

Meta-analysis of the effect of pain education and nursing on relieving cancer pain in cancer patients

Tingting Wu¹, Li Qiao¹, Lingjun Li¹, Chen Chen¹, Haiping Yu^{2*}

¹East Hospital of Tongji University Oncology Department, Shanghai, 200120, China

²East Hospital of Tongji University Nursing Department, Shanghai, 200120, China

*Corresponding author

Keywords: Pain education and nursing; Cancer; Tumor; meta-analysis

Abstract: The analgesic effect of pain education and nursing on cancer patients was studied by meta analysis. Based on the previous work, this project plans to use Chinese databases such as Chinese Medical Literature Database, Chinese Academic Journal Web Publishing Database, Wanfang Database, etc, Foreign databases such as Medline and EMbase were used to select cancer pain management clinical trials in line with China's national conditions according to inclusion and exclusion conditions, Statistical and evaluation of experimental results, RevMan5.0 software was used to conduct meta-analysis of experimental data. In this study, six literatures were selected and meta-analysis showed that education and nursing for cancer pain patients had significant differences in reducing cancer pain ($P<0.05$).The education and nursing of cancer pain can reduce cancer pain effectively.

1. Introduction

Cancer patient pain Education Care refers to the pain relief of cancer patients by providing them with information and skills about pain management, as well as support and guidance on treatment. Among cancer patients, pain is one of the most common symptoms, which will have a great impact on patients' quality of life and mental health[1].In view of this problem, pain education nursing for tumor patients has been gradually paid attention to, and has been widely used in practice. This method can improve patients' understanding of pain and help them better cope with pain. So far, the research on cancer pain is still not in-depth, and a unified and standardized standard is still needed. Therefore, how to improve the analgesic effect and the quality of life of tumor patients still needs to be further discussed. Meta-analysis is a systematic method to synthesize and analyze the results of multiple studies, so as to obtain more accurate conclusions. Meta-analysis of pain education and nursing for cancer patients can help us understand its actual effect on relieving cancer pain, so as to better guide clinical practice. The purpose of this paper is to explore the evaluation effect of tumor pain education and care in reducing cancer pain.

2. Data and Methods

2.1 Retrieval strategy

This paper carries out a reasonable search on the results of RCT studies in existing Chinese and English literature, and uses "tumor", "pain", "educational intervention" and "cancer" as keywords to make statistics on the results of existing literatures in Chinese document databases, such as "China Biomedical Literature Database", "China Medical Journal" and "Wanfang Database". Key words in English: Oncology, pain, educational interventions, nursing, cancer, clinical randomised controlled trials, Medline and EMbase were retrieved, and the deadline was March 2023[2-4].

2.2 Inclusion criteria and exclusion criteria for literature

Inclusion criteria: ① Cancer over 18 years of age, which has been pathologically confirmed as pain caused by malignant tumor, not pain caused by surgery or radiotherapy; ② There are

independent literatures on RCT abroad. ③ The number of participants, the way of intervention and the outcome of patients were described. (4) Cancer pain intervention: personalized cancer pain intervention was carried out for the experimental group, such as written or video data and online help provided by the researchers to intervene in the treatment of cancer pain. This program does not include other psycho-behavioral therapies (e.g., meditation, relaxation, technician training, etc.).

Exclusion criteria: According to the customized criteria, the papers with poor quality, repeated reports, less reported information and no detailed data will be screened.

2.3 Outcome indicators

The severity of cancer pain was the main evaluation result.

2.4 Evaluation of literature quality

The quality of each paper should be evaluated independently from the following perspectives: (1) Using random sampling; (2) Whether hidden allocation can be realized; (3) Whether blind method is used; (4) Report the departure or loss of visits by relevant personnel; (5) Whether intention analysis has been used; (6) Complete baseline comparison.

2.5 Data extraction

This paper extracts the data by reading the title, abstract or full text of the literature and using a uniform extraction table. The extracted data includes the following contents: research design, research location, sample selection criteria and sample quantity; Grouping condition; General information about the subject; Intervention content, intervention frequency and intervention degree; Outcome index; Conclusion et al.[5].

2.6 Statistical Processing

In this study, Stata15.0 was used as statistical tool, and odds ratio (OR) and 95%CI were used as measurement data. In view of the statistical differences in the results of each paper, Chi-square test was used to compare the results. When there was little difference in the results ($P \geq 0.1, I^2 \leq 50\%$), meta-analysis was conducted based on the fixed-effect model. In contrast, meta-analysis was conducted based on random effects model.

3. Results

3.1 Literature search results

In the relevant database, 892 abstracts were retrieved, of which 886 did not meet the required inclusion criteria. Further search and reading were carried out on 6 papers that met the inclusion criteria, and finally 6 papers that met the criteria were selected. The basic literature information is shown in Table 1.

Table 1 Basic information of the literature

| Included literature by author (years) | A particular year | Total number (experimental / control group) | Effect assessment index |
|---------------------------------------|-------------------|---|-------------------------|
| Kahsay D T ^[6] | 2019 | 91(48/43) | The degree of pain |
| Compton P ^[7] | 2020 | 622(290/332) | The degree of pain |
| Salim N A ^[8] | 2020 | 80(53/27) | The degree of pain |
| Kusi Amponsah A ^[9] | 2020 | 64(33 /31) | The degree of pain |
| Manietta C ^[10] | 2022 | 78(41 /37) | The degree of pain |
| Issa M R ^[11] | 2022 | 30(15 /15) | The degree of pain |

3.2 Quality of included literature

According to the quality evaluation index of RCT, it was scored. A total of 7 papers were collected in this study, and their methodological quality was good, reaching Class A. One paper is at the intermediate level and belongs to Category B. Table 2 lists specific outcomes.

Table 2 Quality evaluation of the included literature

| Included literature by author (years) | Randomization method | Assignment scheme hidden | Evaluator (blind method) | Withdrawal and loss of visit | Intention processing analysis | Baseline comparison | quality grade |
|---------------------------------------|----------------------|--------------------------|--------------------------|------------------------------|-------------------------------|---------------------|---------------|
| Kahsay D T(2019) | sufficient | yes | yes | There are | yes | yes | A level |
| Compton P(2020) | sufficient | unknown | yes | There are | no | yes | B level |
| Salim N A(2020) | sufficient | yes | yes | There are | yes | yes | A level |
| Kusi Amponsah A(2020) | sufficient | yes | yes | There are | yes | yes | A level |
| Manietta C(2022) | sufficient | yes | yes | There are | yes | yes | A level |
| Issa M R(2022) | sufficient | yes | yes | There are | yes | yes | A level |

3.3 Results of meta-analysis

3.3.1 The impact of tumor pain education on patients' cognition of cancer pain

Our research group used a variety of measurement tools, and applied a large number of pain control disorders tables (3 articles). There are 27 items in this questionnaire, with 0-5 as the standard. The higher the score, the more the pain, and the greater the burden of processing. After the chi-square test, the difference is statistically significant ($\chi^2=17.261$, $P < 0.05$), using the random effect mode, comprehensive analysis of the survey data, the results showed that the experimental group than the control group, after the pain education of cancer patients, the conclusion as shown in Figure 3.

Table 3 Evaluation of the effect of tumor pain education on patients' cognition of cancer pain

| author | Time (year) | experimental group | | Control group | | weight (%) | SMD price | 95% CI |
|-----------------|-------------|--------------------|---------------------------------|---------------------|---------------------------------|------------|-----------|---------------|
| | | Example number(n) | score(points, $\bar{x} \pm s$) | Number of cases(n) | score(points, $\bar{x} \pm s$) | | | |
| Compton P | 2020 | 48 | - 1. 30 \pm 0. 60 | 43 | - 1. 45 \pm 0. 78 | 45.02 | 0.15 | - 0.14 ~ 0.44 |
| Kusi Amponsah A | 2020 | 290 | - 2. 98 \pm 1. 95 | 332 | - 3.90 \pm 2. 00 | 38.71 | 0.92 | 0.61 ~ 1.23 |
| Issa M R | 2022 | 15 | - 1. 72 \pm 0. 80 | 15 | -2.80 \pm 0.51 | 16.21 | 1.08 | 0.60 ~ 1.56 |

Note: Difference: $\chi^2=17.261$, $df=2$ ($P < 0.05$); $I^2=88\%$; Comprehensive effect value: $Z=6.071$ ($P < 0.05$).

3.3.2 The impact of tumor pain education on cancer pain of cancer patients

This paper collected 6 articles, including 480 experimental groups and 485 control group. After the chi-square test, the difference between different studies was statistically significant ($\chi^2 = 56.053$, $P < 0.05$). Using the use of random effect mode, the results of each survey showed that compared with the control group, the results showed that the pain level of the experimental group was significantly lower than that of the control group. Table Table4 lists the specific outcomes.

Table 4 Effects of tumor pain education on cancer pain in cancer patients

| author | Time (year) | experimental group | | Control group | | weight (%) | SMD price | 95% CI |
|-----------------|-------------|--------------------|---------------------------------|---------------------|---------------------------------|------------|-----------|-------------------|
| | | Example number(n) | score(points, $\bar{x} \pm s$) | Number of cases(n) | score(points, $\bar{x} \pm s$) | | | |
| Kahsay D T | 2019 | 48 | 3. 35 \pm 2. 13 | 43 | 3. 74 \pm 2. 18 | 6.51 | - 0. 39 | -0.39~- 1.28 |
| Compton P | 2020 | 290 | 3. 32 \pm 2. 36 | 332 | 3. 43 \pm 2. 46 | 35. 73 | - 0. 11 | - 0. 11 ~ 0. 49 |
| Salim N A | 2020 | 53 | 1. 70 \pm 1. 49 | 27 | 2. 40 \pm 1. 33 | 12.41 | - 0. 70 | - 1. 34 ~ - 0. 06 |
| Kusi Amponsah A | 2020 | 33 | 2. 90 \pm 2. 40 | 31 | 4. 40 \pm 2. 60 | 3. 42 | - 1. 50 | - 1. 50 ~ 2. 73 |
| Manietta C | 2022 | 41 | 1. 31 \pm 2. 11 | 37 | 5. 45 \pm 2. 46 | 4.92 | - 4. 14 | - 5. 16 ~ - 3. 12 |
| Issa M R | 2022 | 15 | - 1. 72 \pm 0. 80 | 15 | - 2. 80 \pm 0. 51 | 16.21 | 1.08 | 0. 60 ~ 1. 56 |

Note: Difference: $\chi^2 = 56.053$, $df = 7$ ($P < 0.05$); $I^2 = 88\%$; comprehensive effect value: $Z=6.031$ ($P < 0.05$).

4. Discussion

In recent years, with the development of medical ethics, the basic research of pain, the research and development of painkillers, the progress of imaging technology, as well as the research on the diagnosis and treatment of pain, the cause, mechanism, characteristics, diagnosis and treatment of pain has become a new interdisciplinary, pain medicine came into being. On this basis, a complete

nursing system has been established. Because "pain" is a multidisciplinary physiological and pathological phenomenon, and in clinical, almost all patients will be troubled by pain, so the development direction of pain nursing is inevitably toward the direction of multidisciplinary development

According to the literature at home and abroad, the specific ways of pain nursing education for tumor patients include: (1) Training methods: ① students participate in theoretical learning, participate in theoretical teaching, complete thematic discussion, and report in oral form and written form. ② Participate in special lectures and professional rounds of doctors and nurses in the pain clinic. After completing the theoretical course, students will be familiar with the coordination of physical therapy and nerve block, as well as pain evaluation and management through a three-month rotation, so that students can better conduct clinical practice. ③ Students participate in general anesthesia, with a focus on the care of awake patients, intensive care in the ICU, anesthesiology, intensive care research, and intensive care at the Institute of Nursing. ④ Students participate in pain-related projects, have knowledge of scientific research planning and implementation processes in the field, and stay updated with the latest advancements in the field. (2) Training courses: ① Public education courses: Linguistics, Medical Statistics, Essay Writing, Education and Counseling, Nursing Science, Interpersonal Relations; Ethics in Nursing. ② Basic courses: Topics covered include pain diagnosis, anesthesia, neuroanatomy, palliative care, oncology, health education, resources, and systems. ③ Professional courses: pain assessment and documentation, pharmacological principles of analgesia, non-pharmacological pain management, postoperative pain management, cancer pain management, pain related to psychological or psychiatric factors, patient and family health education, etc. [12-15]

5. Conclusion

This Meta-analysis includes six foreign language articles. The results showed that developing cancer pain education can improve patients' experience of pain. With the knowledge of these conditions, the patient's suffering has also eased. As pain increases, cognitive impairment increases, and the severity of pain is an important indicator to evaluate the effect of pain treatment. Meta-analysis shows that cancer patient-based pain education can effectively reduce the pain of patients, however, it is not possible to evaluate the meticulous treatment effect of patients, let alone determine the optimal treatment mode and maintenance effect of patients[16-19]. The statistical differences also show that the different interventional methods are different in this study, so there are different interventional methods. However, the existing treatment methods lack evidence-based evidence, requiring subsequent quantitative research to clarify the specific relationship between "pain education" and "pain relief", the impact of pain education on the analgesic effect of cancer patients, and the impact of the education on the analgesic effect of cancer patients. In addition, sufficient RCT is needed to verify whether the audio and video data can effectively relieve cancer pain, be suitable for middle and late stage cancer pain, and whether effective interventional treatment can be carried out.

Acknowledgment

The authors acknowledge the Clinical peak discipline construction of Pudong New Area Health Committee, East Hospital of Tongji University oncology department. pwygf2021-07

References

- [1] Ding Xiaoxiao, Jiao Ningning, Dou Dongmei. A meta-analysis of the effect of mobile medical intervention on medication compliance of hypertension patients [J]. Chinese Journal of Nursing Management, no.8, pp.125-128, 2021.
- [2] Sun Huan, Gao Liping, Wang Haiming, et al. Effect of Traditional Chinese medicine emotional

- nursing on relieving pain and improving mood in patients with digestive tract tumor [J]. Chinese Journal of Cancer Prevention, no.2, pp.45-48, 2018.
- [3] Yang Ting, Chen Jiazeng, He Lusheng, et al. A meta-analysis of the effect of Mindfulness-based stress reduction therapy on cancer pain patients [J]. Nursing Practice and Research, no.019, pp.56-59, 2022.
- [4] Sun Yongliang. Effect of pain health education on pain control of cancer patients [J]. Maternal and Child World, no.016, pp.78-80, 2018.
- [5] Wang Chengqiong, Xiao Zheng, Chu Yalin, et al. Systemic evaluation of intravenous immunoglobulin in treatment of ventilator-associated pneumonia [J]. Anhui Medical Journal, no.7, pp.788-793, 2015.
- [6] Kahsay D T, Pitkääjärvi M. Emergency nurses knowledge, attitude and perceived barriers regarding pain Management in Resource-Limited Settings: cross-sectional study[J]. BMC nursing, no.18, pp.1-13, 2019.
- [7] Compton P, Blacher S. Nursing education in the midst of the opioid crisis[J]. Pain Management Nursing, vol.21, no.1, pp.35-42, 2020.
- [8] Salim N A, Tuffaha M G, Brant J M. Impact of a pain management program on nurses' knowledge and attitude toward pain in United Arab Emirates: Experimental-four Solomon group design[J]. Applied Nursing Research, no.54, pp.151-134, 2020.
- [9] Kusi Amponsah A, Kyei - Dompim J, Bam V, et al. Exploring the educational needs of nurses on children's pain management: A descriptive qualitative study[J]. Nursing Open, vol.7, no.3, pp.841-849, 2020.
- [10] Manietta C, Labonte V, Thiesemann R, et al. Algorithm - based painmanagement for people with dementia in nursing homes[J]. Cochrane Database of Systematic Reviews, no.4, pp.147-151, 2022.
- [11] Issa M R, Muslim N A, Alzoubi R H, et al. The Relationship between Emotional Intelligence and Pain Management Awareness among Nurses[C]//Healthcare. MDPI, vol.10, no.6, pp.1047, 2022.
- [12] Zhang Minjie, Gao Yufang, Yang Feifei, et al. Meta-analysis of positive detection rate of anti-Epstein-Barr virus antibody in Chinese patients with infectious mononucleosis [J]. Journal of Laboratory Medicine, vol.35, no.3, pp.214-223, 2020..
- [13] Yao Fang, Xue Lian, Yan Jie, et al. Systematic evaluation on the efficacy and safety of Gua Sha in treating neck and shoulder pain [J]. Journal of Nursing Research, vol.32, no.18, pp.2872-2876, 2018.
- [14] Lv Zongkai, Zheng Yangcan, Du Shengnan, et al. A meta-analysis of the relationship between chronic periodontitis and stroke [J]. Chinese Journal of Stomatology, vol.11, no.1, pp.31-35, 2017.
- [15] Li Dinggen, Wang Huaqiong, Chen Feng, et al. A systematic evaluation and meta-analysis of health education intervention effect on lumbago [J]. China Rehabilitation, vol.35, no.5, pp.7, 2020.
- [16] Cui Fuli. Effect of pain education intervention on nursing care of patients with malignant cancer pain [J]. Disease Surveillance and Control, vol.13, no.3, pp.3, 2019.
- [17] Huang Yumei. Discussion on periodical collection of provincial medical information institutions [J]. Medical Information (Upper Ten-day issue), vol.20, no.10, pp.1790-1791, 2007.
- [18] Zhou Xuedan. Analysis of psychological care, health education applied in cancer patients to improve their cancer pain, quality of life analysis [J]. Health Required Reading, no.036, pp.213, 2019.
- [19] Chen Zhijie, Huang Fangfang, Li Na, et al. Application analysis of nursing management and research of cancer pain nursing strategy team in pancreatic cancer patients' cancer pain management [J]. Chinese Journal of Cancer Prevention, no. 2, pp.2, 2018.