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Acupuncture for Pain Management for People Living with Cancer.

Literature Review

ABSTRACT

Pain is acknowledged as a common symptom by people living with cancer while inadequate pain management may adversely affect quality of life. This literature review explores the role of acupuncture in treating cancer related pain. Six studies carried out on 284 patients, at different cancer stages were reviewed. The Quality Assessment Tool for Studies with Diverse Designs (QATSDD) critical appraisal tool was utilised to appraise the quality of the studies, findings were synthesized using a narrative synthesis approach.

Acupuncture was found to have good efficacy in pain relief as an additional therapy, with minimal side effects, relieving those of other oncology treatments. Optimal acupuncture frequency requires further enquiry. Findings indicate that acupuncture when used simultaneously with other management approaches, resulted in decreased pain caused by cancer lesion and other oncology therapies.

Further research is recommended to enable incorporation of acupuncture therapy into routine cancer care. To be effective, nurses caring for people living with cancer must personalise pain management to patient's preferences. These findings, with acupuncture advice provided by Cancer Research UK (2022) and the European Society for Medical Oncology's (ESMO) (Fallon et al 2018), Cancer Pain Management Guidelines may be helpful for nurses supporting people living with cancer.

INTRODUCTION

People living with cancer identify pain as the most common symptom, it has the potential to cause significant impact on all the dimensions of quality of life (QOL) and considerable disruption to activities of daily living (Lopes-Junior et al 2020, van den Beuken-van Everdingen et al 2016).

Pharmacologic and non-pharmacologic treatments can help pain management for people living with cancer. Studies on hypnosis, acupuncture and music therapy have shown an impact on pain. While therapies including medication, mindfulness, massage, and yoga have shown no such impact, but have enhanced mood and relieved anxiety, which are often linked to pain (Deng 2019). Acupuncture is well known for its safety record, with the potential for use as a supportive analgesic therapy and may be beneficial where other therapies have pain as a side effect (Vinjamury et al. 2013).

Nurses have a key role in assessing, managing pain, and supporting people's personal preferences. This review explores the use of acupuncture as an adjunct pain relief option for people living with cancer.

Background

World Cancer Research Fund International (2022) estimates that in 2021 some 18.1 million people were living with cancer worldwide, whilst cancer pain is not inevitable, it is the most prevalent and feared symptom (Deng 2019). Cancer pain can be caused by the carcinoma itself or treatment, it is recognized as a significant complex global factor (Cleary 2019, WHO 2017). Van den Beuken-van Everdingen et al's (2016) global systematic review of pain in people living with cancer, identified that pain is experienced by some 33% of cured patients, 59% during treatment and 64% of patients living with advanced stage cancer. Pain may be acute, chronic, refractory or breakthrough, while some individuals experience all pain types simultaneously (Brant et la 2017). Pain impacts on people's activities of daily living, human functioning, impedes thinking and concentration, mood, and behaviour, for some it is distressing for others it is intolerable (Van den Beuken-van Everdingen et al 2016). While poorly treated prolonged pain may alter a patient's overall wellbeing, disrupting their physical, social and emotional status (Hamood et al 2018).

World Health Organisation's (WHO) (2017) argues that 90% of cancer pain could be well controlled with effective use of opioids, for severe and moderate pain, their three-step analgesic

ladder of cancer pain published in 1986, aimed to assist healthcare providers and policy makers. Yang et al (2020) maintain it has shown some success in lowering pain, although Fallon et al (2018, 2022) argue that it provided poor relief for 40-50% of people. A recent systematic review reports a global decline in pain prevalence and severity, although prevalence rates remain high, especially for people living with advanced cancer (Snijders et al 2023). Reasons for high prevalence may include; an ageing global population with increased multimorbidity, professional attitudes to pain management, patient preference, addiction and opioid effect concerns (Kwon 2014, Makhlouf et al 2020). While the reduction may be attributed to improved pain assessment and management and updated pain management guidelines, which advocate a multimodal approach to personalised pain management (ESMO Fallon et al 2018, Swarm et al 2019**).** Furthermore Van den Beuken-van Everdingen et al (2018) highlight the importance of access to pain management education opportunities for healthcare staff.

Non-pharmacologic interventions may have an important role in cancer care as a method for controlling cancer pain and other symptoms. Integrative medicine therapies are methods of non-pharmacologic interventions which complement other treatments, with the aim of enhancing the quality-of-care people living with cancer can receive (Lyman et al 2018). These complementary therapies include a wide range of mind and body activities, such as body manipulation, use of natural products, adopting healthy habits and methods to enhance mental wellbeing (Deng 2019). Such treatments are in great demand amongst people living with cancer, as they reach out for alternative methods of treating symptoms of cancer, including pain (O'Regan and Filshie 2010).

One such therapy is acupuncture, widely used in China, Japan and Korea, with origins in traditional Chinese medicine. Fine, single-use, sterile needles are inserted into specific parts of the body and manipulated to achieve clinical effects (Hershman et al 2018, Zhang et al 2019). Traditional acupuncture practice is based on the theory of *Qi,* an energy which flows around the body. In contrast western medical acupuncture (WMA), an adaptation of tradition acupuncture, combines in-depth knowledge of the nervous, muscular systems and connective tissue with a current understanding of pain causation (Filshie et al 2016).

Tas et al. (2014), reports that acupuncture is one of the most often utilised supportive therapies and has been shown to be successful (Lee et al. 2017). Although it has not been adopted as a standard part of cancer care, Cancer Research UK (2022) identify that it is an option sometimes available in hospices, hospitals, and clinics to help manage pain, tiredness, weakness, dry

mouth, breathless and hot flushes due to cancer treatment. Although, specifically in relation to managing cancer related pain, Paley et al (2011) found a lack of evidence due to small study sizes, poor reporting and interpretation. While Zhang et al. (2012) found that because patients tend to receive periodic rather than a sequence of therapies, the effectiveness of the treatment was limited. This may present challenges for nurses who are discussing options for pain management with patients (Hu et al. 2016). Although more recent acupuncture research indicates that acupuncture may be effective for pain and symptom control for people living with cancer (Flishie et al 2016). It has also been demonstrated as an effective additional and reliable therapy for several disorders, with minimal adverse health consequences (Lund and Lunderberg 2016) and for post operative pain (Mallory et al 2015). Whilst much of the literature on acupuncture in treating cancer related pain has limitations, there is a growing body of evidence to support it's use.

The study question, based on the above, is: 'What is the role of acupuncture as an adjunct pain relief option for people living with cancer?

METHODS

The review question was developed using the PICO (Patient, Intervention, Comparison, and Outcome) structure (see Table 1) (Suh and Park 2016). No comparison was included.

This study used a narrative synthesis approach to collate the current evidence on the subject.

Table 1: Application of PICO Framework

Patient, Population or Problem	Intervention	Comparison	Outcome
Pain in people living with cancer	Acupuncture	Nil	Pain relief

Search strategy

Health related databases were searched including eBook Collection (EBSCO), Medical Literature Analysis and Retrieval System (MEDLINE), Cumulative Index to Nursing and Allied

Health Literature (CINAHL), and Academic Search Ultimate (Atkinson and Cipriani 2018) and google scholar. Reference chaining was also utilised.

Key words

- Acupuncture
- Acupressure
- Complementary
- Integrative therapy
- Pain
- Discomfort
- Cancer
- Carcinoma.

Boolean operators

Boolean operators were used as recommended by (Atkinson and Cipriani 2018). AND was used to focus the search whilst OR was utilised to ensure that all synonyms were captured (Jesson et al. 2011).

Inclusion and Exclusion Criteria

Inclusion

- Age 18 and above
- All types of cancer related pain: acute and chronic
- 2012-2022
- All genders
- English language
- All countries
- Primary research
- Peer review journal article

Exclusion

- Age below 18
- Non-English language articles
- Secondary Research
- Guidelines, opinion articles, editorials, case reports
- Grey literature

Article Selection

45,624 articles were identified, and 150 duplicates removed. The titles of the remaining papers were examined and 45,463 removed which did not meet the inclusion criteria. The abstracts of the remaining 11 studies indicated that a four were systematic reviews (which were not in the inclusion criteria) and one was a guideline. The remaining six articles met the inclusion criteria. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart in Figure 1. summarises this process ('n' represents number of studies).

Data extraction

Data were extracted from each paper as shown in table 2, enabling the key details, qualities, methodological strengths and limitations and findings from each study to be seen in a single document. This was used as the key point of reference in the development of themes in the synthesis process.

Evaluation tool

The range of methodologies used in the included studies rendered the Quality Assessment Tool for Studies with Diverse Designs (QATSSD) suitable (Sirriyeh et al. 2012). QATSSD assesses the quality of 16 key elements of studies using a scoring system of 0-39. No element is considered intrinsically more important than another and no specific score is deemed indicative of high or low quality, rather the scores facilitate comparison of the relative quality of each study (Harrison et al 2021). However, had any study scored below 20 consideration would have been given as to whether it was of adequate overall quality. No papers scored below 20.

Narrative synthesis

All the included studies were quantitative although their designs varied. A process of narrative synthesis was therefore adopted wherein themes identified from the data extraction process were developed and compared across papers. The synthesis process involved noting similarities, contrasts, and the strength of evidence within each theme. The themes are presented in the findings section.

Ethical approval was not required for the study as data were derived only from published evidence.

FINDINGS

All six studies included, reported on quantitative research. Sample sizes varied between 7-100 participants. The overall quality of the studies was within a range of 20-28/39 quality score. However, the majority of the included studies were small scale, or pilot studies, and most suggested that more research into this subject was needed. Table 2 depicts findings from the six articles.

Table 2: Presentation of reviewed studies

Authors	Title	Study Design	Sample size	Study Aim	Intervention	Findings	Quality Assessment
Vinjamury et al. 2013 (S4)	Effects of acupuncture for cancer pain and quality of life – a case series	Quantitative research	7	To examine acupuncture's usefulness and efficacy in reducing cancer pain and enhancing quality of life	Provision of one to three acupuncture therapies about half an hour per week for 8 weeks	*Pain reduction *Acupuncture can also alleviate the side effects of chemotherapy or radiotherapy *Few concerning harmful effect *Respiratory depression is a worrisome side effect	28/39
Tas et al. 2014 (S1)	Acupuncture as a Complementary Treatment for Cancer Patients Receiving Chemotherapy	Quantitative research	45	To examine the impact of acupuncture on nausea, vomiting, pain, sleep quality and anxiety in cancer patients who received chemotherapy	Pre, intra and post evaluation of acupuncture influence on pain, nausea, vomiting, sleep quality and anxiety	* Statistically significant decline in pain * Pain etiology not determined *Fewer side effects than conventional treatments. *May help alleviate side effects of chemotherapy eg pain, nausea, insomnia, anxiety	20/39
Lam et al.	A pilot	Primary	42	To test the	A course 7 phase	*It has a positive outcome of pain	27/39

2017 (S3)	randomized controlled trial of acupuncture at the Si Guan Xue for cancer pain	research (RCT)		protocol and safety of acupuncture in the management of cancer pain	acupuncture on daily or on alternate day basis.	control management * Long duration of analgesic action *It takes time for the peak analgesic effects of acupuncture therapy to develop *Absence of serious side effects *Need for dose determination	
Dymackova et al. 2021 (S5)	Effect of Acupuncture in Pain Management of Head and Neck Cancer Radiotherapy: Prospective Randomized Unicentric Study	Quantitative research	60	To assess the function of acupuncture in pain management related to cancer therapy	Oncology with or without complementary therapy administered to two groups of patients	*Reduced pain intensity *Reduced analgesic intake *Reduced oncology therapy side effect *It is noninvasive and cost effective *Absence of significant side effects	25/39
Wei-Min and Li 2021 (S6)	Study on Effect of Acupuncture Assisted Three-Step Analgesic Therapy for Cancer Pain and	Quantitative research	100	To examine the influence of acupuncture assisted three-step analgesic therapy on	Patients in control and observation were treated with three-step analgesic therapy and acupuncture	*Pain relief *Significantly reduction of chemotherapy side effects *Fewer adverse reactions. Theme: side effects *Failure to control all cancer pain	24/39

	Its Influence to Quality of Life			cancer pain and quality of life	on the basis of the control group respectively		
He et al. 2022 (S2)	Acupuncture combined with opioids for cancer pain: a pilot pragmatic randomized controlled trial (RCT)	Primary research (RCT)	30	Can acupuncture be useful as an additional intervention for cancer pain	Patients randomized to acupuncture and control group. Four acupuncture sessions were done at 2 day intervals. Pain intensity was measured using a numerical rating scale (NRS) and the daily dose of opioid documented	*Acupuncture was significantly associated with reduced pain *Reduced analgesic needs *Few and slight side effects * Acceptable to people living with cancer	28/39

Key themes

Pain and pain relief

All six studies included in the review identified pain as an issue for those living with cancer and indicated that acupuncture could be an important part of pain management strategies. This included management of pain associated directly with cancer itself, and pain associated with the side effects of treatment (although not all the studies were specific about the origin or nature of the pain that they reported on). Nonetheless, Wei-Min and Li (2021) noted that acupuncture does not control all cancer pain, and the time taken for the effect of acupuncture to be evident, it's duration, and the number of treatments needed for acupuncture to be effective varied. Lam et al. (2017) identified that the best pain relief from acupuncture was achieved after five days of treatment, but that despite this relatively slow onset of peak effect this was then sustained long term.

The overall suggestion was that acupuncture could be a useful adjunct to conventional pain management strategies, albeit acknowledging that it to achieve its best effect more than one session of treatment is needed, and that more research in this area is required.

Side effects

All of the studies included in this review indicated that acupuncture had relatively few undesirable side effects (Vinjamury et al. 2013, Tas et al. 2014, Lam et al 2017, Wei-Min and Li 2021, Dymackova et al. 2021, He et al. 2022). In addition, as well as its effect on cancer related pain, Vinjamury et al. (2013), Tas et al (2014), Wei-Min and Li (2021) and Dymackova et al. (2021) identified that acupuncture may reduce the side of cancer treatment such as nausea, anxiety, and insomnia.

Nonetheless, some potential side effects of acupuncture were noted. Although He et al (2022) identified these as infrequent and mild, Vinjamury et al. (2013) cited respiratory depression as a potential adverse consequence, particularly for high-risk patients (such as older or obese people, people with sleep disorders, and those with weakened respiratory, kidney, heart, or liver capacity).

Level of analgesic use

In the included studies, the analgesic effect of acupuncture was reported to be in association with other pain management interventions, not as a stand-alone therapy. Two studies specifically noted that acupuncture could reduce the amount of analgesic medication required by people living with cancer (Dymackova et al. 2021, He et al. 2022). None of the reviewed studies suggested that acupuncture increased analgesic use.

Cost effectiveness and acceptability

Only Dymackova et al. 2021 commented on the relative cost associated with acupuncture, noting that it was cost effective compared to other treatment options. It should, however, be borne in mind that the optimum dose, and number of doses required for sustained effect requires further research, which could complicate the relative cost. He et al (2022) identified acupuncture was an option that was acceptable to people living with cancer. There were no reports of participants finding acupuncture unacceptable, although this is perhaps accounted for by those being in the trails having been prepared to consent to the use of acupuncture.

DISCUSSION

Although the prevalence rate for cancer related pain has declined over the last decade, the rate remains high (Snijders et al 2023). This review suggests that the inclusion of acupuncture alongside traditional approaches of pain management may be beneficial for people at any stage of living with cancer. This correlates with Chien et al. (2013)'s earlier review which identified acupuncture as a potentially useful approach to addressing a variety of symptoms associated with cancer, including pain. It also links with (Mallory et al. 2015) suggestion that acupuncture can be a useful adjunct post operative pain management option. In addition, updated pain management guidelines encourage a multimodal personalised approach to pain management (ESMO Fallon 2018) while recent research calls for improved access to pain management educational opportunities for healthcare staff (van den Beuken-van Everdingen et al 2018, Snijders et al 2023).

This review found that acupuncture generally has minimal side effects and can reduce the side effects of cancer therapy, with negligible adverse health consequences (Lund and Lunderberg 2016) and has value for pain and symptom control for people living with cancer (Flishie et al 2016). While Chien et al (2013), report that in one European cancer study, a third of patients use a complementary remedy to combat side effects of other treatments. This aligns with Bao et

al.'s (2018) work which supports the use of acupuncture as an effective pain management strategy in cancer patients who develop chronic pain due to intake of analgesics.

Cancer Research UK (2022) acknowledge the importance of ensuring that any acupuncture included in treatment is provided by an approved practitioner, compliant with required safety standards. Only one of the appraised studies commented on the frequency of acupuncture. Overall, there is a lack of evidence regarding the maximal therapeutic dose of acupuncture and the intervention regularity and overall number of sessions and expertise of the therapists. This merits further investigation.

The studies in this review made no mention of patient's perception of acupuncture in cancer related pain control, suggesting that there is currently minimal research concerning patient's perceptions of the therapy. However, in other situations, patients reported a feeling of ease or tranquility after receiving acupuncture therapy (Wilkinson and Faleiro 2007). Additionally, White et al. (2018) revealed that patients spontaneously reported feelings of improved well-being and deep sleep after treatment thus depicting positive perception.

Consequently, acupuncture and other complementary modalities may have a beneficial role to play. More research is required to explore the benefits and risks of acupuncture (Chien et al. 2013), but in the interim time, this review provides nurses working with people living with cancer some evidence to include in discussions, alongside the provided guidance.

CONCLUSION

This review suggests that acupuncture can be an additional option for relieving cancer related pain and discomfort, with less side effects than many traditional analgesics. The evidence indicates that it can reduce the frequency and dosage of pharmacologic analgesics. However, more research is required with regards to its therapeutic dose, frequency, and the best method of combining with other approaches. In addition, research regarding patients' perspectives and experiences of using acupuncture to relieve cancer pain would be beneficial.

STUDY LIMITATIONS

Due to a lack of funding, the review used only English Language articles and excluded grey literature which may have meant that some relevant literature was not included. The review focused only on physical pain (not emotional, psychological or spiritual aspects of pain), which would merit inclusion in a future, larger scale review.

RECOMMENDATIONS

Acupuncture should be an option within routine cancer treatments and nurses can usefully discuss acupuncture as a complementary therapy alongside traditional pain management.

Further research is required into acupuncture optimal intervention regularity, ideal number of sessions, and therapist expertise.

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