

Effectiveness of Education Program on Nursing Knowledge and Attitude toward Pain Management

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ABSTRACT

Objective: Nurses have an integral role in pain assessment and management. Adequate knowledge and positive attitudes toward pain management are essential to provide high-quality nursing care for cancer pain. The purposes of this study are to evaluate nurses' knowledge and attitude toward cancer-related pain and to assess the effectiveness of a pain management education program on nurses' knowledge and attitude toward pain. **Methods:** A quantitative, experimental design was used. **Results:** The total number of participants who were surveyed at three measurement points was 131, with a completion rate of 87.3%. Findings revealed that the score of knowledge and attitude toward cancer-related pain ranged from 14 to 35, with a mean of 23.6 (standard deviation [SD] = 4.38). The mean scores of the

intervention group and the control group at two measurement points regarding knowledge and attitude toward cancer-related pain were 32.7 (SD = 2.8) and 32.8 (SD = 4.3) and 23 (SD = 5.5) and 22.2 (SD = 3.8), respectively. There were significant differences at three measurement points among the intervention group ($F = 114.3, P < 0.0005$). There were no differences in the three measurement points among the control group ($F = 3.4, P = 0.055$). **Conclusions:** Nurses have essential roles in cancer pain. A pain management education program can improve nurses' knowledge and attitude toward cancer-related pain.

Key words: Attitude, cancer pain, education program, knowledge

Introduction

Cancer-related pain is defined as pain that is attributable to cancer or its therapy.^[1] Cancer-related pain is a serious clinical problem^[2] and is one of the worst experiences for patients with cancer and their family^[3,4] and is still inadequately treated.^[5] A systematic search of the studies published between September 2005 and January 2014 was performed using the databases PubMed, Medline, EMBASE, CINAHL, and Cochrane. Articles in English or Dutch that reported on the prevalence of cancer pain

in an adult cancer population were included. The analysis revealed that pain prevalence rates were 39.3% after curative treatment; 55.0% during anticancer treatment; and 66.4% in advanced, metastatic, or terminal disease.^[6] Moderate-to-severe pain was reported by 38.0% of patients in the studies.^[6]

Cancer is a major disease burden worldwide; the GLOBOCAN 2018 estimates of cancer incidence and mortality produced by the International Agency for

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Research on Cancer state that there will be an estimated 18.1 million new cancer cases and 9.6 million cancer deaths in 2018.^[7] According to the Jordan Cancer Registry^[8] in 2014, 8716 new cancer cases occurred in Jordan,^[8] and 4293 cases received oncology treatment at King Hussein Cancer Center (KHCC) in 2015.^[9] A study was conducted among 12 European countries aimed to assess the prevalence of cancer-related pain. It was found that 59% of patients with cancer complained from moderate to severe pain in the last weeks of their life.^[10] In the United States, Fisch *et al.* reported that 67% of patients with cancer have pain, and 33% of them have inadequate pain treatment.^[11] In Jordan, a study by Al Qadire *et al.* found that 73.3% of Jordanian patients with cancer experienced pain.^[5]

Cancer-related pain is a multidimensional syndrome with a mixture of acute and chronic pain.^[4] In addition to the physical harm, pain causes psychosocial, behavioral, emotional, and spiritual problems resulting in a significant negative impact on the patients' quality of life.^[12-14] It may impede the performance of daily activities, and it interferes with patients' work and lifestyle.^[10,13] In addition, it may affect the patient's psychosocial health by causing anxiety, depression, and increasing suicidal ideation.^[15] It also diminishes social interaction and increases family encumbrance.^[16] Delgado-Guay *et al.* reported real effects of pain on the spirituality of patients with cancer and that spiritual pain is common in advanced stages.^[17]

Nurses have fundamental and multidimensional roles in cancer pain, which include pain assessment and reassessment continuously, management using pharmacological and nonpharmacological approaches, teaching patients and their family about medication, pain assessment and treatment plan, and being the patients' advocate to assure that patients get their rights in pain treatment.^[18] However, to achieve all of these roles, sufficient knowledge and positive attitudes toward pain management are required. Nurses hold negative attitudes and have insufficient knowledge toward cancer pain management.^[15,19] Tufekci *et al.* (2016) reported that 92% of nurses did not know that 5 mg hydrocodone orally is equal to 5–10 mg morphine orally, about 85% did not know that they should not administer opioids according to the source of pain, and about 81% did not know that morphine does not have dose ceiling.^[20] Nega *et al.* reported that 89% of nurses believed that vital signs and body expressions are more reliable than a patient's words regarding pain intensity.^[21] Another study result revealed that nurses believed that patients' words are not valid to indicate pain intensity.^[22] Among Jordanian nurses, a study revealed that about 90% of nurses had incorrect information regarding if needed opioid administration^[19,23] and 85% of them did not know that administering oral morphine regularly is more effective

in managing cancer-related pain.^[19] Furthermore, Al Qadire and Al Khalaileh reported that nurses still have a wrong belief about opioid addiction and about the effect of using placebo.^[19]

Therefore, it is clear that there is a lack of knowledge and passive attitudes toward cancer pain management among nurses.^[19] There is a need to focus on nurses' pharmacological information and knowledge regarding cancer-related pain management. Obtaining information about nurses' knowledge and attitude toward cancer-related pain management would have a significant role in managing cancer-related pain.^[24] Knowledge and attitude toward cancer refer to a comprehension of facts and ideas of nurses regarding pharmacological and nonpharmacological approaches to pain relief and a persisting set of beliefs and values that affect how one responds or reacts when pain is involved.^[25,26] The aim of the study is to evaluate nurses' knowledge and attitude toward cancer-related pain and to assess the effectiveness of a pain management education program on nurses' knowledge and attitude toward pain.

Methods

Research design

A quantitative, experimental design was used to evaluate the effect of a pain education program on nurses' knowledge and attitude toward pain.

Participants

All nurses available at the time of data collection were targeted. Based on the power of 0.8 with medium effect size and α of 0.05, the sample size obtained was 128 nurses (64/group).^[27] This study enrolled 150 nurses (75/group) to avoid the attrition problem. The inclusion criteria were being a registered nurse, with experience more than 3 months at KHCC, and consent to participate in the study.

Research intervention

The program, aimed at improving nurses' knowledge and attitude regarding pain and pain management, was composed of a structured pain education program. The content was developed from current standards of pain management.^[28-33] The program included ten educational sessions; each session covered a specific topic related to pain management, including epidemiology and the burden of pain, pain definition, type of pain, pain theory, basic pain management, pain assessment, cancer pain and cancer pain management, chronic pain and chronic pain management, and pharmacological and nonpharmacological pain management.

The program was provided at the training and continuing education centers as they had the appropriate room size,

lighting, ventilation and air conditioning, and modern training equipment. The training program was provided over two consecutive days, eight hours of training were given in each day.

The 1st day included five educational sessions. Each session covered a specific topic: (1) introduction to pain management, the content of which covered epidemiology and the burden of pain, pain definition; (2) type of pain, pain theory; (3) basic pain management; (4) pain assessment; and (5) cancer pain. The sessions at the 2nd day covered: (1) cancer pain management; (2) acute and chronic pain; (3) pharmacological pain management; (4) nonpharmacological pain management; and (5) case study. Different strategies were used, including lectures, discussions, case studies, and pain assessment tools (Descriptive Pain Scale, Numeric Rating Scale, Facial Pain Scale, Visual Analog Scale, and Face, Legs, Activity, Cry, and Consolability scale).

Instrument

The instrument used included two sections: the demographic part and the Knowledge and Attitudes Survey Regarding Pain. Demographic data included age, gender, level of education, years of experience, and hospital settings.

The Knowledge and Attitudes Survey Regarding Pain was developed by Ferrell and McCaffery. This tool was established to evaluate the knowledge and attitude among health-care professionals.^[26] The permission to use this tool and modify it was obtained from the original author.

The Knowledge and Attitudes Survey Regarding Pain was used since its development.^[13,15,34-40] It consists of 40 items, but in this study, 39 items were used to measure both knowledge and attitude toward cancer (the tool does not separate between knowledge and attitudes). The items were classified into three parts; the first part included 21 true/false questions, and the second part was composed of 14 multiple-choice questions. Participants were instructed to select the correct answer, which reflected to their pain management knowledge and attitude. The third part included two case scenarios, each one followed by two questions. The reliability of the scale was assessed, which revealed consistence with test-retest reliability ($r = 0.80$), and the internal consistency reliability (alpha) was $r = 0.7$, with items reflecting both knowledge and attitude domains.^[26] The modified Knowledge and Attitudes Survey score ranges from 0 to 39.

Ethical approval

This study obtained the approval of the institution review board (IRB). Participants were assured that their participation was voluntarily. The purpose of the study was clearly explained to the participants. Participants were

informed that they can withdraw from the study at any time without compromising their work. Confidentiality was guaranteed and the subjects were assured about the anonymity of their data and the individual responses were not to be shared. Informed consent was signed. A locked file cabinet to store all data for this study was used. In addition, the approval to use the tool was obtained from its original author.

Procedures

After obtaining the IRB approval, the participants were approached and selected according to the inclusion criteria. The consent form was signed before data collection and was subsequently assigned with a coding number. Participants were randomly assigned to either the experimental or the control group using the code number, which was printed on the package of the questionnaire; the participant who held an even number was assigned to the experimental group and the participant who held an odd number was assigned to the control group. The package with the printed code number (1–150) containing demographic data sheet and Knowledge and Attitudes Survey Regarding Pain was distributed.

The baseline data (F1) were collected from both the groups (control and experimental) to assess nurses' knowledge and attitude toward pain and to assess equivalence between the groups. The nurses in the intervention group received the structured pain educational program over 2 days, whereas the nurses in the control group did not receive any intervention. Follow-up assessment for the nurses in the experimental group and the control group was performed after the intervention (education end) and 1 month later for The Knowledge and Attitudes Survey Regarding Pain.

Statistical analysis

Statistical analysis was carried out using the IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp data analysis software (IBM). Descriptive statistics were used to describe the demographic characteristics and study variables based on the level of measurements. Chi-squared was used to compare between control and intervention group-related participants' characteristics. In addition, independent sample *t*-test was used to test the differences between the control and experimental groups at baseline, after the intervention, and at 1 month (F3). ANOVA was used to test the difference between mean scores at three measurement points of the control and experimental groups.

Results

Participants' characteristics

The study had 150 participants. All participants were randomly assigned to either the experimental or the control group. The total number of participants who were surveyed at three measurement points was 131, with a completion rate of 87.3%. Completion rates among the intervention group were 84.0% (63/75) and 90.5% (68/75) among the control group. Sixty-three participants received a comprehensive pain education program, and 68 participants served as a control group. In the intervention group, 60.3% were male, the majority had a bachelor degree, 90.5%, and 46% worked in the surgical and medical oncology department, respectively, 36.5% received a training program regarding pain management among cancer patient, and 69.8% had had 4 years or less of experience in the oncology unit. In the control group, 47.1% were male, 76.5% had a bachelor degree, and 48.5% worked in the surgical and medical oncology department, 54.4% received a training program regarding pain management among cancer patient, and 57.4% had had 4 years or less of experience in the oncology unit [Table 1].

Chi-squared was used to compare between the control and the intervention groups. There was no significant difference between both the groups with regard to age ($\chi^2 = 1.41$, $P = 0.35$), gender ($\chi^2 = 4.06$, $P = 0.08$), educational level ($\chi^2 = 0.22$, $P = 0.99$), experience in an oncology unit ($\chi^2 = 0.01$, $P = 0.99$), or pain management training ($\chi^2 = 1.15$, $P = 0.42$) [Table 1].

Nurses' knowledge and attitude toward cancer-related pain

The baseline data showed that the score of knowledge and attitude toward cancer-related pain ranged from 14 to 35, with a mean of 23.6 (standard deviation [SD] = 4.38). In both the control group and the intervention group, the mean score of knowledge and attitude toward cancer-related pain was 23.1 (SD = 3.7) and 24.2 (SD = 4.9), respectively. There were no differences between the mean scores of knowledge and attitude toward cancer-related pain in the control and the intervention groups ($t(129) = 1.5$, $P < 0.135$) [Table 2]. After the intervention, the mean scores of the intervention group at two measurement points regarding knowledge and attitude toward cancer-related pain were 32.7 (SD = 2.8) and 32.8 (SD = 4.3). In the control group, the mean score of the knowledge and attitude toward cancer-related pain was 23 (SD = 5.5) and 22.2 (SD = 3.8) at two measurement points. The independent t -test found that there was a significant difference between the control group and the intervention group at the two measurement points ($t(129) = 12.6$, $P < 0.0005$) ($t(129) = 16.6$, $P < 0.0005$) [Table 2].

ANOVA was used to test differences between the three measurement points of the intervention and the control groups regarding the mean scores of knowledge and attitude toward cancer-related pain. There were significant differences at three measurement points among the intervention group ($F = 114.3$, $P < 0.0005$). There were no differences in the three measurement points among the control group ($F = 3.4$, $P = 0.055$) [Table 3].

Table 1: Participants' characteristics (n=131)

Variable	Intervention group (n=63), n (%)	Control group (n=68), n (%)	χ^2	P
Age (years)				
≤27	31 (49.2)	39 (57.4)	1.14	0.35
≥28	32 (50.8)	29 (42.6)		
Gender				
Male	38 (60.3)	32 (47.1)	4.06	0.08
Female	25 (39.7)	36 (52.9)		
Educational level				
Bachelor degree	57 (90.5)	52 (76.5)	0.22	0.99
Master degree	6 (9.5)	16 (23.5)		
Working place				
Surgical and medical	29 (46)	33 (48.5)	-	-
Bone marrow transplantation	13 (20.6)	17 (25)		
Emergency	9 (14.3)	10 (14.7)		
Intensive care	6 (9.5)	3 (4.4)		
Others	6 (9.5)	5 (7.4)		
Experience in oncology unit (years)				
≤4	44 (69.8)	39 (57.4)	0.01	0.99
≥5	19 (30.2)	29 (42.6)		
Pain management training				
Yes	23 (36.5)	37 (54.4)	1.15	0.42
No	40 (63.5)	31 (45.6)		

Discussion

Nurses have an integral role in pain assessment and management as they are at the frontline of providing direct patient care. Their role includes, but is not limited to, performing a comprehensive assessment, administering intervention-based assessments, and periodically assessing and reviewing the effectiveness of the pain management plan.^[18] In addition, nurses should collaborate with interdisciplinary teams to prevent acute pain from becoming chronic by adequately controlling pain levels, utilizing multimodal analgesia, preventing pain crises by adequate analgesia use, and having an active self-management role by properly educating patients and families.^[18] Adequate knowledge and positive attitudes toward pain management are essential to provide high-quality nursing care for cancer pain.^[24,41] However, professional development and continuous education regarding pain assessment and management are important during graduation or postgraduation through systematic training programs and throughout their study curriculums to improve nurses' knowledge and attitude toward pain management.^[23,42]

At baseline data, this study revealed that the score

Table 2: Differences between the intervention and the control groups regarding knowledge and attitude toward cancer-related pain

Variable	n	Mean (SD)	t	P
Baseline				
Control group	68	23.1 (3.7)	1.5	0.135
Intervention group	63	24.2 (4.9)		
Direct postpain education program				
Control group	68	23 (5.5)	12.6	0.0005
Intervention group	63	32.7 (2.8)		
One-month postpain education program				
Control group	68	22.2 (3.8)	16.6	0.0005
Intervention group	63	32.8 (4.3)		

SD: Standard deviation

Table 3: Difference between the three measurement points of the intervention and the control groups regarding knowledge and attitude toward cancer-related pain

Variable	Mean (SD)	F	P
Control group			
Baseline	23.1 (3.7)	3.4	0.055
Direct postpain education program	23 (5.5)		
One-month postpain education program	22.2 (3.8)		
Intervention group			
Baseline	24.2 (4.9)	114.3	0.0005
Direct postpain education program	32.7 (2.8)		
One-month postpain education program	32.8 (4.3)		

SD: Standard deviation

of knowledge and attitude toward cancer-related pain ranged from 14 to 35, with a mean of 23.6 (SD = 4.38) (60.5% correct answer rate). It means that nurses had fair knowledge and attitude toward cancer-related pain according to the grading criteria that were used by Al-Khawaldeh *et al.*^[34] The grading scale indicates that if the correct answer rate is <50%, the participants have poor knowledge and negative attitudes; if it ranges from 50 to 75%, it indicates that the participants have fair knowledge and attitudes; and if it is more than 75%, it indicates that the participant has good knowledge and positive attitudes toward pain. Our result shows that the score of knowledge and attitude toward cancer-related pain is higher than the score reported in the previous Jordanian study, which reported that nurses working at an oncology unit had fair knowledge and attitude toward cancer-related pain with a correct answer rate (51.5%).^[41] This is also inconsistent with findings of other Jordanian studies which reported that nurses working at oncology units had poor knowledge and attitude toward cancer-related pain with a correct answer rate (48.4%^[19] and 42.8%).^[43]

Providing an educational program to improve knowledge and attitude toward cancer-related pain is necessary.^[5,38] The results of this study show that knowledge and attitude toward cancer-related pain improved after the pain education program was implemented. The mean scores at two measurements increased from 24.2 (SD = 4.9) to 32.7 (SD = 2.8) and 32.8 (SD = 4.3), whereas the control group was 23 (SD = 5.5) and 22.2 (SD = 3.8) at the two measurement points. The results of this study were consistent with other studies, which reported that a pain education program was effective in improving nurses' pain knowledge and attitudes toward pain.^[34,36,44-47]

Conclusion

Nurses have essential roles in cancer pain, which include pain assessment and reassessment continuously, management using pharmacological and nonpharmacological approaches, teaching patient and their family about medication, pain assessment and treatment plan, and being the patient's advocate to ensure that patients got their rights in pain treatment. However, to achieve all these roles, sufficient knowledge and positive attitudes toward pain managements are required. This study was conducted to assess the effectiveness of a pain management education program on nurses' knowledge and attitude toward pain, which proved to have a significant positive effect.

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Conflicts of interest

There are no conflicts of interest.

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