer pain. *J Pain Symptom Manage* 2012;44(2):264-84.
6. Neufeld NJ, Elnahal SM, Alvarez RH. Cancer pain: A review of epidemiology, clinical quality and value impact. *Future Oncology (London, England)* 2017; 13(9):833-41.
7. Ngamkham S, Holden JE, Smith EL. A systematic review: Mindfulness intervention for cancer-related pain. *APJON* 2019;6(2): 161-9.
8. National Comprehensive Cancer Network. Clinical practice guidelines in oncology (NCCN Guidelines®) adult cancer pain, version USA: Comprehensive Cancer Network, Fort Washington, PA; 2015.
9. Cheng L, Wei K, Zhang Q, Zhang Q, Han YL, Hu JL. Effects of self-efficacy intervention on self-efficacy, pain, sleep quality and quality of life in patients with gastric cancer. *Advances in Cancer* 2021; 12:1280-3.

10. Te Boveldt N, Vernooij-Dassen M, Leppink I, Samwel H, Vissers K, Engels Y. Patient empowerment in cancer pain management: An integrative literature review. *Psycho-Oncology* 2014;23(11):1203-11.
11. Bandura A. Self-efficacy, the exercise of control. New York; Freeman and Co, 1997.
12. Bandura A. Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 2001;52:1-26.
13. Anderson A, Starkweather A, Cong X, Kim K, Schulman-Green D, Judge M, et al. Self-efficacy survey study of pain self-management in patients with cancer. *Pain Management Nursing* 2022;23(4):486-93.
14. Chirico A, Lucidi F, Merluzzi T, Alivernini F, Laurentiis M, Botti G, et al. A meta-analytic review of the relationship of cancer coping self-efficacy with distress and quality of life. *Oncotarget* 2017;8(22):36800-11.
15. Royani Z, Rayyani M, Vatanparast M, MahdaviFar M, Goleij J. The relationship between self-care and self-efficacy with empowerment in patients undergoing hemodialysis. *Military Caring Sciences Journal* 2015;1(2):116-22.
16. Zhang XX. Effect of a self-efficacy intervention on cancer pain in patients with advanced liver cancer. Inner Mongolia medical university; 2019.
17. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological review* 1977;84(2):191-215.
18. Bandura A. Self-efficacy mechanism in physiological activation and health-promoting behavior. In J. Madden IV, S. Mathysse, J. Barchas (Eds.), *Adaptation, learning, and affect*. New York: Raven Press. 1986b.
19. Sheeran P, Maki A, Montanaro E, Avishai-Yitshak A, Bryan A, Klein WM, et al. The impact of changing attitudes, norms, and self-efficacy on health-related intentions and behavior: A meta-analysis. *Health psychology: Official journal of the division of health psychology. American Psychological Association* 2016; 35(11):1178-88.
20. Zhang M, Chan SW, You L, Wen Y, Peng L, Liu W, et al. The effectiveness of a self-efficacy-enhancing intervention for Chinese patients with colorectal cancer: A randomized controlled trial with 6-month follow up. *IJNS* 2014;51(8): 1083-92.
21. Smith MJ, Liehr PR. Middle range theory for nursing (3rd ed.). Springer. 2014.
22. Yang B, Zhao Y, Wang YP, Sun YH, Xie BY. The role of health education model in improving self-efficacy of patients with advanced cancer pain. *Chinese Journal of Practical Nursing* 2016; 5:334-7.
23. Xu L, Shi YH. The effect of self-efficacy intervention on cancer pain in patients with malignant tumor during radiotherapy and chemotherapy. *Chinese community physicians* 2019;(32):158-60.
24. Wu YH, Chen WY, Shui XF, Xu LS. Application of self-efficacy in the nursing of patients with lung cancer pain. *Chinese Modern Doctor* 2017;55(8):149-52.
25. Bennett MI, Kaasa S, Barke A, Korwisi B, Rief W, Treede RD; IASP Taskforce for the classification of chronic pain. The IASP classification of chronic pain for ICD-11: chronic cancer-related pain. *Pain* 2019;160(1): 38-44.

26. Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, et al. The revised international association for the study of pain definition of pain: Concepts, challenges, and compromises. *Pain* 2020;161(9):1976–82.
27. Caraceni A, Shkodia M. Cancer pain assessment and classification. *Cancers* 2019; 11(4):510.
28. Fink RM, Gallagher E. Cancer pain assessment and measurement. *Seminars in Oncology Nursing* 2019;35(3):229–34.
29. Fallon M, Giusti R, Aielli F, Hoskin P, Rolke R, Sharma M, et al. Management of cancer pain in adult patients: ESMO clinical practice guidelines. *Ann Oncol* 2018; 29(Suppl 4):iv166–91.
30. Behzadmehr R, Dastyar N, Moghadam MP, Abavisani M, Moradi M. Effect of complementary and alternative medicine interventions on cancer related pain among breast cancer patients: A systematic review. *Complementary Therapies in Medicine* 2020;49:102318.
31. Lara-Solares A, Ahumada Olea M, Basantes Pinos A, Bistre Cohén S, Bonilla Sierra P, Duarte Juárez ER, et al. Latin-American guidelines for cancer pain management. *Pain Management* 2017;7(4): 287–98.
32. Yang YQ. Effect analysis of self-efficacy theory in nursing of cancer pain patients. *Electronic Journal of Practical Clinical Nursing* 2020;5(23):142.
33. Li X. Application of the theory of self-efficacy intervention for nasopharyngeal carcinoma research on the effects of radiation and chemotherapy patients quality of life after discharge. *Guangxi Medical University*;2015.
34. Yang R, Lu Z, Gu X, Dai B. The effect of an information support program on self-efficacy of prostate cancer patients during hormonal therapy. *APJON* 2021;8(6):639–52.
35. Novy DM, Aigner CJ. The biopsychosocial model in cancer pain. *COSPC* 2014; 8(2): 117–23.
36. Stanton AL, Luecken LJ, MacKinnon DP, Thompson EH. Mechanisms in psychosocial interventions for adults living with cancer: opportunity for integration of theory, research, and practice. *JCCP* 2013; 81(2): 318.
37. Yang Y, Yang M, Bai J, Zhao J, Chen K, Zhou X, et al. Validation of simplified chinese version of the pain self-efficacy questionnaire (SC-PSEQ) and SC-PSEQ-2 for patients with nonspecific low back pain in mainland china. *Spine* 2019;44(20): E1219–26.
38. Gunnarsdottir S, Zoëga S, Serlin RC, Sveinsdottir H, Hafsteinsdottir E, Fridriksdottir N, et al. The effectiveness of the pain resource nurse program to improve pain management in the hospital setting: A cluster randomized controlled trial. *IJNS* 2017;75:83–90.
39. Almanasreh E, Moles R, Chen TF. Evaluation of methods used for estimating content validity. *Research in Social and Administrative Pharmacy* 2019;15(2): 214–21.
40. Carson JW, Carson KM, Olsen M, Sanders L, Westbrook K, Keefe FJ, et al. Yoga practice predicts improvements in day-to-day pain in women with metastatic breast cancer. *J Pain Symptom Manage* 2021;61(6):1227–33.
41. Keenan A, Keithley JK. Integrative review: Effects of music on cancer pain in adults. *Oncology Nursing Forum* 2015;42(6):

- E368-75.
42. Foster C, Breckons M, Cotterell P, Barbosa D, Calman L, Corner J, et al. Cancer survivors' self-efficacy to self-manage in the year following primary treatment. *JCSRP* 2015;9(1):11-9.
43. Wang YN, Yin YJ. Effects of self-efficacy intervention on cancer pain in patients with malignant tumor during radiotherapy and chemotherapy. *Nursing Practice and Research* 2018; 16:89-91.