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# Acupuncture as a Complementary Therapy for Cancer Care: Acceptability and Preferences of Patients and Informal Caregivers

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**Background:** Acupuncture can effectively manage cancer-related side effects, for both patients undergoing treatment and for cancer survivors. It may also be effective in managing physiological and psychological symptoms common among informal caregivers of cancer patients.

**Objectives:** The aim of this survey was to explore the acceptability and preferences of cancer patients, cancer survivors, and their informal caregivers in relation to acupuncture.

**Methods:** The survey was conducted from 20<sup>th</sup> November to 27<sup>th</sup> November 2018. The questionnaire was developed to explore acceptability and preferences, including motivation, symptoms to be addressed, and practical issues (location, cost, etc.), in relation to acupuncture.

**Results:** The survey response rate was 94.5% in cancer patients and cancer survivors and 100% in caregivers. Acceptability of acupuncture was 34.5% (n = 40/116) and 48.0% (n = 26/54) in cancer patients and caregivers, respectively. About 52.5% (n = 21/40) of patients preferred to undergo acupuncture at the day center clinic, whereas caregivers had no specific preference. Patients and cancer survivors would use acupuncture for symptoms of fatigue (60%), listlessness (57.5%), and pain (47.5%). Informal caregivers expressed an interest in using acupuncture for their pain, stress, and sleeping difficulties 48.0% (n = 26/54).

**Conclusion:** Cancer patients, cancer survivors, and informal caregivers would accept acupuncture as a complementary therapy. This openness and preference to acupuncture provide the foundations for this complementary therapy to be incorporated into holistic and supportive cancer care, both for patients and those supporting them.

**Keywords:** Acupuncture, Cancer, Informal caregiver, Complementary therapy, Cancer-related side effect

## INTRODUCTION

Although cancer therapies become more advanced over time, relief of cancer-related symptoms remains essential.

The adverse effects of cancer and cancer treatments include nausea, hot flashes, fatigue, drowsiness, pain, anxiety, and sleeping difficulties. These effects can be long term for cancer patients undergoing treatment and cancer survivors,

affecting their quality of life, mental wellbeing, functionality, independence, and overall health [1-4].

Complementary therapies such as acupuncture and mind-body techniques are becoming increasingly popular treatment options for managing cancer-related symptoms when conventional treatment does not bring satisfactory relief or causes adverse effects [5]. Acupuncture has been used for the management of cancer-related symptoms in both supportive and palliative care settings [6-11]. However, information on patient-reported outcomes and satisfaction with acupuncture services within the oncology setting is limited. The effects of cancer further extend to informal caregivers, who provide unpaid support to their loved ones throughout their treatment and recovery. Supporting a loved-one with cancer can have significant health and wellbeing implications, including psychological distress, anxiety, depression, sleeping difficulties, fatigue, poor immune functioning, pain, and decreased quality of life [12]. Therefore, there is a clear need for cancer care that inclusively addresses treatment related adverse effects on patients in addition to addressing the needs of informal caregivers who support them.

Acupuncture provides a possible complementary therapy with the potential to relieve the adverse effects of treatment on both the patient [7,13-15] and informal caregivers [16]. Acupuncture involves penetrating the skin with thin stainless steel needles on specific locations of the body [2,13]. For patients being treated for cancer and for cancer survivors, International Guidelines (e.g. The National Comprehensive Cancer Network, NCCN; National Center for Complementary and Integrative Health, NCCIH; ADD e.g. UK Guidelines; ADD e.g. WHO Guidelines) advocate the use of acupuncture in conjunction with pharmacologic interventions as a “mind and body complementary health approach” to assist in the management of pain and fatigue [17-19]. As such, acupuncture is the most frequently used complementary therapy used in integrative oncology settings in Western countries [3].

While the mechanism of action for acupuncture is not yet fully understood, it is recognized as a relatively safe and effective intervention. Only a few non-serious adverse events such as hematoma/bleeding, needling pain, and orthostatic symptoms have been reported [2]. Given that acupuncture does not interfere with primary treatments [3], it can be safely integrated within current cancer treatment regimens [1]. Acupuncture can be an effective complementary therapy for managing cancer or cancer therapy-related symptoms and improving post-operative pain, chemotherapy-related nausea, vomiting, pain, depression, anxiety, drowsiness, fatigue, numbness or tingling, sleep disturbance, and hot flashes [7,14,15]. It could also offer relief from physiological and psychological symptoms in informal caregivers of

cancer patients. Acupuncture has been found to be effective in relieving anxiety, several types of pain-related disorders such as chronic headache and migraine, gastroenterological problems, and cardiovascular conditions [16,20,21].

Despite the evidenced benefits and recommendations from international guidelines, acupuncture is not appropriately integrated within the conventional cancer treatment regimen. This has been attributed to skepticism about the effectiveness of this complimentary therapy [22-24], more so among the elderly population, even though several trials found acupuncture to have some efficacy in elderly patients [25-27].

In addition to randomized controlled trials to establish the effectiveness of acupuncture, patient-reported outcomes offer valuable information. The novelty of this survey study lies within its prospective design and the inclusion of informal caregivers of cancer patients and cancer survivors. This study explores the preferences of cancer patients undergoing treatment, cancer survivors, and their informal caregivers to receive acupuncture and their acceptability toward the use of acupuncture as a complimentary therapy for the management of physical and psychological symptoms.

## MATERIALS AND METHODS

### 1. Study population and design

Participants were recruited by a healthcare worker (Laura Tack, Tessa Lefebvre) at the day center clinic of the Organisation of European Cancer Institute (OECI)-designated clinical cancer center of the General Hospital Groeninge in Kortrijk (Belgium). Patients with a histologically confirmed solid tumor or hematological malignancy (any stage and any type of treatment), those receiving primary treatment or receiving treatment after relapse, and cancer survivors were asked to participate. Caregivers of both groups were also included. All participants were over 18 years of age and spoke Dutch.

Participation in this study (94.5%) was high, likely because of the process of data collection used. A previous study by our research group implementing a survey found participation rates within this context could be low [28]. Therefore, a healthcare worker completed surveys with respondents.

A questionnaire of six questions, based on relevant literature, was developed for this study. The questionnaire collected data on patient and caregiver demographics and treatment status and explored preferences and acceptability regarding acupuncture. It further explored symptom management. Patients and caregivers were also asked to identify symptoms for which they would opt for acupuncture management. Multiple choice responses and free text fields were included.

On completion of the questionnaire, those interested were provided with an information booklet on acupuncture and

were offered an introductory acupuncture treatment by Virginie Blicke.

The questionnaire did not collect any personal identifiers and was completed anonymously. Written consent was not required as the participants were informed that by completion of the questionnaire their permission for their data to be used for the study is implied. The study findings were stored in a computer database in accordance with the Belgian data protection laws. This study was registered at General Hospital Groninge (AZGS2018093) and was approved by the local ethics committee.

## 2. Statistical analysis

Descriptive statistical analyses were performed to present participant characteristics. The association between interest in acupuncture, gender, and age was explored statistically using a contingency table and a Pearson chi-square test. All analyses were conducted using Microsoft Office Excel 2013 (Microsoft, Inc., Redmond, WA) and IBM SPSS v.25 (SPSS, Inc., Chicago, IL) software.

# RESULTS

## 1. Study population characteristics

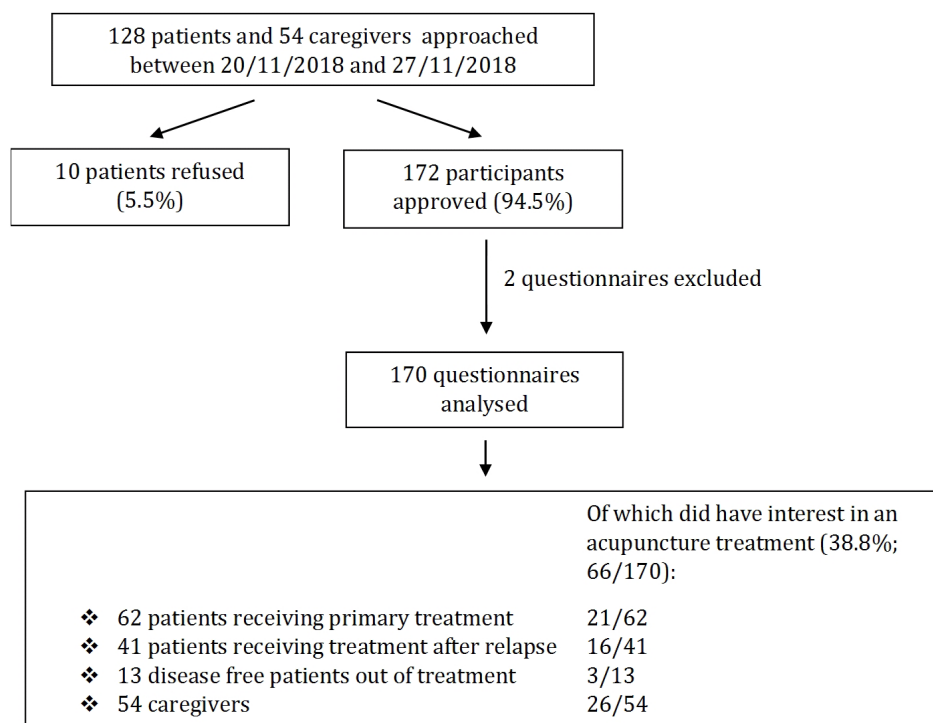
A total of 172 questionnaire responses were obtained at a response rate of 94.5% ( $n = 172/182$ ). Two questionnaire responses were excluded from analysis as the participants did not meet the inclusion criteria. Of the remaining 170

responses, 62 were provided by patients receiving primary treatment; 41 by patients receiving treatment after relapse; 13 by cancer survivors; and 54 by informal caregivers.

**Table 1.** Patient demographic and clinical characteristics ( $n = 116$ )

	No.	%
Age, y	62.8	
Mean (range)	21.0-88.0	
Sex		
Men	32	27.6
Women	84	72.4
Patient type		
Receiving primary treatment	62	53.4
Receiving treatment after relapse	41	35.3
Disease-free, out of treatment	13	11.2
Malignancy		
Breast	43	37.1
Digestive	20	17.2
Hematologic	16	13.8
Urological	15	12.9
Gynaecological	11	9.5
Thoracic	6	5.2
Other*	10	8.6
Therapy		
Chemotherapy	114	98.3
Surgery	80	69.0
Radiotherapy	54	46.6
Immunotherapy	27	23.3
Hormonal therapy	11	9.5

\*Other: bone, brain, head and neck, unknown primary.



**Fig. 1.** Patient flowchart.

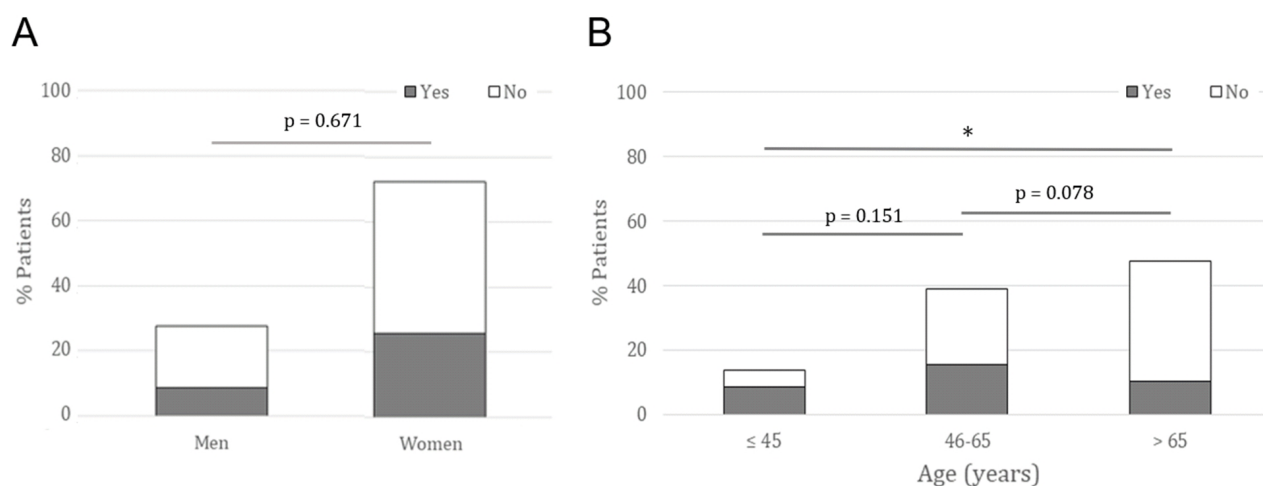
Demographic and clinical characteristics of the patients are presented in Table 1. The mean age of the patients was 62.8 years (range: 21-88 years). Of the 116 patients, 72.4% were women, and 37.1% had been diagnosed with breast cancer. Almost all patients were treated with chemotherapy (98.3%). Other therapies included surgery, radiotherapy, immunotherapy, and hormonal therapy (69.0%, 46.6%, 23.3%, and 9.5%, respectively). Some patients received multiple treatments.

## 2. Acceptability and preferences of patients and cancer survivors

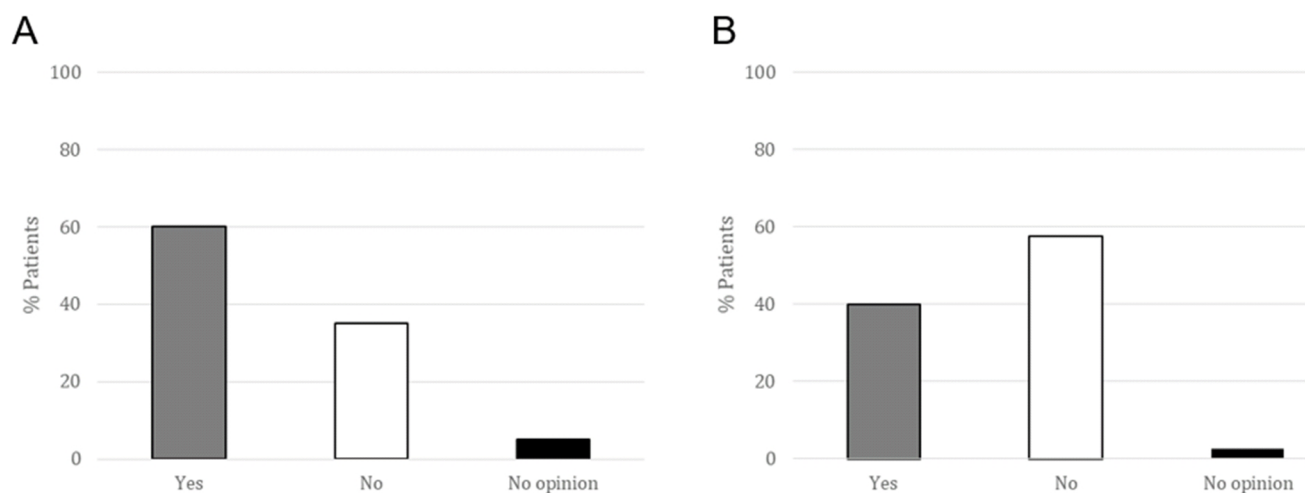
In total, 38.8% of the participants were interested in acupuncture treatment ( $n = 66/170$ ) (Fig. 1). Out of 116 patients and cancer survivors, 34.5% ( $n = 40/116$ ) were interested in

acupuncture treatment, whereas 65.5% were not ( $n = 76/116$ ). No association between gender and interest in acupuncture was found ( $p = 0.67$ ) (Fig. 2A). However, the interest in acupuncture differed significantly between the youngest and oldest age categories ( $p = 0.004$ ) (Fig. 2B). Those patients and cancer survivors aged 46 years or more, were least interested in acupuncture, whereas those aged 18-45 years were significantly more likely to accept acupuncture. Of all patient respondents, 16.4% ( $n = 19/116$ ) were interested in receiving an introductory acupuncture treatment.

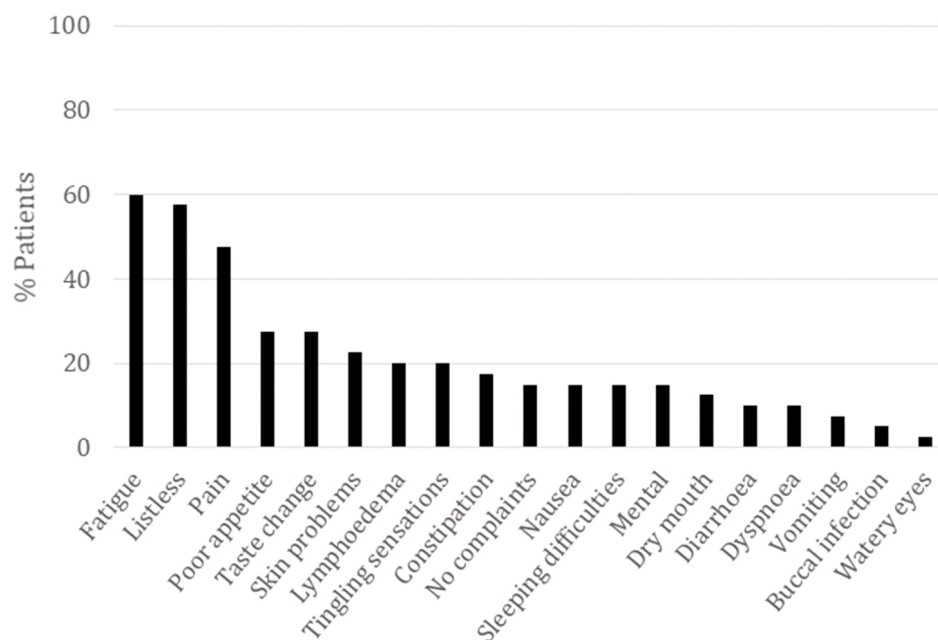
Of those patients interested in acupuncture treatment, 60.0% ( $n = 40/66$ ) indicated that they would be willing to self-fund this complimentary therapy (Fig. 3A). Nevertheless, only 40.0% ( $n = 16/40$ ) of this group were interested in attending an information session about acupuncture (Fig. 3B).



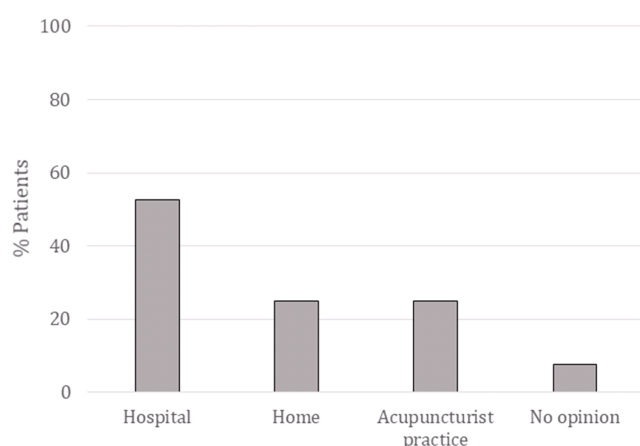
**Fig. 2.** (A) Patient interest in acupuncture stratified by gender. Total numbers of male and female patients were 32 and 84, respectively. (B) Patient interest in acupuncture stratified by age. Total numbers of patients in the age groups of ≤ 45, 46-65, and > 65 years were 16, 45, and 55, respectively. \* $p < 0.005$  by Pearson chi-square test.



**Fig. 3.** (A) Proportions of patients who were willing to pay for acupuncture treatment. (B) Proportions of patients who were interested in an information session about acupuncture.



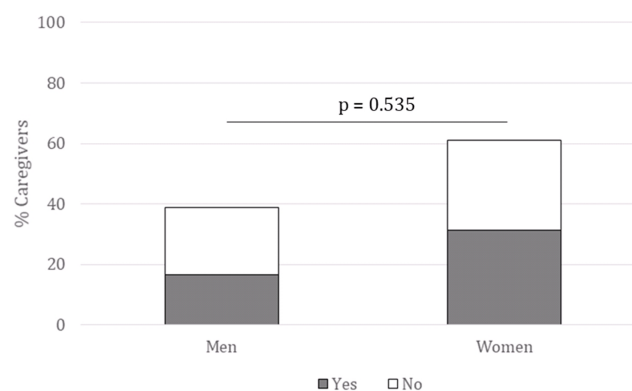
**Fig. 4.** Symptoms for which cancer patients and cancer survivors would receive acupuncture treatment.



**Fig. 5.** Patients' preferences on locality of acupuncture treatment.

In terms of symptom management, patients and cancer survivors were interested in using acupuncture to address the following: fatigue (60.0%;  $n = 24/40$ ), listlessness (57.5%;  $n = 23/40$ ), pain (47.5%;  $n = 19/40$ ), poor appetite (27.5%;  $n = 11/40$ ), and taste change (27.5%;  $n = 11/40$ ) (Fig. 4). Other less frequently cited symptoms included oral and vocal problems; muscle weakness/stiffness/cramps; visual or sensory impairment; migraine; motor disturbance; nervousness; arthritis; bladder problems; heart issues; and smoking cessation.

To determine patient preferences regarding delivery of acupuncture treatment, the 40 interested patients and cancer survivors were asked about preferred locality of treatment (Fig. 5). A hospital was the most preferred locality (52.5%;  $n = 21/40$ ), followed by home (25.0%;  $n = 10/40$ ) and clinic of an accredited acupuncturist (25.0%;  $n = 10/40$ ).



**Fig. 6.** Caregivers' interest in acupuncture stratified by gender.

### 3. Acceptability and preferences of informal caregivers

In total, 61.1% ( $n = 33/54$ ) of informal caregivers were partners of patients, and 31.5% ( $n = 17/54$ ) were relatives including siblings (41.2%;  $n = 7/17$ ), parents (17.6%;  $n = 3/17$ ), and others (41.2%;  $n = 7/17$ ). The remaining were friends of patients and cancer survivors (7.4%;  $n = 4/54$ ). The mean age of all caregivers was 60.9 years (range: 28-83 years).

Among caregivers, 48% were interested in acupuncture treatment ( $n = 26/54$ ). There were more female respondents, but caregiver interest was not associated with gender ( $p = 0.54$ ) (Fig. 6).

Symptom management in caregivers was not dissimilar to that in patients and cancer survivors. Pain was the most frequently mentioned symptom (53.8%;  $n = 14/26$ ), including headache, migraine, muscle pain, (low) back pain, nerve pain, shoulder pain, and arthritis. Other symptoms cited



included: stress (23.1%;  $n = 6/26$ ), sleeping difficulties (19.2%;  $n = 5/26$ ), lack of mental wellbeing (15.4%;  $n = 4/26$ ), fatigue (11.5%;  $n = 3/26$ ), and stomach problems (11.5%;  $n = 3/26$ ). Many interested caregivers (42.3%;  $n = 11/26$ ) did not cite any specific symptoms they would wish to manage using acupuncture.

## DISCUSSION

At present, integrative oncology programs combining complementary healthcare interventions such as acupuncture have become established in the United States and Europe [29,30]. With this survey study, we examined the acceptability to, and preferences for, acupuncture of patients undergoing treatment and cancer survivors as the information on patient-reported outcomes and satisfaction with acupuncture services within the oncology setting is limited [31]. Moreover, we also included the opinions of 54 caregivers. Caregivers are often unjustly forgotten in the cancer treatment setting. Acupuncture is an alternative method for treating various diseases and symptoms.

This study found that 34.5% patients and cancer survivors would be interested in accepting acupuncture as an adjunctive and complementary therapy to their current cancer treatment or as standalone post-cancer treatment. Acceptability of acupuncture was associated with age, with those under the age of 45 years more likely to respond with interest than those over 46 years and especially over 65 years. This result is consistent with what we expected that older people would be more skeptic toward this treatment than younger people. There was no association between gender and acceptability. Interestingly, 57.5% ( $n = 23/40$ ) of interested patients and cancer survivors did not wish to participate in an information session about acupuncture because they already had sufficient awareness of acupuncture and its benefits for symptom management.

Acceptability of acupuncture from patients and cancer survivors in this study is less than that observed in other studies. Lettner et al. found that 63.7% of German cancer patients receiving radiotherapy would use regular acupuncture treatment if it was integrated into the individual therapy concept [32]. This contrasting result to the current study may reflect the differences in countries, with Germany favoring natural products and complementary therapies compared to other European countries [32].

In terms of patient and cancer survivor preferences, over half were willing to self-fund (60%) and preferred to receive an acupuncture treatment in a hospital setting (52.5%). The respondents indicated that this was not only related to the safety of acupuncture but also because acupuncture was seen as an adjunct therapy that could be offered while waiting to

receive other treatments.

Although 65.5% ( $n = 76/116$ ) of patients were not interested in acupuncture treatment, 19.7% ( $n = 15/76$ ) did wish to find out more by attending an information session.

The symptoms highlighted by respondents were diverse, encompassing cancer-related symptoms and wellbeing concerns, such as fatigue, pain, and oral complaints. Similar adverse effects were also reported by those with advanced cancer in a study by Kirkova et al. [33]. In their observational study in 181 patients with advanced cancer, fatigue was reported by 72% patients, followed by pain (67.0%) and dry mouth (66.0%) [33]. Indeed, the prevalence and severity of the symptoms highly depend on the primary site of disease and treatment modalities [34]. A subset of patients did not report any symptoms for which they would accept acupuncture treatment (14.7%;  $n = 17/116$ ), which could be because they had not yet initiated therapy.

Among caregivers, although more respondents expressed interest and willingness to accept acupuncture, over half did not (51.9%). Moreover, no association between acceptability and gender was observed. Most caregivers (42.3%;  $n = 11/26$ ) did not report any symptoms for which they would use acupuncture. For those who did, pain, fatigue, stress, lack of mental wellbeing, and sleep disturbance were highlighted.

The novelty of this study lies within the exploration of the acceptability of cancer patients for acupuncture, whereas previous studies mostly focused on the use of acupuncture in pain management in cancer care or identified clinically meaningful differences. This survey study explored the opinions of patients undergoing cancer therapy and cancer survivors about acupuncture as a complementary therapy for managing cancer or cancer therapy-related symptoms. Moreover, the involvement of caregivers present at the day care clinic of the OECI-designated Kortrijk cancer center reflects the needs and acceptability for acupuncture of loved ones involved in cancer care. The results reflect how acupuncture could be implemented in an integrative oncology program.

This study also has some limitations. The survey was conducted only at one clinical cancer center in Belgium, and as such, we need to consider this limitation before applying our results on a wider scale. There is also a possibility of bias, which is inherent in all self-reported responses, in terms of participant reporting or responder bias to the healthcare worker conducting the survey.

## CONCLUSIONS

This study provides insights into the preferences of cancer patients, cancer survivors, and their caregivers toward acupuncture treatment and their acceptability of this com-

plementary therapy. Furthermore, the respondents mentioned diverse symptoms for which they would opt for acupuncture. Certainly, there is evidence of the efficacy of acupuncture in the treatment of psychological and physical symptoms. Acupuncture has the potential to be integrated with current cancer therapy regimens or administered to cancer survivors following cancer therapy to manage post-treatment adverse effects and disease symptoms. It may also be extended to caregivers who are integral to the recovery and wellbeing of patients (and indeed cancer survivors) but also have their own needs, which can be supported with acupuncture.

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## AUTHORSHIP STATEMENT

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

## AUTHORS' CONTRIBUTIONS

Conceptualization: Tessa Lefebvre, Laura Tack, Philip R. Debruyne; Methodology: Tessa Lefebvre, Philip R. Debruyne; Validation: Tessa Lefebvre, Laura Tack, Hans Pottel, Philip R. Debruyne; Formal analysis: Tessa Lefebvre, Laura Tack, Philip R. Debruyne; Investigation: Tessa Lefebvre, Laura Tack, Virginie Blicke, Koen Van Eygen, Sofie Derijcke, Philippe Vergauwe, Philip R. Debruyne; Data curation: Tessa Lefebvre, Philip R. Debruyne; Writing – original draft preparation: Tessa Lefebvre, Laura Tack, Lieselot Cool, Philip R. Debruyne; Writing – review and editing: Tessa Lefebvre, Laura Tack, Virginie Blicke, Lieselot Cool, Hans Pottel, Koen Van Eygen, Sofie Derijcke, Philippe Vergauwe, Patricia Schofield, Rebecca Chandler, Pauline Lane, Tom Boterberg, Philip R. Debruyne; Visualization: Tessa Lefebvre, Laura Tack, Lieselot Cool, Philip R. Debruyne; Supervision: Patricia Schofield, Rebecca Chandler, Pauline Lane, Tom Boterberg, Philip R. Debruyne; Project administration: Tessa Lefebvre, Philip R. Debruyne; Funding acquisition: Tessa Lefebvre, Philip R. Debruyne.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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