The voices of breast cancer survivors with chronic pain: A qualitative thematic analysis of patients’ challenges to pain management

Chiara Filipponi (chiara.filipponi@ieo.it)  
IEO European Institute of Oncology IRCCS

Marianna Agnese Masiero  
University of Milan

Davide Mazzoni  
University of Milan

Mariam Chichua  
IEO European Institute of Oncology IRCCS

Sara Marceglia  
Università degli Studi di Trieste

Roberta Ferrucci  
University of Milan

Elisa Fragale  
IEO European Institute of Oncology IRCCS

Florence Didier  
IEO European Institute of Oncology IRCCS

Gabriella Pravettoni  
IEO European Institute of Oncology IRCCS

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Abstract

**Purpose:** Breast cancer survivors commonly experience chronic pain following surgery. Despite the existence of treatment guidelines for cancer pain, a significant number of patients do not achieve satisfactory relief with available therapies. To fill this gap, this study aimed to explore the experience of chronic pain further, focusing on needs and obstacles related to its management in breast cancer survivors.

**Methods:** We conducted four focus groups with 17 breast cancer patients (M\text{age}=51, SD=7.99) with chronic pain from mild to severe intensity. The focus groups were audio-recorded, transcribed verbatim and analyzed through qualitative thematic analysis.

**Results:** The thematic analysis of the focus group discussions identified three key themes: (1) The challenges to pain management (with subthemes: (1.1) “Doctor-patients communications barriers” and (1.2) “Contextual and societal barriers”); (2) The self-management needs (subthemes: (2.1) “Psychosocial support”, (2.2) “Care-related needs”, and (2.3) “Shared decision-making”); (3) Treatment preferences and perceptions of pain management (subthemes: (3.1) “Treatment preferences”, (3.2) “Institution preference”, and (3.3) “Decision role perception”).

**Conclusions:** This study emphasizes the interconnectedness of challenges, self-management needs, and treatment preferences in managing chronic breast cancer pain. It highlights the importance of addressing patients' reluctance to report pain, the normalization of pain, and the role of health providers' attitudes. These findings aid the development of personalized support systems to enhance breast cancer pain management and improve cancer survivors' quality of life. Healthcare provider education, multidisciplinary and biopsychosocial approaches, and the use of eHealth tools are highlighted as important factors in achieving better pain management outcomes.

Introduction

Breast cancer survivors commonly experience persistent pain following surgery, with prevalence ranging from 27–46%, depending on location and severity. This pain typically persists beyond the three-month mark, becoming chronic, and it tends to remain stable for up to two years without significantly improving prevalence or intensity [1]. Such pain has a profound impact on the quality of life not only for patients but also for their families [2].

Although guideline-based treatments exist and can effectively control cancer pain, it is estimated that only 70–90% of cases achieve significant relief through available analgesic therapies [3]. Despite this, many patients still struggle with inadequate pain management, and it appears that they may be reluctant to report their pain. Approximately one-third of patients do not receive pain medication proportional to the intensity of their pain [4]. Pain presents a complex, biopsychological, and subjective experience, making it challenging to measure and, consequently, to treat effectively [5].


Understanding patients' needs and preferences can assist healthcare providers in developing more patient-centered approaches to pain management that would enhance breast cancer survivors' physical and emotional well-being. Despite the availability of various pain management strategies, including self-management interventions [6], cancer survivors continue to face difficulties in accessing appropriate care. A recent report [7] found that lack of skills, knowledge, and misconceptions about pain and its management hindered optimal pain control. The authors emphasized the importance of increasing self-management support, which encompasses interventions by healthcare professionals to enhance patients' skills, knowledge, and confidence in effectively managing their condition. Tailored provision of information, combined with strategies that enable patients to manage pain better, leads to improved quality of life and reduced pain intensity.

The challenge of researching cancer pain is the tendency of patients to underreport their pain. This creates a necessity for applying different tools to assess pain. Peretti-Watel [8] applied mixed methods to evaluate the experience of pain in breast cancer patients. Interestingly, the discrepancy was evident between the results of quantitative and qualitative tools applied, even if, in both cases, the research question was about the pain experience. More specifically, while patients elaborated their experience in a rich manner and reported high intensities of pain when asked verbally, they undermined their pain in response to quantitative scales. A possible reason for this could be the normalization of pain due to misconceptions such as considering it a necessary step for recovery or a permanent condition to live with. Such normalization may hinder participants from reporting their pain when it is assessed through self-report questionnaires, and it may come out in a more in-depth interview setting. This observation aligns with the successful use of qualitative methods when it comes to psycho-oncological topics characterized by sensitive content and the need for in-depth analysis [9].

For this reason, the focus on qualitative research is fundamental when studying cancer pain. In a recent meta-synthesis of qualitative studies[10], it has been shown that the main needs of cancer patients with pain were understanding the cause and significance of pain, discussing expectations with family members, access to assistance, and developing skills to avoid isolation. Additionally, specific interventions to support patients’ treatment decisions emerged as crucial aspects in the management of pain. These interventions may help patients express their preferences and enhance their health knowledge to be part of the treatment decision.

As pain management in specific populations is a rising subject of interest in the literature, the focus on chronic pain in breast cancer survivors still needs further investigation. Considering the reported evidence, the current study aims to explore the unique needs, experiences, and preferences of breast cancer survivors with chronic pain.

**Materials and methods**

**Study design and recruitment**
The present study employed focus groups to delve into the difficulties encountered by breast cancer patients who grapple with chronic pain, specifically pertaining to pain and its management. Due to the COVID-19 Emergency issue and transportation constraints for some patients, focus groups were conducted online via Zoom video calls. We followed the guideline for conducting focus group giving by Krueger and Casey [11], taking into account the specificities of online settings [12]. Patients with psychiatric, neurological diseases, other medical conditions that can cause pain, or those who refused to sign the informed consent, were excluded. The final sample consisted of 17 breast cancer patients with chronic pain from the European Institute of Oncology (IEO) afferent to the Breast Unit (See Table 1). All patients were in the follow-up phase.

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of IEO in July 2021 (R1508/21-IEO1594).
# Table 1
Clinical characteristics of the sample (N = 17)

<table>
<thead>
<tr>
<th></th>
<th>N (%) of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Infiltrating ductal carcinoma</td>
<td>7 (41.18)</td>
</tr>
<tr>
<td>Ductal carcinoma</td>
<td>7 (41.18)</td>
</tr>
<tr>
<td>Lobular carcinoma</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td><strong>Type of surgery</strong></td>
<td></td>
</tr>
<tr>
<td>Quadrantectomy</td>
<td>8 (47.06)</td>
</tr>
<tr>
<td>Traditional Mastectomy</td>
<td>2 (11.76)</td>
</tr>
<tr>
<td>Nipple-sparing Mastectomy</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td>Both*</td>
<td>4 (23.53)</td>
</tr>
<tr>
<td><strong>Cancer treatment</strong></td>
<td></td>
</tr>
<tr>
<td>ET</td>
<td>2 (11.76)</td>
</tr>
<tr>
<td>Combined</td>
<td>15 (88.24)</td>
</tr>
<tr>
<td>ET + Rt</td>
<td>8 (47.06)</td>
</tr>
<tr>
<td>Cht + Rt</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td>Cht + ET</td>
<td>1 (5.88)</td>
</tr>
<tr>
<td>Cht + Rt + ET</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td><strong>Other cancer procedure</strong></td>
<td></td>
</tr>
<tr>
<td>SLNB</td>
<td>17 (100)</td>
</tr>
<tr>
<td>Breast reconstruction</td>
<td>7 (41.18)</td>
</tr>
<tr>
<td>Followed by a prosthetic replacement</td>
<td>5 (29.41)</td>
</tr>
<tr>
<td>Breast lipofilling</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td>Port-A-Cath</td>
<td>1 (5.88)</td>
</tr>
<tr>
<td>Breast lift</td>
<td>1 (5.88)</td>
</tr>
<tr>
<td><strong>Current situation of the disease</strong></td>
<td></td>
</tr>
<tr>
<td>Without recurrence</td>
<td>12 (70.59)</td>
</tr>
<tr>
<td>With recurrence</td>
<td>5 (29.41)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>N (%) of patients</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Psychological support</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (29.41)</td>
</tr>
<tr>
<td>No</td>
<td>12 (70.59)</td>
</tr>
<tr>
<td>Taking charge in pain therapy</td>
<td></td>
</tr>
<tr>
<td>In palliative care and pain therapy</td>
<td>3 (17.65)</td>
</tr>
<tr>
<td>In acupuncture</td>
<td>2 (11.76)</td>
</tr>
</tbody>
</table>

*Quadrantectomy and Nipple-sparing mastectomy; Cht = Chemotherapy; ET = Endocrine Therapy; Rt = Radiotherapy; SLNB = Sentinel lymph node biopsy.

**Procedure**

Before participating in the focus group, each patient signed the informed consent via digital and hand-written signatures. The hand-written signature was sent through the Italian post office with the prepaid stamp by the Psycho-Oncology Division or delivered in person during their follow-ups in IEO. The enrolled patients were divided into 4 focus groups (4/5 patients per group). The duration of focus groups lasted approximately 60–90 minutes. To avoid excessive fatigue, an intermediate break was made during the meeting. The focus groups were led by two psychologist-researchers (CF, ST) from the Psycho-Oncology Division of IEO, who were moderators during the discussion. Focus groups’ questions explored the challenges of survivors of breast cancer with chronic pain in relation to pain and its management. After a brief introduction about the focus of the discussion and self-presentations between participants in relation to their experiences, the discussion guidelines encompassed a set of core questions [13]:

1. **Thinking about yourself and your daily life, what do you feel are your difficulties in managing pain or barriers that hinder good pain management?**
2. What are your needs in relation to pain and its management?
3. Have you discussed your treatment preferences with your doctor, caregiver, or anyone important to you?
4. Which treatment would you prefer to follow to treat pain?

The focus groups were entirely audio-recorded and transcribed verbatim by the first author, who removed all identifiable information. The number of focus groups was determined accordingly to the literature [14, 15] for identifying relevant themes. The composition of each group was determined based on the homogeneity of the pain experience, considering the intensity measured during the recruitment phone call and patients’ preferences.

**Data analysis**
A descriptive analysis was made considering the clinical data retrieved from the patients’ electronic health records and data collected during phone calls for recruitment. During the phone call, the pain’s intensity was measured using the Numeric Rating Scale [16]. We must note that the reported pain intensity should not be considered static but subject to changes over time.

This information was integrated with the participants' data on self-reported pain features during the focus group discussion (type, semantics, and location of pain). Then, a body map was created with Python using the matplotlib library to create a customized visualization. A gradation of colors (from light green to dark blue) was used to illustrate the distribution of pain points across the body based on the frequency of reported symptoms. This observation underscores the significance of addressing pain management strategies specific to these areas to improve patients' overall well-being and postoperative recovery.

A reflexive thematic analysis (TA) was applied for data analysis, as Braun and Clarke [17, 18] outlined. This qualitative method is considered a “good practice” regarding reflexivity, creativity, and subjectivity, with researchers’ assumptions as a resource for generating initial themes and interpreting patterns within the data [18]. We used inductive (i.e., coding and theme development directed by the content of the data) clustered with semantic (i.e., reflecting the explicit content of the data) approaches for constructing themes and sub-themes [19]. Our analysis focused on what participants said (i.e., content and meaning) and how they said it (i.e., language use). We followed the steps of reflexive TA (2006), from familiarizing ourselves with the data to producing the report. The coding approach was collaborative and reflexive since more than one research was involved in the analytic process. The primary coder (CF) first read and re-read transcripts making notes of potential interest items to familiarize with the data (step 1). Initial codes were then generated (step 2), and transcripts were coded and clustered manually in candidate themes by CF using an Excel sheet (step 3). Afterward, an iterative discussion with EF, MC, and DM was made to revise the themes generated (step 4) and define and name the final themes (step 5), and finally write up the report (step 6).

Results

The characteristics of the sample

The characteristics of the 17 breast cancer survivors with chronic pain (M\text{age} = 51, SD = 7.88) are shown in Table 1. The average length of time after the end of radiotherapy and/or chemotherapy was 7 years, ranging from less than 2 years to 16 years.

Most patients reported that they were undergoing quadrantectomy (n = 8, 47%) and combined treatments (n = 15, 88%), specifically radiotherapy with endocrine therapy for 5 years (n = 8, 47%). All patients did the sentinel lymph node biopsy (100%). 7 (41%) of 17 patients reported breast reconstruction surgery, followed by prosthetic replacement in 5 (29%). The most common diagnosis was ductal carcinoma (n = 14, 82%). Moreover, more than half had no recurrence, and intervals between reviews were mostly
between 6 months or 1 year. Concerning the psychological support from the psycho-oncology division of IEO, only 5 (29%) patients followed it. As for taking charge in pain therapy, 2 (12%) were admitted in acupuncture treatment, while 3 (18%) in palliative care and pain therapy (e.g., for thoracic and lumbar algesia, bone pain, chronic sacroiliac, and neuropathic pain (burning sensation).

Regarding the pain disease condition, it is possible to describe the sample according to intensity, type of pain, and sensations felt. See Table 2.
Table 2
Features of chronic pain in breast cancer survivors

<table>
<thead>
<tr>
<th>Intensity</th>
<th>N (%)</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>17 (100)</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>8 (47.06)</td>
<td>“At a distance of 3 years to intervention, but with a mild intensity…” [id3]</td>
</tr>
<tr>
<td>Moderate-severe</td>
<td>5 (29.41)</td>
<td>“Post-radiation therapy pain variable moderate-severe intensity depending on periods…” [id5]</td>
</tr>
<tr>
<td>Severe</td>
<td>4 (23.53)</td>
<td>“…I feel severe pain in my armpit…” [id1]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of pain</th>
<th>N (%)</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nociceptive pain</td>
<td>5 (29.41)</td>
<td>“The breast was inflamed in a monstrous way, especially in the part under the glands… So much so that I have a bigger right breast halo because there's still some liquid underneath, you can really see it, it swells up…” [id1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“The pain...but actually in the area of my abdomen that then obviously the whole abdomen is not just like a small piece that I have the skin that pulls, I have this posture because they told me in short that it is due to the fact that the skin was anyway sewn, we say sewn” [id9]</td>
</tr>
<tr>
<td>Neuropathic pain</td>
<td>4 (23.53)</td>
<td>“The neurologist called them peripheral paresthesias…” [id6]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Now I cannot repeat the correct terms, but they ruined my nerve endings…” [id4]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semantics of pain</th>
<th>N (%)</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull/tension-like elastic bands</td>
<td>4 (23.53)</td>
<td>“I had terrible pains, like elastic bands stretching me from the inside” [id7]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“a nuisance that you are a little atrophied... hardened like a tennis ball. Let's say a little pull me…” [id17]</td>
</tr>
<tr>
<td>Twinge</td>
<td>2 (11.76)</td>
<td>“But the scar, I have to tell the truth that scar gives me... let's say this is the only kind of twinge I feel” [id15]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I pulled up this ladder, and immediately after I felt the twinge of the breast towards the nipple, I felt a little annoyed…” [id1]</td>
</tr>
<tr>
<td>Burning sensation</td>
<td>3 (17.65)</td>
<td>“I feel a little peculiar in the face of serious damage of radiation therapy... you feel burning…” [id3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“It was like my arm was on fire and…” [id4]</td>
</tr>
</tbody>
</table>

Notes. *Some patients experience multiple pain sensations, which can be matched together depending on the type of pain.
All participants reported still suffering from chronic pain, from mild (n = 8, 47%) - moderate (n = 5, 29%) to severe (n = 4, 23%) intensity. Moreover, the intensity was reported by patients differently depending on the pain threshold that decreased after cancer procedures, such as biopsy or needle aspiration.

Regarding the type of pain, more than half of the sample (n = 9, 53%) described the mechanisms of their pain and sensations felt with possible overlaps between the types. Specifically, 5 (29%) patients reported nociceptive pain, while 4 (23%) were neuropathic. The sensations were matched to the type of pain. Patients with neuropathic pain tended to report their pain regarding burning sensations (n = 3, 18%) or sensitivity to touch and water (n = 2, 6%). In contrast, pull/tension-like elastic bands (n = 4, 23%) and twinges (n = 2, 12%) were experienced by patients with nociceptive pain.

All patients received as a medical recommendation in the presence of pain to take paracetamol 1000 mg, one tablet in case of pain (maximum dosage three times a day, one tablet every 8 hours).

The body map

The frequency of reported pain in different parts of the body was analyzed, with lower color shades indicating lower frequencies and vice versa. As depicted in Fig. 1, patients consistently identified the lumbar region as the most frequently reported area (n = 8, 47%), followed by the arm (n = 5, 29%) and chest (n = 5, 29%). Other body parts adjacent to these regions, particularly those where surgical procedures had taken place (such as the breast and armpit), were also frequently reported as sources of pain.

Many participants reported joints as a common source of pain (n = 10, 59%). This was followed by bones (n = 3, 18%) and muscle retraction (n = 1, 6%). Although these sources of pain could not be visually represented on the map, we have provided the corresponding frequencies to highlight their prevalence.

The thematic analysis

The analysis yielded three themes that showcase distinct viewpoints on pain and its management. Each theme is presented below, accompanied by anonymized quotes from participants that serve as examples to support our interpretation. See Fig. 2.

Theme 1: Patients’ challenges to pain management
Theme 1 focuses on the various challenges patients encounter in effectively managing their pain. Specifically, it includes sub-themes of (1.1) “Doctor-patients communications barriers” and (1.2) “Contextual and societal barriers”.

In the context of the first sub-theme, patients’ narratives primarily revolved around the conflict between their personal needs and the recommendations provided by doctors (1.1a), which was expressed as a perceived disregard for their needs and a belief that medication was the sole option for pain treatment. As an illustration, one patient expressed the following sentiment:

“Unfortunately, I had to set aside my therapy because pain treatment can be helpful, but they load you up with medications, and I felt even worse. They said I had to endure and get used to them, but I remember perfectly well in what condition I was. Even when they used morphine patches to reduce the pain, it was as if I had just come out of total anesthesia. They even told me to take painkillers before coming because I still felt pain when touched... I didn't want to take more medications.”[id4]

Patients also highlighted a significant concern regarding their reluctance to adhere to doctors' recommendations for cancer treatment due to the perceived pain associated with it. However, ultimately, they acknowledged that they had no alternative but to follow the treatment plan prescribed by their doctors.

Moreover, patients were still determining when they would receive doctor attention, perceiving it as a need that potentially clashes with medical priorities. However, some patients realized that the lack of immediate accessibility to doctors could be attributed to their responsibilities rather than a lack of willingness to assist.

Another crucial factor contributing to the barrier in doctor-patient communication is the inadequate attention healthcare providers give to pain management (1.1b). Patients expressed their discontent with doctors who tend to downplay the intensity of pain, considering it a secondary symptom that will resolve independently. This dismissive approach intensifies patients' fear and anxiety and hinders their ability to receive the necessary pain relief. Furthermore, patients often feel that their needs are not fully heard and struggle to establish a strong relationship with their doctors. The lack of effective communication and bonding further exacerbates the challenges in addressing their pain management effectively. The following examples illustrate patients' experiences in this regard.

“I talked about my pain with the oncologist, but she minimized it...this didn't help me much, in the sense that my doubts and fears remained, and I don't know, this problem was treated a little bit like, a little bit hastily.”[id2]

Moreover, patients voiced dissatisfaction regarding the need for more clarity of information about pain and its management. They expressed frustration at the need for more explicit guidance and the need to search for the necessary information independently. Patients highlighted the importance of access to
comprehensive and easily understandable knowledge to understand better their pain and how to manage it effectively. The example illustrates patients’ experiences in this regard.

“So, I started pain therapy just by chance. I had gone to this hospital one Saturday in late August. I’m not sure which year it was. It just so happened to be “the day of pain”. [...] it was by chance that I found out, no action was taken, no publicity. So, the patient has to look for everything they need and know what services are available, and you don’t always know what you need. Yes, information is the most important thing. Many times, I got angry; I used to tell my psychologist that there is a lack, much information is missing.”[id7]

Additionally, patients expressed that the issue of inadequate information about pain and its management can lead to regret over the decisions they make regarding their treatment. One patient succinctly captured this sentiment, stating:

“If I had known, if I had been informed, in short, about the troubles I was about to face, I would have made different choices.”[id3]

Last but not most minor, a significant issue contributing to the doctor-patient communication barrier is related to doctor communication issues (1.1c). Patients highlighted the absence of empathy exhibited by doctors as a significant hindrance to effective communication and an obstacle to establishing a meaningful doctor-patient relationship. They voiced their deep dissatisfaction with feeling like fictional patients, victims, or mere statistics on a hospital bed rather than being seen as human beings enduring genuine suffering. This led them to feel disregarded and their experiences invalidated. The following quotes encapsulate the range of emotions experienced by patients about the issues above:

“I am still fighting with neurologists and neurosurgeons because they found something else in my head, but they are not getting to the bottom of it... I’m going around, I’m going against doctors to get to the bottom of this thing because even psychologically, it affects you. But sometimes, I’m seen as a delusional sick person, which angers me. This thing gets on my nerves; I mean, holy crap, I have the pains. It’s not like I’m making them up...”[id5]

“What I just said is a common feeling for so many. It often happens to many patients that instead of being called by name, they are identified with a number; it happened to me a few times, which is something to emphasize. A person should never be identified with a code because it is a very ugly feeling.”[id10]

Additionally, patients believed that physicians view pain solely as a physical experience, which created a barrier for them to express their psychological struggles associated with pain. This fragmentation of knowledge and specialization restricts patients from fully expressing their emotions and sentiments. Patient 3 aptly expressed this sentiment, stating:

When I go to the oncologist, I tell him everything; if there is something that worries me a little bit, I try, however, to stay in his field because, as all others said, their expertise is limited to one field, the field of
pathology.

On the contrary, when patients perceive support and empathy from doctors, the barrier to the doctor-patient dynamic dissolves, creating a foundation for a safe space where they can freely express their emotional pain. Specifically, in this context, patients expressed gratitude towards doctors for their total aid, which alleviated their apprehension and enhanced their willingness to discuss their worries openly. Additionally, due to this, they reported to trust in their doctors. For example, patient 8 shared:

I had a fear of having to do chemo, and I immediately intervened with my psychologist even before the surgery; I asked for preparation support to get ready for the surgery. Before and after the surgery, each time I had a chance to go back to the psychologist, we had sessions to handle everything positively. [...]. My plastic surgeon, Dr. [name of the doctor], was there for me for two months. We talked every week. He's genuine every time I go for visits. [...]. He always has an approach that makes me come out of there with a smile and feel good.

About the second sub-theme concerning contextual and societal barriers (2.1), patients faced various obstacles, one of which was associated with location issues (1.2a). More specifically, patients highlighted that the institution was far from their homes, resulting in financial burdens related to transportation costs and challenges arising from roadblocks or other transportation issues. As an example, patient 5 stated:

“[…] I live in Sardinia. This represents a problem because I must always cross the sea to visit this hospital. [...] During chemotherapy and radiation therapy, I had to move for a month to Milan because then we were in full lockdown [COVID-19]. I started it [referring to therapy] in March 2020 and moved there, but not everybody can afford to do something like that, so I don't know.”[id5]

As emphasized by the patient above, another barrier encountered in effectively managing pain was linked to Covid-19 issues (1.2b). Patients voiced their concerns about the repercussions of lockdown measures on their medical care, expressing a sense of abandonment by their doctors or experiencing delays in healthcare services due to emergencies. Furthermore, they reported the distress perceived by being unable to exercise for their well-being as gyms remained closed during the pandemic. Some patients also viewed this approach as a means of coping with pain. The following examples illustrate patients’ experiences in this regard.

“You could not go in the gym because it was closed for a while [...]. After starting hormone therapy, I put on 2 kg. This bothers me very, very much. But now I’m getting back in shape, so I’ve started going to the gym again and so on.”[id15]

Furthermore, patients identified additional challenges in pain management, including concerns about medical malpractice, disparities in treatment approaches where a clear protocol of care seems to be lacking, and the long waiting lists within the Italian public health services. These issues can be seen as contributing factors to health inequality (1.2c). Patients reported them as factors that affect the doctor-
patient relationship. These factors resulted in patient frustration, anxiety, and fear due to the uncertainty and financial burden of seeking private medical consultations.

Lastly, regarding societal and contextual obstacles, patients voiced challenges concerning their access to pain management and related services (1.2d). Based on the patients' narratives, the primary concerns raised included a lack of information about the available services, limited awareness regarding the options for managing pain, and the absence of practical tools for enhancing pain management. Regarding potential solutions, patients expressed their desire for informative resources such as brochures, booklets, or educational videos that could serve as valuable tools to enhance their knowledge and awareness on this subject. As an example, patient 7 stated:

“[…] In the hospitals, it would be nice to receive education and psychological support to deal with hair loss. It would be nice to have such information disseminated through TV or pamphlets... The information is needed not only about procedures being already done for us but also about all the other services in this hospital. This could be very helpful.”[id7]

Theme 2: Patients’ self-management needs

Theme 2 focuses on the needs encountered by patients in effectively managing their pain. Specifically, it includes sub-themes of (2.1) “Psycho-social support”, (2.2) “Care-related needs”, and (2.3) “Shared decision-making”. Patients perceived these needs as being met or unmet based on their experiences.

Regarding the first subtheme, patients reported a fundamental need for support about their emotions and sentiments, sometimes not well captured during medical consultation. For instance, some patients voiced discontent with the lack of acknowledgment, understanding, trust, and reassurance exhibited by doctors. Moreover, they felt unheard. These unfulfilled needs can be categorized as psychological needs (2.1a), often leading to frustration and anger when left unaddressed. The following example provides a glimpse into patients’ firsthand experiences.

“If I complain, it’s not because I want to be a victim or because I can’t cope with the chronic pain in my knee... I know what I’m going through, and I do not complain because of being volatile... They indeed leave you the email and contacts, but you can’t nag the Doctor, ‘Sorry, but I’m in pain, I’m in pain here’. “[id4].

A particular emotional need well expressed by the patients was hope. Specifically, some patients emphasized the significance of hope in confronting the challenges they encounter, conveying a sense of fatalism, hoping that fate would favor them. In contrast, others wished for research advancements and the ability to control and manage their cancer for a better future. Patient 5 provides a definitive statement:

“When I consider that I should endure another three years of treatments... sometimes I even contemplate giving up. But whatever will be, will be... so I hope everything will turn out for the best. I will endure it, knowing it will take time, and I hope that ongoing research will yield valuable insights. I hope it will provide us with a lighter situation... excuse me, my voice is shaking a bit because I feel like crying... I hope this will end so I don't have to face another infamous five years.”
Therefore, patients emphasized the need for psychological support. They initially voiced concerns about the lack of information regarding available psychological services and stressed the importance of accessible information. In addition, patients advocated for including specialized psycho-oncology services as an essential component of cancer care across all cancer institutions. They highlighted the crucial role of expertise in psycho-oncology, considering the unique challenges cancer patients face. It is important to note that patients often experience feelings of shame regarding their circumstances, and seeking help may leave them vulnerable, potentially exacerbating their distress. Moreover, patients expressed the significance of extending these support services to caregivers who actively participate in their journey and undergo noticeable personal changes. Patient 5 eloquently summarized this sentiment:

“I believe there have been times when I needed psychological support... I think psycho-oncology should be an integral part of the treatment plan. In any case, cancer patients experience significant impacts on their lives. It [referring to psychological support] should be given the same importance as check-ups with a senologist, oncologist, or other specialists... But the reality is that it's not often discussed. Some individuals feel ashamed to admit they require this support. [...] Caregivers also require psychological support... I've noticed changes in my husband.”[id5]

While grappling with the challenges brought forth by a chronic condition, another support need expressed by patients was related to the experience of navigating independence loss (2.1b) with their partner. This need aptly encapsulates the profound shift from independence to dependence experienced by patients during the disease experience. The following patient words well summarized this matter:

“There are moments when I think I could tell my partner to live another life because I feel like a burden. I wanted to slap myself for having such thoughts. But I expressed them because, at some point, I felt like I was becoming a limitation for him. Yet, he always tells me, 'We're in this together; we'll face it together. It's not just your struggle; it's mine too.' So, we move forward together.”[id5]

Patients also highlighted the need to receive support from the workplace (2.1c). Specifically, they expressed the desire to have workplaces that understand and accommodate their unique needs, allowing them to continue working while managing their health condition. They stressed the significance of receiving necessary support, flexibility, and reasonable accommodations to ensure their well-being and sustained employment.

Moreover, patients reported the need to share experiences with individuals who have gone through similar situations (2.1d). They expressed that it is often only with those who have had similar experiences that they feel comfortable opening up, as they perceive being understood, listened to, and free from judgment. Patients not only reported the wish to share experiences with other patients but exhibited it behaviorally, too, asking other patients in the focus group about their treatments and side effects. The following extracts exemplify this:

“How is it with the pill you take once a week? Because they [the doctors] told me that the only side effect is that it deteriorates the bones.”[id13]
Furthermore, patients highlighted that this sharing allows for emotional expression and creates a sense of community. Recognizing the value of such connections, patients recommended the implementation of a forum where users can openly share their experiences with others who have faced similar circumstances. The following patients shared their thoughts on the matter:

"I think it would be beneficial to have forums specifically for patients of this hospital categorized by diseases. We could have sections for breast problems, uterine problems, and other areas. It would be beneficial not just for psychological support but also to alert each other if there are any alarming signs. For example, if someone says, 'I had the same experience, and it turned out to be serious,' it could prompt others to seek medical attention. Having such a forum would be truly valuable." [id1]

"In the family, they all reacted badly, even friends; however, over time, I realized that it's one thing to talk to a person who has gone through a similar experience as you. [...] It's another thing to discuss with someone with no such experience, even if they are family members. Because nobody besides you [referring to other patients in the focus group] can understand what I'm going through, what we're going through." [id4]

The second subtheme was about care-related needs (2.2). Regarding this, some patients emphasized a significant requirement addressed through the continuity of care (2.2a). Specifically, they highlighted the importance of ongoing support following recovery, which encompassed receiving home assistance and adhering to recommendations for physical rehabilitation and exercises. The importance of physical activity was once again emphasized to cope with and manage pain, sometimes even conflicting with suggestions from one's romantic partner. The following extract serves as an example:

"When I keep moving, walking, even just around the house, my husband tells me to take a break. Paradoxically, it's worse because if I truly stop, it's the end. That's why the only solution is to stay active, even on Sundays." [id13].

Moreover, patients were concerned about disease management (2.2b). Interestingly, remembering numerous appointments often overwhelms them, and needs more tools to address this issue effectively. Consequently, this situation can worsen their condition, as they worry about their illness and remember various related tasks. Patients also emphasized the importance of receiving patient-centered care for pain management, including long-term monitoring and information aligned with their preferences and needs. To address these needs, patients suggested implementing an eHealth tool, such as a mobile application (App), which would not replace the doctor-patient relationship but provide continuity of care after recovery and alleviate the feeling of complete isolation.

Regarding the features of this App, patients suggested having comprehensive information about pain management and strategies. They also highlighted the importance of maintaining a diary to self-monitor their condition, enabling them to track improvements or worsening symptoms. Additionally, they envisioned the App as a platform for consulting with their doctors, reducing the barriers imposed by context and society. Patients also viewed the App as an opportunity to engage in meditation sessions or
access exercises for pain management. The App's interface must be user-friendly for all individuals, as patients emphasized that a burdensome interface would deter them from utilizing it as a helpful tool. They also stressed the importance of having an expert available to assist in urgent situations. The following examples offer firsthand insight into the experiences shared by patients regarding this matter.

“[…] some apps that would ask me to make notes in the form of a diary in which I would also speak about psychological aspects rather than physical, the pain, etc., [...] This could also indicate some alarming changes happening in you. Knowing there is communication, even if indirect or technological, would make us feel better. The perception that someone has taken us by the hand carries on, even if they are not there. […] An app where I could report perceptions or experiences related to various states of my being.” [id3]

“I made a pain diary. I had just pages and pages with dates, hours, and activities. I did it because when you go to the doctor, you cannot tell them: ‘I have pain’. I had the pain of getting in the car to go up the stairs. I mean, I was prevented from doing several daily activities. So, I believe an app where you can write about all of this could be helpful.” [id16]

The third subtheme was about the need for shared decision-making (2.3). Patients emphasized the importance of actively participating in decision-making and having meaningful discussions with their doctors. Patients expressed frustration over insufficient time during consultations, which often results in their inability to fully express their symptoms and concerns to their doctors. Additionally, they find it challenging to receive all the necessary information regarding the benefits and risks of various treatment options and to have adequate time for thoughtful consideration. As a result, they perceived an imbalance in the roles between them and doctors, with decisions being made without prior consent or meaningful collaboration. Patients believe that a more inclusive and collaborative approach to decision-making would better meet their needs and improve the quality of their care. For instance, patient 3 shared her experience:

They don't tell you what will be waiting for you in the short term, in a month, in the long term, 24 months. [...] They speak of the present, but sometimes it's not enough. If I had known, if I had been made aware, of the trouble I was heading to, I would have made different choices.

**Theme 3: Patients’ preferences and perceptions of pain management**

Theme 3 delves into the preferences and perceptions of patients regarding pain management. It comprises three sub-themes: (3.1) "Treatment preferences", (3.2) "Institution preference", and (3.3) "Decision role perception".

Under the first sub-theme, patients grappled with determining the most suitable treatment for themselves. In this context, they debated prioritizing pharmacological treatments over their personal preferences (3.1a). Discussions revolved around the various prescribed medications, such as antibiotics, cortisone,
ointments, morphine plasters, and other painkillers. Patients expressed concerns about experiencing more side effects from these medications, which heightened irritability, frustration, and dissatisfaction instead of alleviating pain. They also expressed unease regarding the temporary relief provided by painkillers, as the pain persisted daily. As an example, patient 12 said:

I cannot go on anymore with all the drugs.

In cases where pharmacological treatments fail to yield the desired results, patients may consider and be suggested alternative treatments (3.1b) for pain management. However, it should be noted that not all patients are offered these alternatives (acupuncture, psychological support, holistic practices such as reiki, yoga, and pilates), except for physical activities (walking and swimming) and massage, which are specifically mentioned in the medical report. The availability of alternative treatments depends on individual circumstances and the effectiveness of painkillers in addressing the pain. Another challenge patients raise is the lack of awareness about the services available, as they are often only introduced once other options have proven ineffective. This lack of clarity surrounding pain treatment further complicates the situation. Patients emphasized the urgent need for personalized interventions that cater to their preferences and requirements, echoing the sentiments expressed in the next subtheme. The following patients shared their thoughts on the matter:

"I remember I used to tell the physical therapist: ‘Take my arm’, because, as [name of another patient] said, I had a piece of cement instead of an arm. I used to say: ‘Take my arm and move it because if I have to do it myself, I stop right away due to pain’. So, you would say in these services: ‘Okay, it’s the first time for me, I’m hurting; whom can I lean on, what do I need?’ and the answer would be: ‘Here’s this; here’s what we offer’.” [id4]

“My life companion for ten years now is physical activity. It’s not so much, but I always walk and avoid taking the elevator...if I go somewhere within walking distance, I walk. It’s my life partner: physical activity. [...] I do it along with other drugs. So, I took it as a medicine.” [id12].

Lastly, regarding treatment preferences, some patients found that integrating treatments (3.1c) offered an ideal approach to pain management. They viewed pharmacological treatments as pills to be taken when necessary while recognizing that other desires may take precedence over pain relief. In this perspective, pharmacological treatments were no longer seen as the primary focus but as one component in their overall care.

The second sub-theme related to institution preference (3.2) encompasses the patients’ desire for a personalized intervention (3.2a) rather than a one-size-fits-all approach. Patients expressed an appreciation for individualized care that considers their unique characteristics, needs, and preferences. Additionally, they emphasized the importance of being followed in a breast unit multidisciplinary center (3.2b), where they can receive comprehensive care from a team of healthcare professionals specializing in breast cancer. They value the expertise and collaboration of specialists to provide holistic and
coordinated care throughout their treatment journey. Here's an example quote from a patient that exemplifies these sub-themes:

“I preferred to come to this hospital since there is a significant difference in treatment between hospitals. Even though they say you can do the same things at their place [referring to the general hospital], they sometimes need to follow the protocol. They follow the existing general protocol, whereas, at this hospital, it can be tailored. So, it is more specific.”[id10]

The last sub-theme refers to the role perception of patients in their decision-making process (3.3). Specifically, three roles emerged from their narratives: collaborative (3.3a), active (3.3b), and passive (3.3c). Regarding the collaborative role, patients emphasized their preference for shared decision-making, where they and their doctors play an active role. Patient 9, for instance, shared her desire for involvement in the decision-making process. She highlighted the importance of not simply saying "yes" or "no," but expressing her reasons and needs. Patient 9 expressed gratitude for the understanding that medical circumstances can occasionally restrict the available choices, resulting in their agreement to a specific option. Here is her statement:

“[…] so, I fought for that not to happen, but I did well to listen to them in the end. Otherwise, I would be very prone to recurrence. So, I'm thankful that they convinced me. I'm a pretty tough one...Having agreed to the mastectomy, I didn't think the nipple would go away either - you see, in my head, I did not expect it... But they have informed me about this, so I put it off, but then I was convinced; [...]. I am thankful it went well. As for how they approached my pain was explained to me that it was due to the surgery. So, it was nobody's fault.”

As for an active role, patient 15 mentioned that she always played devil's advocate. The difference from the previous collaborative role lies in the patient's perception of their proactive involvement compared to the more passive role of the doctor. Patient 15 actively questioned and challenged the proposed options, seeking additional information and participating in decision-making. However, looking back, the patient now regrets rejecting the reconstruction procedure and the consequences she is experiencing. Instead of feeling grateful for her active role, she realizes the potential negative impact of their decision and expresses remorse:

When it came to the reconstruction surgery, I've always been antagonistic...But, it was for me...I damaged myself by not trusting them. Accepting this kind of procedure... seemed to me too invasive. So, I went mad about deciding and in the end, I said: 'Listen, I'm going to leave my back the way it is'. [...] however, now...maybe I'll have another visit with a plastic surgeon, let's see.

Lastly, the passive role was exemplified by patients who demonstrated complete acceptance and resignation to medical decisions, often using passive narratives to express their experiences. For instance, one patient's account serves as an illustrative example:
“I was under the impression that I only had to do the radiotherapy. But instead, after the multidisciplinary meeting, they decided to have me do chemo as well...The pains have decreased a little bit; however, I realized that my oncologist did not want to change the therapy and preferred to go on with Letrozole, so I put my mind at rest; I continued to take Letrozole, which is what I'm taking now.”

Discussion

This work delves into three significant themes: the challenges, self-management needs, and treatment preferences and perceptions surrounding chronic breast cancer pain and its management. Each subtheme represents points that patients spoke of regarding these three themes. It is essential to emphasize that the themes and sub-themes should not be perceived as isolated entities but rather as interconnected elements forming a continuum. Each theme and sub-theme should be understood within the context of this continuum, where needs and preferences emerge in response to the presence of obstacles in breast cancer pain management.

This is the first qualitative work focusing on the chronic pain of breast cancer survivors. With the use of focus groups, we were able to go in-depth about their personal needs and emotions, which are sometimes difficult to assess with other quantitative methods, such as questionnaires [20]. Specifically, patients often are reluctant to report their pain, underestimating it and calling it “a normal nuisance”. We came across this simplified description of pain during the participant recruitment process; however, this reluctance disappeared when they were in the group interaction. Patients were prone to open up without hesitation. This is in line with observations of Peretti-Watel [8], who found that patients extensively described their experiences and reported significant pain intensity when asked verbally.

Interestingly, however, patients’ reporting of pain diminished when assessed using quantitative scales. This observation aligns with our understanding that a plausible explanation for this disparity lies in the normalization of pain. Misconceptions, such as perceiving pain as an inevitable part of the recovery process or a chronic condition to endure, may contribute to this phenomenon. Additionally, as emphasized by patients, another hindrance arises from the inclination of doctors to normalize pain, viewing it as a secondary symptom that will naturally subside over time. This dismissive attitude amplifies patients' apprehension and distress while impeding their access to essential pain relief, thereby exacerbating the difficulties in adequately addressing their pain management needs. This aspect is part of the doctor-patient communication barrier, specifically related to doctors' approach to pain and its management. As it has also been emphasized in the literature, there is still a need to solve the knowledge deficiencies in cancer pain management among healthcare providers [4, 21, 22]. A recent systematic meta-synthesis [10] showed that patients consistently voiced the need for increased focus on pain management. Indeed, patients communicated that doctors prioritized the cure of cancer, with addressing pain as a secondary concern [23]. Insufficient education emerges as one of the predominant obstacles to effective pain management, affecting healthcare providers and patients. For example, in another qualitative study [24], it has been shown that breast cancer patients did not expect that their pain would
persist after surgery, complaining about the fact that appropriate information about pain or risk of persistent pain after surgery wasn't given at the time of recovery and follow-ups.

Moreover, as our patients empathized, they also need to be informed about the available services and tools for managing pain and different options for treating pain (i.e., pharmacological and nonpharmacological treatments). As highlighted by Deng [25], there is a need for multidisciplinary and biopsychosocial approaches in cancer pain in which the preference of patients will be heard, and their cultural background and belief system will be considered. By enhancing patients' awareness, it is possible to alleviate the uncertainty associated with the numerous challenges of pain management. This includes addressing concerns about the condition and alleviating worries about the future, as patients frequently experience such sentiments [26]. The uncertainty takes shape as a series of “what-if” scenarios entwined with cancer, accompanied by the anguish and apprehension it brings. For example, they think about whether cancer will spread, diminish, or reappear. Additionally, they grapple with uncertainty surrounding the myriad of cancer treatments and procedures and the duration and origin of the pain they endure.

According to a recent systematic review [27], interventions aimed at managing uncertainty encompass a diverse range of components, with information support playing a pivotal role in uncertainty management. Given the significance of pain management, it is vital for healthcare professionals to possess insights that inform the customization of interventions for patients grappling with uncertainty, particularly in the context of chronic pain. In this regard, eHealth tools present a potential avenue for implementing such interventions [28–31], as proposed by patients during the discussion as well. This eHealth tool can play a crucial role in facilitating the transition from hospital to home care, fostering a smooth and uninterrupted continuum of care. Doing so helps bridge the gaps between these two healthcare settings, ultimately reducing disparities in healthcare services and providing access to all patients, regardless of contextual and societal barriers. However, as patients highlighted during the discussion, this tool should not replace the relationship with the doctor, which is key for effective satisfaction with care management. The findings of this study indicate that when patients perceive support and empathy from their doctors, it breaks down barriers in the doctor-patient relationship, establishing a safe environment where they feel comfortable expressing their emotional and physical pain. Particularly in this context, patients expressed gratitude towards their doctors for providing comprehensive support, alleviating their concerns, and encouraging them to discuss their worries about pain openly. Consequently, this strengthened their trust in their doctors. This result aligns with a recent meta-analysis [32] that demonstrated positive outcomes for cancer patients, including reduced psychological distress and higher patient satisfaction with care. These improvements were observed in relation to patient-reported physician empathy.

The need for support extends beyond healthcare providers and encompasses primary caregivers as well. Our study reveals that patients' sense of independence is disrupted when they confront a chronic condition. This loss of independence leads patients to recognize that they are not traversing this journey alone. Instead, they come to acknowledge the indispensability of others, which we previously referred to as the co-dependence effect in our work [2], perceiving themselves as a burden to their partner [26]. In
accordance with the Systemic Transactional Model [33], when two partners navigate a chronic illness, interdependence, and mutuality come into play. This means that the stress experienced by one partner invariably impacts the other. Still, it also signifies that one partner's resources augment the other's resources, fostering the creation of new synergies.

An additional source of support emerges from individuals who have undergone similar experiences. As highlighted earlier, patients perceived the focus group discussions as a valuable platform to express their emotions and feelings, emphasizing that only those who have lived through comparable circumstances can truly comprehend their journey. This form of connection and support can be described as emotional exposure, where patients can authentically share their emotions, thoughts, and experiences with others. This process allows them to express their struggles, fears, hopes, and desires in a safe and accepting environment. The shared experiences foster a sense of belonging and offer reassurance and support during times of hardship, as demonstrated in other studies [26, 34–36]. The forum was proposed as a possible solution that could serve as a space to be in contact with peers, providing a space for mutual understanding, empathy, and exchanging knowledge and support. Specifically, it has also been demonstrated that these online groups may serve as a tool for empowered patients to manage their chronic disease [37].

In accordance with a recent meta-synthesis of qualitative studies [10], it has been emphasized that healthcare providers should focus on supporting the patients by considering their needs and preferences rather than trying to manage them. A primary concern in medical practice should be providing patients with information, enabling them to participate in their medical decisions actively. This approach aligns with the concept of shared decision-making, which is considered a new paradigm in the doctor-patient relationship and represents the essence of patient-centered medicine [38]. Shared decision-making involves patients and doctors considering the best available evidence when faced with decision-making tasks while also supporting patients in exploring options to achieve informed preferences. Another important aspect to consider in shared decision-making is how active/engaged or passive/disengaged patients prefer to be when it comes to making medical decisions. In fact, considering their preference may prevent the future regret they may experience regarding these decisions [39]. In the current study, patients express the need for collaborative decision-making with their doctors, where they can actively participate and be involved. This need is crucial to ensure patients' concerns are addressed and their voices are heard.

**Limitations**

This work has several limitations. First, detailed socio-demographic information (e.g., education level, marital status, employment) was not collected, as well as the cultural background was limited. When interpreting this work, it should be considered that all participants were Italian and of the same cultural background. We cannot claim that all concepts shared will apply to different cultural contexts. Additionally, it should be noted that descriptors and reports concerning pain characteristics were self-reported and not based on a clinical examination. Data pertaining to pain type, experienced sensations,
specific body parts mentioned, and administered medications were solely derived from patient narratives, which may have been incomplete for certain individuals.

**Conclusion**

In conclusion, this study highlights the interconnected nature of challenges, self-management needs, and treatment preferences in chronic breast cancer pain management. Patients' reluctance to report pain and the normalization of pain contribute to the disparity between their perceived pain and quantitative assessments. The dismissive attitude of doctors towards pain further hinders effective pain management and underscores the need for improved education and knowledge among healthcare providers. Our work emphasized the importance of informing patients about available services and treatment options and the need for multidisciplinary and biopsychosocial approaches that consider their preferences, cultural background, and belief system. Addressing uncertainty associated with pain management and providing information support is crucial in alleviating patients' concerns. eHealth tools present potential avenues for intervention and can facilitate the continuity of care between hospital and home settings. However, it is essential to maintain the doctor-patient relationship as a key aspect of effective care management. Positive outcomes are observed when patients perceive empathy and support from their doctors, leading to reduced distress and higher satisfaction with care. The study also highlights the role of primary caregivers and the importance of peer support through forums and online communities. Healthcare providers should promote shared decisions and active patient involvement in their medical decisions to address patients' preferences and needs effectively. Collaborative decision-making ensures that patients' concerns are heard and their voices are valued in their pain management journey.

**Declarations**

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**Conflicts of Interest**

None declared.

**Author contributions**
CF, MM, and GP contributed to the study's conception and design. CF performed material preparation, data collection, and analysis. FD supervised focus groups discussion. Generated codes and themes were discussed among CF, MC, DM, and EF. MC contributed to the analysis part, revised by DM. CF performed the first manuscript draft, including figures and tables. GP supervised all the work. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

References


Figures
Figure 1

Breast cancer pain markings on the body map

Notes. The figure displays color shading to represent the number of patients who reported pain in different body parts. Lighter colors indicate fewer patients reporting pain, while darker colors indicate more patients saying pain. The x and y axes denote the coordinates of the reported pain locations. It's important to note that color shading is associated with the number of patients reporting pain in each body part rather than the intensity of the reported pain. Additionally, the body parts were reported irrespective of whether they occurred on the left or right side.
Figure 2

Map of themes derived from the qualitative thematic analysis

Note. HCPs=Healthcare providers; Pharmac.=Pharmacological. In the figure, the use of different colors (green, purple, violet) represents the three main themes that have emerged from the thematic analysis. Unidirectional arrows have been employed to connect each main theme with its corresponding...
subthemes. Additionally, bidirectional arrows have been utilized to indicate connections between subthemes belonging to different main themes. The color-coded and directional arrows help visualize the relationships and interconnections between the themes and subthemes identified in the analysis. It's important to note that the first two levels represent the main themes and sub-themes, whereas the third level is the related topic.